1. 9:30 A.M. Agenda

   Documents:

   2023-03-02 City Council WS And Regular Meeting.pdf

2. Meeting Material

   Documents:

   Goals Definition.pdf
   Administrative_Policy 1 Goal Setting.pdf
   ODOT Community Charging Corresp.pdf
   2023-03 Womens History Month.pdf
   Water Dept. Report.pdf
   SWLCWPUD WMP Ad..Pdf
   Yachats DWPP Monitoring Plan.pdf
   Yachats Conservation Encouragement.pdf
   Yachats WMCP.pdf

3. Additional Documents Added After Meeting

   Documents:

   Cheris Karamarae Intorduction.pdf
   Preliminary Goal List.pdf
   Carey Goals 2023.Pdf
   City Council Road Map 2023 Suggested By Mayor Berdie.pdf
   Mayor Berdies Input 2023 Council Goals.pdf
   OShaughnessey 2023 Council Goals.pdf
   Scott - Goals.pdf

CITY OF YACHATS
CITY COUNCIL WORK SESSION AND REGULAR MEETING
Yachats OR
Thursday March 2, 2023, at 9:30 am
To Be Held Via Zoom & In-Person

Join Zoom Meeting
https://us02web.zoom.us/j/84651149572
Meeting ID: 846 5114 9572
One tap mobile
+16699006833,,84651149572# US (San Jose)
+12532158782,,84651149572# US (Tacoma)

AGENDA

Council Work Session

I. Goals

Immediately Following Work Session - Regular Council Meeting

I. Announcements, Proclamations, and Correspondence
   a. ODOT Community Charging Rebate Program
   b. Women's History Month Proclamation

II. Public Comment - limited to items not on the agenda
(5-minute limitation per person)

III. New Business
   a. Appoint new member to Budget Committee
   b. Status of Local Wetland Inventory – City Planner, Katherine Guenther
   c. Address Modifications of Administrative Policy #1

VI. Ongoing Business
   a. Water Report, Water Lead, Rick McClung
   b. Schedule Housing Implementation Plan Joint Work Session (Council with Planning Commission)

IV. Other Business
   a. From Mayor
   b. From Council
   c. From Staff

The Yachats City Council meetings are open to the public and interested citizens are invited to attend via Zoom. These are open meetings under Oregon law, but a work session is not a community forum; audience participation is at the discretion of the Council. Meetings are audio-recorded. The meeting are accessible to persons with disabilities. For accommodations, please call (541) 547-3565, or Oregon Relay 1-800-735-2900 TDD) two days in advance. City of Yachats does not discriminate on the basis of race, color, religion, creed, gender, national origin, age, disability, marital or veteran status, sexual orientation, or any other legally protected status. Sign language or foreign language interpreter may be available, with advance notice. Call City Hall at 541-547-3565 or Oregon Relay 1-800-735-2900 (TDD) two days in advance. POSTED

Thoughts About Goals

After reflecting on the end of the last council meeting and the task yet ahead of us to finish the goals process, we believe there is a need to shift gears, step back and push for an acceptable definition of what a goal means. Failure to do this will continue to consume time as we continually debate what is administrative. Perhaps a starting point could be each of us look up the definition of a goal.

Goal Definition Examples:
Merriam-Webster: A goal is the end toward which effort is directed.
Dictionary.com: The result or achievement toward which effort is directed.
Wikipedia: An idea of the future or desired result that a person or a group of people envision.
Referenceforbusiness.com: A future state that an organization strives to achieve
Study.com: The objectives that organizations are seeking to achieve

What is the difference between goals and objectives? The main difference is that objectives are precise actions or measurable steps individuals and groups take to move closer to the goal.

Council Goals
Goals should be broad based outcomes the council wants to achieve. They should not focus on how, when, where or who is responsible for the outcome. By definition, it should be the council's responsibility to achieve these goals as we formulate policy, approve regulations, review and approve the budget and consider city support for requests. It is very likely that goals will change very little from one year to the next. It is desirable that goals be measurable when that is possible.

Examples of possible council goals :

To achieve water sustainability.

To deliver efficient, effective, transparent municipal services.

To provide safe access to and use of city infrastructure, trails, parks.

To be environmentally responsible in all that we do.

To effectively manage and plan for the city's financial needs.

To synchronize and update city policies and administrative rules

Housing - I am struggling with this one. While I understand why it is important, I am having difficulty connecting it to our mission and Charter. All of the current items are objectives. What is the goal? The city's main role in housing is land use (zoning) and complaint regulations. Given the lack of human support services in our area, are we saying that there is a role for the city to fund and support basic services for those in need? If so, perhaps we should be thinking about a community discussion around this topic. I can see this as an area the city could partner with the Presbyterian church where they provide the leadership for services and the city functions as the financial agent as we recently did for homeless shelters.

Goals should be easy to remember. Staff and commission members should be encouraged to consider council goals as they engage in their work. Instead of asking commissions for goals suggestions, we might consider asking commissions to propose objectives. This would give commissions a more direct and active role in the work that needs to occur to achieve goals and this process is more consistent with goal planning processes other organizations use.

Possible motion : I move that administrative policy #1 for Goals be modified to reflect that they are council goals and reflect broad based outcomes that the council believes the city needs to achieve.

Submitted by: Ann Stott and Greg Scott 2/22/23

CITY OF YACHATS

ADMINISTRATIVE POLICY NO. 1	**ANNUAL GOAL SETTING**

OBJECTIVE
To facilitate an orderly process for handling short and long-term projects and concerns within the City's jurisdiction and to lay a basis for the new year's budget.

SCHEDULING
At the beginning of each calendar year, the City Council shall hold a public Goal Setting Work Sessions in conjunction with the appropriate City Department Heads. City Council shall meet in January.

PROCEDURES AND OBJECTIVES

1. **Goal Input.** During the proceeding November, the City shall solicit comments from Commissions, staff, and the community for additions to and amendments to City goals.

2. **Review**. The City Council shall consider community strategic needs, review existing goals as they relate to those needs, and revise goals as appropriate.

3. **Scope of Considerations.** Goals may be both short-term (1-5 years), and long-term (5-20 years). Council shall rank the goals in priority order.

4. **Budget Considerations.** Adopted goals shall serve as preliminary groundwork for proposed budget recommendations.

5. **Timetables.** The council shall set realistic timetables for accomplishing goals after consultation with appropriate commissions and staff.

6. **Implementation.** Appropriate Commissions and Department Heads shall prepare implementation plans for each City Goal Action and written evaluations shall be conducted every six months to measure progress.

7. **Mid-Year Review.** In June or July, staff and commissions shall review progress on goals and make adjustments and recommendations as needed.

Correspondence to the Mayor

Brittney Breen <brittneybreen@forthmobility.org>

My name is Brittney Breen and I work on the Access-to-Charging team at Forth, a non-profit organization dedicated to the equitable advancement of clean transportation.

It is my pleasure to announce to you the upcoming launch of the Oregon Department of Transportation's (ODOT's) Community Charging Rebates (CCR) program. The CCR program aims to increase access to Level 2 charging stations in Oregon communities to encourage widespread EV adoption. Rebates will be offered to public and private entities to reduce the cost of purchasing, installing, and maintaining qualified Level 2 charging equipment at publicly accessible parking locations and multi-family housing (MFH) throughout Oregon. Level 1 charging station rebates will also be offered at multi-family housing only.

ODOT has contracted with Forth to implement an Outreach, Education and Technical Assistance Program to increase awareness of the CCR Program and to reduce barriers to access for priority applicants. We would love to meet with you to discuss how Forth can support you in leveraging these funds to reduce the cost burden and promote the installation of charging infrastructure.

You can find out more information on ODOT's website:
https://www.oregon.gov/odot/climate/Pages/communitychargingrebates.aspx

In addition, Forth is hosting biweekly information sessions on the rebate. You can register on the Forth website: https://forthmobility.org/Community%20Charging%20Rebate

If you have questions about CCR or are interested in potential partnership opportunities related to Forth's Outreach Program, you can contact Forth's Program Manager, JR Anderson, at jranderson@forthmobility.org. If you would like to stay informed about CCR program news, sign up for ODOT's EV listserv.
Sincerely,

Brittney

FORTH Empowering Mobility
BRITTNEY BREEN *(she, her, hers)* | Program Associate
C: 360.831.7065
FORTHMOBILITY.ORG

On Wed, Feb 22, 2023, 3:40 PM Janette Square <janettesquare@gmail.com> wrote:

Good Afternoon Mayor and City Council,

I'm writing to you regarding the street lights that were removed a week or so ago. At first I thought the bulb was out on the one out in front of our house. After a few days, I went out to get the pole number to report to CLPUD only to discover that the light and its bracket were gone entirely! I contacted CLPUD and was advised that the City recently requested they remove 4 street lights and this was one of them. They also said that it was not scheduled to be replaced and to contact the city if I had any safety concerns. I believe another one that was removed is at 7th and Ocean View, another intersection where safety is a concern, especially since this is where it changes to one way. I have filed a report on the city website.

This is a major safety concern for me and others as well. I understand that the city wants a "Dark Sky", but these lights were placed at strategic corners for a reason…safety. I live at the corner of Marine Dr. and Ocean View Dr. right at the curve. The left pointing arrow that used to be on the street sign disappeared during a storm some time ago and was never replaced. Now the street light is gone. Both are important safety features for this corner and are no longer there. Cars and semi trucks go around this corner much faster than the stated speed limit. Since the city apparently ordered them removed, I think this could be not only a safety issue, but potentially a liability issue as well.

There are other options available besides simply removing them. LED directional lighting is one. I posted in the Residents facebook group when I first noticed it was gone and was surprised at the number of comments and messages from others who also think that the "Dark Sky" initiative has gone too far. We were never notified that this or the other lights were going to be removed and had no say or input in this. I have even been contacted by a person who lives on another dark street and can't even leave her porch light on without getting complaints from the "light police". Where do we draw the line between safety and the wishes of a few people who prefer to live in the dark? The few tend to be the loudest, and therefore it is believed to be the wishes of all. This is not the case where lights and safety are concerned.

You can read the comments in the Yachats Residents group on facebook for yourself. Suffice it to say that there are more comments in favor of safety than against. The city manager commented that they received "many calls" asking that these and other lights be replaced. She also stated that no one removed the lights. The lights are gone.

This isn't the first time major issues have been acted upon regardless of, or without citizen's input. The trucks that fly down Marine Dr. never used this road until the other end of Ocean View was made one way (in the wrong direction). Now we have big heavy trucks using the very area of Ocean View Dr. that "the city" was trying to preserve in the first place. The trucks never had the need to use it before. This also requires people that live in my area to make multiple left turns on to and off of Highway 101 to return from town. As you know this can be difficult in the summer. This was done despite the input from residents and only to accommodate the trucks going into the grocery store and for no other reason. The

original consensus of the majority was to have it one way north bound if it did indeed need to be one way at all.

I hope that CLPUD is indeed mistaken and that the lights will be replaced. I trust that someone at City Hall is spearheading the effort to correct this safety issue in a timely manner. I'm curious if the complaints received came from people that are actually affected by them directly. I am affected by them directly and want them returned as soon as possible. One of the CLPUD workers I spoke to yesterday when they were here for another issue said he was actually threatened once by someone when he went to replace a burnt out street light.

Sincerely.

Janette Square
1197 Ocean View Dr.
Yachats, OR 97498

To all concerned in city decisions,

Before making the one way on Ocean View Dr it was the wild west of persons parking cars, RVs, and other things along the trail to the west of the pavement for minutes, hours, overnights, and days in some cases . It was unsafe and unsightly for all except the people parking their vehicles. Walking and/or bicycling along the edge of the pavement was scary at times due to speeding and poorly parked vehicles.

Once some action was finally taken after months and years with the introduction of the dilineators and the one way designation it appeared that all would be much better, it wasn't due to the intellectually challenged violating all logic. People would drive to the west of the dilineators and park on the paved portion of the trail to the west of side of the dilineators or in the dirt and gravel of the "pocket park areas". They ran over dilineators or drove down the paved portion west of the dilineators until reaching the "pocket park areas." After much discussion, in my opinion, the large boulders were installed, thank goodness, and have pretty much solved the parking problems.

Signage has never been adequate and still isn't with regard to trail usage by pedestrians and bicycles. A few pavement markings show an outline of a pedestrian BUT absolutely nothing about bicycle usage on the trail.

So here we are today. The paved portion of the trail west of the dilineators is about 7 foot wide which is perfect for usage of walkers and bicyclists. This idea of moving the benches to within no less of 4 foot from the dilineators has not been considered completely with respect to ALL users. It makes no sense. It is blocking 3 foot of the trail for no good reason. As the mayor said as you sit there on the bench people will be walking/bicycling right behind your head possibly striking you and at the very least disturbing your relaxation on the bench, others will be walking/cycling right in front of you disturbing your view west. That is the way it will be if you implement this proposal.

Leave the rocks or move them slightly west and place the benches line abreast with the rocks to get them away from the drop off and not on trail as proposed. Don't ruin the benches view with this poorly thought out solution. DO NOT MOVE THE ROCKS MUCH TO THE WEST OR PEOPLE WILL START ONCE

AGAIN DRIVING DOWN THE PATH AND PARKING ON THE PAVEMENT/GRAVEL DIRT AREAS BY RUNNING OVER THE DILINEATORS.

Believe me, IT WILL HAPPEN THAT WAY, it did before and it will repeat itself and be a serious safety problem.

Do it right the first time, by considering all the solutions thoroughly, or you will generate more problems otherwise.

Respectfully,

Paul Thompson
1153 Driftwood Ln
Yachats, 541-991-6774

City of Yachats

Women's History Month 2023 Proclamation

Proclamations designating the month of March as "Women's History Month" often point out that women in the U.S have not only worked for their own rights and opportunities but have also been principal advocates in every major social movement.

The theme for this Women's History Month is "Celebrating Women Who Tell Our Stories."

WHEREAS, Women's histories and stories are regularly and systematically ignored or neglected in media and educational institutions

WHEREAS, Stories help us understand the root causes of discrimination and violence against women and other often silenced groups of people such as Black, Hispanic, Indigenous, Asian, disabled, and LGBTQ+ individuals

WHEREAS, Women's history in Yachats is no different, as it includes unimaginable violence against Native Americans of the central Oregon coast that led to massive number of deaths and inter-generational trauma among those who survived. Recently there have been efforts, with the support and supervision of regional Tribes, to document some of the government-sponsored genocidal policies, and to honor the lives of the women and men native to this area (think of, for example, the creation of the Amanda and Ya'Xaik Trails).

WHEREAS, Women's accounts have been passed on from the earliest storytellers to pioneering and current authors, songwriters, playwrights and poets, including stories from the Black, indigenous, and other women of color who form the majority of the volunteer labor force and the essential workers of the nation

THEREFORE, May we resolve to learn more about women's history not only globally and nationally, but also locally. Good resources to do so are bookstores, libraries, and online accounts, as well as the local historians and social activists dedicated to telling women's stories. May we take responsibility to actively fight against current discrimination, aiming for true equality and equity.

NOW, THEREFORE, The Yachats City Council do hereby proclaim the Month of March Women's History Month.

Dated this 2nd day of March 2023

_____

CRAIG BERDIE, MAYOR

City of Yachats

WATER DEPARTMENT
500 W. 7th St.
P.O. Box 345
Yachats, OR 97498

Date: February 6th, 2023

To: Heide Lambert, City Manager

From: Rick McClung, Water Department Leader

Re: WMP and WMCP **Subject:** Next steps

This report focuses on water sustainability and water management. In addition, a path forward will be introduced.

The city has two major plans it should be following. They were written at the same time and complement each other.

1. 2021 Water Master Plan (WMP) covers the nuts and bolts of a water system.
2. 2021 Water Management and Conservation Plan (WMCP) covers management of a water system.

Below are my comments on both,

1. Water Master Plan

With the completion of 2021 Water Master Plan (WMP) it is time to start implementing CIP projects that are outlined in the 20-year plan. The majority of the CIP recommendations in the plan center around upgrades and replacements to the city's current infrastructure; distribution lines, reservoirs, booster stations, water plant and creek intakes. Only a small portion of the plan has recommendations to address water sustainability. The obtainable choices were limited at the time the WMP was written and had 3 recommendations.

- Yachats River- was included in the plan with cost estimates of near $5,000,000.
- Raw Water Storage- only the need of raw water storage was mentioned in the plan because there was no identifiable location to construct it.

- Southwest Lincoln Country Water PUD – Utilizing the PUD was only mentioned because there was no agreement with the PUD beyond emergency use. The plan recommended obtaining agreements for water usage beyond emergency use.

For a variety of reasons, the city does not wish to develop the Yachats River. This leaves the city with 2 options -raw water storage and the PUD.

Over the last year the city manager and I have been exploring these two options and a lot has been discovered on raw water storage and the PUD.

Raw Water Storage

The adjoining 8-acre property west of the water plant has come up for sale. It is an ideal location to build new raw water storage tanks on and has been identified by the city as a potential CIP and is currently in the discovery phase.

Project Concept

The city currently has a 500,000g raw water tank next to this property and this project would add more tanks to the area creating essentially a reservoir farm. Rough guess is the site could hold a total of 1.5 million gallons giving the city a total of 2 million gallons of storage. Project cost estimate: $4,000,000+

Southwest Lincoln County Water PUD (SWLCWPUD)

The city has an intergovernmental agreement with the PUD and an interconnection between the two water providers. The agreement stipulates that the interconnection can only be used by the city for emergency purposes, such as a water shortage, and it is not intended to be used as a supplemental water source on a regular basis.

The intertie at the north end of the limits was developed about 20 years ago, we are each other's backup plan in case of water emergencies. Outside of emergencies, the PUD doesn't need the city's water, but the city needs water from the PUD.

The PUD has amazing water sources and I have seen all 4 of their water intakes at the end of summer, it's easy to see how they could supplement Yachats and Waldport's water needs well into the future.

The city manager and I have been working to develop a strong relationship with the PUD and a lot has been happening in the background. Over the last year we have made progress and we have positive results to report.

The city manager has been working with high level stakeholders like the PUD board president, County Commissioners and State Representatives. I started temporarily helping PUD run their water plants as they go through staff transitions and have developed a good working relationship with the PUD manager. The city manager and I have been transparent with the PUD by saying the city wants the PUD water and how do we do this?

The PUD recently created new 20-year WMP to upgrade and replace their infrastructure. The WMP did not include the infrastructure needed to supply Yachats with water as a permanent customer.

The PUD manager tasked engineers to create an addendum to the WMP to identify how much water the PUD can provide to Yachats and Waldport, and the cost of the infrastructure needed to do it.

The addendum identifies the PUD can supply Yachats a maximum of 300 gallons per minute/ 432,000 gallons per day/ 12,960,000 gallons per month. This is more than enough to supplement the city's future water demands. The cost of the infrastructure needed to supply this water could be a few million dollars and in addition there will be added staff cost to operate the water treatments plants.

Water Management and Conservation Plan

The purpose of the Water Management and Conservation Plan (WMCP) is to describe the City's strategy for providing a reliable water supply through the implementation of existing and additional water management and conservation policies and programs.

The city developed this WMCP in tandem with the city's WMP. Data sharing and coordination occurred during development of both plans to ensure consistency among the documents. Consequently, portions of this WMCP draw from information developed for the WMP.

The WMCP fulfills the requirements of the Oregon Administrative Rules (OAR) adopted by the Water Resources Commission in December 2018 (OAR Chapter 690, Division 86). It describes water management, water conservation, and curtailment programs to guide the wise use and stewardship of the City's water supply.

Final Recommendations

Southwest Lincoln County Water (PUD)

The city manager and I both agree this is the best option and should be further pursued. The PUD is understanding of the cities desire to begin negotiations and are ready to talk.

Before entering negotiations, a couple items need to be noted:

- The PUD has not and nor do they ever wish to be involved in the Mid-Coast Water Partnership. The city's goal needs to be kept simple- all we want is to be a permanent customer of the PUD.

- The city will need to financially contribute to the PUD's infrastructure development. Our cost may end up costing as much as a raw water storage farm or the Yachats River intake.

Hopefully after our meetings with the PUD some sort of deal structure will begin to form. This is when we will need professional and volunteer help.

Professional

- Attorney- There will a considerable amount of law work involved.
- Engineer- WMP will need an addendum that is focused on projects that enhance infrastructure for long term use of the PUD water.
- Consultant- Yachats might need guidance to help steer the ship.

Volunteers

Public Works and Streets Commission

- Help with the WMP addendum that is focus on the PUD.
- Restructure the 5–20-year priority list of CIPs as upgrades and replacements to the city's current infrastructure; distribution lines, reservoirs, booster stations, water plant and creek intakes still need to happen.

Finance Committee

- CIP expenditures will need to be planned for in conjunction with the new 5-20-year plan.
- When the day comes the city uses PUD water more routinely, water revenue will need to be analyzed and rates may need to be adjusted.

Raw Water Storage

A contingent offer will need to be made on property that stipulates the property needs to pass an expansive Geotech study first. Cost of Geotech study is $40,000.
I recommend putting the concept of raw water storage on the shelf for now until the city knows more about the opportunity to use PUD water.

Help Needed
Volunteers- Consider other uses for this property. It's out of the tsunami zone and could be used for purposes such as public works equipment storage and/or relocating the water treatment plant.

Water Conservation
I recommend that the city make this plan part of its institutional memory and start being reviewed so action can start taking place on the responsibilities and elements of being a municipal water purveyor.

Help Needed

Volunteers
Public Works and Streets Commission

- Review the WMCP
- Define a list of tasks that resulted from the review.
- Delegate tasks to a task force as needed

Thank you,

Rick McClung

PHONE (541)547-3565 RELAY OREGON (800)735-2900 (T.D.D.) FAX (541)547-3063
E-MAIL Rick@YachatsMail.Org WEB SITE www.YachatsOregon.org

SW LINCOLN COUNTY WATER

People's Utility District

LINCOLN COUNTY, OREGON

Water Master Plan

Addendum-Water Treatment

December 2021

www.civilwest.com | Willamette Valley | North Coast | South Coast | Rogue Valley

Civil West Engineering Services, Inc.

SW Lincoln County Water

People's Utility District

LINCOLN COUNTY, OREGON

DRAFT-Water Master Plan Addendum-Water Treatment

December 2021

Prepared by:

Civil West Engineering Services, Inc.

O:\CW_Projects\2815 SW Lincoln County Water PUD\2815-004 Water Master Plan Addendum - Water Treatment Plant Evaluaiton\03 Planning\WMP Addenda Document\WMP WTP Planning Addenda.docx

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1 EXECUTIVE SUMMARY

1.1 Introduction and Overview

On June 17, 2021 The SW Lincoln County Water PUD (District) contracted Civil West Engineering Services to develop a Water Master Plan (WMP) Addendum that specifically examined both Blodgett and Dicks Fork Water Treatment Plants. Although this document was intended to be independent of the WMP, it will build upon the evaluations found therein, and will reference the CIP developed within.

The scope of this planning document is defined below:

- Detailed evaluation and analysis of both treatment plants current conditions
- Detailed evaluations of Capacity (Current and Projected)
- Demand vs. Capacity analysis with Focus on the Blodgett Water Treatment Plant (BWTP)
- Cost of constructing a new treatment train at the BWTP
- Final recommendations regarding the need for BWTP capacity expansion

1.2 Existing Treatment Infrastructure

1.2.1 Water Intakes

There are four (4) sources of water, each source from a surface water stream: Dicks Fork, Big Creek, Vingie Creek, and Starr Creek. These creeks have proven to be very reliable water sources. Water rights appear to be sufficient for the needs of the District for the next several years; however, the District is taking proactive steps and currently seeking to acquire additional water rights for Vingie Creek.

1.2.2 Water Treatment Plants

The District operates two water treatment plants (Blodgett Water Treatment Plant and the Dicks Fork Water Treatment Plant) that were both built in 1997 and treat the raw water from the above-mentioned water sources. Both plants process the raw water through a Trident mixed-media adsorption clarifier treatment unit. Both WTPs use large reservoirs located at the WTP site for contact time. The plants use a generator for emergency power and alum, sodium hypochlorite, a polymer, and soda ash for water treatment processes.

The Blodgett Water Treatment Plant provides water to approximately 75% of the District's customers. The Dicks Fork Water Treatment Plant serves the remaining 25%. At this time, both treatment plants are adequate for the near future, although routine maintenance and upkeep is always required.

1.3 Existing and Projected Water Demands

District existing and projected demands were evaluated in addition to the potential demands generated by neighboring water systems.

1.3.1 District Existing Demands

The existing demand was developed using WTP production over the last 3 years. Average daily, max monthly, max daily, and max peak hourly demands were determined using peaking factors 1.0, 1.7, 2.5, and 5 respectively. The calculated values can be seen in Table 1.1

1.3.2 District Future Demands

To determine the demand projections a population growth rate was established by examining local population forecasts. The historical growth rate of the District was also calculated. The final growth rate used to determine demand projections was 1.0%. Table 1.1 displays the projected demands given the established growth rate.

TABLE 1.1 – PROJECTED DISTRICT FUTURE WATER DEMAND (GALLONS/MINUTE)

Demand Paramter	Peak Factor	2021	2026	2031	2041
Average Daily Demand - ADD (gal/min.)	1.0	113	119	125	138
Average Max. Monthly Demand - MMD (gal/min.)	1.7	193	203	213	235
Average Max. Day Demand - MDD (gal/min.)	2.5	283	298	313	346
Average Peak Hourly Demand - PHD (gal/min.)	5.0	567	596	626	691

1.3.3 Waldport and Yachats Water Demands

The District's water system has a tie-in into both the City of Yachats water system, and the City of Waldport's system. Both communities have expressed an interest in buying water from the District. The City of Waldport's need is less urgent, but could still be present under drought conditions. The City of Yachats had a more pressing demand. This need is a result of their primary water sources drying out during summer months. The potential demands from these communities are summarized in Table 1.2.

TABLE 1.2 – DEMAND SUMMARY FOR THE DISTRICT'S WATER SYSTEM

Demand Source	Peak Demand (gpm)	Comments
SWLPUD	346	This demand is based on 2040 demand projections
Industrial Park	106	This is a Waldport development that is within the borders of the
City of Waldport	50	This demand would only be present under extreme drought conditions, or beyond the current WMP planning period (2040)-The demand under these conditions would vary, for this study it was set at 50 gpm
City of Yachats	130	Yachats Source can drop to as low as 180 gpm, projected demand is 200 gpm, and an additional 110 gpm is required to replenish fire flows in a 72 hour period

1.4 Demand Vs. Capacity

1.4.1 Demand Summary

The demand summary was shown in table 1.2

1.4.2 Capacity Summary

To determine the needed improvements, the capacities were also evaluated. A breakdown of the capacities was completed for each water system component. The results are tabulated in Table 1.3.

TABLE 1.3 – CAPACITY SUMMARY FOR THE DISTRICT'S INFRASTRUCTURE

Demand Source	Peak Demand (gpm)	Comments
Blodgett WTP	350	This supply is based on two filter trains operating. Plant was designed to house on more train which would add an additional 175 gpm.
Dicks Fork WTP	180	The WTP capacity is 200 gpm. Water right from Dicks Fork is 180 gpm. This limits the Districts ability to run the WTP at full capacity
City of Waldport Tie-in	225	8" Tie-in with a 2" Bypass-Water can only be conveyed to Waldport from the SWLPUD through the Tie-In due to pressure differentials
City of Yachats Tie-In	300	4" Tie-in. Pump station built at the tie-in pushes water to the City of Yachats. A pressure reducer was installed at the tie-in so water can also be fed from the Yachats system to the SWLPUD
Seabrook Pump Station	160	Yachats Source can drop to as low as 180 gpm, projected demand is 200 gpm, and an additional 110 gpm is required to replenish fire flows in a 72 hour period

1.4.3 Demand vs. Capacity Evaluations

All system components currently have the capacity (this evaluations excludes pipes) to supply the demand stemming from only the needs of its current and projected users. When the demand of Yachats and Waldport is added to the total demand, the two treatment plants capacities are insufficient. To meet that demand an additional train needs to be added at the BWTP. A portion of this supply would need to be conveyed from the lower pressure system to the upper pressure system.

TABLE 1.4 – DEMAND VS. CAPACITY

Demand Sources	Total Capacity vs. Total Demand	Dicks Fork Pressure Zone Capacity vs. Demand	Demand vs. Capacity Comments
District	346/530	87/180	No Improvements are required to meet these demands
District and Yachats	476/530	87/180	No Improvements are required to meet these demands
District, Yachats, and Industrial Park	582/530	193/180	To meet this demand the capacity of the BWTP would need to be increased. For redundancy, and system stability, replacement of the Seabrook pump station would also be recommended. According to Waldport, development of the Industrial Park is not a Priority.
District, Yahcats, Industrial Park, and Waldport	632/530	243/190	To meet this demand the capacity of the BWTP would need to be increased. For redundancy, and system stability, replacement of the Seabrook pump station would also be recommended. According to Waldport, development of the Industrial Park is not a Priority. Also, Waldport demand would only be necessary under extreme drought conditions. Developing infrastructure improvements based on a demand that may never be needed is not recommended.

1.5 Water Treatment Plant Recommendations

There are considerable improvements currently underway at the BWTP. However, very few upgrades or modifications have occurred at the DFWTP. Both WTPs contain the same systems and were built at the same time. For that reason the majority of the improvements currently being done on the BWTP will also need to be done at the DFWTP at some point.

1.5.1 Recommendations Based on Conditions, and Projected District Demands

A list of improvements for both the BWTP and DFWTP are given below:

BWTP Recommendations:

- Replace existing Treated Water Pumps
- Install an additional treated water pump
- Install a magnetic flow meter downstream of the Blodgett Reservoir
- Big Creek, and Starr Creek Settlement Basin Isolation, and Automation Improvement

DFWTP Recommendations:

- Replace existing PLC/SCADA System with Rockwell Systems
- Replace WTP Desktop Computer
- Automate Water Treatment Plant to Have the Capability of Running 24-Hours a Day
- Replacement of Trident Train Underdrains
- Replacement of Trident Train Media (Sand (Silicia), Sand (Garnet), Anthracite)
- Replacement of Trident Train Suction Screen, Media Retainer Grating, and Various Gaskets
- Trident Train Refurbishment (Welding, Surfacing, Painting)
- Replace existing Treated Water Pumps
- Compressor Replacement
- Turbidimeter Replacement
- Install a magnetic flow meter downstream of the Dicks Fork Reservoir
- Dicks Fork Settlement Basin Isolation, and automation Improvement

1.5.2 Recommendations Based on Neighboring Water System Needs

As the District has not finalized whether or not they will be supplying Yachats and Waldport with water on any kind of regular basis, completing the improvements related to their needs is not recommended. However, if in the future that demand is established, the following would be recommended:

- Expansion of the BWTP-Add another 175 gpm treatment train at the WTP
- Replace/Rehab the Seabrook Pump Station.

1.6 5- Year Capital Improvement Plan

1.6.1 Capital Improvement Plan

The various raw water supply, water storage, and water distribution system improvements recommended in the current WMP and this addendum were weighted based on fundability, cost, and system need. A CIP was developed for projects recommended to be designed/constructed within the next 5 years. The 5-year CIP is shown in Table 1.5.

TABLE 1.5 – CAPITAL IMPROVEMENT PLAN 2022-2027

CAPITAL IMPROVEMENT PLAN 2022-2027				
FEMA PROJECTS				
Project Number	**Project Name**	**Pipe Length**	**Project Description**	**Item Cost**
1	Dicks Fork Tank No. 2	--	Add an additional 200,000 gallon Tank at Dicks Fork WTP Site	
2	SW Seabrook Lane	1,800	Waterline from Dick's Fork WTP to Lower Pressure Zone (North)-Primary Waterlline for Seabrook Tank-8" to 12"	
3	SW Wakonds Beach	1,600	Replace 6" Waterline from Dick's Fork WTP to Lower Pressure Zone (South)	
4	SW Tara Lane to SW Forest Lane	1,900	Replaces Aging 6" AC Pipe That Provides Looping and More Reliable Conveyance of Water From Dick's Fork Tank to the Most Northern Section of the Water System	
5	PRV Improvements	--	Fire Flows in the Lower System Can Be Provided by Dick's Fork Tank	
SHOVEL READY PROJECTS				
Project Number	**Project Description**	**Pipe Length**	**Project Description**	**Item Cost**
6	Raw Waterline From Big Creek Settling Basin to Blodgett WTP	4,400	Replace aged 8" AC Raw Waterline	
7	NE Forest Hill to NE Star Creek Dr.	1,500	Replace aged 6" AC Pipe	
8	West Side of HWY 101 -From Fernwood Drive South to Wakeetum Street	2,900	Abandon 6" AC Waterline-Reconnect Service Connections to the 10" Waterline on East Side of Hwy. 101. Relocate Fire Hydrants to the East Side of Hwy. 101	
9	East Side of HWY 101 -From Fernwood Drive North to SW Whitecap Drive	1,900	Abandon 6" AC Waterline-Reconnect Service Connections to the 10" Waterline	
10	Camp One Road	1,300	Replaces aged Pipes-Increases Fire Flow-4" to 6"	
11	NE California Street	1,000	Replaces aged Pipes-Increases Fire Flow-4" to 8"	

1.6.2 Preliminary Engineering Report (PER)

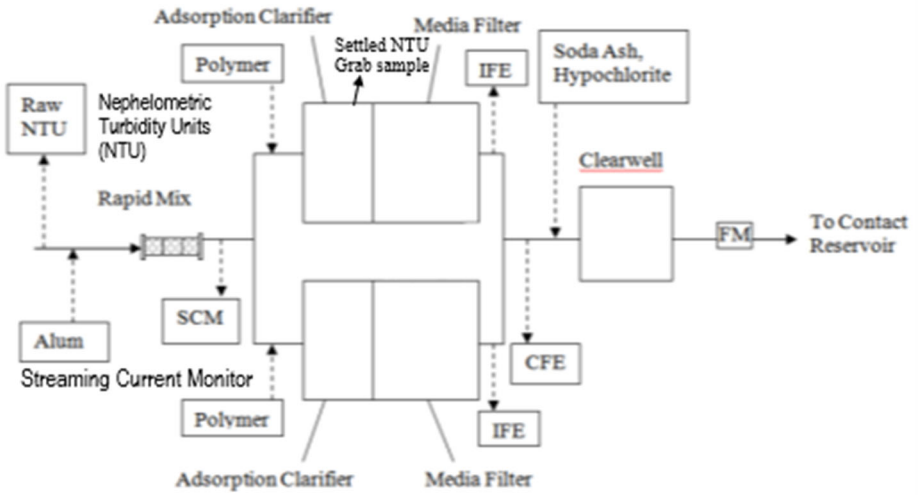
All recommended improvement projects from the WMP and this addendum were weighed based on the priorities previously discussed. This evaluation facilitated the reduction of CIP projects from dozens planned over 20 years to 11 planned over the next 5 years. Further analysis in the form a PER for the shovel ready projects would provide additional information that would help to further refine project priority.

2 EXISTING WATER TREATMENT INFRASTRUCTURE

The District operates two water treatment plants (WTPs), Blodgett Water Treatment Plant and the Dicks Fork Water Treatment Plant, which treat the water from the Big Creek, Starr Creek, Vingie Creek, and Dicks Fork. The Blodgett Water Treatment Plant provides water to approximately 75% of the District's customers and Dicks Fork Water Treatment Plant serves the remaining 25%.

The water treatment plants went on-line in July of 1997. The water treatment plants use treated water during their operation for chemical makeup water and to backwash the filter beds. This usage amounts to less than 3% of the total amount of water treated. The water treatment plants also use untreated water during the backwash process, which amounts to approximately 8% of the diverted amount of water. The actual amount depends upon number of gallons treated and the quality of the raw water. The operational treatment plant schematic shown in Figure 21 is typical of both treatment plants.

FIGURE 2.1 – TYPICAL TREATMENT PLANT SCHEMATIC



The WTPs use conventional treatment techniques (e.g. coagulation, sedimentation, filtration) to treat the water to a level that meets the requirements of the Safe Drinking Water Act and the Oregon Department of Human Services, Public Health Division standards for potable water (OAR 333-061-0030 and 0032). Adjacent to each WTP is a storage tank that provides the primary storage and chlorine contact time for the treated water.

2.1 Blodgett Water Treatment Plant (BWTP)

2.1.1 General

The BWTP is a conventional surface water treatment plant. The adjacent 1,000,000 Steel Reservoir (Blodgett Reservoir) which is effectively a clearwell was constructed at the same time as the WTP (1997). The WTP is over 20 years old and as a result much of the equipment is

reaching the end of its lifecycle or has become obsolete. For this reason, the District has committed resources to improving the BWTP. Some of the improvements have been completed others are being planned for next year. As the existing microfloc control system is outdated the District has contracted a consultant to modernize the BWTP controls. All controls will be incorporated into a new PLC and new Controls will be added to the Human Machine Interface (HMI) setpoints. The BWTP controls will be converted to a Rockwell SCADA/PLC Control System. Upgrades to the instrumentation and controls system, new filter media, and other minor improvements will be completed in 2022. BWTP air compressor and turbdimeters were replaced this year (2021). Original design capacity of the plant was 350 gpm and is expandable to 700 gpm. The WTP site plan is shown in Figure 2.2.

FIGURE 2.2 – BLODGETT RAW WTP SITE PLAN (WILL BE INSERTED)

The plant consists of two side-by-side identical Trident treatment trains sitting on concrete pedestals. The filters, chemical feed systems, supply pumps, backwash pumps, compressor, and the sampling and lab area are all in the same room. The controls are housed in a separate room.

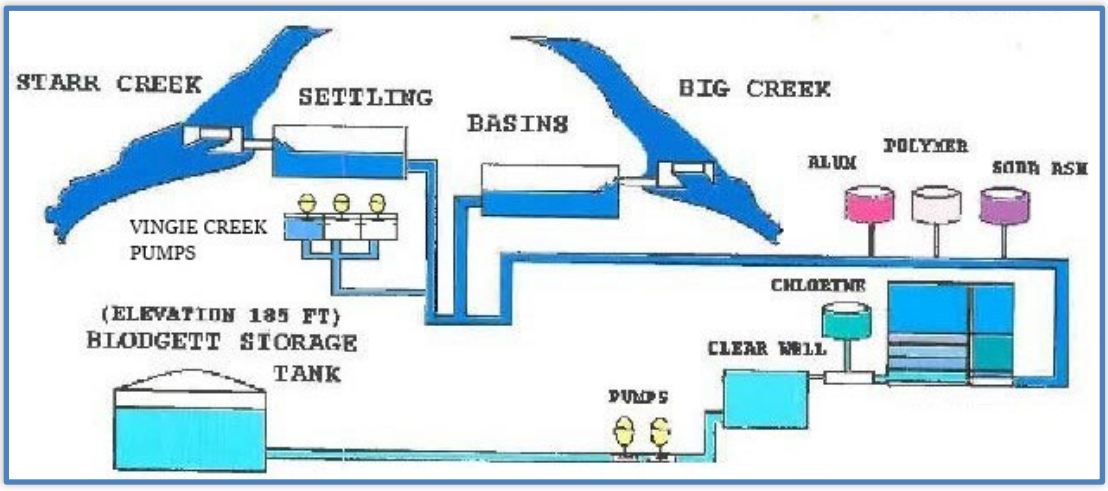
In general, finished water quality is good and the plant functions properly. The average finished water turbidity over the last ten years is around 0.09 NTU. The State of Oregon credits the plant filtration process with 2.5-log removal credit for Giardia. Several components of the plant are past their design life and will eventually require replacement. Various major components of the plant are discussed in following sections.

Turbidity spikes in the raw water during the first large storm of the winter season requires frequent filter backwashes to produce treated water. This significantly limits the ability of the WTP to produce treated water. For this reason the District usually chooses to minimize run time during these events.

2.1.2 WTP Intake Systems

The Blodgett WTP receives water from Starr Creek, Big Creek, and Vingie Creek. Supply sources are shown in Figure 2.3.

FIGURE 2.3 – BLODGETT RAW WATER SOURCES



Starr Creek: Three springs, two at elevation 1400 feet one at 700 feet feed this stream. There are no recently documented sightings of salmon in this stream near the diversion. A portion of the Starr Creek watershed above the District's diversion point was logged in the late 1980's. The current U.S. Forest Service operating plans do not show any logging or other management practices in this watershed, which would affect the water quality for at least 30 years

Starr Creek intake is at an elevation of 238 feet. Water is diverted from the creek into a 120,000 gallon settling basin and then piped by gravity to the Blodgett WTP at elevation 160 feet. Diversion quantity is limited by water right cerficate No. 29023 to 0.3 cfs/135 gpm. This water right certificate is dated 6/8/1945.

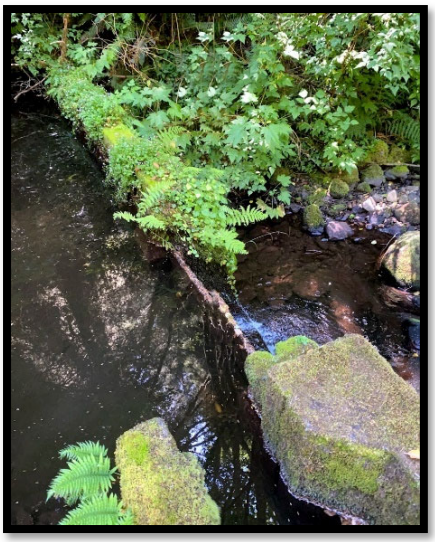


FIGURE 2.4 – STARR CREEK INTAKE AND SETTLING BASIN

Big Creek: This stream is the main stream of three branches, and it begins at three springs located between elevation 1200 feet and 1600 feet. Two other creeks join this stream at about elevation 80 feet and are about the same size as the main stream. There is a small estuary on this stream at about elevation 20 feet. Salmon spawn on the lower reaches of this stream but due to a natural waterfall downstream of the diversion point, the salmon are not able to reach the District's diversion point. A portion of the Big Creek watershed above the District's diversion point was logged in the late 1980's. The current U.S. Forest Service operating plans do not show any logging or other management practices in this watershed which would affect the water quality for at least 30 years.

Big Creek intake and associated pump station is at an elevation of 238 feet. Water is diverted from the creek into a 61,000 gallon settling basin and then piped by gravity to the Blodgett WTP at elevation 160 feet. Diversion quantity is limited by water right certificate No. 29022 to 0.3 cfs/135 gpm. This water right certificate is dated 6/8/1945.

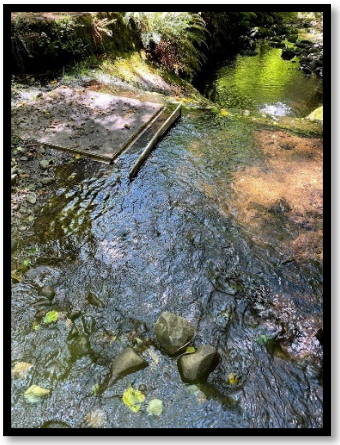



FIGURE 2.5 – BIG CREEK INTAKE AND SETTLING BASIN

Vingie Creek: This stream lies between Starr Creek and Big Creek and has a drainage area similar in size to Big Creek. This stream is fed by two springs located at elevation 1200 feet and 1400 feet. There are no recently documented sightings of salmon in this stream. The current U.S. Forest Service operating plans do not show any logging or other management practices in this watershed which would affect the water quality for at least 30 years. The portion of the watershed in private ownership could be logged within the next 10 to 15 years but is not expected to cause water quality problems except possibly higher turbidity in the winter months. The watershed area upstream from the District's diversion point has not been logged since 1930.

The location of the diversion point is on private land and requires the diverted water be pumped to the treatment plant. This diversion structure is off-stream and able to divert up to 0.9 cfs from the stream. However, being off-stream with no restrictions to the stream flow much less water is captured. There is the potential of diverting more water from this source. This diversion was completed in April 2002.



FIGURE 2.6 – VINGIE CREEK INTAKE AND PUMP PLUMBING

The Vingie Creek source water is diverted into a large manhole (there is a small settling basin between the\creek and the manhole) from which the water is pumped into the raw water line

from Starr Creek. Before Vingie Creek joins with Starr/Big Creek, both individual pipelines pass through Brubaker Vault where both flows are metered. Just downstream of the Vault the flows are joined into a single 10-inch PVC pressure pipeline which continues to Blodgett WTP. Although this pipeline can flow by gravity to the Blodgett WTP, when the Vingie pumps turn on the volume of water through the pipe increases. DISTRICT has two pending certifications, No. S 52498 and No. S 31979 on Vingie Creek. The water rights are 1.0 cfs/449 gpm and 0.3 cfs/135 gpm respectively. Table 2.1 lists BWTP raw water sources and their associated characteristics.

TABLE 2.1 – BLODGETT RAW WATER SOURCE SUMMARY

Water Source	Permitted Use Rate (cfs / gpm)	Permit and Certificate Number	Use and Priority Date
Big Creek	0.3 / 135	Permit No. S 19165, Certificate No. 29022	year-round municipal use; 6/8/1945
	The District has another permit to remove an additional 0.3 cfs for scheduled repairs or emergencies between November 1 and April 30 when stream flows exceed 10 cfs. This permit provides no benefit to the District during timesof high use in the summer months.		
Vingie Creek	0.3 / 135	Permit No. S 31979 (Certification pending)	year-round municipal use; 9/6/1966
	1.0 / 449 (0.6 / 269)	Permit No. S 52498 (Certification pending)	year-round municipal use; 1/13/1989. Use rate of 1.0 cfs for eleven months and a use rate of 0.6 cfs for one month (July)
Starr Creek	0.3 / 135	Permit No. S 16464, Certificate No. 29023	year-round municipal use; 6/8/1945

2.1.3 Chemical Addition

Original plant provisions included injection points for activated carbon for taste and odor control, potassium permanganate for iron and manganese precipitation, alum for primary coagulation, lime for pH and alkalinity adjustment, and polymer (Poly Super Floc c-573) for a coagulant aid. Coagulant addition occurs upstream of an in-line mechanical flash mixer that is situated in the raw water feed line. Provisions for feed points also exist after flocculation. Activated carbon and permanganate are not being used at this time.

Alum dosage at the plant averages 17 mg/L. During periodic storm events dosage is increased as high as 40 mg/L. Liquid alum is stored in a 5,000-gallon fiberglass reinforced plastic tank. A cationic polymer (573C) used as coagulant aid at a dose of 0.1 mg/L.

As with many surface waters in Oregon, the Big Creek, Starr Creek, and Vingie Creek are relatively low in natural alkalinity and supplemental alkalinity is required to allow proper alum coagulation. Approximately 45 pounds per day of lime is used during the summer and 20 pounds per day during the winter to adjust the raw water alkalinity to allow proper alum coagulation. Lime is dosed with adjustable dry hopper and the solution is fed downstream of the rapid mix and alum feed point.

Soda Ash is added to the final filtered water for pH adjustment and corrosion control. An average of 30 to 70 pounds per day of Soda Ash is required with dosages ranging from 4 to 8 mg/L and averaging about 5 mg/L.

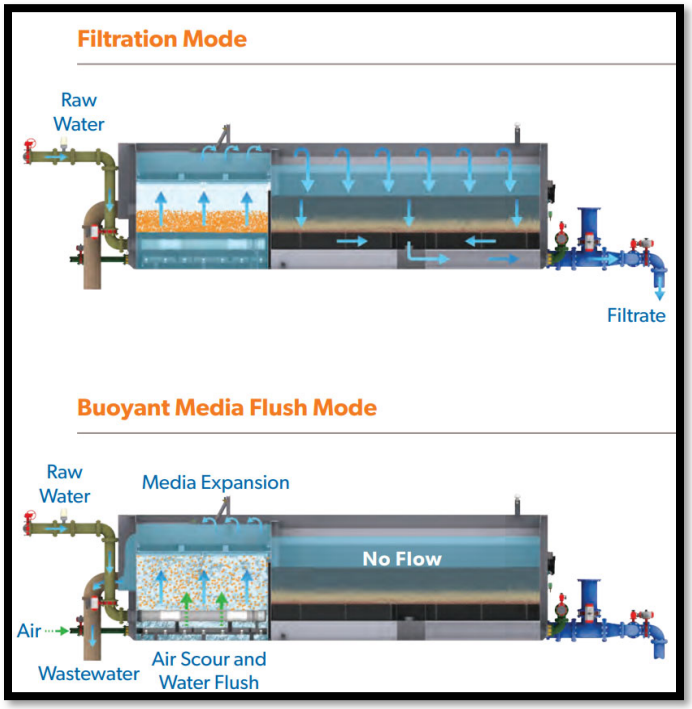
Sodium hypochlorite is added for final disinfection. Prechlorination provisions are not currently used but may be used in the future as needed.

2.1.4 Adsorption Clarifier

Following chemical addition and rapid mixing, raw water enters the adsorption clarifier at the bottom of the unit. Water follows an upward path through a bed of buoyant plastic media, where the tortuous path causes mixing and collisions of coagulated particles. The buoyant clarifier media adsorbs the coagulated particles, eliminating the need for settling.

The Adsorption Clarifier is cleaned periodically using water at process flow rates combined with a small amount of air. The media bed becomes completely fluidized, creating a vigorous mixing environment allowing captured solids to be effectively removed. The adsorption filtration and flush modes are shown in Figure 2.8.

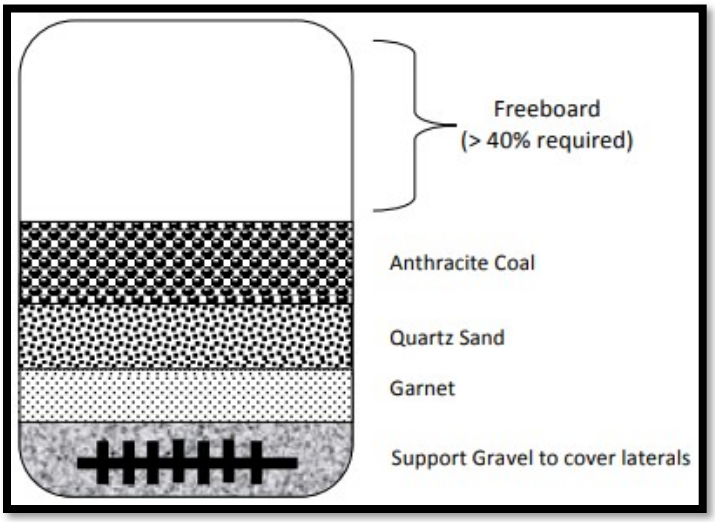
FIGURE 2.8 – ADSORPTION CLARIFIER SCHEMATIC



The air for this process is provided by a 5 HP compressor located along the inside wall of the WTP. The same compressor is used for multiple functions throughout the WTP, and was recently replaced.

Current Trident adsorption clarifiers are designed to process 10 gpm per square foot of clarifier area. The area of each clarifier at the WTP is 20 square feet, and provides a processing capacity of 200 gpm under ideal circumstances.

FIGURE 2.9 – MIXED MEDIA LAYERING



2.1.5 Filtration

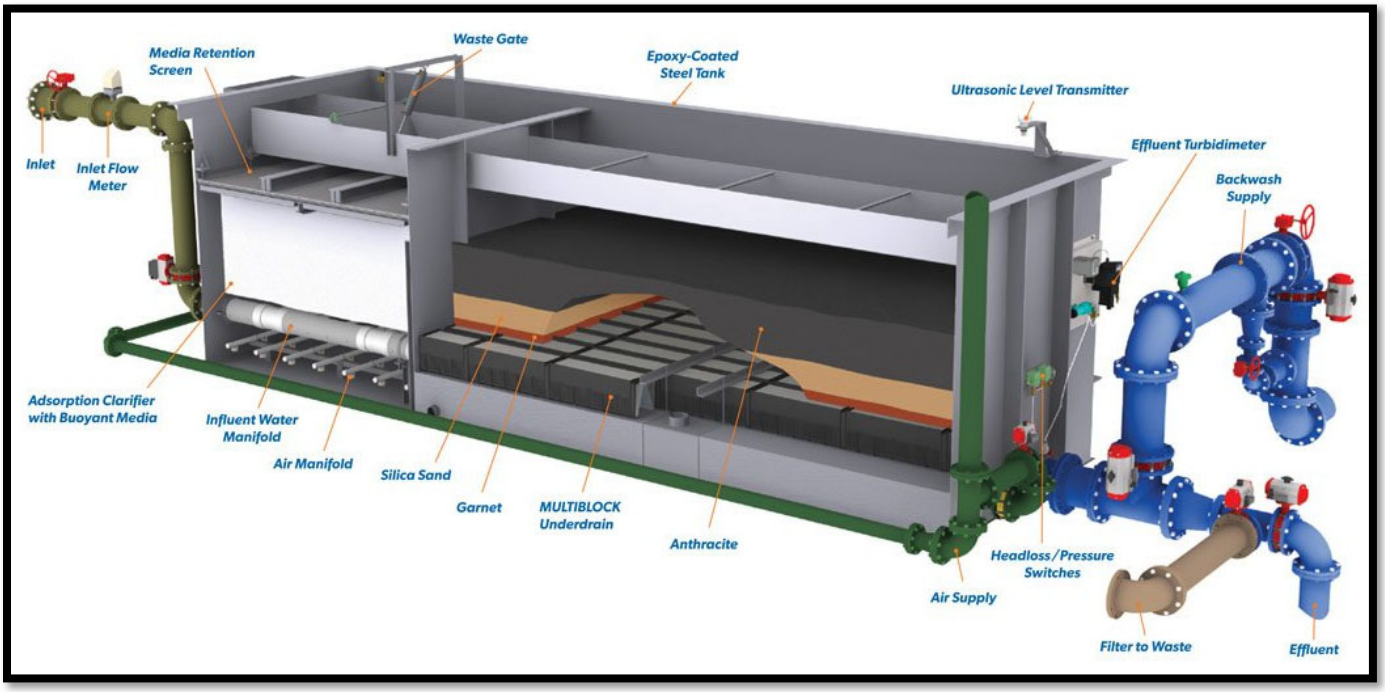
As the water travels to the top of the clarifier it spills over a weir into the multi-media filtration portion of the Trident treatment unit. A multi-media filter is a pressure filter vessel with three or more different media above the gravel bed. The three media are ordered in decreasing porosity. Anthracite (104 cubic feet), sand (84 cubic feet), and garnet 24 (cubic feet)

were used due to their size and density differences. Anthracite is the lightest, then sand, and then garnet.

The larger (but lighter) anthracite stays on top and the denser (but smaller) garnet stays on the bottom. The largest particles are removed near the top of the media bed, in the large spaces between the anthracite. As particles, get smaller, they are captured deeper and deeper in the media. In this way, the entire depth of the bed acts as a filter. This gives more efficient particulate removal. A 12-inch-thick layer of graded support gravel lies on top of the underdrain.

Backwashing of the filters is accomplished with hydraulic upflow as described in the following section.

FIGURE 2.10 – TRIDENT TRI-MITE FILTRATION UNIT



2.1.6 Backwash

Filter backwash is accomplished with hydraulic upflow water. No auxiliary air scour is provided. The filters are backwashed for approsimately 20 minutes. The original backwash pump from the 1997 plant remains in use today. The 5 hp vertical turbine pumps a combination of treated and raw water from the Blodgett Reservoir and raw water line and forces the water upwards through the filter media to expand the bed and remove sediment. Filter backwash occurs at a rate of 175 gpm with a total of 1,750 gallons of water required to backwash one filter. The total backwash volume used equates to 161 gal/ft$_2$. With a filter area of 120 ft$_2$ each, the resulting backwash rate is 15 gpm/ft$_2$. Based on the size and type of filter media, this backwash rate should achieve approximately 10 to 20% expansion of the filter bed.

The goal for ideal hydraulic backwash is to achieve a 25-50% expansion of the media. To achieve this expansion, backwash rates required will vary between 17 and 23 gpm/ft$_2$ depending on the media configuration and the water temperature. For each 1°C increase in water temperature, an increase in the backwash rate of approximately 2% is required to prevent

a reduction in bed expansion. A 25% expansion of the existing filter media during a backwash equates to 7.5-inches of rise in the existing filters. The backwash pump output (15 gpm/ft_2 maximum) is slightly less than optimal and mudball formation deep in the media is possible over time. This may be partially offset under current operations due to the lengthy backwash cycle and high total volume of water being used.

Backwash waste water is dumped into the 61,000 gallon backwash waste basin prior to being discharged into the municipal sanitary sewer system.

2.1.7 Disinfection

The disinfection system consists of sodium hypochlorite (12.5% concentration) injected in the filter effluent which provides chlorine contact time prior to water use. The chemical injection system is in good condition.

At the EPA recommended efficiency value of 10% for non-baffled chlorine contact basins, the effective volume of the clearwell/Blodgett Reservoir would be 1,000,000 gallons. A tracer survey was completed in 2010 to verify actual efficiency and contact time. Based on the tracer survey, there is no need for baffling at this time.

2.1.8 Plant Domestic Water Supply System

Plant water is supplied by the plant water pump located near the control room. Approximately One-inch piping connects the pump to a hydropneumatic tank. The tank is 3 feet in diameter, 6.5 feet tall, and is an ASME 125 pound pressure vessel. The water pump is used to maintain a set pressure range within the tank. A safety pressure relief valve is set at 100 psi. A pressure switch turns the plant water pump on and off at 60 psi and 85 psi respectively. This system shows no deficiencies, but is over 20 years old, and may need to be replaced within the planning period.

2.1.9 Electrical System

The 25-year old motor control center (MCC) in the control room is still in use today and repair and replacement parts are hard to find as the equipment is antiquated. The MCC should be updated to allow for continued reliability and safety. As noted earlier, the District is currently in the process of updating electrical systems, and controls.

A 65 kW diesel generator provides standby backup power for the plant's primary functions. The gen-set has a newer above ground fuel tank. With proper maintenance and exercising the generator should function for the planning period.

2.2 Dicks Fork Water Treatment Plant (DFWTP)

2.2.1 General

The DFWTP is a conventional surface water treatment plant with a capacity of 200 gpm. The WTP production is limited to 180 gpm as the water right associated with its raw water source limits the production to 180 gpm. The adjacent 200,000 Concrete Reservoir (Dicks Fork Reservoir) which is effectively a clearwell was constructed approximately 20 years before the WTP was constructed (1976). The WTP is over 20 years old and as a result much of the equipment is reaching the end of its lifecycle or has become obsolete. For this reason, the

Distract has plans to commit District resources toward improving existing systems equipment replacement, control automation, media replacement…etc) once BWTP improvements are complete. Figure 2.11 shows the Dicks Fork WTP Site Plan.

FIGURE 2.11 – DICKS FORK RAW WTP SITE PLAN (WILL BE INSERTED)

The plant consists of two side-by-side identical Trident treatment trains sitting on concrete pedestals. The filters, chemical feed systems, supply pumps, backwash pumps, compressor, and the sampling, lab area, and all controls and electrical components are all housed in the same room.

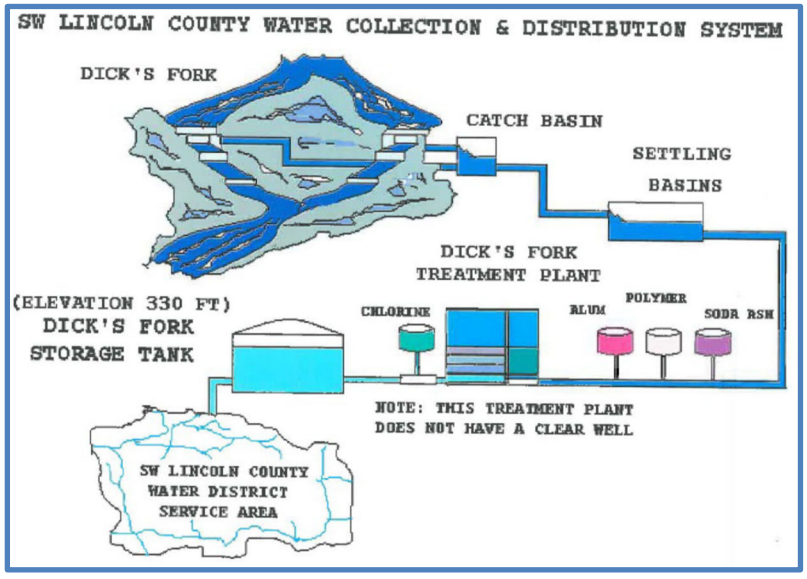
In general, finished water quality is good and the plant functions properly. The average finished water turbidity over the last ten years is around 0.09 NTU. The State of Oregon credits the plant filtration process with 2.5-log removal credit for Giardia. Several components of the plant are past their design life and will eventually require replacement. Various major components of the plant are discussed in following sections.

Turbidity spikes in the raw water during the first large storm of the winter season requires frequent filter backwashes to produce treated water. This significantly limits the ability of the WTP to produce treated water. For this reason the District usually chooses to minimize run time during these events.

2.2.2 WTP Intake Systems

The DFWTP receives water from Dicks Fork. Supply sources are shown in Figure 2.12.

FIGURE 2.12 – DICKS FORK RAW WATER SOURCES



Dicks Fork Creek:

This stream begins at three springs located at about elevation 1200 feet. There are two stream forks that come together at the diversion point. Dicks Fork flows ultimately combine into Big Creek at about elevation 80 feet. There are no recently documented sightings of salmon in this stream near the diversion. The Dicks Fork watershed above the District's diversion point was

last logged in the 1930's. The current U.S. Forest Service operating plans do not show any logging or other management practices in this watershed, which would affect the water quality for at least 30 years.

Dicks Fork source is at elevation 434 feet. Water from this source flows to a 126,000 settling basin at elevation 372 feet and then flows to the Dicks Fork WTP at elevation 310 feet (near the Dicks Fork Tank). As per water right Certificate No. 80664 THE DISTRICT can divert raw water at a rate of 0.4 cfs/180 gpm. Water right priority date is 6/7/1971.

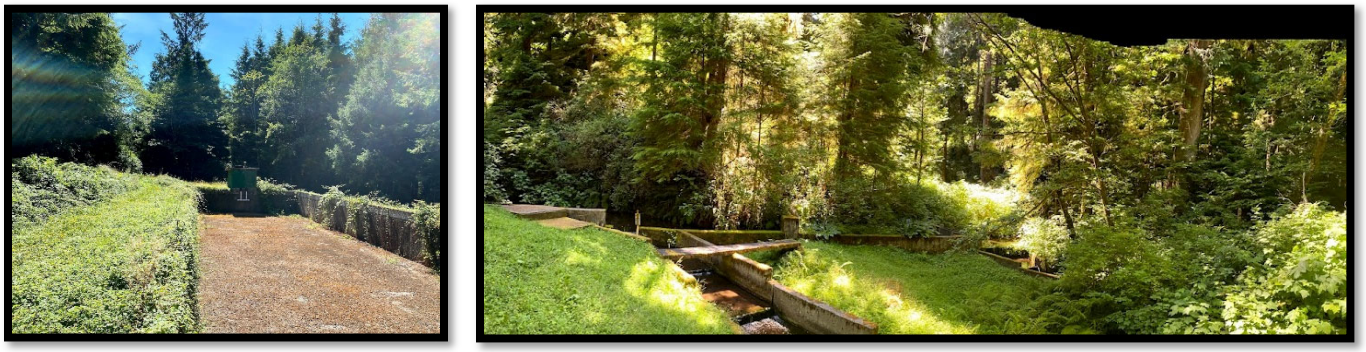


FIGURE 2.13 – DICKS FORK INTAKE AND SETTLING BASIN

TABLE 2.2 – DICKS FORK RAW WATER SOURCE SUMMARY

Water Source	Permitted Use Rate (cfs / gpm)	Permit and Certificate Number	Use and Priority Date
Dicks Fork	0.4 / 180	Permit No. S 36270, Certificate No. 80664	year-round municipal use; 6/7/1971

2.2.3 Chemical Addition

Original plant provisions included injection points for activated carbon for taste and odor control, potassium permanganate for iron and manganese precipitation, alum for primary coagulation, lime for pH and alkalinity adjustment, and polymer (Poly Super Floc c-573) for a coagulant aid. Coagulant addition occurs upstream of an in-line mechanical flash mixer that is situated in the raw water feed line. Provisions for feed points also exist after flocculation. Activated carbon and permanganate are not being used at this time.

Alum dosage at the plant averages 17 mg/L. During periodic storm events dosage is increased as high as 40 mg/L. Liquid alum is stored in a 5,000-gallon fiberglass reinforced plastic tank. A cationic polymer (573C) used as coagulant aid at a dose of 0.1 mg/L.

As with many surface waters in Oregon Dicks Fork is relatively low in natural alkalinity and supplemental alkalinity is required to allow proper alum coagulation. Approximately 45 pounds per day of lime

is used during the summer and 20 pounds per day during the winter to adjust the raw water alkalinity to allow proper alum coagulation. Lime is dosed with adjustable dry hopper and the solution is fed downstream of the rapid mix and alum feed point.

Soda Ash is added to the final filtered water for pH adjustment and corrosion control. An average of 30 to 70 pounds per day of Soda Ash is required with dosages ranging from 4 to 8 mg/L and averaging about 5 mg/L.

Sodium hypochlorite is added for final disinfection. Prechlorination provisions are not currently used but may be used in the future as needed.

2.2.4 Adsorption Clarifier

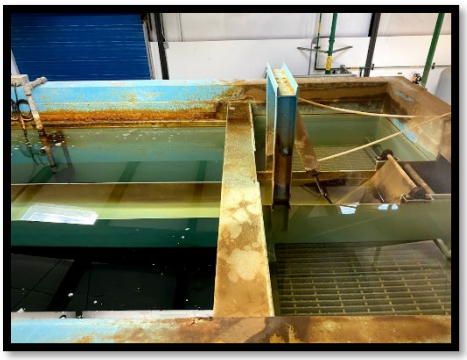
Following chemical addition and rapid mixing, raw water enters the adsorption clarifier at the bottom of the treatment unit. Water follows an upward path through a bed of buoyant plastic media, where the tortuous path causes mixing and collisions of coagulated particles. The buoyant clarifier media adsorbs the coagulated particles, eliminating the need for settling.

The Adsorption Clarifier is cleaned periodically using water at process flow rates combined with a small amount of air. The media bed becomes completely fluidized, creating a vigorous mixing environment allowing captured solids to be effectively removed. The adsorption filtration and flush modes are shown in Figure 2.8.

The air for this process is provided by a 3 HP compressor located along the inside wall of the WTP. The same compressor is used for multiple functions throughout the WTP, and was recently replaced.

Current Trident adsorption clarifiers are designed to process 10 gpm per square foot of clarifier area. The area of each clarifier at the WTP is 20 square feet, and provides a processing capacity of 100 gpm under ideal circumstances.

2.2.5 Filtration



As the water travels to the top of the clarifier it spills over a weir into the multi-media filtration portion of the Trident treatment unit. A multi-media filter is a pressure filter vessel with three or more different media above the gravel bed. The three media are ordered in decreasing porosity. Anthracite (104 cubic feet), sand (84 cubic feet), and garnet 24 (cubic feet) were used due to their size and density differences. Anthracite is the lightest, then sand, and then garnet.

The larger (but lighter) anthracite stays on top and the denser (but smaller) garnet stays on the bottom. The largest particles are removed near the top of the media bed, in the large spaces between the anthracite. As particles, get smaller, they are captured deeper and deeper in the media. In this way, the entire depth of the bed acts as a filter. This gives more efficient particulate removal. A 12 inch thick layer of graded support gravel lies on top of the underdrain.

Backwashing of the filters is accomplished with hydraulic upflow as described in the following section.

2.2.6 Backwash

Filter backwash is accomplished with hydraulic upflow water. No auxiliary air scour is provided. The original backwash pump from the 1997 plant remains in use today. The filters are backwashed for approximately 20 minutes before they return to water production. The 60 hp vertical turbine pumps a combination of treated and raw water from the Blodgett Reservoir and raw water line and forces the water upwards through the filter media to expand the bed and remove sediment. Filter backwash occurs at a rate of 100 gpm with a total of 1,000 gallons of water required to backwash one filter. The total backwash volume used equates to 161 gal/ft$_2$. With a filter area of 70 ft$_2$ each, the resulting backwash rate is 15 gpm/ft$_2$. Based on the size and type of filter media, this backwash rate should achieve approximately 10 to 20% expansion of the filter bed.

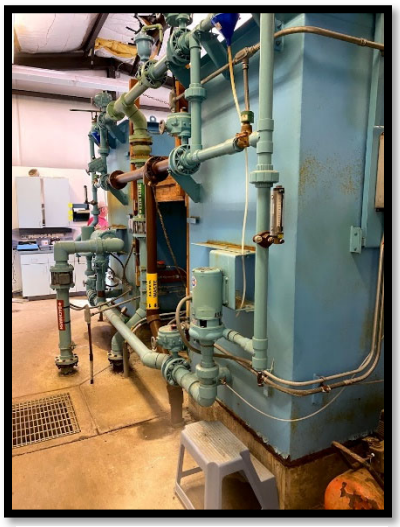


FIGURE 2.16 – BACKWASH FILTER EFFLUENT PIPING

The goal for ideal hydraulic backwash is to achieve a 25-50% expansion of the media. To achieve this expansion, backwash rates required will vary between 17 and 23 gpm/ft$_2$ depending on the media configuration and the water temperature. For each 1°C increase in water temperature, an increase in the backwash rate of approximately 2% is required to prevent a reduction in bed expansion. A 25% expansion of the existing filter media during a backwash equates to 7.5-inches of rise in the existing filters. The backwash pump output (15 gpm/ft$_2$ maximum) is slightly less than optimal and mudball formation deep in the media is possible over time. This may be partially offset under current operations due to the lengthy backwash cycle and high total volume of water being used.

Backwash waste water is dumped into the 61,000 gallon backwash waste basin prior to being discharged into the municipal sanitary sewer system. The use of filter backwash recycling provisions originally designed into the plant has been discontinued.

2.2.7 Disinfection

The disinfection system consists of sodium hypochlorite (12.5% concentration) injected in the filter effluent which provides chlorine contact time prior to water use. The chemical injection system is in good condition.

At the EPA recommended efficiency value of 10% for non-baffled chlorine contact basins, the effective volume of the clearwell/Blodgett Reservoir would be 1,000,000 gallons. A tracer survey was completed in 2010 to verify actual efficiency and contact time. Based on the tracer survey, there is no need for baffling at this time.

2.2.8 Plant Domestic Water Supply System

Plant water is supplied by the plant water pump located near the lab area. Approximately One-inch piping connects the pump to a hydropneumatic tank. The tank is 2.5 feet in diameter, 5 feet

tall, and is an ASME 125 pound pressure vessel. The water pump is used to maintain a set pressure range within the tank. A safety pressure relief valve is set at 100 psi. A pressure switch turns the plant water pump on and off at 60 psi and 85 psi respectively. This system shows no deficiencies, but is over 20 years old, and may need to be replaced within the planning period.

2.2.9 Electrical System

The 25-year old motor control center (MCC) in the control room and is still in use today and repair and replacement parts are hard to find as the equipment is antiquated. The MCC should be updated to allow for continued reliability and safety.

A 45 kW diesel generator provides standby backup power for the plant's primary functions. The gen-set has a newer above ground fuel tank. With proper maintenance and exercising the generator should function for the planning period.

3 EXISTING AND PROJECTED WATER DEMANDS

3.1 Demand Definitions

System water demand is the quantity of water that must enter the system in order to meet all water needs in the community. Water demand includes water delivered to the system to meet the needs of consumers as well as water used for firefighting and system flushing, and other unaccounted water. Additionally, virtually all systems have a certain amount of leakage that cannot be economically removed and thus total demand typically includes some leakage. The difference between the amount of water metered and sold and the total amount delivered to the system is referred to as unaccounted water. Water demand varies seasonally with the lowest usage in winter months and the highest usage during summer months. Variations in demand also occur with respect to time of day. Diurnal peaks typically occur during the morning and early evening periods, while the lowest usage occurs during nighttime hours.

The objective of this section is to determine the current water demand characteristics and to project future demand requirements that will establish system component adequacy and sizing needs. Water demand is described in the following terms:

Average Annual Demand (AAD) - The total volume of water delivered to the system in a full year expressed in gallons. When demand fluctuates up and down over several years, an average is used.

Average Daily Demand (ADD) - The total volume of water delivered to the system over a year divided by 365 days. The average use in a single day expressed in gallons per day.

Maximum Month Demand (MMD) - The gallons per day average during the month with the highest water demand. The highest monthly usage typically occurs during a summer month.

Maximum Day Demand (MDD) - The largest volume of water delivered to the system in a single day expressed in gallons per day. The water supply and treatment facilities should be designed to handle the maximum day demand.

Peak Hourly Demand (PHD) - The maximum volume of water delivered to the system in a single hour expressed in gallons per day or gallons per minute. Distribution systems should be designed to adequately handle the peak hourly demand or maximum day demand plus fire flows, whichever is greater. During peak hourly flows, storage reservoirs supply the demand in excess of the maximum day demand.

Demands described above, expressed in gallons per day (gpd), can be divided by the population or Equivalent Dwelling Units (EDUs) served to come up with a demand per person or per capita which is expressed in gallons per capita per day (gpcd), or demand per EDU (gpd/EDU). These unit demands can be multiplied by future population or EDU projections to estimate future water demands for planning purposes.

3.2 Present Demands

3.2.1 District's Existing Demands

The District does not currently have water treatment plant (WTP) production numbers tabulated on a daily basis, instead it is recorded weekly. Therefore, determining MDD, or PHD based on available data is not possible. Therefore, consistent with the 2019 Water Master Plan, peaking factors of 2.5 and 5 will be used to estimate MDD and PHD respectively. The factors are typically used in water industry to convert ADD into MDD and PHD. Table 3.1 contains the metered district water use by month. Table 3.2 summarizes system demands from 2012-2013 to 2020-2021. Due to failure in the District's recording equipment 2018-2020 water use per customer data was inaccurate, and is not represented in the Table.

TABLE 3.1 – 2020-2021 METERED DISTRICT WATER USE BY MONTH

Month	Total (gallons)	Monthly Average (gpm)	ADD (gpm)	Peak Factor (PF)(gpm)
July	7,244,150	**162**	113	**1.43**
August	6,949,110	156	113	1.37
September	5,125,780	119	113	1.05
October	5,221,950	117	113	1.03
November	4,204,280	97	113	0.86
December	4,453,490	100	113	0.88
January	4,212,960	94	113	0.83
February	3,999,490	99	113	0.88
March	4,886,740	109	113	0.97
April	3,579,136	83	113	0.73
May	4,481,790	100	113	0.89
June	5,210,730	121	113	1.06

TABLE 3.2 – AVERAGE WATER USE PER CUSTOMER SERVICE

Month	ADD (gpm) PF=1.0	MMD (gpm) PF=Varies	MDD (gpm) PF= 2.5	PHD (gpm) PF=5.0	Number of Sys. Connections	ADD (gpd) Per Connection	MDD (gpd) Per Connection
2012-2013	105	211	262	524	1253	120	301
2013-2014	94	148	236	471	1250	109	272
2014-2015	95	148	238	475	1247	110	274
2015-2016	97	140	242	483	1247	112	279
2016-2017	94	142	235	470	1254	108	270
2017-2018	98	157	246	492	1258	113	281
2018-2019	--	--	--	--	--	--	--
2019-2020	--	--	--	--	--	--	--
2020-2021	113	162	283	567	1298	126	314

3.2.2 District's Future Demands

The baseline demand quantities for MDD and PHD were calculated using peaking factors. The future demand quantities were projected using an annual growth rate . The Oregon Office of Economic Analysis long-term population forecast (as updated March 2021) indicates

an average annual population increase of 0.51%, 0.75%, and 1.16% for Lincoln County, Waldport, and Yachats respectively from 2020 to 2040. Additionally, the growth rate experienced by Lincoln County based on estimates from the Portland State University-Population Research Center (PSU PRC) for 2020-2021 is 1.02%. Finally, the historical growth rate within the DISTRICT over the last 3 years has been 1.05%. Based on local projections, and the District's historical growth, an average annual growth rate of 1.0% was adopted for this plan. Table 3.3 shows a summary of the projected future demands for the District.

TABLE 3.3 – PROJECTED FUTURE DISTRICT WATER DEMAND (GALLONS/DAY)

Demand Paramter	Peak Factor	2021	2026	2031	2041
Average Daily Demand - ADD (gal/min.)	1.0	113	119	125	138
Average Max. Monthly Demand - MMD (gal/min.)	1.7	193	203	213	235
Average Max. Day Demand - MDD (gal/min.)	2.5	283	298	313	346
Average Peak Hourly Demand - PHD (gal/min.)	5.0	567	596	626	691

3.2.3 City of Yachats Demands

The following quote summarizes the potential needs of the City of Yachats and is an excerpt from the Yachats Water Master Plan Executive Summary:

> ***Water Supply Evaluation – Chapter 6***
>
> *At the present time, the City currently obtains all drinking water from Reedy Creek and Salmon Creek. During the summer months, the combined flow from these sources can drop to as low as 180 gpm. The projected peak day demand at the end of the planning period is approximately 200 gallons per minute (Table 5-8). In order to replenish fire flow storage in a 72 hour period, an additional 110 gpm is required (Table 5-9). Therefore, the total water production required to meet projected peak day demands while simultaneously replenishing fire flow storage is approximately 310 gpm. During the winter months, the City can produce water at this rate. However, during dry weather conditions at the end of the summer when the combined flow from Reedy and Salmon Creek drop below 200 gpm, the City will be unable to meet production needs with the existing supply sources. For this reason, it is recommended that the City develop the upper Yachats River diversion during the planning period. This would provide an additional 224 gpm of supply for a total reliable water supply of about 400 gpm. This is significantly higher than the 310 gpm that is required to meet peak day demands while simultaneously replenishing fire flow storage. Once the Yachats River Intake is completed, it will increase the City's reliable water supply to not only supply the anticipated growth during the planning period, but future growth well into the next planning period (i.e., beyond 2041).*
>
> *Overall, the City's water rights are sufficient for the planning period, but additional development work (i.e., infrastructure construction) is needed to ensure a reliable water supply.*

3.2.4 City of Waldport Demands

The following quote summarizes the potential needs of the City of Waldport and is an excerpt from the Waldport Water Master Plan Executive Summary:

Water Supply Evaluation (Chapter 6)

In Oregon, all water is publicly owned. The Oregon Water Resources Department (OWRD) regulates the use of both surface and groundwater throughout the state. Over the years as greater demands have been placed on limited water resources, OWRD has exercised increasing control over water use. Water rights establish a hierarchy utilized by OWRD to adjudicate water in times of water shortages. Accordingly, it is paramount the City secure and maintain suitable water rights to meet long term municipal needs.

The City holds certificated water rights for the Weist/Eckman Creek system. The amount of water that can be withdrawn under these rights is sufficient to supply the City for many years. However, the possession of documented water rights does not guarantee that the water will be physically present. During dry conditions in the late summer and early fall, the flow in the North and South Fork of Weist Creek essentially stops and the City is not able to use the Weist Creek diversions. During these conditions all water must be supplied from Eckman Creek. The City's current water rights allow the City to withdraw up to 4 cubic feet per second (CFRS) from Eckman Creek. However, during dry conditions, the flow in Eckman Creek may drop below this value. There is no long-term database of flow measurements for Eckman Creek. Therefore, it is unclear how much water the City can reasonably expect to divert from Eckman Creek during dry weather conditions. Based on a cursory review of limited available data, it appears that flow is Eckman Creek should be sufficient to allow the City to divert as much as 2 CFS during dry weather conditions. 2 CFS should be sufficient to meet the City's needs during the current planning period. However, looking beyond the current planning period (i.e., 2040) the City may need to obtain additional water supplies.

The City of Waldport is also planning on developing an Industrial Park within the boundaries of the District. Given it's location, the development would need to be fed by the Dicks Fork Water Treatment Plant. Based on information provided by Waldport's Engineer, this development will have a MDD of 154,000 gpd (106 gpm), and will need to sustain fire flows of 2,500 gpm for 3 hours.

4 WTP DEMAND VS. CAPACITY

This section of the District's Water Master Plan Addendum provides a summary of existing and future treated water demands on the District and evaluates the current facilities ability to meet that demand. The purpose of the evaluation is to identify improvements and alternatives, where such exist, for meeting the anticipated needs of the District and other entities based on existing and future demands.

4.1 Demand Summary

For this planning document the potential demand from the future Industrial Park development, the City of Yachats, and the City of Waldport will be considered alongside the demand of the District itself. The Industrial Park is a project the City of Waldport is looking to develop. This property sits within the borders of the District but is also within Waldport City limits. A summary of the existing and potential demands on the District is given in Table 4.1.

TABLE 4.1 – DEMAND SUMMARY FOR THE DISTRICT'S SYSTEM

Demand Source	Peak Demand (gpm)	Comments
SWLPUD	346	This demand is based on 2040 demand projections
Industrial Park	106	This is a Waldport development that is within the borders of the
City of Waldport	50	This demand would only be present under extreme drought conditions, or beyond the current WMP planning period (2040)-The demand under these conditions would vary, for this study it was set at 50 gpm
City of Yachats	130	Yachats Source can drop to as low as 180 gpm, projected demand is 200 gpm, and an additional 110 gpm is required to replenish fire flows in a 72 hour period
Total	**632**	

4.2 Capacity Summary

The ability for the District to meet system demands is dependent on the capacities of the key pieces of infrastructure. These system components and their associated capacities are listed in Table 4.2.

TABLE 4.2 – CAPACITY SUMMARY FOR THE DISTRICT'S INFRASTRUCTURE

Demand Source	Peak Demand (gpm)	Comments
Blodgett WTP	350	This supply is based on two filter trains operating. Plant was designed to house on more train which would add an additional 175 gpm.
Dicks Fork WTP	180	The WTP capacity is 200 gpm. Water right from Dicks Fork is 180 gpm. This limits the Districts ability to run the WTP at full capacity
City of Waldport Tie-in	225	8" Tie-in with a 2" Bypass-Water can only be conveyed to Waldport from the SWLPUD through the Tie-In due to pressure differentials
City of Yachats Tie-In	300	4" Tie-in. Pump station built at the tie-in pushes water to the City of Yachats. A pressure reducer was installed at the tie-in so water can also be fed from the Yachats system to the SWLPUD
Seabrook Pump Station	160	Yachats Source can drop to as low as 180 gpm, projected demand is 200 gpm, and an additional 110 gpm is required to replenish fire flows in a 72 hour period

4.3 Demand vs. Capacity Evaluations

The improvements that will be needed is dependent on what demands the District wishes to supply. Currently, the District can supply its own projected demand through the planning period with the infrastructure in place. In order for the District to meet the water demands of the Industrial Park, the City of Yachats, and potentially the City of Waldport, the District would need to increase the capacity of the Blodgett WTP.

If it is assumed that the City of Waldport will need approx. 50 gpm during drought conditions, the demand from all water systems totals 632 gpm. The addition of a matching third train at the BWTP would increase the BWTP capacity to 525 gpm. With the capacity of DFWTP, and the additional capacity at the BWTP the supply from all sources totals 705 gpm. The BWTP capacity increase would allow the District to feasibly supply water to themselves, the City of Yachats, and the City Waldport at the supply rate shown in Table 4.1.

The supply from Dicks Fork WTP is not sufficient to meet the peak demands of all users that are directly connected to the upper pressure system which it serves. DFWTP serves approximately 25% of the users in the DISTRICT'S system. Thus, the projected demand on the plant from users within the District would be 87 gpm (25% of 346 gpm). Additionally, the demand of The City of Waldport (50 gpm), and the Industrial Park (106 gpm), would place a total demand on the DFWTP of 243 gpm. This exceeds the capacity of the DFWTP by 63 gpm.

The additional 63 gpm could be provided by the BWTP through the Seabrook Pump Station. The Seabrook Pump Station pumps water from the lower system to the upper pressure system served by the DFWTP. The Pump Station was originally constructed in 1997 and is nearing the end of its life cycle. To reliably provide the 63 gpm supply, the pump station needs to be replaced. Increasing the size of the pump within the pump station and adding a fireflow pump should be considered when designing the new pump station.

No improvements will need to be completed at the tie-ins to facilitate meeting the projected demands of the other water system. Valves should be exercised regularly and undergo standardized maintenance.

TABLE 4.3 – DEMAND VS. CAPACITY

Demand Sources	Total Capacity vs. Total Demand	Dicks Fork Pressure Zone Capacity vs. Demand	Demand vs. Capacity Comments
District	346/530	87/180	No Improvements are required to meet these demands
District and Yachats	476/530	87/180	No Improvements are required to meet these demands
District, Yachats, and Industrial Park	582/530	193/180	To meet this demand the capacity of the BWTP would need to be increased. For redundancy, and system stability, replacement of the Seabrook pump station would also be recommended. According to Waldport, development of the Industrial Park is not a Priority.
District, Yahcats, Industrial Park, and Waldport	632/530	243/190	To meet this demand the capacity of the BWTP would need to be increased. For redundancy, and system stability, replacement of the Seabrook pump station would also be recommended. According to Waldport, development of the Industrial Park is not a Priority. Also, Waldport demand would only be necessary under extreme drought conditions. Developing infrastructure improvements based on a demand that may never be needed is not recommended.

5 WATER TREATMENT PLANTS RECOMMENDATIONS

5.1 Treatment Recommendations Based on Conditions, and District System Demands

5.1.1 WTP Control Improvements

As discussed previously, much of the equipment within the WTPs are reaching the end of their life span or are in need of upgrades to keep from becoming obsolete.

Blodgett Water Treatment Plant:

The District has begun to address the issues with old and obsolete equipment at the BWTP, and much of the needed improvements are already underway. These improvements are listed below and will not be included in our recommendations.

- Replace existing PLC/SCADA System with Rockwell Systems
- Replace WTP Desktop Computer
- Automate Water Treatment Plant to Have the Capability of Running 24-Hours a Day
- Replacement of Trident Train Underdrains
- Replacement of Trident Train Media (Sand (Silicia), Sand (Garnet), Anthracite)
- Replacement of Trident Train Suction Screen, Media Retainer Grating, and Various Gaskets
- Trident Train Refurbishment (Welding, Surfacing, Painting
- Replacement of the Compressor
- Replacement of the Turbidimeters
- Replacement of one of the Treated Water Pumps

The District has expressed no concern regarding the operation of any other pieces of equipment at the BWTP.

Although the treated water pumps are not showing any signs of failure, they are nearing the end of their life cycle. If one of the pumps did fail during the peak usage periods, the WTP could not keep up with system demands. If both pumps were replaced, the District would still be lacking redundancy in their treated water pump configuration. Adding a third pump would assist with system redundancy, and provide more capacity to the treated pumps for future expansions.

Adding a Flow meter at the Blodgett Reservoir outlet would help to optimize system function. Currently there is not a simple way to determine exactly how much flow is leaving the Blodgett Reservoir tank at any given time. This information would be helpful in leak detection and assessing precise usage patterns for future planning and billing purposes. This could be tabulated using WTP plant production numbers, and tank elevation data, but given current data collection methods, and various other considerations, the flow calculations would not be as accurate and therefore not as useful.

The recommended improvement projects for the BWTP are as follows ($98,000):

- Replace existing Treated Water Pump that was original to the WTP
- Install an additional treated water pump
- Install a magnetic flow meter downstream of the Blodgett Reservoir

Dicks Fork Water Treatment Plant:

The DFWTP is only ran a couple of days a week during high demand periods and has proven to be very reliable. For these reasons the WTP has not been modified or improved much since its construction in 1997. Although it currently does not provide the majority of the supply to the District, the need for the supply from DFWTP will increase during the planning period, and its ability to provide redundancy to BWTP makes this Plant a pivotal part of the District's infrastructure. As such, the BWTP improvements should shadow those recommended or already underway at the BWTP. These modifications would provide automation, and an ability to run 24-hours a day and would assure that the BWTP would continue to be reliable.

The recommended improvement projects for the DFWTP are as follows ($256,000):

- Replace existing PLC/SCADA System with Rockwell Systems
- Replace WTP Desktop Computer
- Automate Water Treatment Plant to Have the Capability of Running 24-Hours a Day
- Replacement of Trident Train Underdrains
- Replacement of Trident Train Media (Sand (Silicia), Sand (Garnet), Anthracite)
- Replacement of Trident Train Suction Screen, Media Retainer Grating, and Various Gaskets
- Trident Train Refurbishment (Welding, Surfacing, Painting)
- Replace existing Treated Water Pumps
- Compressor Replacement
- Turbidimeter Replacement
- Install a magnetic flow meter downstream of the Dicks Fork Reservoir

5.1.2 WTP Intake Improvements

The primary operational concern of the District for treatment system are the raw water turbidity spikes that occur during large storm events. These spikes force the operators to slow production, and in some cases shut down the plants until the turbidity level decrease.

Both operational adjustments and settling basin modifications could be used to minimize the impacts of turbidity spikes on production capabilities. The settling basins at the Big Creek, Starr Creek, and Dicks Fork could be operated to create a turbidity buffer for both WTPs.

The average daily demand for 2019-2020 during the months of October and November was 113 gpm, and 105 gpm respectively. The combined volume of the 3 settling basins is 307,000 gallons. If a large turbidity spike occurs within the raw water sources these basins could be isolated from the source and be used a raw water storage. With a raw water flow to the WTP of 123 gpm (10 gpm to account for additional flow required for backwash), the basins have enough raw water storage to last 41.6 hours. This would require the addition of control and monitoring systems to the basins to facilitate their complete isolation from their respective raw water source.

Alternatively, or in combination with basin isolation methods, reduction in the impacts of turbidity spikes would be experienced by increasing the degree of settling that occurs within the basin. Adding a coagulant at the entry point to the settling basins, and installing baffling within the basins should increase the degree of settling within the basin, and reduce any shortcutting that is occurring. Both improvements would reduce the levels of turbidity entering the WTPs.

The recommended improvement project for the Big Creek Intake is as follows ($222,700):

This project would include the installment of: a small platform and sluice gate, a small control building, raw water turbidimeter, SCADA system components and actuated valving, baffling, and a chemical injection system. Power is not provided at the site. Systems requiring power should be solar powered. Telecom is also not provided at the intake site. The District would need to either install a mission type system using cell towers to communicate with the existing SCADA system, or coordinate with the local power company to assess cost for extending their utitlity to the intake site. Utility extension will likely be cost prohibitive, but would allow for the installation of SCADA components that would be match existing infrastructure.

The recommended improvement project for the Starr Creek Intake are as follows ($204,680):

This project would include the installment of: a new fence, a small control building, raw water turbidimeter, SCADA system components and actuated valving, baffling, and a chemical injection system. Power and telecom utility connections are not available at site. This would be addressed as described in the Big Creek Improvement Project description.

The recommended improvement project for the Dicks Fork Intake are as follows ($190,400):

This project would include the installment of: a raw water turbidimeter, SCADA system components and actuated valving, baffling, and a chemical injection system. There is an existing small control building that could be used to house system improvements. Power and telecom utility connections are not available at site. This would be addressed as described in the Big Creek Improvement Project description.

5.2 Water System Reccomendations Based on Providing Treated Water to Neigboring Water Districts

The water systems to the north (Waldport) and south (Yachats) of the District have potential supply needs. If the District is required to meet the needs of both communities and its own projected demands, as described in Section 4, additional improvement projects will be needed. These additional projects are described below.

5.2.1 WTP Expansion ($1,560,000)

The BWTP was designed to house 3 Trident treatment trains, but currently contains 2. This project would include adding another 175 gpm Trident train next to the existing filters. The addition of another treated water pump, chemical injection components, piping, valving, and control systems would also be included in the project. There are existing concrete footings for the additional tank and pump.

5.2.2 Seabrook Pump Station Replacement ($255,000)

The Seabrook Pump Station is approximately 25 years old. This project includes removal of existing pump station, and construction of a pre-packaged pump station with increased capacity. The new pump station would be equipped with features not available on the original pump station. New features would include but not be limited to flow metering and remote access to pump station controls via the District's SCADA system.

6 UPDATED CAPITAL IMPROVEMENT PLAN

This study is an addendum to the District's existing WMP with its primary focus being on the water treatment system. Several improvement projects were recommended based on the evaluations of the treatment system.

The need for a portion of the recommended improvements is dependent on the District supplying water to the City of Yachats and Waldport. As it is unclear whether these neighboring water systems will request water from the District, these projects are not yet considered necessary. The remaining recommended improvements found within this addendum include various improvements to be completed at the two WTP sites based on conditions, and improvements at the individual intakes. The WTP improvements are summarized in Table 6.1. Intake improvements were not included as they were developed to address the Turbidity spikes in the raw water. However, these occur when demand is minimal, and the WTPs can afford to be shut down for a short period. Therefore, other improvement projects have a higher priority.

TABLE 6.1 – WTPS IMPROVEMENT COST SUMMARY

Project Improvements	Cost Estimate
Dicks Fork Water Treatment Plant	$256,000.00
Blodgett Water Treatment Plant	$98,000.00

As part of this planning document the existing Capital Improvement Plan (CIP) developed in the most recent WMP will be updated. All projects presented in the WMP and this addendum were considered when developing the updated CIP.

To develop project priority fundability, cost, and system need were all considered. Given the recent stimulus package approved by the federal government, projects that cater to the requirements of this funding will be more desirable as they could be partially, or fully paid for with federal/state funds. For this reason, projects that can be easily transitioned into shovel ready projects, have a high-cost benefit analysis, and/or meet the stipulations set by FEMA funding packages have been given the highest priority when developing a project list for the CIP. The CIP presented in this section includes improvement projects that are recommended to be constructed within the next 5 years.

6.1 Capital Improvement Plan

The various water storage, and water distribution system recommended improvements are summarized in Table 6.1. Refer to Sections 4 and 5 of the current WMP and this document for detailed project breakdown and justification for the specific recommended improvements.

Neither projects 5 or 9 were included in the current WMP, or discussed previously in this addendum. During the process of re-evaluating the CIP, it was noted that the PRVs did not allow fire flows from the high pressure system into the lower system. Improvement Project 5 includes the replacement of both pressure reducing vaults (PRV). The new vaults would include a 2" PRV line, and an 8" fire flow bypass line. Also noted was the lack of necessity of the two 6"

AC waterlines on the east and west side of Hwy. 101 that run parallel to a 10 inch waterline. The 10" waterline is sufficiently sized to serve and provide fire flows to all areas currently served by the 6" AC waterlines. Improvement Project 9 scope includes all work associated with the abandonment of this 6" AC waterline (service, hydrant and intersecting waterline reconnections).

Project 8 was originally discussed in the WMP as a remove and replace waterline project. The scope has been modified for the updated CIP. The project scope now includes the abandonment of the 6" AC waterline, and reconnection of all existing services, intersecting waterlines, and hydrants to the 10" waterline on the opposite side of Hwy. 101.

TABLE 6.1 – CAPITAL IMPROVEMENT PLAN 2022-2027

CAPITAL IMPROVEMENT PLAN 2022-2027				
FEMA PROJECTS				
Project Number	**Project Name**	**Pipe Length**	**Project Description**	**Item Cost**
1	Dicks Fork Tank No. 2	--	Add an additional 200,000 gallon Tank at Dicks Fork WTP Site	
2	SW Seabrook Lane	1,800	Waterline from Dick's Fork WTP to Lower Pressure Zone (North)-Primary Waterlline for Seabrook Tank-8" to 12"	
3	SW Wakonds Beach	1,600	Replace 6" Waterline from Dick's Fork WTP to Lower Pressure Zone (South)	
4	SW Tara Lane to SW Forest Lane	1,900	Replaces Aging 6" AC Pipe That Provides Looping and More Reliable Conveyance of Water From Dick's Fork Tank to the Most Northern Section of the Water System	
5	PRV Improvements	--	Fire Flows in the Lower System Can Be Provided by Dick's Fork Tank	
SHOVEL READY PROJECTS				
Project Number	**Project Description**	**Pipe Length**	**Project Description**	**Item Cost**
6	Raw Waterline From Big Creek Settling Basin to Blodgett WTP	4,400	Replace aged 8" AC Raw Waterline	
7	NE Forest Hill to NE Star Creek Dr.	1,500	Replace aged 6" AC Pipe	
8	West Side of HWY 101 -From Fernwood Drive South to Wakeetum Street	2,900	Abandon 6" AC Waterline-Reconnect Service Connections to the 10" Waterline on East Side of Hwy. 101. Relocate Fire Hydrants to the East Side of Hwy. 101	
9	East Side of HWY 101 -From Fernwood Drive North to SW Whitecap Drive	1,900	Abandon 6" AC Waterline-Reconnect Service Connections to the 10" Waterline	
10	Camp One Road	1,300	Replaces aged Pipes-Increases Fire Flow-4" to 6"	
11	NE California Street	1,000	Replaces aged Pipes-Increases Fire Flow-4" to 8"	

Images depicting the waterline projects described in the CIP are provided on the following pages.

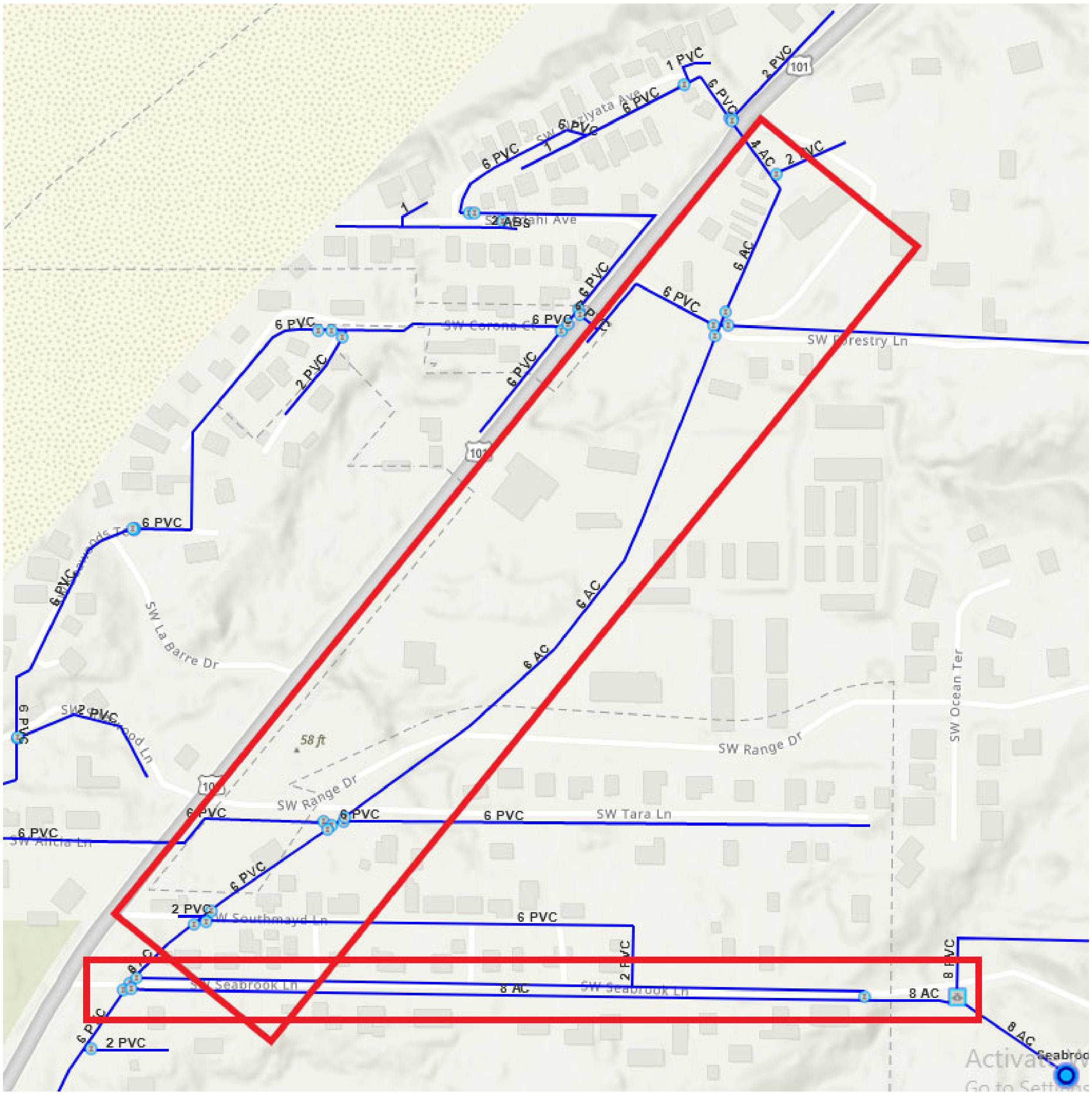
6.2 Prelimineering Engineering Report

All recommended improvement projects from the WMP and this addendum were weighed based on the priorities previously discussed. This evaluation was the means by which dozens of improvement projects were limited to the 11 shown in the 5-year CIP. Further analysis in the form a preliminary engineering report (PER) for the shovel ready projects would provide additional information that would help to further refine project priority. At a minimum the PER process would achieve the following:

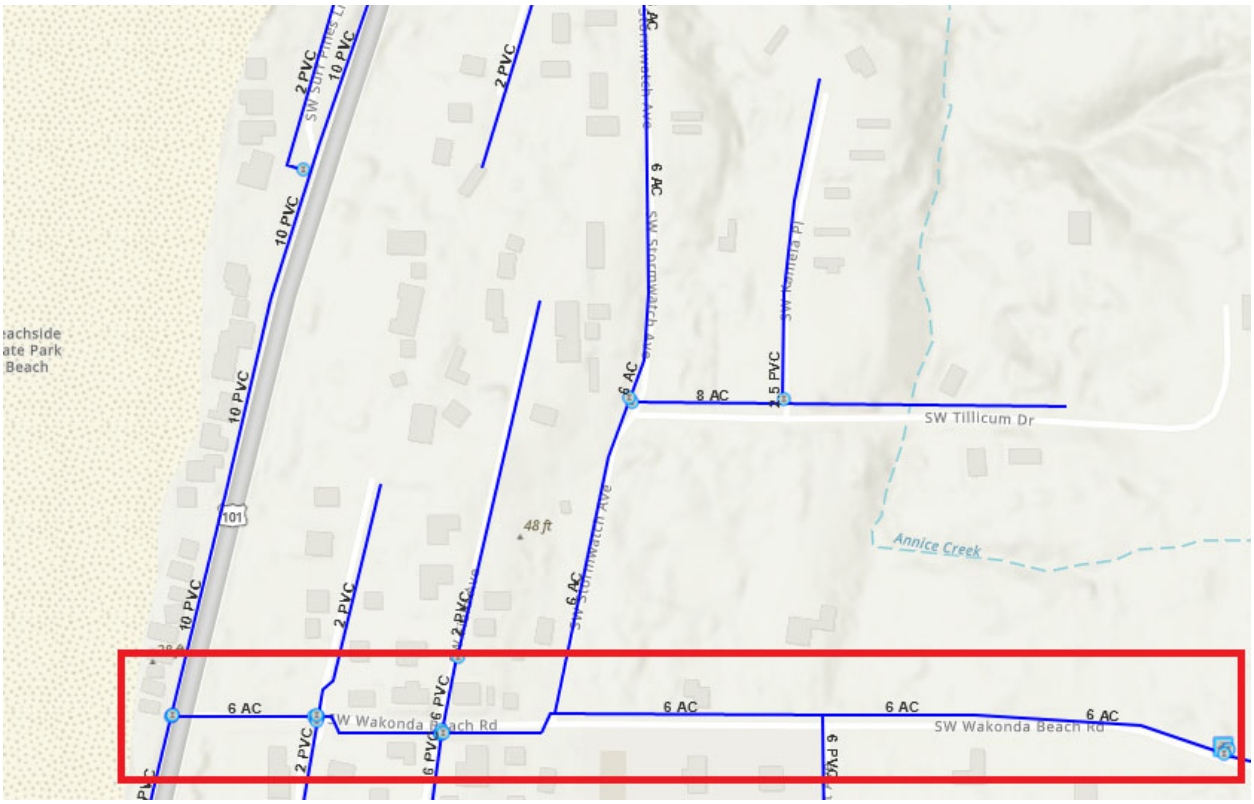
- Development of a preliminary design (30% Design)
- Establish a more accurate cost estimate based on the preliminary design
- Assess environmental roadblocks based on the preliminary design
- Assess any design obstacles that diminish the value of the project based on feasibility

It is recommended that a PER is developed for all shovel ready projects shown in Table 6.1.

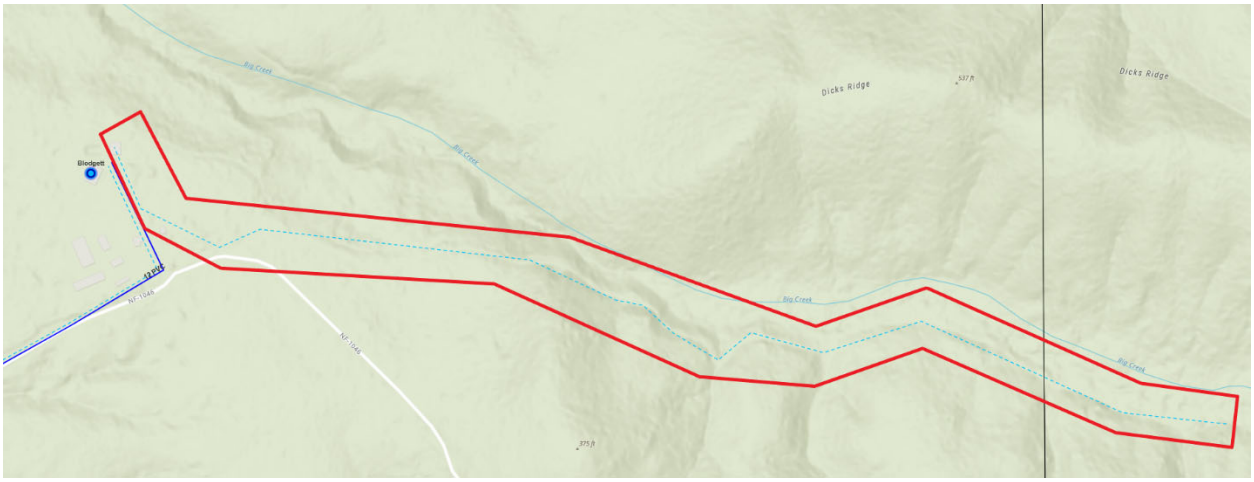
Project 2 and 4


SW Corona Ct
SW Forestry Ln
SW La Barre Dr
SW Range Dr
SW Tara Ln
SW Southmayd Ln
SW Seabrook Ln
SW Ocean Ter
SW Alicia Ln
58 ft
6 PVC
6 AC
8 AC
2 PVC
1 PVC
2 ABS

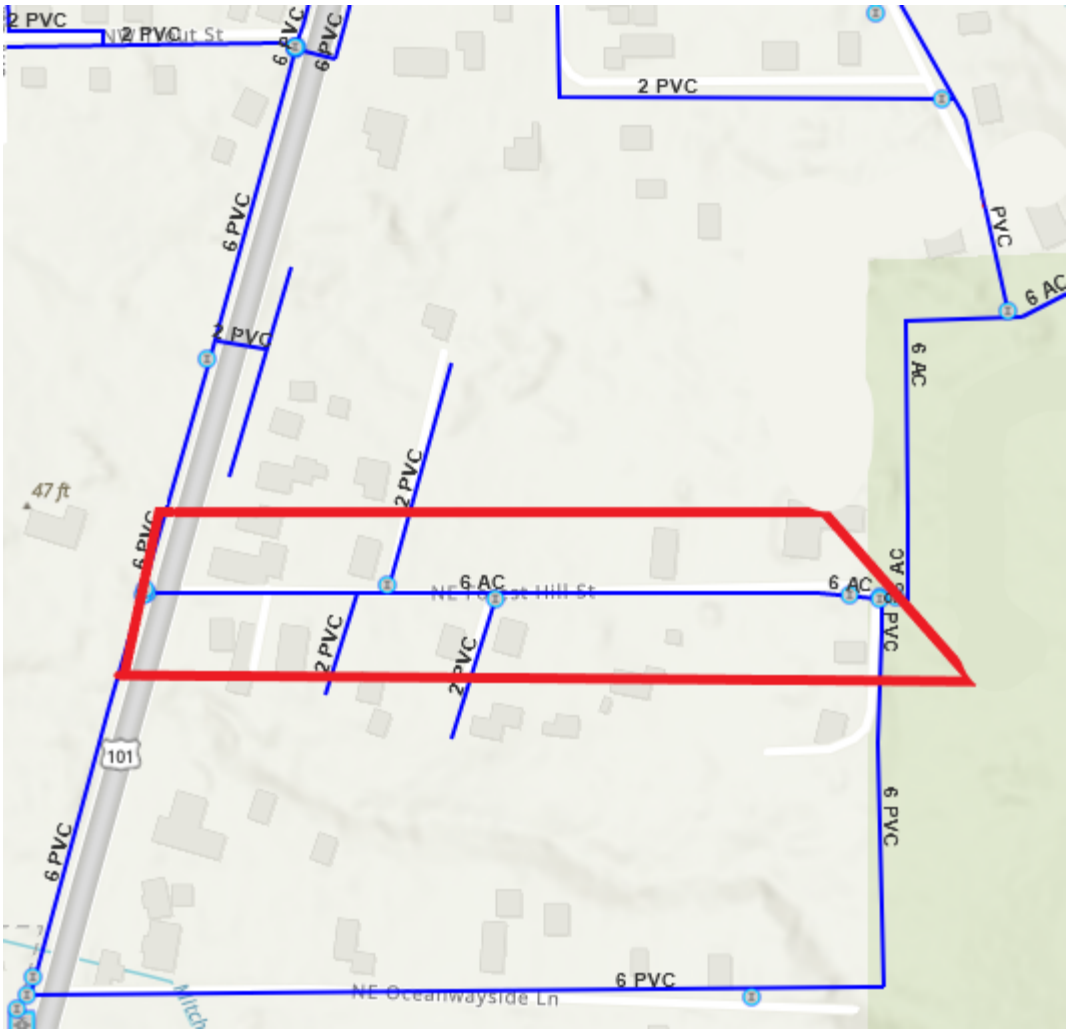
Project 3



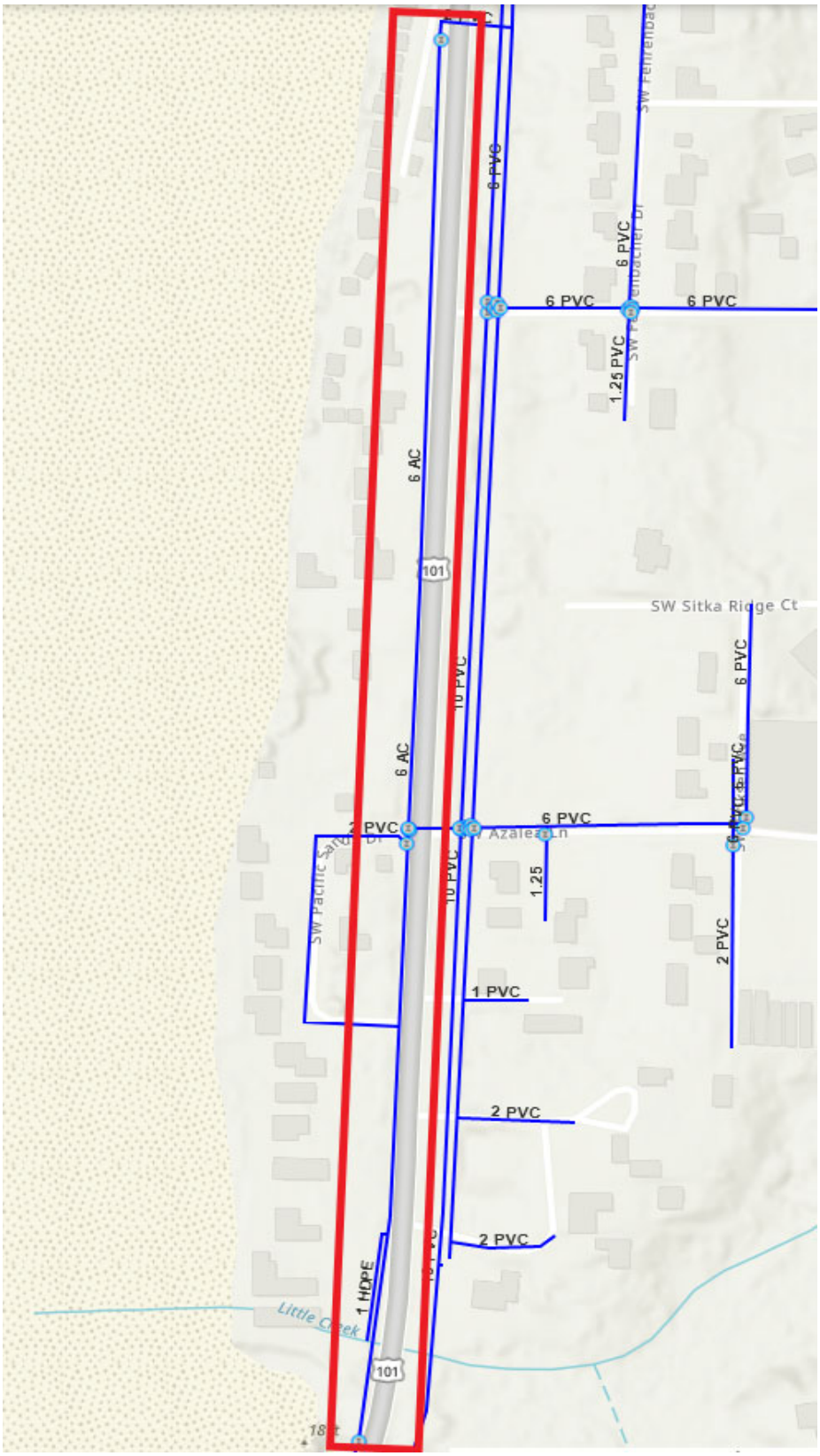
Project 6



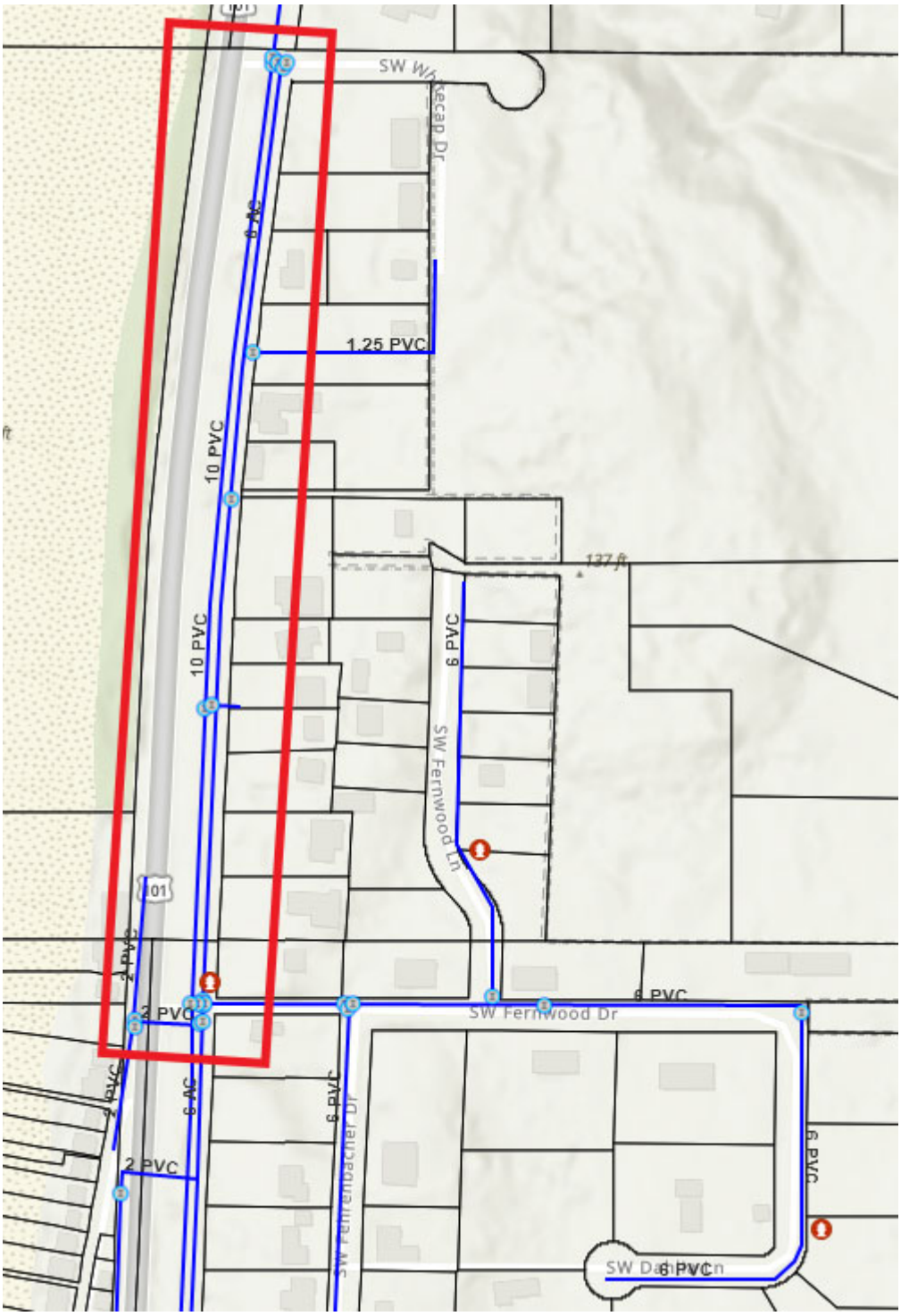
Project 7


2 PVC
2 PVC
6 PVC
6 PVC
2 PVC
6 PVC
2 PVC
PVC
6 AC
6 AC
47 ft
6 PVC
2 PVC
6 AC
6 AC
2 PVC
2 PVC
101
6 PVC
6 PVC
6 PVC
NE Oceanwayside Ln

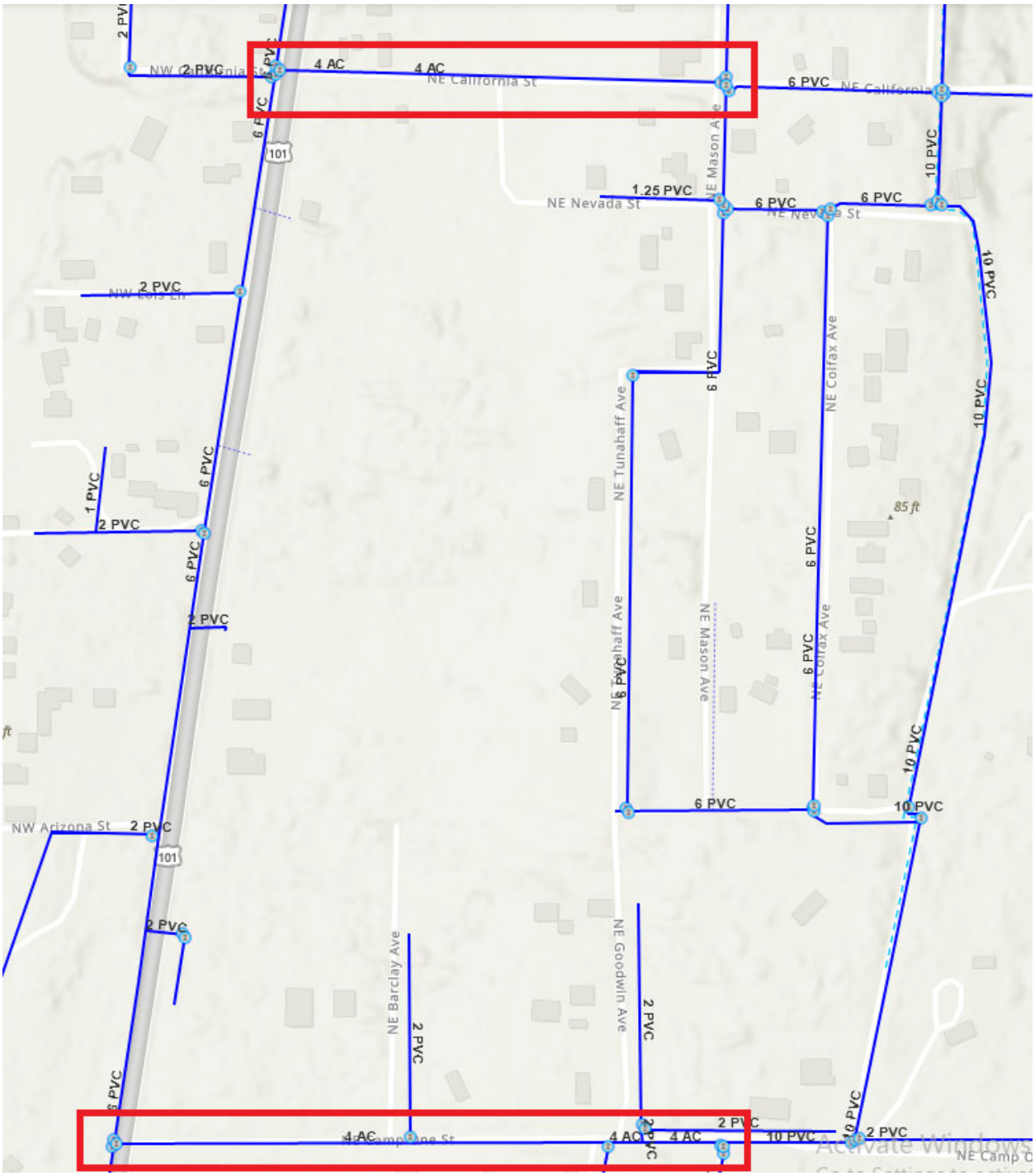
Project 8


6 PVC
6 PVC
6 PVC
6 PVC
1.25 PVC
6 AC
6 AC
101
SW Sitka Ridge Ct
6 PVC
10 PVC
10 PVC
2 PVC
6 PVC
1.25
2 PVC
1 PVC
2 PVC
2 PVC
1 HDPE
Little Creek
101

Project 9



Project 10 and 11


4 AC
4 AC
NE California St
6 PVC
NE California
10 PVC
1.25 PVC
NE Nevada St
6 PVC
6 PVC
NE Nevada St
NE Mason Ave
10 PVC
2 PVC
NW Lois Ln
6 PVC
NE Tunahaff Ave
NE Colfax Ave
85 ft
1 PVC
2 PVC
6 PVC
6 PVC
2 PVC
NE Tunahaff Ave
NE Mason Ave
NE Colfax Ave
6 PVC
10 PVC
6 PVC
10 PVC
NW Arizona St
2 PVC
101
2 PVC
NE Barclay Ave
NE Goodwin Ave
2 PVC
2 PVC
6 PVC
4 AC
4 AC
4 AC
2 PVC
10 PVC
10 PVC
2 PVC

TECHNICAL MEMORANDUM

City of Yachats Drinking Water Protection Plan Monitoring Plan

To: Rick McClung, City of Yachats

From: Renee Fowler, GSI Water Solutions, Inc.

Suzanne de Szoeke, GSI Water Solutions, Inc.

Attachments:

Attachment A. Stream Channel Reference Sites: An Illustrated Guide to Field Technique (U.S. Department of Agriculture, 1994)

Attachment B. Discharge Measurements at Gaging Stations (U.S. Geological Survey, 2010)

Attachment C. Stream Inspection Form Example

Attachment D. Stream Visual Assessment Protocol Version 2 (U.S. Department of Agriculture, 2009)

Attachment E. Surface Water Sampling Operation Procedure (U.S. Environmental Protection Agency, 2021)

Date: January 31, 2023

1. Introduction

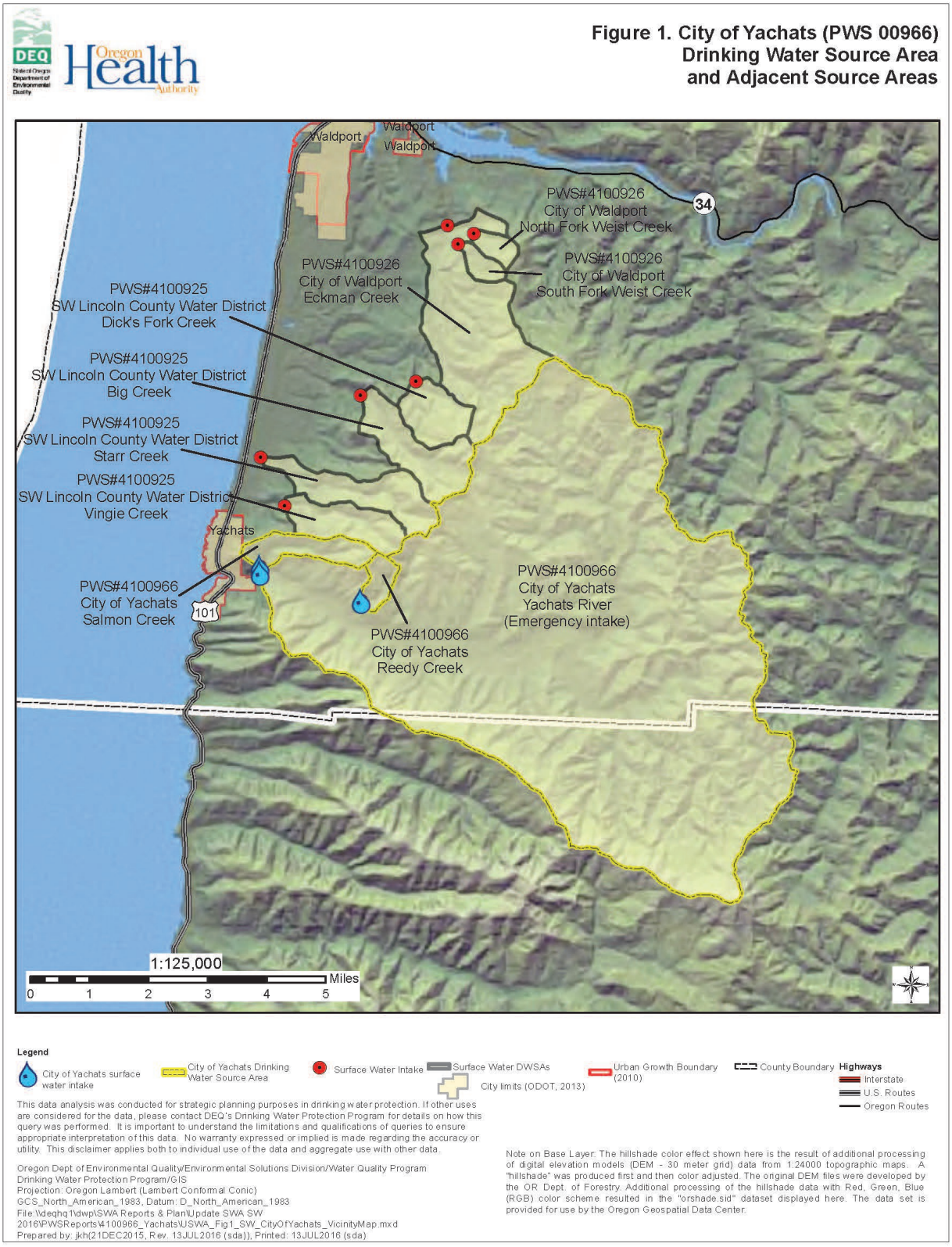
The City of Yachats (City) is the southernmost city in Lincoln County, located along Highway 101 on the scenic Oregon coast. The City's municipal water supply currently comes from two sources: Reedy Creek and Salmon Creek. The City's primary water source is Reedy Creek, a tributary of the Yachats River (Figure 1). Water from Salmon Creek, another tributary of the Yachats River, is used to supplement the supply from Reedy Creek. Protecting the watersheds of Reedy Creek and Salmon Creek is vital to preserving high water quality for the community.

In 2021, the City completed a Drinking Water Protection Plan (DWPP) that describes risks to the City's drinking water source areas, identifies strategies to address those risks, and presents an implementation plan outlining actions to implement those strategies. The DWPP's implementation plan included an action to develop a water quality monitoring plan that would enable the City to detect and address potential issues in a timely manner, specifically related to three risks to drinking water sources:

- Natural Disasters: Climate Change
- Natural Disasters: Severe Weather Events
- Forestry Management: Timber Harvest and Pesticides

The objective of this water quality monitoring plan is to help address the above risks to the City's drinking water sources by determining water quality parameters to monitor, helping identify potential monitoring locations, developing protocols and schedules for monitoring, and identifying responsible parties to conduct the monitoring.

Figure 1. Map of Drinking Water Source Watersheds



2. City of Yachats Current Water Quality Monitoring

The City's Water Treatment Plant currently monitors turbidity, pH, and temperature measurements on raw water when the Treatment Plant is actively treating water from Reedy Creek and/or Salmon Creek. However, only turbidity data is saved in the Treatment Plant's data logging system; pH and temperature data are not electronically retained. When the Treatment Plant is not treating raw water, turbidity data is not collected from either source creek (Reedy Creek and/or Salmon Creek) as no water is entering the Treatment Plant. The raw water turbidity tends to range between 0.5 Nephelometric Turbidity Units (NTU) to 80 NTU, with increases in turbidity usually correlating with heavy rains. The turbidity of treated water in the distribution system is generally 0.03 NTU.

Currently, the Treatment Plant typically treats water every other day during the winter with the aid of the City's reservoir. This schedule allows for the City to plan around short-term high-turbidity events, often associated with heavy rains.

Treated water is sampled and analyzed in accordance the City's sampling schedule with the Oregon Health Authority (OHA); the schedule is available on OHA's Drinking Water Data Online website (yourwater.oregon.gov). The objective of OHA-regulated monitoring is to ensure that the City's treated water meets or exceeds drinking water quality standards. These samples are collected by the City and transported from Newport, Oregon to Analytical Laboratory Group, Inc in Eugene, Oregon by a lab courier (available every Wednesday).

Cellular service (including data) is not available at Reedy Creek and is extremely limited at Salmon Creek and the Treatment Plant (only currently available with T-Mobile). This limitation can impact the viability of real-time monitoring at the source creeks, particularly Reedy Creek, and will influence how continuous monitoring can be implemented.

3. Water Quality Monitoring for Potential Risks

Maintaining high water quality is critical for municipal water supplies. The City's Treatment Plant is designed for the typically high quality raw water that is usually available in the source creeks (e.g., Reedy Creek and Salmon Creek). Monitoring the water quality of the City's source creeks for potential risks (e.g., climate change, severe weather events, and timber harvest) will help the City be more informed of stream conditions that affect the long- or short-term quality of water in Reedy Creek and Salmon Creek, and thereby, will enable the City to take more timely action to address water quality issues. This monitoring would be in addition to the City's OHA-regulated monitoring requirements, as this is associated with the water source (i.e., raw water) rather than treated drinking water.

3.1 Natural Disasters: Climate Change

Long-term monitoring of source water will help the City determine whether raw water quality degradation is occurring over time due to erosion, runoff, or other factors associated with climate change. Maintaining long-term records of streamflow and stream morphology will help the City identify trends that could indicate raw water quality issues that the City may want to address. The following monitoring activities are recommended for Reedy Creek and Salmon Creek.

3.1.1 Continuous Water Quality Monitoring

Water quality parameters, such as temperature and turbidity, are helpful indicators to understand changes in stream morphology. For example, an increase in turbidity can indicate erosion of stream banks, urban/agricultural runoff, and various other natural and management-related causes. Similarly, the temperature of source water can be an indicator of a change in the riparian area management, such as the removal of trees (natural or anthropological) along a stretch of bank, which can lead to bank instability and

erosion issues. For this reason, both turbidity and temperature are important parameters to monitor in each source creek.

As discussed in Section 2, the City continuously monitors and electronically stores raw water turbidity levels when the Treatment Plant is treating water. If feasible, it would be beneficial to electronically store the raw water temperature measurements, too. For the purpose of this Monitoring Plan, it would be helpful to identify if the Treatment Plant is solely utilizing Reedy Creek or if Salmon Creek is supplementing Reedy Creek when storing this information for long-term record keeping.

As turbidity (and temperature) data is only collected when the Treatment Plant is actively treating water, these parameters are not measured when the Treatment Plant is not actively pulling water from the source (Reedy Creek and/or Salmon Creek). For climate change monitoring, it would be beneficial to have turbidity and temperature readings for both Reedy Creek and Salmon Creek 24 hours a day, 7 days a week. However, this maybe be challenging due to the configuration of the source water entering the Treatment Plant and the lack of cellular service, particularly at Reedy Creek. However, true continuous turbidity and temperature monitoring at both source creeks might be viable in a future capital improvement project.

3.1.2 Streamflow Monitoring

Long-term monitoring of streamflow in Reedy Creek and Salmon Creek is important for assessing if streamflow is decreasing over time. Additionally, it's helpful to understand how streamflow changes throughout the year for planning purposes (i.e., planning if and when to supplement Reedy Creek with Salmon Creek or confirming there is sufficient water for the City's needs). Streamflow can be measured by (1) specialized equipment to measure streamflow, (2) calculating streamflow using a weir, and (3) calculating streamflow using a staff gage and rating curve, which is discussed in more detail below.

Currently, the City measures streamflow at Reedy Creek using a flow meter at the water Treatment Plant. When streamflow at Reedy Creek is low enough that all available water is flowing into the Treatment Plant's intake, then this flow meter is sufficient to collect Reedy Creek discharge. If flow is sufficient so that water flows in Reedy Creek downstream of the Treatment Plant's intake, then an alternative method should be employed to collect streamflow measurements. One example of an alternative method is the mid-section method using a top setting wading rod with a current meter.

Salmon Creek has a V-notch weir for measuring streamflow; however, streamflow can only be measured using the weir if the City is not using Salmon Creek as a water source. As Salmon Creek is only used as a supplement when flows are low in Reedy Creek, this is likely sufficient for measuring streamflow for the purpose of long-term monitoring purposes. However, if Salmon Creek is used as a water source more in the future, it's important to collect streamflow measurements using alternative methods other than the weir. Another consideration to using the V-notch weir for streamflow measurements is that it needs to be removed during high flow events (e.g., severe weather events) to prevent damage to the weir. If the City wishes to collect streamflow measurements at Salmon Creek during high flow events or when the City is using Salmon Creek as an active water supply source, an alternative method should be employed to collect streamflow measurements. An example of an alternative method is the mid-section method using a top setting wading rod with a current meter.

This monitoring plan recommends that streamflow, or stream discharge, measurements are collected at both creeks upstream of their intakes at least six times per year for two years and four times per year thereafter for several years to create a rating curve. For Reedy Creek, collecting streamflow measurements using the mid-section method is recommended to ensure all flow is included in the measurement. The V-notch weir may be used to collect streamflow measurements at Salmon Creek when the weir is installed, but an alternative method, such as the mid-section method, is recommended during high flow events and/or when the City is using Salmon Creek as a water source (i.e., when the weir is removed).

In addition to discharge measurements, installation of a staff gage is recommended at each creek so that a correlation can be developed between (1) the discharge measurements (collected via the mid-stream method or V-notch weir) and (2) the staff gage reading. This correlation between the two data points is a rating curve, with the staff gage measurement on one axis and the discharge on the other axis. The timing of the streamflow measurements and staff gage readings should target various creek stages to enable a more robust and accurate rating curve. Once the rating curve is established, the City can estimate the creek's discharge based on the staff gage reading. It should be noted that a gage for stage height is present on Salmon Creek's weir, but it cannot be used when the weir is removed. Therefore, a staff gage would still be beneficial at Salmon Creek.

A pressure transducer installed in combination with the staff gage is recommended to provide continuous streamflow data. The pressure transducer can collect continuous measurements at the staff gage (e.g., once per hour or every 30 minutes) to track the changes in streamflow in the creeks that occur daily, seasonally, or after storm or timber harvest events. Furthermore, continuous stage data from the pressure transducer can help inform the City of potential long-term water source issues, such as increased erratic discharge events due to climate change or a prolonged and slow reduction in discharge.

Guidance documents on how to measure discharge (including V-notch weir and mid-section method with a current meter measurements) and how to install a staff gage are available in Attachments A and B.

3.1.3 Stream Inspections

Stream channels naturally change shape over time unless there are anthropogenic constrictions on the channel. Monitoring the morphology over time can help the City respond to these changes to minimize negative impacts to water quality. As previous discussed, changes in stream morphology includes erosion and bank stability, which can lead to high turbidity in source water and therefore decreasing water quality. One way to track stream morphology is through stream inspections on both Reedy Creek and Salmon Creek.

Ideally, stream inspections would occur quarterly to capture seasonal differences over time. This monitoring plan recommends that stream inspection locations be selected along each creek. These locations should be flagged and location coordinates collected using a global positioning system (GPS) device to enable long-term monitoring. Inspection locations are recommended along each stream upstream of the Treatment Plant intakes. One to three locations are ideal but ability to access each creek along its length will directly dictate the number and location of these stream inspection locations. Below are some considerations for stream inspection locations:

- Reedy Creek
  - Intake and Creek Description: The channel becomes braided shortly upstream of the intake. The braided section is less than a quarter mile in length before becoming a single channel again.
  - Inspection Location(s): A stream inspection location could be located almost immediately upstream of the braided channel. The area between the braided channel and over-channel vegetation (approximately 20-40 feet) could be included in the inspection location. Additional locations upstream will be more challenging as it would require clearing of vegetation covering the channel.
  - Access: The suggested inspection location can be accessed by walking up the channel, specifically the right channel (when looking downstream) during the braided section. However, this may be challenging during high flow; access should be reassessed during the spring and/or other periods of high flow. Riparian vegetation is dense and a path would need to be cleared if unable to walk up the channel.

- Salmon Creek
  - Intake and Creek Description: A small waterfall feeds into a large pool immediately upstream of the intake. Steep banks surround the pool. Immediately upstream of the waterfall, Salmon Creek consists of a series of small pools on bedrock.
  - Inspection Location(s): A stream inspection location could be amidst the series of pools, where there is a break in pools. Gravel deposition is occurring in this cross-section. Just downstream of the gravel deposition is an area of bank erosion that could be monitored. Therefore, including both of these areas, spanning approximately 20 feet, in the inspection location is recommended. Additional locations upstream will be more challenging as it requires clearing of vegetation covering the channel.
  - Access: Current access is bushwacking up a steep bank alongside the pool to access the creek upstream of the waterfall. This access is likely unsafe in inclement weather and creating a path for field personnel is recommended. Additionally, the bedrock makes for a slippery walking surface so field staff should be cautious.

When performing the Reedy Creek and Salmon Creek inspections, the following information is recommended to be documented at each stream inspection location using a field form, such as the example form provided in Attachment C:

- Channel conditions, include cross section description, general flow description, scouring, deposition, bank condition, streambed material, bankfull, wetted width, maximum depth, and average depth.
- Riparian conditions, including upper and mid canopy descriptions, ground cover description, and canopy cover over the channel.
  - Alternative to an estimated percentage of canopy cover as outlined in Attachment B, a Solar Pathfinder could be used for more accurate data.
  - A Streamside Vegetation Assessment (an Oregon Department of Agricultural concept) every 5 or 10 years would be beneficial, too.
- Water conditions, including appearance, and field turbidity and temperature measurements.
- Photographs of channel and riparian conditions should be taken and descriptions recorded on the stream inspection form. Photo monitoring site locations should also be recorded through descriptions and photograph. In addition, markers could be placed at photo monitoring sites.

Prior to field staff performing the stream inspection, staff should review and understand guidance documents related to stream assessments, such as the one provided in Attachment D. When applicable, water quality meters should be calibrated prior to using.

3.2 Natural Disasters: Severe Weather Events

Severe weather can lead to high flow events (associated with heavy precipitation) and erosion, which can lead to increased turbidity and nutrient overload in the creek.

3.2.1 Streamflow Surges

High precipitation during a severe weather event can lead to flashy high flow events in Reedy Creek and/or Salmon Creek, which can result in soil erosion and bank instability that contributes to sedimentation and turbidity in the stream. Much of this information will be qualitatively collected during the quarterly stream inspections related to climate change monitoring (Section 2.1.2). Long-term monitoring of the peak creek stage during these severe weather events would also be helpful to understand if storm surges are increasing in intensity over time. A crest gage could be installed on the staff gage (suggested in Section 3.1.2) to capture the peak creek stage. A traditional crest gage consists of a metal pipe with a wood pole and crushed cork inside; the cork will rise within the pipe as the stage increases and adhere to the wooden pole. This

device is accurate at measuring the peak stage but needs to be reset after each storm. Alternatively, a pressure transducer (also suggested in Section 3.1.2) could gather this information. Although the ultimate peak stage could be missed depending on the duration of the stage and frequency of the pressure transducer readings, a pressure transducer is advantageous as it does not need to be reset after each storm, provides pre- and post-storm readings, and roughly records the storm's duration.

3.2.2 Analytical Water Quality Samples

Severe weather events can temporarily impact the quality of the City's source water, with elevated turbidity as the main concern. Additionally, there is a potential for nutrient overload in combination with high turbidity, which can lead to an algae event. Water quality monitoring is recommended prior to each storm season, which roughly begins in November, and after extreme storms in areas prone to excessive erosion and sedimentation. Collecting two grab samples per creek each storm season, in addition to a baseline sample, is recommended.

Water quality samples for laboratory analysis should be collected at Reedy Creek and Salmon Creek. The Reedy Creek sample could be a grab sample from the Treatment Plant sample port if Reedy Creek was the only source for the Treatment Plant or from the creek near the intake. The Salmon Creek sample would be collected as a grab sample from the creek near the intake. Grab samples from the creeks should be collected within 24 to 48 hours after the storm, but only as access and safety allow.

Each sampling event would include the following analyses at each creek:

- Field turbidity, temperature, and pH using a water quality meter
- Total suspended solids by Standard Method (SM) 2540 D
- Total organic carbon by SM 5310B
- Nutrients and inorganic compounds
  - Nitrate and nitrite by U.S. Environmental Protection Agency (EPA) Method 300.0[1]
  - Total Kjeldahl nitrogen by SM 4500-N(org) C
  - Phosphorous by EPA Method 365.3
  - Orthophosphate phosphorus by EPA Method 300.0[1]
  - Potassium by SM 3111 B
  - Sulfate by EPA Method 300.0

Grab water quality samples collected from the Treatment Plant should follow City sampling protocols using laboratory supplied bottles. Field personnel should become familiar with how to collect a grab sample from the creek, potentially using the dip method or swing arm/scoop method described in the guidance document provided in Attachment E.

3.3 Forestry Management

The forested watersheds comprising Yachats' current drinking water source areas are predominantly owned by the United States Forestry Service and are part of the Siuslaw National Forest. However, a significant portion of the Salmon Creek watershed, directly upstream from the drinking water intake, is private industrial timberland. Oregon's Forest Practices Act sets standards for forestry operations, access roads, reforestation, and water protection, among other issues. Nonetheless, forestry practices may still have the potential for drinking water quality impacts due to lack of compliance or gaps in regulations.

[1] Sample will need to be received at an analytical laboratory, such as Analytical Laboratory Group, Inc. in Eugene, Oregon, within 24 hours of collection.

3.3.1 Timber Harvest

As needed, monitoring downstream of identified problem areas after timber harvest is recommended to assess whether water quality degradation is occurring by erosion, runoff, or other factors.

Performing stream inspections (outlined in Section 3.1.3) will provide a baseline for each creek that can be referenced for comparison of stream conditions following a timber harvest. If additional inspection locations downstream of timber harvest areas could potentially yield helpful water quality data, then additional inspection locations should be added if possible. Stream inspections should increase in frequency from the baseline frequency to monthly shortly following a timber harvest if impacting water quality. Stream inspection frequency can decrease as the stream reestablishes its equilibrium. The key elements in the stream inspection outlined in Section 3.1.3 and Attachment B to monitor after timber harvest include:

- Field turbidity and temperature measurements using water quality meters.
- Documentation and pictures of scouring, deposition, bank stability, and riparian vegetation. Pictures of the creek reestablishing itself are critical.

3.3.2 Forestry Pesticides

Over-application or improper handling of pesticides (i.e., insecticides, fungicides, and herbicides) used in forestry management, or aerial spraying, could contaminate drinking water sources. Timing of applications can potentially contribute to water quality impacts, such as applying pesticides before precipitation events or during periods during the year when breakdown by soil microorganisms is slower, by increasing the likelihood of the pesticides making it into drinking water sources.

The City can track if a pesticide permit has been pulled for application in either Reedy Creek or Salmon Creek watersheds. If pesticides have been applied to either watershed, the City should collect a water quality sample from the applicable creek and have it analyzed for pesticides.

4. Implementation

Implementation activities involved in monitoring the risks associated with climate change, severe weather events, and timber harvest events include: (1) streamflow monitoring, (2) stream inspections, and (3) water quality samples. Table 1 outlines when each of these monitoring activities should occur throughout the year, what parameters are involved, and how the information is collected.

Table 1. Climate Change and Severe Weather Event Monitoring Implementation

Monitoring Activities	Schedule				Parameters	Approach
	Q1	Q2	Q3	Q4		
Streamflow Monitoring [1]	X	X	X	X	Stream discharge	Reedy Creek: mid-section method Salmon Creek: weir or mid-section method
					Stream stage	Staff Gage: manual recording Pressure transducer: continuous recording, download quarterly
Add-On Streamflow Monitoring [1,2] (Year 1 and Year 2 only)	-	Jun	X	-	Stream discharge	Reedy Creek: mid-section method Salmon Creek: weir or mid-section method
					Stream stage	Staff Gage: manual recording Pressure transducer: continuous recording, download quarterly
Stream Inspections [1]	X	X	X	X	Observations: scouring, deposition, bank stability, riparian vegetation	▪ Record observations on Stream Inspection Form ▪ Photographs
					Stream field parameters: turbidity, temperature, and conductivity (optional)	Water quality meters
Baseline Water Quality Samples [1,3]	-	-	-	Oct	Stream field parameters: turbidity, temperature, and pH	Water quality meters
					Analytical samples: TSS, TOC, nutrients and inorganic compounds	Reedy Creek: grab near intake or treatment plant sample port Salmon Creek: grab near intake
Post-storm Water Quality Samples [1,3,4,5]	X	Apr, May	-	Nov, Dec	Stream field parameters: turbidity, temperature, and pH	Water quality meters
					Analytical samples: TSS, TOC, nutrients and inorganic compounds	Reedy Creek: grab near intake or treatment plant sample port Salmon Creek: grab near intake
Pesticide Water Quality Sample	-	-	-	-	Analytical samples: pesticides	Collect grab sample as needed if pesticides applied within Reedy Creek or Salmon Creek watershed.

Notes

[1] Activity should occur at both Reedy Creek and Salmon Creek.

[2] In Year 1 and Year 2 of streamflow monitoring, two (2) additional streamflow measurements should occur at Reedy Creek and Salmon creek in addition to the quarterly streamflow monitoring. These two additional measurements should occur between June 1 and September 30.

[3] Samples will need to be received at an analytical laboratory, such as Analytical Laboratory Group, Inc. in Eugene, Oregon, within 24 hours of collection.

[4] Collect two (2) samples per storm season.

[5] Sample needs to be collected 24 to 48 hours after the severe weather event, as safety allows.

Nutrients and inorganic compounds = nitrate, nitrite, total Kjeldahl nitrogen, phosphorous, orthophosphate, potassium, and sulfate.

Q1, Q2, Q3, and Q4 = first quarter (January-March), second quarter (April-June), third quarter (July-September), and fourth quarter (October-December)

TOC = total organic carbon

TSS = total suspended solids

X = activity should occur anytime within the quarter; month(s) are indicated as needed

4.1 Next Steps

This Monitoring Plan is a framework of possible monitoring activities that the City can implement in support of their DWPP. The City should consider the following prior to implementing these monitoring activities:

- Identify which monitoring activities the City would like to implement. This includes reviewing the recommendations in this Monitoring Plan and exploring costs and logistics associated with the recommendations.
- Identify who will perform the monitoring activities. This could include City staff, consultants, and/or non-profits.
- Develop specific and detailed protocols for monitoring activities that were selected.

TECHNICAL MEMORANDUM

Ordinances Encouraging Water Conservation

To: Rick McClung, City of Yachats

From: Suzanne de Szoeke, GSI Water Solutions, Inc.
Leah Cogan, GSI Water Solutions, Inc.

Attachments: Appendix A – Table of Water Conservation Ordinance Examples

Date: January 31, 2023

Introduction

In September 2021, the Oregon Health Authority (OHA) and Oregon Department of Environmental Quality (DEQ) approved the City of Yachats (City) Drinking Water Protection Plan (DWPP) to safeguard the City's municipal water sources. A team of local stakeholders and technical experts developed the DWPP with public input. The DWPP assesses potential risks to drinking water arising in the watersheds of the City's water sources, Reedy Creek and Salmon Creek, and sets forth strategies to address those risks. Among these strategies, the DWPP recommends that the City consider adopting ordinances promoting water conservation to reduce demand on the water quantity of the City's water sources and to protect water quality in those sources from deteriorating during low flows.

To assist the City in implementing the DWPP and achieving its water conservation goals, GSI Water Solutions, Inc. (GSI) has prepared this technical memorandum describing opportunities to encourage water conservation in the City's Municipal Code. For this memo, GSI examined the relevant sections of municipal, development, and land use codes for cities with effective water conservation policies, primarily in the western United States. The primary data sources explored were the Municode Library (an online database of municipal codes) and city and state websites. This memo provides a brief background and then describes common themes in indoor and outdoor water conservation policies, including considerations for short-term rentals. Examples of ordinance concepts and language are provided, and **Appendix A** includes a more extensive table of ordinance excerpts from various cities with links to the associated code. Each example referenced in this memo is numbered to correspond with the table.

Background

Municipal water demand typically shows a seasonal pattern of increased water usage in the summer and decreased usage during the winter, leading many cities to target summer water use for conservation programs. Spikes in demand during the summer "peak season" months may be attributed to increases in the outdoor use of water for lawn and landscape irrigation, indoor water use to serve a higher tourist population, or both. Total water demand in Yachats follows this seasonal pattern, but specific data on consumption by customer category was not available to help distinguish the precise factors behind the increased summer water use. Instead, GSI examined water use by customer category in nearby communities to understand local trends. Residential customer water usage in the summer in Florence and Waldport are approximately double the winter usage, which is likely a combination of increased landscape irrigation and short-term rental occupancy. Summer increases in commercial water use, likely linked to tourism, are apparent in both cities,

with a stronger trend in Florence. Irrigation customer accounts in Florence (outdoor use only, with no connection to the wastewater system) show significant water use from about May to October.

The Implementation Plan in the DWPP describes approaches to using ordinances to encourage both indoor and outdoor water conservation to address these potential causes of high water use in Yachats. As part of the DWPP implementation process, GSI has assisted the City with conducting water conservation ordinance research and facilitating community engagement in the development of proposed ordinances. Public meetings were held on September 19 and November 14, 2022, to provide opportunities for public input on proposed ordinance concepts. Feedback received from community members showed support for a greater focus on indoor conservation policies, including those targeting short-term rentals. Community members indicated that outdoor conservation actions may have a smaller impact due to the limited use of irrigation systems in the area. This memo takes this feedback into account when evaluating ordinance concepts and presenting recommendations.

Indoor Water Conservation

New construction must comply with relevant building codes, so newer buildings are usually more water-efficient than older buildings. The DWPP suggests focusing indoor water conservation efforts on older homes and businesses where water savings would be more significant. In practice, inspections to enforce building codes typically only occur during initial permitting and construction phase of development projects. Additional opportunities to require water efficiency improvements could arise during remodels, resale, or permitting a residence as a short-term rental. Requiring applicable remodels to meet water efficiency criteria is more common than requiring retrofits upon resale, which can be unpopular due to the added expense to the property owner when selling the building. While improving indoor water efficiency in existing buildings through these means may be a longer-term process, the water savings can be substantial and should not be overlooked.

Water-Efficient Fixture Flow Rates

Specifying the maximum allowable flow rates of indoor plumbing fixtures can promote water conservation by requiring the use of efficient fixtures. For new development in Yachats, building permit applications involve a joint review by the City and Lincoln County. The City reviews certain aspects of the applications, such as confirming water and sewer availability, while Lincoln County reviews aspects such as plumbing and conducts all site inspections. Therefore, any proposed code changes affecting plumbing requirements or inspections would require coordination with Lincoln County to adjust permit review and inspection procedures.

The State of Oregon Plumbing Specialty Code designates the maximum flow rates for plumbing fixtures in new construction (Oregon Building Codes Division, 2021). In many cases, the Oregon code is equivalent to the federal EPA WaterSense program, which provides another common standard for certifying water-efficient products (US Environmental Protection Agency, 2022). Although both the Oregon plumbing code and the WaterSense specifications are substantially more efficient than older fixtures, there are readily available fixtures capable of even greater potential water efficiency. **Tables 1** and **2** present a comparison of maximum flow rates for various fixtures for residential and commercial buildings, respectively. Since both commercial and residential (including short-term rental) customers likely contribute to high summer water use, targeting both categories for water conservation would be appropriate. Community members also expressed a desire to ensure that City-owned facilities meet the same standards as commercial properties.

Table 1. Maximum Residential Fixture Flow Rates

Fixture	OR Code	EPA WaterSense	Potential Efficiency
Showerheads	2.0 gpm	2.0 gpm	1.25-1.5 gpm
Toilets	1.28 gpf	1.28 gpf	1.28/0.8 gpf**
Bathroom faucets	1.5 gpm	1.5 gpm	0.5-1.0 gpm
Kitchen faucets	1.8 gpm	*	1.5 gpm

gpm = gallons per minute; gpf = gallons per flush
* No EPA WaterSense specification has been developed for kitchen faucets.
** Gallons per flush for dual flush toilet models.

Table 2. Maximum Commercial Fixture Flow Rates

Fixture	OR Code	EPA WaterSense	Potential Efficiency
Showerheads	2.0 gpm	2.0 gpm	1.25-1.5 gpm
Toilets	1.28 gpf	1.28 gpf	1.28/0.8 gpf**
Urinals	0.5 gpf	0.5 gpf	0.5 gpf
Bathroom faucets	0.5 gpm	*	0.5 gpm
Pre-rinse spray valves	1.6 gpm	1.0-1.28 gpm	1.0-1.28 gpm

gpm = gallons per minute; gpf = gallons per flush
* No EPA WaterSense specification has been developed for commercial bathroom faucets.
** Gallons per flush for dual flush toilet models.

Although it does not appear very common for cities in Oregon to adopt ordinances specifying the maximum flow rates for fixtures, policies in other states may designate flow rates or require the use of WaterSense-labeled fixtures (see Appendix A, Examples 1-6). The City could provide its own table of water efficiency standards to be met, or could consider language such as:

> **All new construction and applicable remodels shall have fixtures that meet or exceed the water efficiency standards for maximum flow rates in the State of Oregon Plumbing Specialty Code or the most current EPA WaterSense product specification standards, whichever is more restrictive.**

The City could consider requiring certain appliances to meet Energy Star standards when being installed in new construction or remodels. The Energy Star program provides certifications for energy-efficient appliances, many of which are also significantly more water-efficient than standard models (US Environmental Protection Agency and US Department of Energy, 2022). This includes residential and commercial clothes washers, residential and commercial dishwashers, commercial ice makers, commercial steam cookers, and residential and commercial water heaters.

The water savings potential of fixture upgrades could also be factored into the City's decision of which water fixtures to address in ordinances. A recent study on the cost-effectiveness of upgrading existing fixtures and appliances to more water-efficient models found that showerheads and clothes washers were among the most impactful in residential settings, while the most valuable upgrades in commercial settings came from showerheads, pre-rinse spray valves, food steamers, ice machines, clothes washers (replacing top-loading with front-loading models), and faucet aerators (Cooley & Phurisamban, 2018). Upgrading residential toilets to efficient models using 1.28 gpf can reduce the water used by 20 percent when converting from a 1.6 gpf model or 60 percent converting from a 3.5 gpf model. Installing bathroom faucet aerators can produce 55

percent water savings when replacing a 2.2 gpm model with a 1.0 gpm model. In commercial kitchen settings, switching to pre-rinse spray valves that use 1.15 gpm or lower flow rates can achieve 77 percent water savings when converting from a 5.0 gpm model or 54 percent when converting from a 2.5 gpm model. The City could choose to target the most high-impact devices to increase the effectiveness of any new ordinance proposed. In addition to considering ordinances for new construction and remodels, the City could expand the reach of these water conservation efforts to existing buildings by providing free high-impact conservation items to customers or exploring rebate programs for larger fixtures and appliances, potentially in collaboration with the Mid-Coast Water Conservation Consortium.

Short-Term Rentals

Yachats Municipal Code Chapter 4.08 describes the requirements for licensing vacation rentals. The City allows for a total of 125 licenses, which can be renewed annually. An inspection is required prior to initially granting a license and every 5 years thereafter if the license continues to be renewed. Properties must meet requirements for parking, trash, occupancy limits, and similar factors related to health and safety, but there is currently no requirement related to water use efficiency. The licensing and inspection process presents an opportunity to include additional requirements for water-efficient plumbing fixtures that could be phased in gradually as existing properties renew their licenses and new properties enter the program. Another potential method of reducing water use at short-term rental properties would be to require posting of water conservation outreach materials to provide information about the City's water resources and encourage visitors to be mindful of their water use.

Conservation During Water Shortages

Actions to be taken during various stages of water shortages are outlined in Chapter 8.22 of the Yachats Municipal Code and are included in the curtailment section of the City's Water Management and Conservation Plan. There are 4 phases of shortages defined, with Phases 1-3 being increasing levels of drought or low flows in the City's water sources and Phase 4 being a sudden disaster or catastrophic interruption of the water supply. A Phase 3 water shortage requires very restrictive water conservation measures, including a requirement that all "commercial large meter" customers (1.5 inches or larger meter) send linens for laundering outside the City, with an exemption for commercial laundromats. Community members attending the public meetings expressed concern that the lack of options for commercial laundering would completely prevent them from operating if a Phase 3 water shortage were declared. Commenters noted that many businesses subject to the rule already take other measures to reduce their water use, such as planting native landscaping that does not require any irrigation. Business owners offered suggestions for meeting water conservation goals while still allowing in-house laundering, such as providing an exemption for customers that demonstrate efficient use of water. If the City is interested in modifying this provision, one recommendation would be to require the use of Energy Star certified front load clothes washers, which use 50 percent less water than a standard top load agitator washer (US Environmental Protection Agency and US Department of Energy, 2022).

Outdoor Water Conservation

As described previously, details on outdoor water use in Yachats are limited, and community feedback indicated that lawn and landscape irrigation is probably a more minor contributor to increased summer water use compared to the effects of tourism. Since extensive lawn watering and in-ground irrigation systems do not appear to be prevalent in the community, ordinances targeting irrigation system design or turf area restrictions appeared less likely to produce immediate water savings than indoor water conservation ordinances. Nonetheless, having outdoor ordinances in place may be beneficial for addressing any poor outdoor water management practices that may exist in the community currently or that may arise in the coming years as a result of climate change impacts on local precipitation.

Common outdoor ordinances in municipal codes focus on fundamental principles of preventing water waste and optimizing the timing of watering. The City's municipal code does not currently include specific provisions prohibiting runoff caused by excessive irrigation or overspray of sprinklers onto areas not intended to be irrigated. Several municipalities have adopted this type of ordinance in order to create an enforceable provision against water waste (see Appendix A, Examples 7-11). The City could consider modifying Section 5.08.140 of the municipal code, which already prohibits runoff of stormwater, to include runoff of landscape irrigation water:

> **The owner or person in charge of property shall design irrigation systems to minimize overspray to non-irrigated areas.**
>
> **Water runoff leaving the landscape area due to excessive irrigation or overspray where water flows onto adjacent property, roadways, parking lots, or other non-irrigated areas is prohibited.**

Another potential opportunity to prevent water waste is to restrict irrigation during the warmest hours of the day, when water is more likely to evaporate. Currently, Section 8.22 of the City's municipal code prohibits irrigation between the hours of 10:00 a.m. and 7:00 p.m. when a Phase 1 water shortage has been declared, and this regulation remains in effect through any subsequent phases of water shortage that are declared. Other communities have similar restrictions in place regardless of whether a water shortage is in effect, which improves overall outdoor water use efficiency (see Appendix A, Examples 12-15). The City could therefore consider expanding its time-of-day restrictions to be in place permanently.

Although outdoor water use may not currently be very high, the Risk Assessment section of the DWPP notes that one of the projected impacts of climate change in the Pacific Northwest is reduced summer rainfall, which could increase the prevalence of lawn and landscape irrigation in the future. Therefore, it may be prudent for the City to analyze data on water use trends when available and consider implementing outdoor water conservation ordinances if needed. Common themes among outdoor ordinances include plant selection, irrigation system efficiency, and landscape design. Criteria for these elements could be integrated into development permit applications that require approval of a site plan, which would entail coordination of the permitting process with Lincoln County.

Ordinances related to landscaping plant selection range from encouragement of low water use, native, and drought-tolerant plant species to mandates that plants be selected from a pre-approved list (see Appendix A, Examples 16-19). Irrigation systems can be tailored to increase efficiency by methods such as requiring automatic irrigation controllers to limit unnecessary watering or requiring drip systems on steep slopes to prevent erosion (see Appendix A, Examples 20-22). Incorporating water-wise landscape design requirements into site development plans is a proactive way to reduce the outdoor water use of proposed new developments. Common features of this type of ordinance include restrictions on the landscape area that can be planted with turf and high water use plants or have water features like fountains and ponds (see Appendix A, Examples 23-26).

Members of the DWPP development team and comments received at public meetings showed support for the use of alternative sources of irrigation water such as gray water or stormwater captured in rain barrels or directed into rain gardens. Although it appears rare for municipalities to make this mandatory, there are examples of communities encouraging or promoting alternative sources through either ordinances or as part of their water conservation outreach programming (see Appendix A, Examples 27-28). Similarly, outreach and education could be used to encourage water-wise landscape design, low impact development, and permeable surfaces.

Conclusion

Many communities use ordinances to protect their drinking water supplies by promoting indoor and outdoor water conservation and prohibiting water waste. Leaving more water instream also protects water quality in the water sources, since low flows can concentrate pollutants and exacerbate problems with turbidity. The primary recommended types of ordinances include:

- Require that indoor plumbing fixtures meet or exceed specified efficient flow rates
- Integrate water efficiency requirements into the short-term rental licensing process
- Prohibit excessive landscape irrigation that causes runoff to leave the irrigated area
- Prohibit watering between 10:00 a.m. and 7:00 p.m., regardless of whether a water shortage is in effect
- Consider whether additional outdoor water conservation ordinances are warranted

Ordinances can be combined with other conservation efforts, such as public outreach, demonstration gardens, free water conservation items or rebate programs, and water rates that are tiered or otherwise structured to encourage customers to limit their water use. Through the City's participation in the Mid-Coast Water Conservation Consortium, the City already has access to outreach materials and bulk purchases of conservation items such as low water use showerheads and faucet aerators, which are two of the most cost-effective conservation fixtures. Developing or participating in a rebate program for clothes washers (including commercial models), pre-rinse spray valves, food steamers, and ice machines could produce substantial water savings, particularly for tourism-related summer water use in the commercial customer category. To reduce outdoor water use, outreach on low water use gardening could be combined with ordinances prohibiting wasteful practices such as excessive irrigation, overspray, and watering in the middle of the day. Metering faucets, foot- or knee-activated faucets, and efficient water heater systems could be areas for future research.

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Appendix A

Table of Water Conservation Ordinance Examples

Examples of Water Conservation Policies in Municipal Codes

City	Category	Code Example	Code Reference	Example #
Burlingame, CA	Indoor Fixtures	All new construction and applicable remodels will have, at a minimum, fixtures that comply with the efficiency standards listed in the Indoor Water Use Efficiency Table. [Note: the standards shown are substantially equivalent to WaterSense and State of Oregon requirements]	Municipal Code 18.19.050	1
Illinois (model ordinance)	Indoor Fixtures	Plumbing fixtures in all new and rehabbed construction shall not exceed the following flow rates and must be a labeled WaterSense fixture. The residential section of this ordinance applies to single family homes, townhomes and multifamily units (i.e. condos, apartments, etc.). Retrofit on Resale. All residential property owners, prior to change of ownership, must certify that the structure has high efficiency plumbing fixtures (toilets, faucets, and showerheads) as defined in Section 1.0 Plumbing Fixtures in this ordinance. This applies to all residential property built prior to January 1, 1994. The Municipality may waive the requirements in Section 3.0 based on certain household characteristics such as extreme economic hardship, historical landmark designation, transfers within a family, foreclosures, eminent domain, teardowns, etc.	Model Ordinance	2
Illinois (model ordinance)	Indoor Fixtures	The following flow rates shall at a minimum maintain alignment with the most current EPA WaterSense product specification standards for all fixtures listed below. No water closet shall have a flush volume greater than 1.6 gallons per flush. The maximum water factor for residential dishwashers shall be 5.8 and be EPA Energy Star rated. Residential clothes washers shall comply with the EPA Energy Star program requirements and shall have a water factor of 5.0 or less. The maximum flow rate for lavatory faucets shall be 1.5 gallons per minute at 60 psi. The maximum flow rate for showerheads shall be 2.0 gallons per minute at 80 psi. [Note: This document was developed in 2009. EPA WaterSense standards and Oregon Plumbing Specialty Code may now have stricter requirements.]	Model Ordinance	3
Nevada (state code)	Indoor Fixtures	Except as otherwise provided in subsection 6, each residential, commercial or industrial structure on which construction begins on or after January 1, 2020, and each existing residential, commercial or industrial structure which is expanded or renovated on or after January 1, 2020: (a) If the WaterSense program established by the United States Environmental Protection Agency has developed a final product specification for a type of toilet, shower apparatus, urinal or faucet, must not install any toilet, shower apparatus, urinal or faucet that has not been certified under the WaterSense program. (b) If the WaterSense program has not developed a final product specification for a type of toilet, shower apparatus, urinal or faucet, must not install any toilet, shower apparatus, urinal or faucet that does not comply with any applicable requirements of federal law and the building code of the county or city. If the WaterSense program modifies the requirements for a plumbing fixture to be certified under the WaterSense program, a plumbing fixture that was certified under the previous requirements shall be deemed certified for use under the WaterSense program for a period of 12 months following the modification of the requirements for certification.	NRS 278.582	4
New York City, NY	Indoor Fixtures	Showerheads, private lavatory faucets, water closets and for urinals, the urinal flush valve or fixture/valve combination, shall meet the specifications required for the WaterSense program label and shall bear such label, or shall be approved in accordance with this code.	Plumbing Code 604.4.1	5
Santa Cruz, CA	Indoor Fixtures	All existing residential, commercial, and industrial buildings shall, at the time of sale, be retrofitted, if not already so, exclusively with high efficiency plumbing fixtures. “High efficiency plumbing fixtures” means any fixture that is designated as an USEPA WaterSense fixture; or any showerhead rated to use a maximum of 2.0 gallons of water per minute, any high efficiency toilet rated to use a maximum of 1.28 gallons of water per flush, and any urinal and associated flush valve rated to use a maximum of 0.5 gallons of water per flush.	Chapter 16.03.040	6
Ashland, OR	Water Waste	Design irrigation systems to minimize runoff and overspray to non-irrigated areas.	Land Use Ordinance 18.4.4.030.I.2	7
Roseville, CA	Water Waste	The irrigation system shall be designed to prevent runoff, low head drainage, overspray, or other similar conditions where irrigation water flows onto non-targeted areas, such as adjacent property, non-irrigated areas, hardscapes, roadways, or structures.	Municipal Code 14.18	8
San Francisco, CA	Water Waste	Water runoff leaving the landscape area due to low head drainage, overspray, broken irrigation hardware, or other similar conditions where water flows onto adjacent property, walks, roadways, parking lots, structures, or non-irrigated areas designated for non-development such as open spaces and existing native vegetation, is prohibited.	Administrative Code 63.7	9
Santa Fe, NM	Water Waste	Irrigation systems shall be designed to prevent water waste, over-watering and overspray or drainage of water onto any paved or unplanted surface.	Land Development Code 14-8.4(E)(4)	10
Bend, OR	Water Waste	Water that travels beyond the property line is considered water waste. Allowing water to flow onto adjoining properties due to poorly designed, maintained or adjusted irrigation systems that allow water to be applied beyond intended irrigated areas or spray or run off onto adjoining walls or fences is prohibited.	Municipal Code 14.20.030.A.2	11
Cupertino, CA	Time of Day	Irrigation is limited to between 8:00 pm and 10:00 am, unless unfavorable weather prevents it or renders irrigation unnecessary.	Municipal Code 14.15.050	12
Roseville, CA	Time of Day	Overhead irrigation using potable water shall be scheduled between 8:00 p.m. and 10:00 a.m. unless it is demonstrated that weather conditions are unfavorable or would result in detriment to plant health.	Municipal Code 14.18	13

City	Category	Code Example	Code Reference	Example #
Bend, OR	Time of Day	Irrigation is not allowed between the hours of 9:00 a.m. and 5:00 p.m.	Municipal Code 14.20.050.B	14
Prineville, OR	Time of Day	Between April 15 and October 15 of each year, users of city water for irrigation shall comply with the following restrictions: Irrigation shall be permitted before 10:00 a.m. and after 4:00 p.m. but shall be prohibited in the hours between.	Municipal Code 52.020(A)(1)	15
Coos Bay, OR	Plant Selection	Landscape materials should be selected and sited to produce a hardy and drought-resistant landscape area. Selection should include consideration of soil type and depth, the amount of maintenance required, spacing, exposure to sun and wind, the slope and contours of the site, compatibility with existing native vegetation preserved on the site, water conservation where needed, and the impact of landscaping on visibility of the site for purposes of public safety and surveillance. Landscaping materials shall be selected in accordance with a list of plant materials adopted by reference as the Sunset Western Garden Book.	Supp. Development Standards, Chapter 17.335	16
Lincoln City, OR	Plant Selection	Use of native and drought-tolerant species is advised generally, and required in subsection (G)(1) of this section for shrubs and perennials.	Supp. Regs. Chapter 17.52	17
Ontario, OR	Plant Selection	Plant species that do not require irrigation once established (drought tolerant) are preferred over species including grass lawn that require irrigation.	Planning & Zoning Development Standards 10A-57-55.4.b	18
Santa Cruz, CA	Plant Selection	Turf varieties shall be water-conserving species, such as tall and hard fescues.	Municipal Code 16.16.070(c)(3)	19
Ashland, OR	Irrigation Systems	Equip all irrigation systems with a controller capable of dual or multiple programming. Controllers shall have a multiple start time capability, station run times in minutes to hours, and water days by interval, day of the week, and even/odd days. Use controllers with a percent adjust (water budget) feature, or the capability of accepting an external rain or soil moisture sensor. Use sprinkler heads with a precipitation rate of .85 inches per hour or less on slopes exceeding 15 percent to minimize run-off, or when slope exceeds ten percent within ten feet of hardscape.	Land Use Ordinance 18.4.4.030.I.2	20
Cupertino, CA	Irrigation Systems	Automatic irrigation controllers are required for irrigation scheduling, utilizing evapotranspiration or soil moisture sensor data. Separate valves are required for each hydrozone. Where feasible, trees shall be placed on separate valves from shrubs, groundcovers and turf. Low-volume irrigation is required in mulched areas, areas with slope >25%, within 24 inches of a non-permeable surface, and in any narrow or irregularly shaped areas that are less than eight (8) feet in width in any direction.	Municipal Code 14.15.050	21
Roseville, CA	Irrigation Systems	Automatic irrigation controllers utilizing either evapotranspiration or soil moisture sensor data utilizing non-volatile memory shall be required for irrigation scheduling in all irrigation systems. For single-family residential properties, controller shall have a minimum of eight stations or be upgradable to eight stations or more.	Municipal Code 14.18	22
Ashland, OR	Landscape Design	Limit combined natural turf or water areas (i.e., pools, ponds, and fountains) to 20 percent of the landscaped areas. These limitations do not apply to parks, common open space, golf courses, cemeteries, and school recreation areas.	Land Use Ordinance 18.4.4.030.I.1.e	23
Phoenix, AZ	Landscape Design	No more than 50% of the landscaped area at maturity or 10% of the net lot area, whichever is less, should be planted in turf or high water use plants. Functional turf areas such as in parks, schools, multiple-family and single-family common areas, individual single-family lot, and golf courses are exempt.	Zoning Ordinance 507.A.II.A.3.1.13	24
Reno, NV	Landscape Design	In multi-family, mixed-use, or nonresidential districts, or model homes, lawn or turf areas shall not exceed 50 percent of the required landscape area.	Land Development Code 18.04.806.c	25
Santa Cruz, CA	Landscape Design	The combined size of turf and areas devoted to high water use plants, decorative pools, fountains, water features and swimming pools for residential projects shall be limited to no more than twenty-five percent of the total developed landscape area. Turf is not permitted in new nonresidential landscape projects. These limits do not apply to recreation areas requiring large turf areas for their primary function. However, recreation areas shall be designed to limit turf in any portion of the landscaped area not essential for the operation of the recreational facility.	Municipal Code 16.16.070(c)(1)	26
Roseville, CA	Alternative Water Sources	Irrigation systems shall be designed and constructed to allow the use of recycled water where such recycled water is available or may become available in the future.	Municipal Code 14.18	27
Santa Fe, NM	Alternative Water Sources	Alternative sources of irrigation water shall be developed, including harvested water from roof and site runoff. Gray water use is recommended where appropriate. Potable water shall be used only as a back-up or temporary irrigation water source to the greatest extent possible. The purpose of these strategies is to develop drought tolerant landscapes and to reduce the demand on the potable water system.	Land Development Code 14-8.4(E)(1)	28

Final Draft

Water Management and Conservation Plan

City of Yachats

October 2021

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Appendices

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1. Municipal Water Supplier Plan Elements

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

This rule requires a list of affected local government to whom the plan was made available, and a proposed date for submittal of an updated plan.

1.1 Introduction

The City of Yachats (City) is the southernmost city in Lincoln County, located along Highway 101 on the Oregon coast. Tourism is a major driver of the economy, and seasonal residents can substantially increase the number of water users served and water demand, especially during the summer months. The combination of increased water demand in summer and reduced streamflows in the City's water supply sources has resulted in the City needing to implement water curtailment measures in recent years and to develop new strategies for providing a reliable long-term water supply.

The purpose of this Water Management and Conservation Plan (WMCP) is to describe the City's strategy for providing a reliable water supply through the implementation of existing and additional water management and conservation policies and programs. This strategy includes analysis of how the City can use its water rights to meet future water needs.

The City developed this WMCP in tandem with the City's Water System Master Plan (WSMP) (anticipated publication in 2021). Data sharing and coordination occurred during development of both plans to ensure consistency among the documents. Consequently, portions of this WMCP draw from information developed for the WSMP.

1.2 Plan Requirement

The City first submitted a draft WMCP in 1997, which Oregon Water Resources Department (OWRD) reviewed and commented on. The City resubmitted the draft WMCP on December 30, 1999 and OWRD issued a "Final Order Determination" on May 2, 2000. This order was subsequently withdrawn based on a timely request for reconsideration and OWRD issued an interim order on April 5, 2001 setting out deficiencies in the City's WMCP and providing the City time to correct the plan. On June 27, 2001, the City submitted an updated WMCP, which was part of its Water System Master Plan. This updated WMCP met the conditions of the April 5, 2001 interim order and OWRD issued a Final Order approving the City's WMCP on August 2, 2002. OWRD's Final Order required that the City submit an updated WMCP by July 1, 2006. In addition, OWRD's Final Order for Extension of Time for Permit S-53471 requires submittal of a WMCP by February 23, 2008. Finally, this plan also meets the requirement in the Final Order for Extension of Time of Permit S-29018 issued (X date) to submit a WMCP within 3 years. This is the City's second WMCP.

1.3 Plan Organization

This WMCP fulfills the requirements of the Oregon Administrative Rules (OAR) adopted by the Water Resources Commission in December 2018 (OAR Chapter 690, Division 86). It describes water

management, water conservation, and curtailment programs to guide the wise use and stewardship of the City's water supply.

The WMCP is organized into the following sections, each addressing specific sections of OAR Chapter 690, Division 86. Section 2 is an evaluation of the City's water supply, water use, water rights and water systems. The information developed for Section 2 is the foundation for the sections that follow. Section 3 discusses the City's current conservation measures and presents the City's benchmarks for future efforts. Section 4 describes the City's water curtailment history, assesses the City's abilities to address water shortages, and provides blueprints for action when curtailment of supply is necessary. Section 5 draws information from Sections 2 and 3 to present the City's future water needs and how the City intends to utilize its water sources to meet future demand.

Section	Requirement
Section 1 – Municipal Water Supplier Plan Elements	*OAR 690-086-0125*
Section 2 – Municipal Water Suppliers Description	*OAR 690-086-0140*
Section 3 – Municipal Water Conservation Element	*OAR 690-086-0150*
Section 4 – Municipal Water Curtailment Element	*OAR 690-086-0160*
Section 5 – Municipal Water Supply Element	*OAR 690-086-0170*

1.4 Affected Local Governments

OAR 690-086-0125(5)

The following governmental agencies may be affected by this WMCP:

- Lincoln County
- City of Yachats

Thirty days before submitting this WMCP to OWRD, the City made the draft WMCP available for review by the affected local government listed above along with a request for comments relating to consistency with the local government's comprehensive land use plan. The letters requesting comment are in Appendix A. The City did not receive any comments.

In addition, the City provided the following water providers with a copy of the draft WMCP as a courtesy.

- Southwest Lincoln County Water People's Utility District

1.5 Plan Update Schedule

OAR 690-086-1025(6)

The City anticipates submitting an update of this plan within 10 years of OWRD's final order approving the plan. As required by OAR Chapter 690, Division 86, a progress report will be submitted within 5 years of the final order.

1.6 Time Extension

OAR 690-086-0125(7)

The City is not requesting an extension of time to implement metering or a benchmark established in a previously approved plan.

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2. Municipal Water Supplier Description

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

This rule requires descriptions of the water supplier's water sources, service area and population, water rights, and adequacy and reliability of the existing water supply. The rule also requires descriptions of the water supplier's customers and their water use, the water system, interconnections with other water suppliers, and quantification of water loss.

2.1 Terminology

The following terminology is used in this WMCP.

Demand (i.e., production) refers to the quantity of water delivered to the distribution system from the water treatment plant. Demand includes metered consumption (e.g., residential customer and commercial customer consumption), unmetered public uses (firefighting, hydrant flushing, other), and water lost to leakage, reservoir overflow, and other factors.

Consumption is equal to metered water use and unmetered, authorized water uses (e.g., system flushing).

Demand minus consumption equals *water loss*. Water loss is equal to the sum of apparent and real losses. Apparent losses include unauthorized consumption, accounting errors, and meter inaccuracies, among other loss types. Real losses include leakage.

Generally, demand and consumption in municipal systems are expressed in units of mgd, but also may be expressed in cubic feet per second (cfs) or gallons per minute (gpm). One mgd is equivalent to 1.55 cfs or 694 gpm. For annual or monthly values, a quantity of water is typically reported in million gallons (MG).

The following terms are used to describe specific values of system demands:

- Average day demand (ADD) equals the total annual production divided by 365 days.
- Maximum day demand (MDD) equals the highest system demand that occurs on any single day during a calendar year. It is also called the one-day MDD or peak day demand.
- Monthly ADD equals the total volume of water produced in a month divided by the number of days in the month.
- Maximum monthly demand (MMD) as a volume equals the month in a calendar year with the greatest volume of demand. MMD as a rate equals the ADD of the month in the calendar year with the greatest volume of demand.

2.2 Water Sources

OAR 690-086-0140(1)

The City holds water rights for the use of water from the following sources: Reedy Creek, Salmon Creek, North Cape Creek, and the Yachats River. Currently, Reedy Creek is the City's primary supply source and Salmon Creek is a secondary supply source used only when Reedy Creek flows are insufficient to meet the City's water demands. The City relies on its Salmon Creek water supply every summer now due to insufficient flows in Reedy Creek. In recent years, reduced flows in Salmon Creek coupled with water treatment plant limitations have forced the City to implement water curtailment measures. The City has been holding its water rights on North Cape Creek (referred to as Cape Creek) and the Yachats River in reserve for potential future water sources.

2.3 Interconnections with Other Systems

OAR 690-086-0140(7)

The City has an interconnection with Southwest Lincoln County Water People's Utility District (SWLCWPUD), which can be used to supply the City's distribution system with water during a water shortage emergency. This interconnection has a capacity of 0.33 cfs (150 gpm) and is a two-way interconnection. This interconnection has not been used to date.

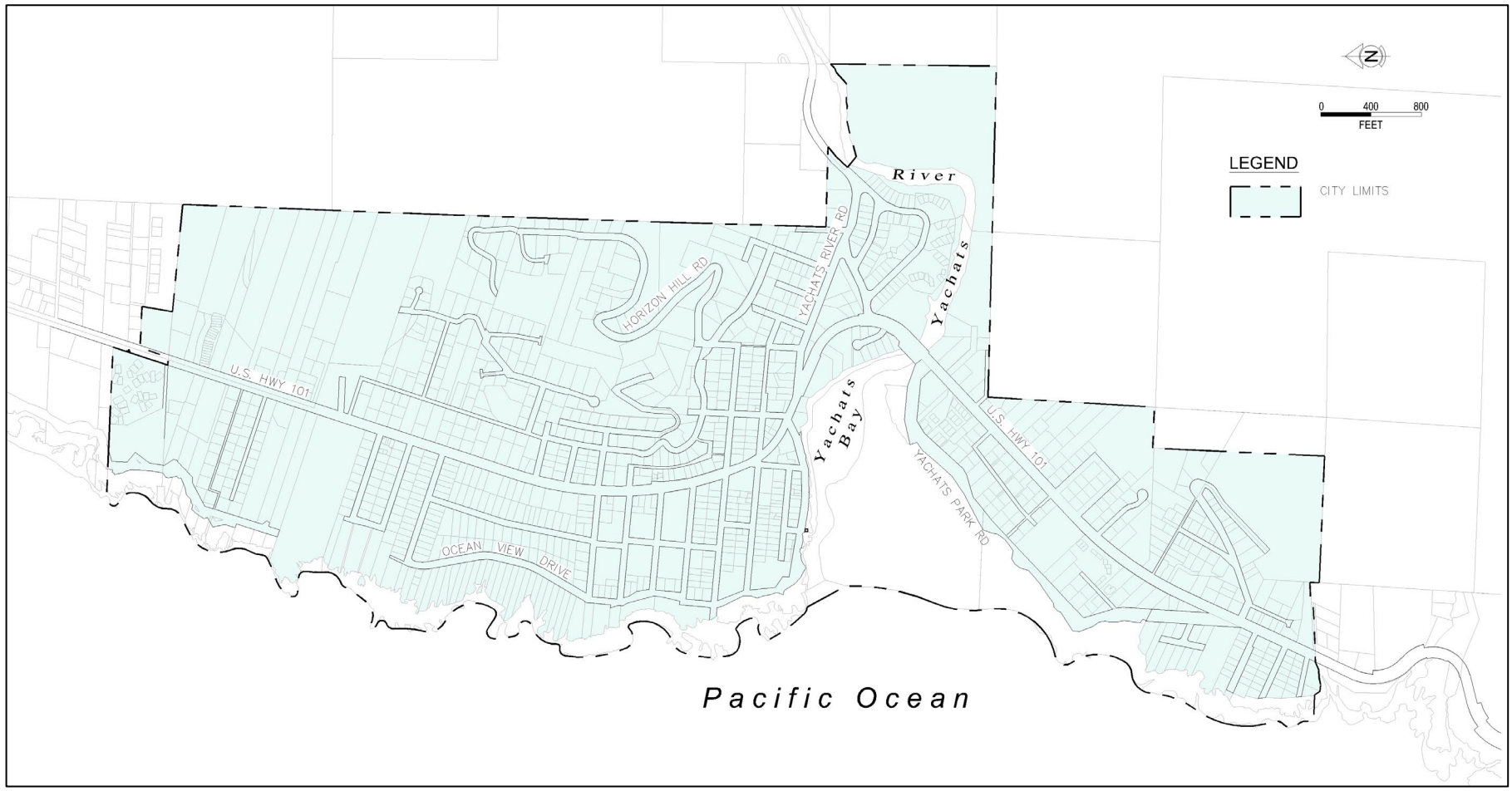
2.4 Intergovernmental Agreements

The City has an intergovernmental agreement with SWLCWPUD for operation of an interconnection between the two water providers. The agreement stipulates that the interconnection can only be used by the City of Yachats for emergency purposes, such as a water shortage, and it is not intended to be used as a supplemental water source on a regular basis.

2.5 Current Service Area Description and Population

The City's water service area is the entire area within city limits, which is approximately 600 acres and encompasses the same area as its Urban Growth Boundary (UGB). The water service area is shown in **Exhibit 2-1**. According to estimates from the Portland State University Population Research Center, the population within the UGB in 2020 was 780. Given the importance of tourism to the economy of Yachats, using this resident population in water demand projections underestimates the City's service population. The City's Water System Master Plan, developed concurrently with this WMCP, calculated the population served by the municipal water system based on the number of system connections, an estimated breakdown of user types (single family, multifamily, and hotel rooms), and estimated occupancy per connection. Using this methodology, the City's service population in 2020 was approximately 2,191.

Exhibit 2-1. City of Yachats Water Service Area



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2.6 Demand

OAR 690-086-0140(4)

2.6.1 Annual, Monthly, and Seasonal Demand

Exhibit 2-2 presents the volumes of finished water produced annually at the water treatment plant (demand) from 2017 through 2020. This exhibit shows annual water demand, average day demand (ADD), and maximum month demand (MMD) as a volume and rate.

Exhibit 2-2. Water Demand Summary, 2017 to 2020

Year	Annual Water Demand (MG)	Average Day Demand (ADD)	Max Month Demand (MMD)	Max Month Demand (MMD)*	Max Month Demand (MMD)*
		mgd	MG	mgd	cfs
2017	51.2	0.14	5.34	0.17	0.27
2018	46.9	0.13	5.42	0.17	0.27
2019	46.0	0.13	5.15	0.17	0.27
2020	**	**	5.08	0.16	0.25
Average	48.0	0.13	5.25	0.17	0.27
Max	51.2	0.14	5.42	0.17	0.27

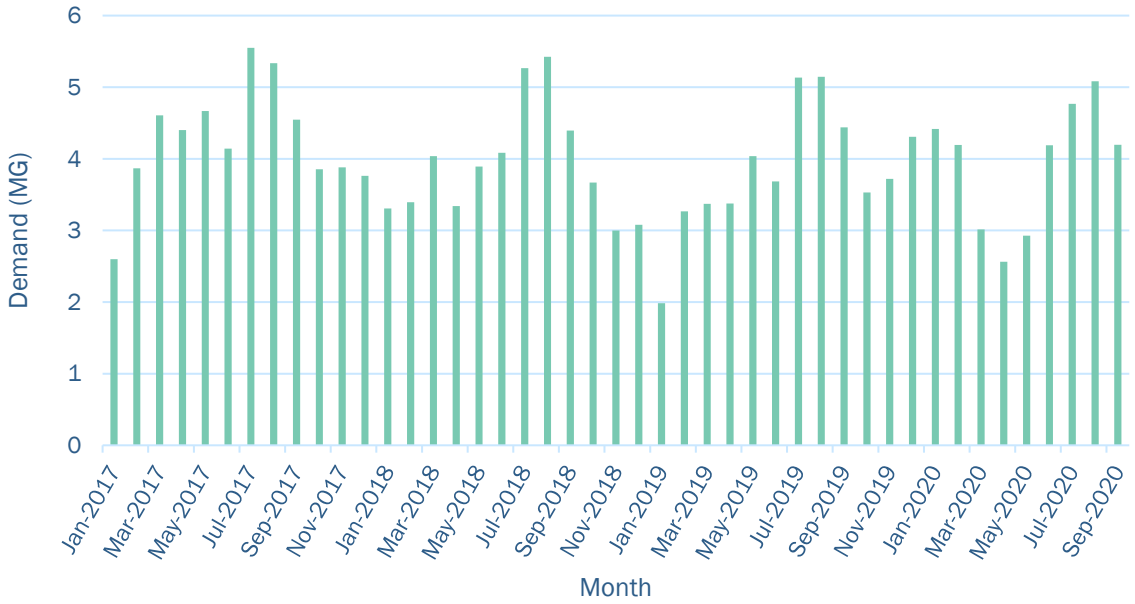
*As described further below, MMD as a rate provides the closest estimate of MDD.

**Data for water demand in 2020 was not available for the full year at the time of .

Total demand declined slightly since 2017, and ADD decreased from 0.14 mgd in 2017 to 0.13 mgd in 2019. Water production at the treatment plant is generally intermittent, with days of no production followed by days with substantially higher production. Although seasonal trends can be seen in demand, these data cannot directly be used to determine maximum day demands, because there are many days when the treatment plant is operated for long periods of time to produce water for more than one day. Therefore, maximum month demand as a rate provides the closest estimate of MDD. MMD occurred in August of each year and fluctuated slightly throughout the period of available data.

Exhibit 2-3 reflects the seasonal variations in water demand throughout the year, showing the typical pattern of increased water demand in summer and lower demand during the winter. During the summer peak demand season, the treatment plant is typically operated on a daily or almost daily basis. Throughout the rest of the year, the City first uses water from the main finished water storage tank, and then treats additional water as needed to replenish the supply.

Exhibit 2-3. Monthly Demand, 2017-2020.



2.7 Consumption

OAR 690-086-0140(6)

2.7.1 Customer Categories Data

The City has experienced numerous leadership transitions over the past eight years, which contributed to the City changing its utility billing software four times during that period. Creating customer categories and assigning customers to the appropriate categories did not occur during the repeated and disruptive changes in billing software. Consequently, the City lacks recent data on the number of customers by customer category and meter consumption by customer category. The WSMP estimated that the City has 959 total connections in 2020, including eight hotel connections and 11 multifamily connections. The remaining 940 connections were not further defined into residential or commercial connections. No further analysis of consumption by customer category is included in this WMCP due to information availability and data analysis constraints.

2.7.2 Annual and Monthly Consumption

Total annual metered consumption based on sales from the utility billing system is shown in **Exhibit 2-4** for calendar years 2018 through 2020. Consumption data was not available for August and September of 2019 and December of 2020, and as a result annual consumption in these two years are underestimated. The data shows a fluctuating but generally decreasing trend of consumption. The trend may be partially explained by the missing data for some months of 2019 and 2020.

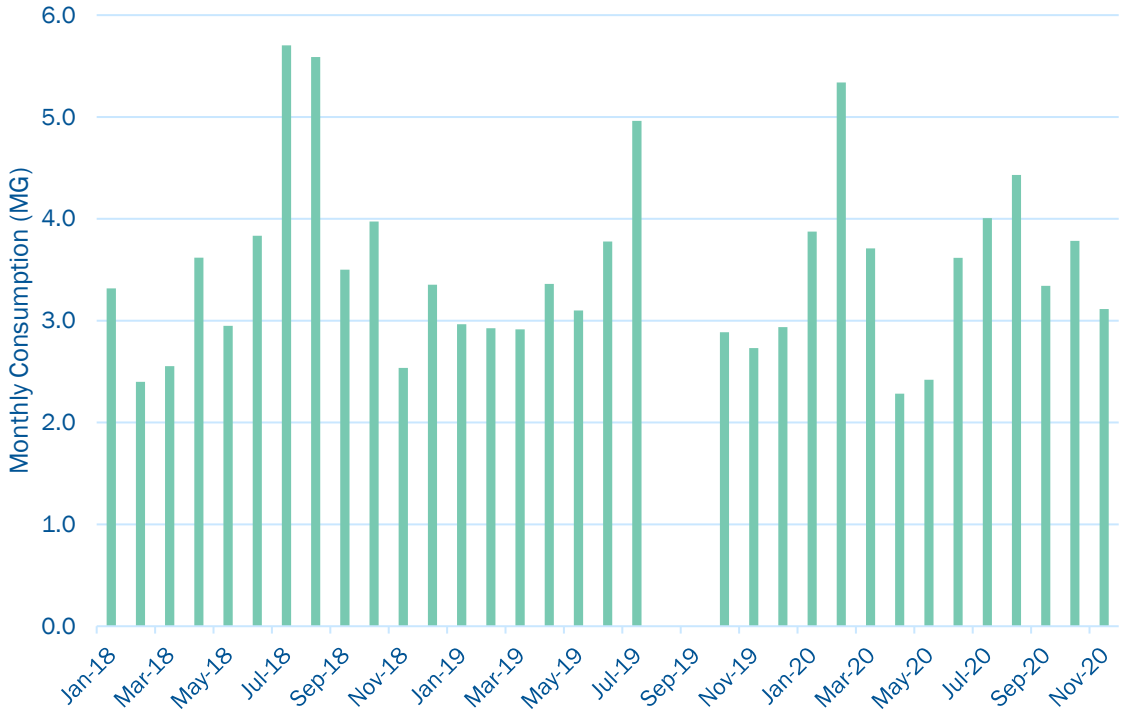
Exhibit 2-4. Annual Consumption, 2018-2020

Year	Annual Metered Consumption (MG)*
2018	43.58
2019	32.56
2020	39.92

*Data were not available for August and September 2019 and December 2020, so annual consumption in these years is underestimated.

The City's service population varies seasonally due to the influence of tourism and part-time residents. Generally, the service population, and therefore water consumption, are higher during the summer months, weekends, and holidays. Consumption also increases during the summer due to outdoor water use, including irrigation of lawns and landscapes. **Exhibit 2-5** shows these seasonal trends for calendar years 2018 through 2020.

Exhibit 2-5. Monthly Consumption, 2018-2020



2.7.3 Largest Customers

Exhibit 2-6 presents the annual consumption by the City's top 10 water users in 2016. The list is comprised of five customers in the Motel category, two City accounts, one customer in the Apartments/Assisted Living category, one customer in the Apartments category, and one customer in the Food & Beverage category. Combined, these customers' average annual consumption represented approximately 34.6 percent of the total annual consumption for all customer classes. Water conservation efforts targeting these customers have the potential to yield notable water savings.

Exhibit 2-6. Annual Consumption, 2016

Customer Category	Annual Consumption (MG)
Motel	2.55
City	2.18
Motel	2.12
Motel	1.36
Apartments/Assisted Living	1.22
City	1.01
Motel	0.86
Apartments	0.67
Food & Beverage	0.65
Motel	0.64
Total	**13.27**

2.8 Water Loss

OAR 690-086-0140(9)

The City calculated water loss as the difference between water demand and total metered consumption, and calculated the water loss percentage by dividing the resulting water loss volume by demand volume. **Exhibit 2-7** shows the City's calculations of water loss for 2018 through November 2020. In some months, the available data was either incomplete or potentially invalid as it showed consumption (water sold) exceeding demand (water produced at the treatment plant) in a given month. The City is investigating these data errors. Estimated water loss in Exhibit 2-7 therefore shows water loss as a range for each year depending on whether invalid months were excluded. These water loss estimates do not account for the estimated 0.036 MG used for flushing the water system annually. For consistency with the WSMP, flushing was not accounted for in the water loss estimates. Accounting for flushing would slightly reduce the water loss.

Exhibit 2-7. Water Loss, 2018-2020

Year	Annual Water Demand (MG)	Metered Consumption (MG)	Water Loss (MG)	Water Loss (%)*
2018	47.05	43.58	3.47	7.4-15.6%
2019	40.06	32.56	7.50	18.7-20.6%
2020	42.47	39.92	2.55	6.0%-12.6%

*Range of water loss varies based on calculations using all available monthly data or calculations omitting months where consumption exceeded demand or values were incomplete.

As noted in the exhibit, the City's water loss in 2020 was 6 percent when comparing demand and consumption totals while water loss was 12.6 percent when excluding the months of February and March due to consumption exceeding demand in those months. Consumption in excess of demand is likely due to the City not having synchronized time periods of consumption data and demand data and

accounting errors related to apparent water loss issues described below. Given the data discrepancy, the City considers its water loss to be somewhere in the range of 6 percent through 12.6 percent.

The City considers most of its water loss to be apparent water loss, specifically accounting and metering. The City has been taking actions to address accounting and metering issues. The City has been working to improve customer billing, upgrading or changing its utility billing software four times in the last eight years. The most recent utility billing software that has been operating since 2019 is proving to be the most accurate thus far. To improve tracking of water consumption for purposes of better understanding customer behaviors and targeting water conservation towards customers, the City plans to work with it billing software company to set up the system to track consumption by customer category. This is a detail that the City missed as it worked to address other issues with billing software. Using meter size as a surrogate for the customer category label does not work in the City. An array of commercial customers have not upgraded to commercial meters due to the costs associated with those upgrades, instead pursuing other ways of meeting water needs. As part of its efforts to improve accounting, the City also wants to more closely align the monthly demand and monthly consumption time periods of comparison. In the past two years, the City replaced all 2-inch meters and the more accurate meter readings showed higher water consumption than the previous meters were recording. This demonstrates that old meters in the City's system are likely under-recording water consumption, which the City is endeavoring to address. Section 3.3.3 Meter Testing and Maintenance discusses this issue in the more detail.

While real water losses (i.e., system leakage) is a component of the City's water loss, the City does not consider it to be a major component of its 2020 water loss based on results of meter replacement discussed above, SCADA system monitoring, and results of recent leak detection efforts. The City's SCADA system, which tracks water demand in the system, indicates that the City's water system has no notable leaks. In addition, the City hired a professional leak detection company to conduct a leak detection survey of the City's water system in 2014, 2016, and 2019, which found leaks in water lines that the City promptly addressed. In 2020, the City addressed leaks identified in the November 2019 survey, which the detection company estimated would save approximately 1.1 MG/month. More details about leak detection are provided in Section 3.3.5. The combination of the improved utility billing software, replacement of 2-inch meters, and water line repair and replacement efforts related to leak detection likely led to the lower water loss seen in 2020 compared to previous years.

Based on this assessment of apparent and real water losses, the City is confident that system leakage is only a small portion of its water loss presented in Exhibit 2-6, so well below the 15 percent system leakage threshold identified in the Stipulated Final Order and Agreement on Reconsideration (Stipulated Agreement) (issued in 1997) associated with the City's Permit Amendment T-7589, which would have added an additional point of diversion under former Permit S-51190 (Permit S-51190 was superseded by Permit S-53471; See Section 2.9.1 for more details). The Stipulated Agreement included a number of conditions, such as one related to water loss, that are detailed under Section 2.9.3 Assessment of Water Supply

2.9 Water Rights

OAR 690-086-0140(5)

2.9.1 Summary of Water Rights

The City holds two water right certificates and two permits, which are all for municipal use. These water rights are described below and in **Exhibit 2-8**.

- Certificate 22933 authorizes the use of up to 2.0 cfs from Reedy Creek and has a priority date of July 9, 1945.
- Certificate 14104 authorizes the use of up to 0.49 cfs from North Cape Creek (referred to as Cape Creek) and has a priority date of July 31, 1934.
- Permit S-29018 authorizes the use of up to 2.0 cfs from Salmon Creek, with 1.0 cfs having a priority date of June 26, 1963 and 1.0 cfs having a priority date of August 22, 1963. On [x date] the City received a Final Order from OWRD extending the completion date to October 1, XXXX. Permit S-29018 also states that use of the water right shall be limited to any deficiency in the available supply under the prior existing water right from Reedy Creek (Certificate 22933).
- Permit S-53471 (formerly Permit S-51190) authorizes the use of up to 2.0 cfs from the Yachats River and has a priority date of March 20, 1989. Permit S-53471 is the product of an agreement reached to address challenges to OWRD's approval of Permit Amendment T-7589, which would have added an additional point of diversion under Permit S-51190. The Stipulated Final Order and Agreement on Reconsideration (Stipulated Agreement) resulted in issuance of Permit Amendment T-7967, which changed the location of Point of Diversion 1 (POD 1) to approximately 2 miles upstream of POD 2, located in the estuary near the City's water treatment plant. The Stipulated Agreement also resulted in cancellation of Permit S-51190 and issuance of a superseding permit S-53471, as well as a number of conditions, which are detailed under Section 2.9.3 Assessment of Water Supply. The authorized date of completion for putting Permit S-53471 to full beneficial use is October 1, 2043.

Exhibit 2-8. City of Yachats Water Rights

Source	Application	Permit	Permit Amendment	Certificate	Priority Date	Type of Beneficial Use	Authorized Rate (cfs)	Authorized Date for Completion	Maximum Rate of Withdrawal to Date Instantaneous (cfs)	WY 2019-2020 Average Withdrawal Monthly (MG)	WY 2019-2020 Average Withdrawal Daily (mgd)	Five-Year (WY 2015-2016 to WY 2019-2020) Average Withdrawal Monthly (MG)	Five-Year (WY 2015-2016 to WY 2019-2020) Average Withdrawal Daily (mgd)	Comments
Reedy Creek	S-20951	S-17333	--	22933	7/9/1945	Municipal	" 2.0	NA	**2.0**	4.10	0.13	4.16	0.14	City's primary water source.
Salmon Creek	S-38383	S-29018	--	--	8/22/1963 for 1.0 cfs; 6/26/1963 for 1.0 cfs	Municipal	2.0	10/1/XXXX (extension pending)	**0.52**	0.06	0.002	0.05	0.002	City's secondary water source; to make up deficiency under Certificate 22933 (Reedy Creek water right)
(North) Cape Creek	S-15440	S-11586	--	14104	7/31/1934	Municipal	0.49	NA	**0.49**	0.00	0.00	0.00	0.00	Currently held in reserve as a water source.
Yachats River	S-69856	S-53471	T-7967	--	3/20/1989	Municipal	2.0[1]	10/1/2043	**0**	0.00	0.00	0.00	0.00	Permit Amendment T-7967 changed the point of diversion for POD 1. Currently held in reserve as a water source. No water has been diverted under this water right to date.

cfs = cubic feet per second

[1] Several conditions apply to the use of this water as described in Section 2.9.3 Assessment of Water Supply.

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2.9.2 Aquatic Resource Concerns

OAR 690-086-140(5)

OAR 690-086-140(5) requires municipal water suppliers to identify the following for each of its water sources: 1) any listing of the source as water quality limited (and the water quality parameters for which the source was listed); 2) any streamflow-dependent species listed by a state or federal agency as sensitive threatened or endangered that are present in the source; and 3) any designation of the source as being in a critical groundwater area.

The Oregon Department of Environmental Quality's (DEQ) publishes the Integrated Report Assessment Database, which identifies surface water bodies that are water quality limited and associated water quality limiting parameters. The information described below was drawn from DEQ's 2018/20 Integrated Report, otherwise known as DEQ's "303d list" which can be found on DEQ's web page at https://www.oregon.gov/deq/wq/Pages/WQ-Assessment.aspx.

The City's current water sources are Reedy Creek and Salmon Creek, which are tributaries to the Yachats River. The City also holds a permit for the use of water from the Yachats River, which has not yet been developed and is being held in reserve as a water source, and a certificate for use of water from North Cape Creek, which is held in reserve as a water source. Reedy Creek, Salmon Creek, and North Cape Creek are not listed as water quality limited in DEQ's database. The Yachats River is listed under Category 5 in the database from the confluence with Keller Creek to its mouth for the following parameters: dissolved oxygen (spawning) and temperature (spawning; year-round). The confluence with Keller Creek is upstream of the points of diversion on the Yachats River authorized by the City's permit.

The Yachats River and its tributaries support several fish species that are listed as threatened, endangered, or sensitive under state and federal laws. The listed fish species that may occur in these water bodies is summarized in **Exhibit 2-9**.

Exhibit 2-9. Listed Fish Species

Species	Evolutionarily Significant Unit (ESU)	Federal Listing	State Listing
Coho salmon (*Oncorhynchus kisutch*)	Oregon Coast	Threatened	Sensitive
Chinook salmon (*O. tshawytscha*)	Coastal Spring Chinook SMU	N/A	Sensitive
Steelhead trout (*O. mykiss*)	Oregon Coast ESU/Coastal Summer Steelhead SMU	N/A	Sensitive
Chum salmon (*O. keta*)	Coastal Chum Salmon SMU/Pacific Coast ESU	N/A	Sensitive – Critical
Western brook lamprey (*Lampetra richardsoni*)	No ESU listed	N/A	Sensitive

Species	Evolutionarily Significant Unit (ESU)	Federal Listing	State Listing
Western river lamprey (*L. ayresii*)	No ESU listed	N/A	Sensitive
Pacific lamprey (*Entosphenus tridentatus*)	No ESU listed	N/A	Sensitive
Pacific Eulachon (*Thaleichthys pacificus*)	Southern DPS	Threatened	N/A
Umpqua chub (*Oregonichthys kalawatseti*)	No ESU listed	N/A	Sensitive – Critical
Green Sturgeon (*Acipenser medirostris*)	Southern DPS	Threatened	Sensitive – Critical
White sturgeon (*A. transmontanus*)	Coastal Population	N/A	Sensitive

DPS = Distinct Population Segment
SMU = Species Management Unit
Sources for this list:

- State of Oregon Sensitive Species List (2019)-- https://www.dfw.state.or.us/wildlife/diversity/species/docs/Sensitive_Species_List.pdf
- Endangered Species Act Listing for West Coast Salmon and Steelhead, National Oceanic and Atmospheric Administration (2016)-- https://archive.fisheries.noaa.gov/wcr/publications/gis_maps/maps/salmon_steelhead/critical_habitat/wcr_salmonid_ch_esa_july2016.pdf
- Oregon Conservation Strategy-- http://oregonconservationstrategy.org/ocs-strategy-species/fish/

The City does not have any municipal groundwater rights and is not located in a Critical Groundwater Area.

2.9.3 Assessment of Water Supply

OAR 690-086-0140(3)

Reedy Creek, Salmon Creek, and Cape Creek

Streamflow in the peak summer season affects the reliability of the City's water rights on Reedy Creek, Salmon Creek, and Cape Creek. According to City staff, the City is currently maximizing the amount of water that can be diverted from Reedy Creek and Salmon Creek during the peak summer season, as demonstrated by the need to implement water curtailment stages in recent years. Consequently, these water sources are not expected to be able to provide sufficient additional water to meet increased water demands in the summer from population growth. Flows in Cape Creek have not been measured, with the exception of one measurement in September 2020 by Westech Engineering. The measured flow rate was 0.39 cfs, but given that the measurement occurred after a rainstorm, the typical streamflow during the summer months is likely less.

Yachats River

Reliability of the Yachats River as a water source is affected by conditions in Permit S-53471 and the Yachats River Mutual Agreement Stipulated Final Order issued in 1997, which was a result of challenges to OWRD's approval of Permit Amendment T-7589 (Stipulated Agreement) (See Appendix B for the Stipulated Agreement). Permit S-53471 has a priority date of March 20, 1989. Instream water right

certificates 59739 and 59608 are senior in priority (July 12, 1966 and March 26, 1974 priority dates, respectively) to the City's Permit S-53471 while instream water right certificate 73161 is junior in priority (March 25, 1991 priority date). The senior instream water rights state that the instream water rights have priority over Permit S-53471 except that 1 cfs is reserved for municipal purposes below River Mile 5, meaning that the City would have had access to use 1 cfs of water below River Mile 5 prior to the Stipulated Agreement. However, the Stipulated Agreement conditioned the City's permit such that the City can only use the full 2.0 cfs authorized by the permit when flows in the Yachats River (measured at OWRD Gage 14306872, Yachats River above Clear Creek near Yachats) are sufficient to meet the junior instream water right (Certificate 73161) and senior instream water rights (Certificates 59739 and 59608). As shown in **Exhibits 2-10**, streamflow records from 2013 through 2020 indicate that these instream rights are not met throughout the year and are met with a particularly low frequency in summer, so the City is unlikely to be able to access the full 2.0 cfs during the peak demand season.

Exhibit 2-10. Frequency Maximum Instream Water Right Met

Time Period			Max Instream Water Right (cfs)	Frequency ISWR is Met, 2013 - 2020
January 1	-	January 15	132	91.7%
January 16	-	January 31	132	90.6%
February 1	-	February 15	132	92.5%
February 16	-	February 29	132	90.6%
March 1	-	March 15	132	72.5%
March 16	-	March 31	132	73.4%
April 1	-	April 15	132	75.8%
April 16	-	April 30	132	48.3%
May 1	-	May 15	63	88.3%
May 16	-	May 31	63	52.3%
June 1	-	June 15	63	44.2%
June 16	-	June 30	42	50.8%
July 1	-	July 15	40.2	20.8%
July 16	-	July 31	40.2	0.0%
August 1	-	August 15	25.6	1.7%
August 16	-	August 31	25.6	2.3%
September 1	-	September 15	24.9	5.8%
September 16	-	September 30	24.9	26.7%
October 1	-	October 15	49.1	24.2%
October 16	-	October 31	50	50.8%
November 1	-	November 15	132	29.2%
November 16	-	November 30	132	63.3%
December 1	-	December 15	132	63.3%
December 16	-	December 31	132	77.3%

Furthermore, when flows in the Yachats River drop below the flows identified in the junior and senior instream water rights, the Stipulated Agreement and Permit S-53471 limit the City to 1.0 cfs (limited to 0.5 cfs at the upper point of diversion (POD 1) and 0.5 cfs at the lower point of diversion (POD 2)) during "emergencies" or "when population growth exceeds other sources of supply." Given that the lower point of diversion has saltwater intrusion risks, the City is largely limited to up to 0.5 cfs that the City could potentially divert from the upper point of diversion.

To allow for use under the population growth condition, the City must be in compliance with its WMCP, and the WMCP has to include certain elements from the Stipulated Agreement beyond the standard OWRD requirements, which are described in **Exhibit 2-12** along with descriptions of how the City has addressed those elements from the Stipulated Agreement.

Exhibit 2-11. Stipulated Agreement Required Elements and City Actions To Comply

Additional WMCP Element per Stipulated Agreement	Actions Taken To Meet Element in Stipulated Agreement
Goal of 85% water use efficiency and a plan and timetable for meeting that goal	The City's water loss was less than 15% in 2020, as described in Section 2.7 Water Loss.
Demand projections based on the 85% efficiency level and demand figures based upon the best practicable estimate of population and occupancy figures and seasonal average water use	Demand projections are based on the City's 85% efficiency, the best practicable estimate of population and occupancy and seasonal average water use, as shown in Section 5.
Schedule for water audits (annual)	The City conducts annual water audits, as described in Section 3.
Cooperation in efforts to develop a regional water supply	The City is involved in regional water supply planning efforts through its participation in the Mid-Coast Water Conservation Partnership and continues to communicate with other water providers about regional water supply opportunities, which are described in Section 3.
Analysis of the land-use approval process required to develop a Yachats River point of diversion and a discussion of how and when the City intends to comply with those land-use processes	This analysis is included in Section 5.
Analysis of the feasibility of other water sources and a timeline for when the City will abandon nonviable sources or seek to transfer those sources to instream rights	This analysis is included in Section 5.
Curtailment plan with triggers for curtailment based on stream flows (actual water curtailment is not required to use water under the population growth scenario)	The City has a curtailment plan with triggers for curtailment based on stream flows, as shown in Section 4.
All elements necessary to meet WMCP requirements	All required elements of a WMCP are included in this WMCP

Furthermore, the Stipulated Agreement has very specific language related to the water efficiency requirement listed in Exhibit 2-12. Per the Stipulated Agreement, since more than 15 years have passed since the Stipulated Agreement and more than 10 years since the approval of the WMCP, the relevant water efficiency requirement is that the City "has reached or exceeded 85% water use efficiency, yet

remains unable to meet the requirements of the City's resident population using other developed sources." Thus, the City must have water losses below 15% (to achieve 85% water use efficiency) and still need additional water in order to begin diverting water under the permit. If the City's losses still exceed 15%, or other developed water sources could feasibly be used to meet demand, then the City would likely be prohibited from using the Yachats River permit under the population growth provision. As described above, the City had water loss below 15% in 2020 and Section 5 describes how the Yachats River is the most feasible source to develop next to meet water demand projections.

"Emergencies" are limited to sustained drought and to the following short-term or catastrophic events: supply line breakage, firefighting, outdoor events within the City's service area that place an abnormally high demand on water supply, catastrophic loss of a primary water supply source, and threats to public health not attributable to inefficiency or chronic conditions, as may be approved jointly by ODFW and OWRD. The potential exists that sustained drought may become more of a regular event with climate change, but accessing water under this situation could only occur when curtailment measures are instituted as described in the City's WMCP.

2.10 System Description

OAR 690-086-0140(8)

A water system schematic is provided in **Exhibit 2-13**. This schematic shows the locations of the City's water supply sources, water treatment plant, transmission and distribution lines, reservoirs, and pump stations.

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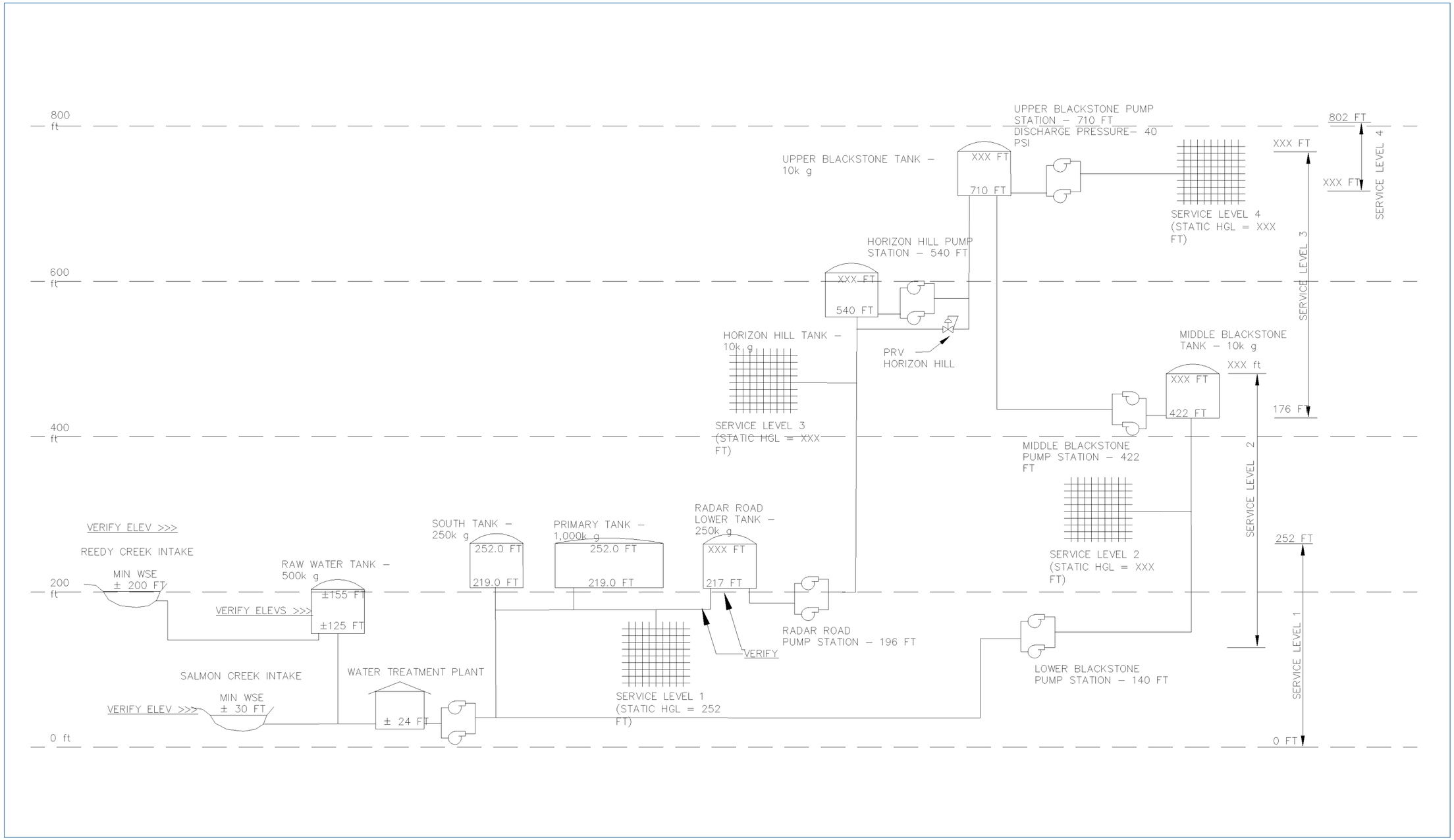
Exhibit 2-12. City of Yachats Water System Flow Schematic



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2.10.1 Raw Water Intakes, Transmission Lines, and Storage

The City's Reedy Creek intake is approximately one-half mile upstream from the Yachats River. The City built the original intake impoundment in the 1940s. A landslide in 1998 destroyed the original impoundment and intake, and the City only rebuilt the intake. The intake consists of an infiltration gallery that pre-filters the raw water, which is then conveyed by gravity approximately 8,400 feet to the City's raw water storage tank via a combination of asbestos concrete pipe and high-density polyethylene pipe.

The City's intake on Salmon Creek is approximately 300 feet from the water treatment plant. The stainless steel intake pipe is located in an impoundment, and water is then conveyed by gravity through a PVC pipe to the treatment plant.

Cape Creek is located approximately 2 miles south of the City's UGB in the Cape Perpetua area. Although Cape Creek historically served as the City's water source, the source has not been used for many years. No infrastructure has been developed for use of water from the Yachats River.

The City constructed a 500,000 gallon raw water reservoir adjacent to the water treatment plant in 2000. The reservoir is made of welded steel and is 35 feet high and 50 feet in diameter. The reservoir is filled with flows from Reedy Creek. Water from the reservoir is fed to the treatment plant during low flows to supplement direct flows from the City's water sources.

2.10.2 Water Treatment

The City completed construction of its water treatment and filtration plant in 1992 and has a total rated treatment capacity of 0.5 mgd (350 gpm). Currently, the City is able to reliably operate the plant at approximately 475,000 gallons per day (330 gpm). The plant includes the following components:

- Pre-chlorination
- Chemical coagulation and polymer addition
- Up-flow contact clarification
- Multi-media filtration
- Disinfection (post-chlorination)
- Serpentine contact basin clearwell

The plant is a custom treatment system with a "conventional" type treatment train. The treatment process includes a single stage flocculation and clarification process followed by mixed media filtration. Water is pumped from the clearwell into the City's distribution system by two vertical turbine high service pumps.

2.10.3 Treated Water Storage

The City currently has six finished water reservoirs with a combined storage capacity of 1,590,000 gallons as described below.

The Upper Radar Road Reservoir was built in 1992 concurrently with the water treatment plant, and it is the City's primary storage structure. All water from the treatment plant is conveyed to this reservoir before being directed to other reservoirs and pump stations. The water level in this reservoir therefore determines the pressure provided to a large number of water users in the service area. The rectangular reinforced-concrete structure is approximately 124 feet long and 49 feet wide, and it has a storage volume of 1.0 million gallons.

The Lower Radar Road Reservoir, built in 1945, is located approximately 120 feet from the Upper Radar Road Reservoir and is about 50 feet lower in elevation. It is a circular concrete cast-in-place structure with a diameter of 50 feet and a storage volume of 200,000 gallons. This reservoir provides water primarily to the northern part of the City. The reservoir delivers water directly to the Radar Road Pump Station and to the Lower Blackstone Pump Station.

The Horizon Hill Reservoir was built in 1964. The reservoir is a rectangular reinforced-concrete cast-in-place structure, approximately 14 feet long and 14 feet wide, with a storage capacity of 10,000 gallons. Water is delivered to the reservoir primarily from the Radar Road Pump Station. A pump station located next to the Horizon Hill Reservoir is used to maintain water levels in the Upper Blackstone Reservoir.

The South Reservoir was constructed in 2018 and primarily serves users south of the Yachats River. The tank is constructed of bolted steel with a glass-fused coating system. It is 36 feet in diameter and has a storage volume of 250,000 gallons. The reservoir's level is maintained by the level in the Upper Radar Road Reservoir.

The Middle Blackstone Reservoir was built in 2007. The reservoir is made of welded stainless steel, 10 feet in diameter, and its storage volume is 10,000 gallons. The reservoir's levels are maintained by the Lower Blackstone Pump Station based on water level readings.

The Upper Blackstone Reservoir was constructed in 2007 as part of the Blackstone development. It is a circular concrete cast-in-place structure with a diameter of 31.5 feet and a storage volume of 120,000 gallons. The reservoir's levels are maintained by the Middle Blackstone Pump Station.

2.10.4 Distribution System

The City's distribution system conveys water from the water treatment plant and from reservoirs to end users. Pipe sizes range from 1-inch water services up to 12-inch water mains. The current distribution system consists of a mix of asbestos cement, ductile iron, high density polyethylene, and polyvinyl chloride (PVC) pipes, with the majority being composed of PVC in a variety of sizes. The City operates approximately 15.3 miles of distribution pipeline.

3. Water Conservation Element

This section addresses the requirements of OAR 690-086-0150(1) – (6). This rule requires a description of specific required conservation measures and benchmarks, and additional conservation measures implemented by the City.

3.1 Progress Report

OAR 690-086-0150(1)

This is the City's second WMCP. OWRD approved the City's first WMCP on August 2, 2002. The previous WMCP described the City's efforts to implement mandatory conservation activities required under OAR 690-086, as well as additional water conservation activities, including a description of each measure, progress in implementation, and a schedule and budget for each activity, rather than a specific benchmark for each conservation measure. **Exhibit 3-1** presents a progress report on each of these benchmarks.

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Exhibit 3-1. Progress Report for City of Yachats' Conservation Benchmarks

OAR 690-086-150 (4) Requirement 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.		
Sub-Section Requirement	2001 Implementation Progress	2021 Conservation Measure Status
(a) An annual water audit that includes a systematic and documented methodology for estimating any un-metered authorized and unauthorized uses	The City compares finished water meter demand to metered consumption.	The City conducts annual water audits. The City uses its SCADA system to track water demand. The City has upgraded utility billing software for improved accuracy in tracking consumption. Over the past two years, all 2" meters have been replaced with models that give more accurate readings.
(b) If the system is not fully metered, a program to install meters on all un-metered water service connections.	The system is fully metered and the City has plans in place to replace older, inefficient meters.	The system is fully metered, and meters are installed at all new connections.
(c) A meter testing and maintenance program	Meters are being systematically replaced and upgraded.	Approximately 200 older meters have been replaced with radio read meters. Meters are tested when consumption is observed to change abnormally.
(d) A rate structure under which customers' bills are based, at least in part, on the quantity of water metered at the service connections	The base rate charged to customers increases with increasing meter size.	The base rate charged to customers increases with increasing meter size.
(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	Leak detection surveys are completed regularly by a professional leak detection company. The City repairs leaks and replaces leaking lines identified in the Capital Improvement Plan.	Leak detection surveys continue to be completed regularly by a professional leak detection company. The City repairs leaks and replaces leaking lines identified in the leak detection reports and in the Capital Improvement Plan.
(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	The City has not yet implemented a public education program for water conservation.	The City has partnered with regional water providers to establish the Mid-Coast Water Conservation Consortium, which will provide public education about water conservation (e.g., billing messages, newsletter articles, and water quality report content) to members of the consortium. The City plans to begin implementing public outreach measures in Fiscal Year 2021-2022 either through that newly established organization or on its own, including billing messages, newsletter articles, and website content promoting indoor and outdoor water conservation.

OAR 690-086-150 (5) Requirement If the 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), or if the supplier serves a population greater than 7,500, 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 implementation of the measures is neither feasible nor appropriate for ensuring the efficient use of water and the prevention of waste.		
Sub-Section Requirement	2011 Implementation Progress	2021 Conservation Measure Status
(a) Technical and financial assistance to encourage and aid residential, commercial, and industrial customers in implementation of conservation measures	The City serves a permanent resident population under 1,000 but the service population during the peak season and holidays is greater than 1,000. The City was exploring technical and financial assistance activities but had not yet implemented them in 2011.	The City intends to begin implementing technical and financial assistance programs, including technical assistance for leak detection and offering toilet leak detection dye tablets to customers.
(b) Supplier financed retrofitting or replacement of existing inefficient water fixtures, including distribution of residential conservation kits and rebates for customer investments in water conservation	The City was exploring fixture replaced programs but had not yet implemented them in 2011.	The City intends to begin implementing a fixture replacement program starting with offering low-flow showerheads and faucet aerators to its customers. The City will also explore a rebate program for additional fixture replacements.
(c) Adoption of rate structures, billing schedules, and other associated programs that support and encourage water conservation	Customers are billed monthly, enabling them to connect higher water use with higher bills and encouraging conservation.	Customers are billed monthly, enabling them to connect higher water use with higher bills and encouraging conservation. The City is considering implementing a tiered water rate structure.
(d) Water reuse, recycling, and non-potable water opportunities	The City had not begun to develop water reuse and recycling projects.	The City is developing a project to recycle water treatment plant backwash water.
(e) Any other conservation measures identified by the water supplier that would improve water use efficiency	The City does not yet implement additional conservation measures.	The City is engaged with the Mid-Coast Water Planning Partnership for regional collaboration on sustainable water supplies. During 2020-2021, the City developed a Drinking Water Protection Plan with stakeholder engagement, which identified water conservation and public education recommendations. The City has partnered with other regional water providers to establish the Mid-Coast Water Conservation Consortium that will assist participating water providers with water conservation outreach and support.

3.2 Other Current Conservation Measures

Since the City needed to implement water curtailment stages in 2015 and 2017, it has been more aggressively pursuing strategies to address its water supply issues in summer when flows in Reedy Creek and Salmon Creek have been inadequate. Actions that the City has been taking are summarized below and detailed further in this section.

- Installing Automated Meter Reading (AMR) meters to improve accounting and to more quickly identify customer leaks
- Developing a project to recycle backwash water from the water treatment plant
- Developing a Drinking Water Protection Plan to create strategies to address risks to the City's drinking water supply
- Participating in the development and launch of the Mid-Coast Water Conservation Consortium aimed at cost-effectively implementing water conservation measures by pooling resources of water providers on the Mid-Coast
- Participating in the Mid-Coast Water Planning Partnership, which is a region-wide effort of diverse stakeholders to develop sustainable water supply solutions

3.3 Use and Reporting Program

OAR 690-086-0150(2)

The City's Public Water System Identification number is 41-00966.

The City's water measurement and reporting program complies with the measurement and reporting standards in OAR Chapter 690, Division 85.

The City currently measures diversions from Reedy Creek using a mutating disc positive displacement meter located 900 feet from the intake. This meter is experiencing fouling from solids, so the City is in the process of buying a magnetic meter. The City measures diversions from Salmon Creek using a mutating disc positive displacement meter, and it plans to buy a magnetic meter for the Salmon Creek intake in Fiscal Year 2021-2022. The City also has a master meter at the intake of the water treatment plant, allowing the City to measure the total flow from both sources and subtract the meter readings from a functioning intake meter to determine flows at a meter that may not be working properly at a given time period.

The City submits monthly water use measurements to OWRD on an annual basis. Reporting is for the previous water year (October 1 to September 30). The City's water use records can be found at http://apps.wrd.state.or.us/apps/wr/wateruse_report/

3.4 Required Conservation Measures

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

OAR 690-086-0150(4) requires that all water suppliers provide a description of activities implemented and five-year benchmarks for each of the following water conservation measures:

1. Annual water audit
2. System-wide metering
3. Meter testing and maintenance
4. Unit-based billing
5. Water loss analysis
6. Public education

This sub-section describes the City's activities under those water conservation measures and the City's plans during the next five years to initiate, continue, or expand its water conservation activities. These water conservation measures are required of all municipal water suppliers when a condition of a water use permit, permit extension, or another order or rule requires a WMCP.

3.4.1 Annual Water Audit

OWRD defines a water audit as an analysis of the water system that includes a thorough accounting of all water entering and leaving the system. The City's water audit currently consists of comparing demand (finished water entering the distribution system) to metered consumption to determine water loss on a monthly and annual basis. The City has not been estimating unmetered authorized water uses, except the City does have an estimate of water used annually to flush hydrants and other water system components, which is 36,000 gallons. The City is not aware of any unauthorized water uses.

As shown in Exhibit 2-7, the City's water loss was between 6 percent and 12.6 percent in 2020. The City attributes this water loss to primarily accounting and metering, and consequently, has been implementing the following actions: improving its utility billing software, planning improvements in tracking of customer accounts and alignment of demand and consumption data, replacing old customer meters, and investigating replacing customer meters with AMR meters. The City also continues to address the system leakage component of its water loss by using its SCADA system to monitor for system leaks and regularly hiring a professional leak detection company then repairing any leaks found. The City's efforts to reduce water loss are described in greater detail in Section 2.8 Water Loss.

Five-Year Benchmark – The City will continue to conduct annual water audits. In the next five years, the City will add a systematic and documented methodology for estimating any unmetered authorized and unauthorized uses. In the next five years, the City will analyze and implement to the extent possible alignment of monthly demand and consumption data. In the next five years, the City will begin tracking water consumption by customer category.

3.4.3 System-wide Metering

The City's water system is fully metered and the City installs meters at all new water connections.

Five-Year Benchmark – The City will continue to install meters on all new water connections.

3.4.4 Meter Testing and Maintenance

The City has a meter testing and maintenance program. The City replaced all of its customer meters 20 years ago and then slightly upgraded them 10 years ago. In the past 2 ½ years, the City has converted approximately 200 meters to radio read meters to improve accuracy and increase meter reading efficiency. However, the City wants to convert all of its meters to Automated Meter Reading (AMR), which will provide the City with water consumption in real time. This upgrade will help the City quickly identify leaks that a water customer may be experiencing and will improve water auditing, such as enabling closer comparison of monthly demand and consumption. In the meantime, the City is testing meters when billing staff or customers note that consumption has changed abnormally from one month to the next.

The City has water system master meters at the intakes of Reedy Creek and Salmon Creek, before entering the water treatment plant, and where water leaves the water treatment plant and enters the water distribution system. The meters at the two intakes are mutating disk positive displacement meters, which are old and susceptible to fouling from solids. As a result, the City is currently buying a magnetic meter for the Reedy Creek intake and plans to buy a magnetic meter for the Salmon Creek intake in Fiscal Year 2021-2022. The City has magnetic meters at the water treatment plant. To date, the City has been tracking accuracy of the meters based on SCADA trends, but the City plans to create a maintenance schedule for testing the water treatment plant master meters.

Five-Year Benchmark – The City will continue its meter testing and maintenance program. The City will continue its effort to secure funding to convert its customer meters to AMR. In the next two years, the City will replace the old meters at both intakes with magnetic meters. In the next year, the City will create a meter maintenance schedule for its water treatment plant master meters.

3.4.5 Water Rate Structure

The City's water rate structure consists of a base rate that includes a water consumption allowance of up to 1,496 gallons per month (2 units) and a usage rate based on the volume of water consumed beyond the allowance (ranging from $5.33 to $8.02 per unit beyond 2 units, as of December 2020).

Five-Year Benchmark – The City will continue to bill customers, based in part, on the volume of water consumed.

3.4.6 Water Loss Analysis

As discussed in Section 3.3.1, the City's water loss was between 6 percent and 12 percent in 2020. The City attributes this water loss to primarily accounting and metering, and consequently, has been implementing the following actions: improving its utility billing software, planning improvements in tracking of customer accounts and alignment of demand and consumption data, replacing old customer meters, and investigating replacing customer meters with AMR meters.

The City implements activities to detect and fix system leaks. The City uses its SCADA system to monitor for data trends that suggest leaks and those trends indicate that the City has a tight water system with no notable leaks. The City has been implementing water line repair and replacement projects identified in its current Capital Improvement Plan. In addition, the City hired a professional leak detection company to conduct a leak detection survey of the City's water system in 2014, 2016, and 2019. The City promptly addressed leaks identified, including those identified in November 2019. (The City also added meters to two water services identified as lacking meters in the 2019 leak detection survey and fixed the touch read portion of meters identified as broken in that survey. The meters still worked, but had to be hand read before repair.) The 2014 leak detection survey found 17 leaks totaling approximately 1.04 MG per month of leakage in the City's water system. The 2016 leak detection survey found 10 leaks totaling approximately 0.5 MG per month of leakage. The 2019 leak detection survey of the City's entire water system found 10 leaks totaling approximately 1.1 MG per month of leakage.

Given that the City has discrepancies in its data that makes it difficult to clearly determine whether its water loss is below 10 percent or not, the City will approach OAR 690-086-0150(4)(e) as though its water losses exceed 10 percent. The City understands that OWRD's rules under OAR 690-086-0150(4)(e)(A) and (B) require the City to provide a description and analysis identifying potential factors for loss and selected actions for remedy to OWRD within two years of approval of this WMCP. In addition, if the selected actions do not reduce water loss to less than 10 percent within five years of approval of the WMCP, the City will have to take additional leak detection and repair measures.

Five-Year Benchmark – Within two years of approval of this WMCP, the City shall provide OWRD with 1) results of water audits for the past two years and 2) a description and analysis identifying potential factors for the water loss and selected actions for remedy. If the selected actions do not show that water loss is less than 10 percent within five years of approval of the WMCP, the City will either develop and implement a regularly scheduled and systematic program to detect and repair leaks in the transmission and distribution system, or develop and implement a water loss program consistent with AWWA standards.

3.4.7 Public Education

This rule requires the City to establish a public education program to encourage efficient indoor and outdoor water use that includes regular communication of the supplier's water conservation activities and schedule to customers. The City has been unable to implement public education measures that promote water conservation due to lack of staff resources. However, the City recognizes the importance of doing so, and as such, has been working with other regional water providers since 2019 to develop a water conservation consortium that can help water providers on the Mid-Coast implement a range of water conservation measures, including public outreach, by pooling resources. The City plans to begin implementing public outreach measures in Fiscal Year 2021-2022 through participation in the Mid-Coast Water Conservation Consortium, including billing messages, newsletter articles, and website content promoting indoor and outdoor water conservation and leak detection.

Five-Year Benchmark – In Fiscal Year 2021-2022, the City will begin to promote indoor and outdoor water conservation through at least three billing messages per year and at least two newsletter articles per year, with at least one article focused on outdoor water conservation. In Fiscal Year 2021-2022, the

City will add indoor and outdoor water conservation information, including leak detection information, to its website.

3.5 Additional Conservation Measures

OAR 690-086-0150(6)

OAR 690-086-0150(6) requires municipal water suppliers that either: (a) serve a population greater than 1,000 and propose to expand or initiate diversion of water under an extended permit for which resource issues have been identified, or (b) serve a population greater than 7,500, to provide a description of the specific activities, along with a five-year schedule to implement several additional conservation measures. This rule applies to the City given that it serves a population greater than 1,000 and proposes to initiate diversion under *extended permit* S-53471 within the 20-year planning period of this WMCP.

3.5.1 Technical and Financial Assistance

The City is not currently implementing technical and financial assistance programs, but considers it important to assist customers with leak detection and other water conservation practices. The City plans to begin offering toilet leak detection dye tablets to assist residents with identifying leaky fixtures that need to be repaired or replaced. Technical assistance on leak detection will be provided via the City's website. The website will also include an online home water audit tool for understanding home water use and increasing water efficiency.

Five-Year Benchmark – In the next 5 years, the City will begin to provide toilet leak detection dye tablets to help customers identify leaks and leak detection information on its website. In the next 5 years, the City will provide an online home water audit tool on its website for customers to better understand their personal water use.

3.5.2 Supplier Financed Retrofitting or Replacement of Inefficient Fixtures

Significant water savings can be achieved through the installation of low-cost items, such as water-efficient faucet aerators and showerheads. Other water-efficient fixtures may require a higher initial investment in order but greatly reduce water consumption, such as water-efficient clothes washers or landscaping irrigation systems. The City intends to begin offering customers free water-efficient faucet aerators and showerheads to encourage immediate water conservation, and it will further explore developing a rebate program for other water-efficient fixtures.

Five-Year Benchmark – In the next 5 years, the City will begin offering free water-efficient faucet aerators and showerheads to customers. In the next 5 years, the City will explore the feasibility of offering rebates for customer investments in water-efficient fixtures and will implement the program if deemed feasible.

3.5.3 Rate Structure and Billing Practices that Encourage Conservation

Water utility billing is completed on a monthly basis to provide customers with timely feedback on their water consumption. The City plans to start including water conservation outreach in customer

water bills to reach water users directly and to reinforce the need for conservation and avoidance of water waste.

As previously described, the City's water rate structure currently includes a base rate and a usage rate based on volume of water consumed beyond the allowance included in the base rate. At the City's request, the Oregon Association of Water Utilities conducted a water rate study that included analysis of a tiered increasing block rate structure to encourage water conservation. The study was completed in December 2020 and used American Water Works Association standards. The study identified inconsistencies in billing rates compared to meter size, which the City plans to address as part of its exploration of implementing a tiered rate structure in 2021. The tiered rate structure is a potential tool for reducing demand in summer when the City has been experiencing water supply issues.

Five-Year Benchmark – The City will continue to bill customers on a monthly basis. In the next year, the City will begin to include water conservation messages in water bills at least 3 times per year. In the next year, the City will bring a tiered water rate structure proposal to City Council for consideration and will implement that rate structure if approved.

3.5.4 Water Reuse, Recycling, and Non-potable Water Opportunities

Currently, the City is seeking funding for a project to recycle backwash water from the water treatment plant. The project cost is estimated at $150,000 and would save 60,000 gallons per day (30,000 gallons per backwash, conducted twice daily).

Five-Year Benchmark – The City will continue its effort to obtain funding to recycle water treatment plant backwash water. The City will continue to look for water reuse, recycling, and non-potable water opportunities.

3.5.5 Other Water Conservation Measures

The City has been engaged in the activities of the Mid-Coast Water Planning Partnership, a collaborative regional effort to develop sustainable solutions that balance the needs of local public water systems and local industry, as well as healthy watersheds and fish and wildlife.

The City pursued development of a Drinking Water Protection Plan in 2019 to develop a strategy for addressing risks to its water supply, which became a particular concern after the City needed to implement water curtailment stages in recent years (2015 and 2017). The City secured a grant that year from Oregon Health Authority to develop a Drinking Water Protection Plan from 2020 through 2021. The Drinking Water Protection Plan, which involved robust stakeholder participation, identified a range of water conservation activities to protect the municipal drinking water supply. These include activities such as increased public education, incentives for installing more water-efficient fixtures, and ordinances to increase indoor and outdoor water conservation.

Spurred by water supply issues in recent years, the City has been working with other Mid-Coast water providers since 2019 to develop a framework for a water conservation consortium. This organization would assist water providers in cost-effective implementation of water conservation activities and public education efforts. A group of Mid-Coast water providers, including the City of Yachats, decided in March 2021 to fund Year 1 (Fiscal Year 2021-2022) of the Mid-Coast Water Conservation Consortium. Tasks of the Mid-Coast Water Conservation Consortium will include: developing water

conservation and leak detection website content; developing newsletter articles, billing inserts, billing messages, and content for Annual Water Quality Reports; and purchasing water-efficient fixtures, such as water-efficient showerheads and faucet aerators.

The Public Works Department and Planning Department have been working together to develop City ordinances that promote water conservation and plan to have ordinances ready for City Council review within the next year or two.

The City also has a streamflow gage on the Yachats River that it monitors to determine when the City is in drought and the stage of water curtailment, and to initiate public outreach to reduce customer water demand.

Five-Year Benchmark – The City will continue to participate in the Mid-Coast Water Planning Partnership and to be involved in regional water supply discussions. The City will participate in the Mid-Coast Water Conservation Consortium. In the next 2 years, the City will develop draft water conservation ordinances for City Council review, with at least one draft ordinance addressing water-efficiency standards for indoor water fixtures and at least one draft ordinance addressing outdoor water conservation. If approved by City Council, the City will add these ordinances to City Code.

Exhibit 3-2 provides a summary of the conservation benchmarks developed for this WMCP.

Exhibit 3-2. Summary of 2021 Conservation Benchmarks

Conservation Measures	Five-Year Benchmarks
Annual Water Audit	The City will continue to conduct annual water audits. In the next five years, the City will add a systematic and documented methodology for estimating any unmetered authorized and unauthorized uses. In the next five years, the City will analyze and implement to the extent possible alignment of monthly demand and consumption data. In the next five years, the City will begin tracking water consumption by customer category.
System-wide Metering	The City will continue to install meters on all new water connections.
Meter Testing and Maintenance	The City will continue its meter testing and maintenance program. The City will continue its effort to secure funding to convert its customer meters to AMR. In the next two years, the City will replace the old meters at both intakes with magnetic meters. In the next year, the City will create a meter maintenance schedule for its water treatment plant master meters.
Water Rate Structure and	The City will continue to bill customers, based in part, on the volume of water consumed.

Conservation Measures	Five-Year Benchmarks
Billing Practices that Encourage Conservation	The City will continue to bill customers on a monthly basis. In the next year, the City will begin to include water conservation messages in water bills at least 3 times per year. In the next year, the City will bring a tiered water rate structure proposal to City Council for consideration and will implement that rate structure if approved.
Water Loss Analysis	Within two years of approval of this WMCP, the City shall provide OWRD with 1) results of water audits for the past two years and 2) a description and analysis identifying potential factors for the water loss and selected actions for remedy. If the selected actions do not show that water loss is less than 10 percent within five years of approval of the WMCP, the City will either develop and implement a regularly scheduled and systematic program to detect and repair leaks in the transmission and distribution system, or develop and implement a water loss program consistent with AWWA standards.
Public Education	In Fiscal Year 2021-2022, the City will begin to promote indoor and outdoor water conservation through at least three billing messages per year and at least two newsletter articles per year, with at least one article focused on outdoor water conservation. In Fiscal Year 2021-2022, the City will add indoor and outdoor water conservation information, including leak detection information, to its website.
Technical and Financial Assistance Programs	In the next 5 years, the City will begin to provide toilet leak detection dye tablets to help customers identify leaks and leak detection information on its website. In the next 5 years, the City will provide an online home water audit tool on its website for customers to better understand their personal water use.
Supplier Financed Retrofit or Replacement of Inefficient Fixtures	In the next 5 years, the City will begin offering free water-efficient faucet aerators and showerheads to customers. In the next 5 years, the City will explore the feasibility of offering rebates for customer investments in water-efficient fixtures and will implement the program if deemed feasible.
Water Reuse, Recycling, and Nonpotable Opportunities	The City will continue its effort to obtain funding to recycle water treatment plant backwash water. The City will continue to look for water reuse, recycling, and non-potable water opportunities.

Conservation Measures	Five-Year Benchmarks
Other Water Conservation Measures	The City will continue to participate in the Mid-Coast Water Planning Partnership and to be involved in regional water supply discussions. The City will participate in the Mid-Coast Water Conservation Consortium. In the next 2 years, the City will develop draft water conservation ordinances for City Council review, with at least one draft ordinance addressing water-efficiency standards for indoor water fixtures and at least one draft ordinance addressing outdoor water conservation. If approved by City Council, the City will add these ordinances to City Code.

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4. Water Curtailment Element

This section satisfies the requirements of OAR 690-086-0160. This rule requires a description of past supply deficiencies and current capacity limitation. It also requires inclusion of stages of alert and the associated triggers and curtailment actions for each stage.

4.1 Introduction

Curtailment planning is the development of protocols for identifying the level of water curtailment needed and water conservation measures to reduce water demand. Events or conditions that can cause water supply shortages include: prolonged drought, water source contamination, and partial or full system failure. The City's 2021 Drinking Water Protection Plan identified an array of risks to the City's drinking water source areas that could cause water supplies shortages, such as: municipal, residential, and commercial property management practices (e.g., development and management, aging water infrastructure, landscape care, and sabotage/vandalism of municipal water infrastructure); forestry land management practices (e.g., timber harvest, pesticides and herbicides, and access roads); and natural disasters (e.g., drought/low flows, climate change, severe weather events, wildfires, earthquakes, tsunamis, and insect outbreaks).

The City developed this curtailment plan by reflecting on the most likely events that may reduce the City's ability to meet system demands and cause water shortages. Those events include an earthquake, power failure, infrastructure failure, and source water contamination. The City's planned responses to these types of events are described in Section 4.4.

The curtailment plan described in this WMCP draws directly from Yachats Municipal Code Chapter 8.22-Water Shortage Emergency Regulations, and some sections from the Yachats Municipal Code are identified when applicable.

4.2 History of System Curtailment Episodes

OAR 690-086-0160(1)

The City needed to implement water curtailment stages two times within the last 10 years as a result of low flows in Reedy Creek and Salmon Creek. In 2015, the City activated Stage 2 curtailment (nearly needed Stage 3 curtailment), which remained in place for three months. In 2017, the City activated Stage 1 curtailment (nearly needed Stage 2 curtailment), which remained in place for one month.

4.3 Capability Assessment

The City's current capacity limitations are the flows in Reedy Creek and Salmon Creek, specifically during summer months. The raw water storage tank, water treatment plant capacity, and the distribution piping are all sufficient. If a drought, natural disaster, or contamination event were to occur in one of the City's drinking water source areas, the City's water supply would be limited to the flows that can be diverted from the unaffected creek and the water in its finished water storage tanks.

4.4 Curtailment Stages and Initiating Conditions

OAR 690-086-0160(2) and (3)

The City developed a four-stage curtailment plan to be invoked in the event of a water supply shortage. These stages are of increasing severity and could be initiated and implemented in progressive steps or a later stage could be implemented directly. The plan includes both voluntary and mandatory measures, depending upon the cause, severity, and anticipated duration of the shortage.

Exhibit 4-1 presents the City's four curtailment stages and their initiating conditions (i.e., triggers). Initiation of a curtailment stage is based on the specific circumstances of the actual event. The decision to implement curtailment will also consider the knowledge and judgment of City staff members familiar with the water system. Staff members may evaluate such considerations as assessments of the extent of system damage or contamination, duration of repair, costs, fire hazards, and weather forecasts.

Exhibit 4-1. Curtailment Stages of Alert and Initiating Conditions

Curtailment Stages	Initiating Conditions
Stage 1: Water Alert Status	1. The flow in the Yachats River is recorded to be less than thirty-five (35) cubic feet per second (hereafter cfs)[1]; or 2. The combined flow of Reedy and Salmon Creek is less than 0.64 cfs (two hundred seventy-five (275) gallons per minute (hereafter gpm))[2]; or 3. According to the Palmer Drought Severity Index, the Coastal Region is in a Moderate to Extreme Drought and the Public Works Director determines that conditions exist to warrant Stage 1 restrictions.
Stage 2: Water Warning Status	1. The flow of the Yachats River is measured to be less than twenty (20) cfs[1]; or 2. The combined flow of Reedy and Salmon Creek is less than 0.50 cfs (two hundred (200) gpm)[2]; or 3. According to the Palmer Drought Severity Index, the Coastal Region is in a Severe or Extreme Drought and the Public Works Director determines that conditions exist to warrant Stage 2 restrictions.
Stage 3: Emergency Water Status	1. The flow of the Yachats River is measured to be less than fifteen (15) cfs[1]; or 2. The combined flow of Reedy and Salmon Creek is less than 0.40 cfs (one hundred seventy-five (175) gpm)[2]; or 3. According to the Palmer Drought Severity Index, the Coastal Region is in an Extreme Drought and the Public Works Director determines that conditions exist to warrant Stage 3 restrictions.
Stage 4: Critical Water Status	1. The City's water system has been damaged beyond immediate repair. 2. The City cannot meet the basic water needs, creating a health and safety hazard.

[1] Based on readings at OWRD Gage 14306872, Yachats River above Clear Creek near Yachats.
[2] Based on the City's master meter readings.

4.5 Authority and Enforcement

The authority to declare a water shortage emergency is described in Sections 8.22.100 and 8.22.060 of the City's municipal code. In an emergency, as determined in the discretion of the Public Works Director, the Public Works Director may declare a water shortage and the necessity for water conservation actions under Stages 1 through 3. The Public Works Director shall notify the Council immediately upon such declaration, and the Council shall meet as soon as practical to accept, reject, or modify such determination. Stage 4 water conservation actions shall be implemented in case of disaster conditions and may be put into effect without further action of the City Council upon determination by the Public Works Director that the water system has been damaged beyond immediate repair (Section 8.22.060). The water conservation actions shall be in full force and effect and shall be enforced until such time as the Public Works Director declares a suspension or termination of the water shortage. The penalties for violating the water conservation requirements are set forth in Sections 8.22.070 and 8.22.080. Each day a violation is committed or permitted to continue constitutes a separate infraction. Penalties range from a written warning to suspension or termination of water service.

4.6 Curtailment Plan Implementation

OAR 690-086-0160(4)

The City's curtailment plan provides specific curtailment actions for each of the four curtailment stages. In Stage 1, voluntary actions are requested of customers. In the latter curtailment stages, mandatory actions are prescribed to restrict water use. In regard to the following lists of measures or restrictions, the City may revise, add, or remove specific measures or restrictions on water use or activities as needed, depending upon the circumstances of the event for which curtailment is necessary.

4.6.1 Stage 1: Water Alert Status

The following non-essential uses are restricted or prohibited under Stage 1:

- The watering of lawns, gardens and landscaping is restricted to alternative days. Specifically, houses with an address number ending in even numbers (0-2-4-6-8) shall be permitted to water lawns only on even numbered calendar days. Houses with an address number ending in odd numbers (1-3-5-7-9), or fractional addresses, shall be permitted to water only on odd numbered calendar days. All watering of lawns, gardens and landscaping shall be prohibited between the hours of 10:00 a.m. and 7:00 p.m. of each day.
- All sales of water to persons who are not customers of the water system are prohibited.
- No water shall be used by the Yachats Rural Fire District for drills, fire hose testing, hydrant flushing or truck washing.
- The operation of an ornamental fountain, unless it is equipped with a recirculation system, is prohibited.

4.6.2 Stage 2: Water Warning Status

In addition to the restrictions and prohibitions for Stage 1 above, for Stage 2 the following non-essential uses are prohibited:

- The watering of any vegetation, except that trees and shrubs may be watered with a hand held watering device, bucket or hose with flow control nozzle, or drip irrigation system only (no airborne sprinkler systems).
- The use of water for washing, hosing and the like of buildings and pavement or other pedestrian surfaces.
- Drinking water served at restaurants, motels and other businesses which serve food or drink to the public, unless users post "drought notices" in a clearly conspicuous manner so that members of the public will be apprised of the water shortage. If so posted, water for drinking purposes may be served upon request.
- Washing of vehicles, equipment, watercraft and the like.
- The operation of all exterior ornamental fountains, even with a recirculating system.
- Use of City water for dust control.

For Stage 2, all commercial large meter, commercial water, and transient water users shall post the written notice, provided by the City, in a conspicuous location on the property receiving City water service within twenty-four (24) hours of receiving said notice. For transient water users, the notice shall be posted in each rental unit.

4.6.3 Stage 3: Water Emergency Status

In addition to the restrictions and prohibitions for Stages 1 and 2, above, for Stage 3 the following non-essential uses of water are prohibited:

- All landscape watering is prohibited.
- Use of water from a fire hydrant for any use other than for firefighting.
- Use of non-recirculating hot tubs, whirlpools or spas.
- All "commercial large meter" users are required to send linens for laundering outside the City except that commercial laundromats are exempt from this regulation.

For Stage 3, all small meters, including residential water, outside City water, commercial water, and transient water users shall be charged the base volumetric rate for the first four hundred (400) cubic feet per month usage. Usage over four hundred (400) cubic feet per month usage shall be charged the base volumetric rate plus two dollars ($2) per one hundred (100) cubic feet over the four hundred (400) cubic feet. Fractions of months under Phase 3 water conservation restrictions shall be billed extra based on daily usage over 13.33 cubic feet per day. Meters may be read more frequently by City personnel or approved City agents to enforce these restrictions. Small meter users using more than twenty-seven (27) cubic feet per day on average shall be given a written warning to reduce usage and thereafter cited.

For Stage 3, all users may be required to reduce their normal usage by a certain percentage when compared to the average normal usage over the same calendar time period from the previous two (2) years. For water utility accounts with less than two (2) years of usage history, the percentage reduction shall be compared to a City-wide median usage for similar users.

No water connections to new residences, business or industry shall be permitted during Phase 3.

All commercial large meter, commercial, and transient water users shall post the written notice, provided by the City, in a conspicuous location on the property receiving City water service within two (2) days of receiving notice of a Stage 3. For transient water users, the notice shall be posted in each rental unit.

4.6.4 Stage 4: Critical Water Status

Stage 4 addresses disaster conditions or when the City's water system has been damaged beyond immediate repair. Under Stage 4, restrictions and prohibitions for Stages 1 through 3 are intended to remain in effect (even though that is not explicitly stipulated in City code). Water use is intended to be limited to only essential needs that sustain life, health, and safety.

In Stage 4, the City shall take the following actions:

1. The City shall discontinue service through its normal distribution system;
2. Providing adequate water remains in the City reservoirs, water may be provided directly from the reservoir only to single, duplex and multiple family dwellings, other residential uses, health clinics and assisted living facilities. If this water can be dispersed through the distribution system without substantial losses, such water may be provided through the system during set hours (for example, from 6:00 to 7:00 a.m. and 7:00 to 8:00 p.m. daily) so as to extend the treated water supply for sustaining life.
3. In the event reservoirs are destroyed or damaged, the City shall purchase available water from the nearest city or water district. If the nearest city or water district is unable to supply water to the City, the City may contract for or commandeer private vehicles to transport water to the City. If the City is unable to obtain water from other sources, the City will pump raw water from the Yachats River with a boil water order until the critical water supply status has ended and the City's water system is functioning on a normal basis.

4.7 Notifications of Curtailment

The City will notify water customers of stages of curtailment. The City will notify customers using such means of communication as: the City's website, signage in conspicuous locations in town, water bills or newsletters if timely, flyers, calls or text messages, and/or personal visits. The method of notification will depend upon the stage of curtailment and event triggering curtailment.

4.8 Drought Declaration

If a declaration of a severe drought in Lincoln County is declared by the Governor per ORS 536.720, the Oregon Water Resources Commission may order political subdivisions within any drainage basin or subbasin to implement a water conservation or curtailment plan or both, approved under ORS 536.780. The conservation and curtailment elements of this WMCP meet these requirements. If the City falls within a severe drought area declared by the Governor, such as Lincoln County, the City will

consider whether curtailment measures are needed to meet system demands. Regardless of whether curtailment is needed, the City will continue to encourage customers to conserve water.

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5. Municipal Water Supply Element

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

This rule requires descriptions of the City's current and future service area and population projections, demand projections for 10 and 20 years, and the schedule for when the City expects to fully exercise its water rights. The rule also requires comparison of the City's projected water needs and the available sources of supply, an analysis of alternative sources of water, and a description of required mitigation actions.

5.1 Delineation of Service Area

OAR 690-086-0170(1)

Within the 20-year planning period, the City does not anticipate that its service area will expand beyond its existing service area boundary. Thus, the City's future service area for the WMCP planning period is the same as its current service area, which is described in Section 2 and delineated in Exhibit 2-1.

5.2 Population Projections

OAR 690-086-0170(1)

The population projections presented in this WMCP draw directly from the City's 2021 Water System Master Plan (WSMP), excerpts of which are in Appendix C.

The Portland State University Population Research Center prepared population projections for Lincoln County in 2017. These projections estimate the population of Yachats within the UGB to increase to 1,061 in 2040, based on an average annual growth rate of 1.4 percent from 2020-2035 and 0.9 percent from 2035-2067. The City used these projected annual growth rates to project that the City's population would be 942 in 2031 (extrapolated from WSMP data) and 1,070 in 2041.

However, these projections underrepresent the population that the City experiences at points during the year, and as a result, the City developed population projections that account for seasonal occupancy and a wider range of users. The City considered the influence of seasonal occupancy on its water service population given that many of its connections are vacation homes or are utilized for tourism (e.g., hotels and vacation rentals). Water use from these connections fluctuates on a seasonal basis with increases during the summer, weekends, and holidays. To account for fluctuations in demand related to the degree of occupancy of the service population, the City assumed occupancy percentages associated with levels of demand, with the MMD reflecting 80 percent occupancy and MDD reflecting 100 percent occupancy of the total service population.

The City determined that its water demand projections needed to focus on a service population estimate at full occupancy comprised of three different types of water users: single-family, multifamily, and hotel rooms. The City estimated the number of people per connection for the three types of users comprising the service population: single-family units (1.8), multifamily units (1.8), and hotel rooms (1.2). Each user type was assumed to grow at the same rate forecasted by PSU. The City estimated the

number of multifamily units, calculated the number of hotels and the number of rooms per hotel, and assumed the number of single-family units to be the total number of connections less the total multifamily and hotel connections. **Exhibit 5-1** presents the resulting projected service population at 80 percent and 100 percent occupancy.

Exhibit 5-1. Estimated service population at MMD (80 percent) and MDD (100 percent) occupancy

Year	MMD Population	MDD Population
2020	1,753	2,191
2031	2,045	2,556
2041	2,282	2,853

5.3 Demand Forecast

OAR 690-086-0170(3)

The demand projections presented in this WMCP draw directly from the City's 2021 WSMP, excerpts of which are in Appendix C.

The City combined the projected populations described in Section 5.2 with historical water demand data to develop its water demand projections. Specifically, the City calculated the projected MMD and MDD by multiplying the projected total service population by the estimated water use rate of the service population during corresponding occupancy (100 gallons per capita per day for both the MMD and MDD occupancy scenarios) and the corresponding occupancy rate (80 percent for the MMD and 100 percent for the MDD). Given that the City's historical water production data cannot be used to determine MDDs (see Section 2.6 for MDD details), the City used a conservative municipal per capita water consumption of 100 gallons per person per day, which compared well to City data for relatively high water demand events, including historical peak week water demands during the summer, and to water plant operator observations.

The City's demand projections also include the following assumptions.

- Future occupancy rates will remain approximately equal to the existing occupancy rates.
- The ratio of residential to non-residential use (commercial, industrial and public uses) will remain constant. In other words, future commercial and industrial developments will track population growth.
- Long-term per capita water demands will not exceed the City's historical averages despite anticipated longer, warmer summers due to water conservation measures that will be implemented.

- New commercial and industrial developments will not be large water users; no provision has been made for new industries with heavy water demands, such as food processing or beverage production.
- The population projections of Section 5.2 are reasonable estimates of future municipal populations and the ratio between MDDs to ADDs will remain relatively constant during the planning period.
- Future water loss will not exceed the City's historical averages. As described in Section 2, the City's water loss in 2020 was in the range of 6 percent to 12.4 percent.

Exhibit 5-2 presents the City's MMD projections in 2031 and 2041, which are 0.31 cfs and 0.34 cfs.

Exhibit 5-3 presents the City's MDD projections in 2031 and 2041, which are 0.40 cfs and 0.44 cfs.

Exhibit 5-2. MMD Projections

Year	Population	MMD (gpm)	MMD (mgd)	MMD (cfs)
2020	2,191	117	0.16	0.25
2031	2,556	138	0.20	0.31
2041	2,853	154	0.22	0.34

Exhibit 5-3. MDD Projections

Year	Population	MDD (gpm)	MDD (mgd)	MDD (cfs)
2020	2,191	152	0.22	0.34
2031	2,556	178	0.26	0.40
2041	2,853	198	0.28	0.44

5.4 Schedule to Exercise Permits and Comparison of Projected Need to Available Sources

OAR 690-086-0170(2) and (4)

As described in Section 2, the City currently uses its Reedy Creek water right (Certificate 22933) up to its authorized rate or the extent to which the City can divert water during summer low streamflow periods. The City uses its Salmon Creek water right (Permit S-29018) to meet water demands in excess of what can be met by Reedy Creek. However, flows in Salmon Creek also decrease in summer to the point that the City has already been close to diverting the maximum possible under low streamflow conditions within the permit's authorized rate, as shown by the City's need to implement water curtailment stages in 2015 and 2017. Historically, the City has diverted up to 0.52 cfs (232 gpm) under Permit S-29018,

however, the City is no longer able to sustain that rate of diversion. In addition to reduced streamflows in recent years, water use under Permit S-29018 has not exceeded 0.52 cfs due to treatment limitations. A waterfall above the intake makes the water highly oxygenated, necessitating that this water moves through the water treatment plant more slowly for proper treatment. Water treatment plant upgrades to address this issue are currently not cost-effective due to the marginal increase in water supply during low flow months, though this may change in the future. Therefore, at this time the City is not seeking access to additional water under *extended permit* S-29018, but will continue evaluating its options for Salmon Creek to meet operational water needs year-round (especially in the peak season), to secure a year-round redundant water supply for Reedy Creek in the event that Reedy Creek is insufficient or becomes unavailable, and to provide the opportunity for the City to participate in a potential regional water supply effort. As described in the extension of time for Permit S-29018 full beneficial use of the permit is expected to occur within approximately 20 years, by 2041.

However, given that Reedy Creek and Salmon Creek have already been proven to be insufficient to meet summer MDDs (estimated to be 0.34 cfs in 2020) and the MDD in 2041 is projected to be 0.44 cfs, the City needs to plan for an additional water source to meet projected demands within the 20-year planning period of this WMCP and to provide some level of redundancy in the event that the City loses its Reedy Creek or Salmon Creek supply sources.

After analyzing an array of water supply options, the City's 2021 Water System Master Plan identified the following as the two best options: developing Permit S-53471 for use of the Yachats River at POD 1 (the upstream authorized POD), and increasing reliance on the Southwest Lincoln County Water PUD (SWLCWPUD).

As described in Section 2, conditions in Permit S-53471 and the Stipulated Agreement limit the rate that the City can divert water from the Yachats River at POD 1 to 0.5 cfs, which is enough to enable the City to meet the projected MDD in 2041 and is greater than the rate that would be present in Cape Creek during the critical summer months. Currently, the City does not have access to any water under Permit S-53471 based on a development limitation in the Final Order approving the extension of time for Permit S-53471 (dated February 23, 2005), and therefore, will need to request access to water under the permit in a WMCP and receive approval in a WMCP Final Order to be able to divert water. In this WMCP, the City is not requesting access to water under *extended permit* S-53471 due to current uncertainties about the best water supply option to pursue.

The 2021 Water System Master Plan recommends that the City enter into discussions with the SWLCWPUD to determine the costs and conditions required to purchase water on a routine basis. The City currently has an agreement with the SWLCWPUD for mutual aid of water in emergencies only, so would need to negotiate a new agreement that allows the City to use SWLCWPUD water on a routine basis. A new agreement between the two parties will likely require a significant financial contribution from the City to the SWLCWPUD in addition to normal water user fees, as well as significant funding from the City to implement major infrastructure improvements to increase the water production capacity of the SWLCWPUD's system. The 2021 Water System Master Plan recommends that the City gather information about the SWLCWPUD option and compare it to the Yachats River option to determine the best long-term water supply solution for the City.

In summary, the City is currently not requesting access to water under its water right permits as more information is needed to determine the best long-term water supply source for the City. If subsequent analyses indicate that the water from Salmon Creek under Permit S-29018 can be feasibly developed to a greater extent or water from the Yachats River under Permit S-53471 is the best option for a future water supply source, the City will request access to water under one or both of these permits in a subsequent WMCP.

That said, in accordance with the permit extension for Permit S-29018 (Final Order issued XX), the City intends to fully develop Permit S-29018 by 2041 and in accordance with the permit extension for Permit S-53471 (Final Order issued February 23, 2005), the City intends to fully develop Permit S-53471 by 2043. The City is currently meeting the conditions for use of water under Permit S-53471 listed in Permit S-53471 and the Stipulated Agreement, as described in Exhibit 2-12.

5.5 Alternative Sources

OAR 690-086-0170(5)

OAR 690-086-0170(5) requires an analysis of alternative sources of water if any expansion or initial diversion of water allocated under existing permits is necessary to meet future water demand. The City currently has no plans to expand diversion under *extended permit* S-29018 or to initiate diversion of water under *extended permit* S-53471. Therefore, this rule does not apply.

5.6 Stipulated Agreement Elements

5.6.1 Land-use Approval Process Analysis

The Stipulated Agreement requires an analysis of the land-use approval process required to develop a Yachats River point of diversion and a discussion of how and when the City intends to comply with those land-use processes.

As described in Section 2.9.3, the City can essentially only divert water from the upper point of diversion (POD 1) due to saltwater intrusion risks at the low point of diversion (POD 2). POD 1 is believed to be located on land owned by the Siuslaw National Forest. Consequently, the City would need to obtain an easement from the US Forest Service for the new intake and potentially additional easements to convey water through other private properties. The City will initiate the process to comply with those land-use processes upon approval from City Council to proceed with developing the Yachats River as a water source. Following approval, the City would contract with a consulting/engineering firm to investigate and comply with land-use processes.

5.6.2 Feasibility of Other Water Sources

The Stipulated Agreement requires that the City provide an analysis of the feasibility of other water sources and a timeline for when the City will abandon nonviable sources or seek to transfer those sources to instream water rights.

The WSMP analyzed the feasibility of other water sources. The following summarizes this analysis.

- (North) Cape Creek: The City has a certificated water right for this water source, but Cape Creek

has not been utilized for many years and no infrastructure currently exists. As described in Section 2.9.3, summer streamflows in Cape Creek are low, affecting the reliability of this water service. Consequently, flows are anticipated to be too low in summer to justify infrastructure investment in this water source at least over the next 20 years. If after 20 years the City has found sufficiently reliable water sources to meet its long-term water needs and concludes this source to be nonviable, the City will consider transferring this water right instream.

- Raw Water Storage Reservoir: A raw water storage reservoir could be constructed to store water during the winter months for use during the summer months. However, a relatively large impoundment would need to be constructed, which would require constructing a dam, a challenging task in the current regulatory climate. In addition, a dam construction project would need to include mitigation for all wetland impacts and impacts to aquatic species habitat, which would likely be prohibitively expensive. Other issues include finding the site with suitable topography and subsurface conditions, purchasing the land, and likely needing expensive filters added to the water treatment plant to address taste and odor problems related to anticipated algae or other plant growth in the stagnant water of the impoundment. Another option is to use the piece of City-owned land near the water treatment plant for a storage pond that would serve as a supplemental source to meet demands for short duration (1-2 weeks) during critical low flow periods. While this could provide supply to meet peak demands for short periods, it does not provide the City with a supply that could help meet demands throughout the summer and water treatment plant improvements would be needed to address taste and odor issues that would likely exist.

- Obtaining Existing Water Rights: The City could identify the water rights held on the Yachats River or tributaries that could help meet its water supply needs and approach holders of those water rights to discuss a potential purchase. The City could potentially purchase an entire piece of property to obtain the water rights appurtenant to the property, as well. This approach requires research and willing sellers of water rights or properties with water rights, and could provide extra supply, but likely less than the 0.5 cfs that the City can obtain by exercising its water right on the Yachats River. An intake on the Yachats River would be needed to support this approach.

- Regional Water System: The water distribution systems from the City of Newport to the City of Yachats are almost entirely interconnected, except for a missing section at the bridge crossing the Alsea River along Highway 101. If that connection occurs, water providers on the Mid-Coast could potentially develop a strategy for using their collective water rights to provide a net benefit. However, at the same time many of the Mid-Coast water providers have individual water supply challenges that complicate a regional approach to satisfying water demand. The City of Yachats has been participating in the Mid-Coast Water Planning Partnership to explore possibilities for a regional approach to meeting projected water demands and to develop stronger relationships with other water providers.

- Increase Reliance on SWLCWPUD: As described in 5.4, the City could consider changing its agreement with SWLCWPUD to become a customer instead of an emergency user in the future, which would require an assessment of source supply, successful negotiation, and infrastructure upgrades.

- Desalination: A desalination plant has the ability to remove salt from seawater to provide municipal drinking water. No desalination plants currently exist in Oregon and desalination is not considered a cost-effective option during the current planning period, but it could be a water supply option in the future.

5.7 Quantification of Maximum Rate and Monthly Volume

OAR 690-086-0170(6)

OAR 690-086-0170(6) requires a quantification of the maximum rate of withdrawal and maximum monthly use if any expansion or initial diversion of water allocated under an existing permit is necessary to meet demands in the 20-year planning horizon. The City currently has no plans to expand diversion under *extended permit* S-29018 or to initiate diversion of water under *extended permit* S-53471. Therefore, this rule does not apply.

5.8 Mitigation Actions under State and Federal Law

OAR 690-086-0170(7)

Under OAR 690-086-0170(7), if mitigation is required for expansion or initial diversion of water under an existing permit, the water supplier is to describe mitigation actions it is taking to comply with legal requirements of the Endangered Species Act, Clean Water Act, and other applicable state or federal environmental regulation. The City currently has no plans to expand diversion under *extended permit* S-29018 or to initiate diversion of water under *extended permit* S-53471. Therefore, this rule does not apply.

5.9 New Water Rights

OAR 690-086-0170(8)

Under OAR 690-086-0170(8), an analysis of alternative sources of additional water is required if acquisition of new water rights will be necessary within the next 20 years to meet the projected water demands. The City's water rights are anticipated to be sufficient to meet projected water demands over the next 20 years, as described in Section 5.4. Consequently, this rule does not apply.

Appendix A

Letters to Affected Local Governments and Comments

GSI Water Solutions, Inc.

September 14, 2021

Onno Husing, Director
Lincoln County
Department of Planning & Development
210 SW 2nd Street
Newport, OR 97365
ohusing@co.lincoln.or.us

Subject: Water Management and Conservation Plan for the City of Yachats

Dear Mr. Husing:

The City of Yachats has developed a draft Water Management and Conservation Plan (WMCP) to fulfill the requirements of Oregon Administrative Rule Chapter 690, Division 86 of the Oregon Water Resources Department.

Under these rules, the water supplier shall make its draft WMCP available for review by affected local governments and seek comments relating to consistency with the local governments' comprehensive land use plans. Attached you will find a copy of the City of Yachats's draft WMCP for your review.

Please provide comments to me within 30 days from the date of this letter. If the plan appears consistent with your Comprehensive Land Use Plan, a letter response to that effect would be appreciated. You may send your comments to me by email at sdeszoeke@gsiws.com.

If you have any questions, please feel free to contact me at 541-224-4588. Thank you for your interest.

Sincerely,
GSI Water Solutions Inc.

Suzanne de Szoeke, Water Resources Consultant

Enclosure

GSI Water Solutions, Inc.

September 14, 2021

Katherine Guenther, City Planner
City of Yachats
501 Hwy 101 N
P.O. Box 345
Yachats, OR 97498
planner@yachatsmail.org

Subject: Water Management and Conservation Plan for the City of Yachats

Dear Katherine Guenther:

The City of Yachats has developed a draft Water Management and Conservation Plan (WMCP) to fulfill the requirements of Oregon Administrative Rule Chapter 690, Division 86 of the Oregon Water Resources Department.

Under these rules, the water supplier shall make its draft WMCP available for review by affected local governments and seek comments relating to consistency with the local governments' comprehensive land use plans. Attached you will find a copy of the City of Yachats's draft WMCP for your review.

Please provide comments to me within 30 days from the date of this letter. If the plan appears consistent with your Comprehensive Land Use Plan, a letter response to that effect would be appreciated. You may send your comments to me by email at sdeszoeke@gsiws.com.

If you have any questions, please feel free to contact me at 541-224-4588. Thank you for your interest.

Sincerely,
GSI Water Solutions Inc.

Suzanne de Szoeke, Water Resources Consultant

Enclosure

GSI Water Solutions, Inc.

September 14, 2021

Southwest Lincoln County Water People's Utility District
P.O. Box 368
Waldport, OR 97394-0368
swlcwpud@swlcwpud.org

Subject: Water Management and Conservation Plan for the City of Yachats

Dear Southwest Lincoln County Water People's Utility District:

The City of Yachats has developed a Draft Water Management and Conservation Plan (WMCP) to fulfill the requirements of Oregon Administrative Rule Chapter 690, Division 86 of the Oregon Water Resources Department. Under these rules, the water supplier shall make its Draft WMCP available for review by affected local governments and seek comments relating to consistency with the local governments' comprehensive land use plans.

As a courtesy, the City of Yachats is providing you with a copy of the Draft WMCP via email. If you have any questions, please feel free to contact me at 541-224-4588 or sdeszoeke@gsiws.com.

Sincerely,
GSI Water Solutions Inc.

Suzanne de Szoeke
Water Resources Consultant

Enclosure

Appendix B

Stipulated Final Order and Agreement on Reconsideration (Stipulated Agreement)

STIPULATED FINAL ORDER AND AGREEMENT ON RECONSIDERATION

STATE OF OREGON

WATER RESOURCES DEPARTMENT

Oregon Department of Water Resources Permit

In the matter of the Special Order, Volume 50, Page 578-579 Approving an Additional Point of Diversion for City of Yachats, Transfer 7589 Modification of Permit 51190

Background

On July 8, 1996, pursuant to ORS 537.211(4), the City of Yachats (City) submitted an application to add a point of diversion to the water right authorized by permit 51190 (T-7589). The additional point of diversion is proposed downstream from the original, in the Yachats River estuary. The Department received comments opposing the application to add a point of diversion from the Yachats Area Watershed Restoration Advisory Council, WaterWatch and others on or before September 12, 1996.

On September 12, 1996, the Department granted the City's request (Special Order Vol. 50, page 578). On November 8, 1996, WaterWatch of Oregon; T.B. Dame and Paul Engelmeyer; Yachats Area Watershed Restoration Advisory Council (Council); Dike Dame; Ron Taves; Hans Radtke; Andrea Scharf; Paul Engelmeyer; and James Adler (collectively, "the Petitioners") petitioned the Department to reconsider it's approval of the permit amendment, on several grounds.

On April 4, 1997, the Department issued an "Order of Reconsideration" and listed the two matters on which the Department sought additional evidence and argument before entering a final order. A second "Order on Reconsideration" reciting the basis for the grant of reconsideration and referring the matter to contested case hearing, was issued on October 10, 1997. An order setting contested case hearing was issued on January 28, 1998, by Administrative Law Judge Weisha Mize.

The Petitioners contest the City's proposed action, maintaining, inter alia, that the Water Resources Department has no authority to issue an order adding a point of diversion, that an additional point of diversion will result in injury to existing instream water rights, that approval of the City's proposed action allows violation of permit conditions which include compliance with land use laws and that the approval of the City's proposed action sets bad polity because it allows for expansion of a permit and perpetuates wasteful use of water. The City contends inter alia, that the proposed diversions are lawful and necessary to maintain a reliable water supply for the current and future residents of Yachats.

Agreed Terms and Conditions

The City, the Petitioners and the Department now agree that the issues in this case may be settled on the following terms and conditions and hereby stipulate as follows:

1. Entry of this stipulate final order by the Administrative Law Judge.

2. Issuance of an order approving the City's permit amendment application (T-7589), a draft of which is attached an incorporated herein by reference. The attached order shall supersede the Special Order at Volume 50, Page 578 – 579.

3. Issuance of a permit superceding permit 51190, a draft of which is attached and incorporated herein by reference.

4. The parties waive the right to file exceptions to this order and the right to judicial review of this order and agreement, and permit conditions arising from this order and agreement.

5. The City shall install and maintain a permanent recording measuring device on the Yachats River, the design and location of which will be specified in consultation with the Water Resources Department (WRD) and the Department of Fish and Wildlife (ODFW). The device shall be installed prior to any diversions or use of water under this permit, placed so as to accurately measure steam flows needed to meet instream water rights Cert. 59739, Cert 59608 and Cert. 73161, and be accessible to WRD and ODFW staff at all times. Maintenance of the measuring device and associated rating curve shall substantially comply with the applicable provisions of OAR 690-085-015(4) (methods for measuring open channels) so an estimate of flow can be made at any time. Flow shall be determined prior to and during diversions under this permit, and the City shall maintain a record of flow measurements and observations.

6. Before water use may begin under this permit, the permittee shall install a meter or other suitable measuring device as approved by the Director at each point of diversion. The permittee shall maintain the meter or measuring device in good working order, shall keep a complete record of the volume and instantaneous rate of water used each month and shall submit a report which includes the recorded water use measurements to the Department annually or more frequently as may be required by the Director. Further, the Director may require the permittee to report general water use information, including the place and nature of use of water under the permit.

The permittee shall allow the watermaster access to the meter or measuring device; provided however, where the meter or measuring device is located with a private structure, the watermaster shall request access upon reasonable notice.

7. When streamflow on the Yachats River, measured at the device described in #5 above, exceeds senior and junior instream rights (Cert. 59739, Cert. 59608, Cert. 73161) the City may exercise this permit (both points of diversion and the full 2.0 cfs) without restriction beyond the existing terms of the permit as amended. The minimum streamflows are set out in the following table:

MONTH	DAYS	59739	59608	73161
Jan		65.00	65.00	132.00
Feb		65.00	65.00	132.00
Mar		65.00	65.00	132.00
Apr		65.00	65.00	132.00
May		40.00	40.00	63.00

June	1 – 15	30.00	30.00	63.00
June	16 – 30	30.00	30.00	42.00
July	1 – 15	20.00	20.00	40.20
July	16 – 31	15.00	20.00	40.20
Aug		15.00	15.00	25.60
Sep		15.00	15.00	24.90
Oct	1 – 15	15.00	25.00	49.10
Oct	16 – 31	50.00	50.00	49.10
Nov		70.00	70.00	132.00
Dec		70.00	70.00	132.00

8. When streamflows measured at the device described in #5 above drop below the flows identified in the junior instream water rights (Cert. 59739 or Cert. 69608), use of the Yachats River under this permit may be made only in emergencies or when population growth exceeds other sources of supply. Future use due to population growth exceeding supply shall be limited by the City's compliance with it's approved water management and conservation plan.

a) For purposes of this settlement agreement, "emergencies" are limited to: sustained drought, accompanied by the institution of curtailment measures described in the City's water management plan that include curtailment triggers linked to steamflows; supply line breakage; firefighting; outdoor events within the City's service area which place an abnormally high demand on water supply (e.g. Cycle Oregon, outdoor festivals); catastrophic loss of use of primary water supply sources; and threats to public health, not attributable to inefficiency or chronic conditions, as may be approved jointly by ODFW and WRD.

b) For purposes of this settlement agreement, population growth will be deemed to have "exceeded other sources of supply" only if the City: (1) is in compliance with its approved water management plan which includes the elements specified in #9 of the Stipulated Final Order and Agreement on Reconsideration, and (2) (a) prior to 15 years from the date of this agreement or 10 years from the date of approval of the management plan, whichever comes first, is either meeting the plan schedule or has reached the goal of 85% water use efficiency, yet remains unable to meet the requirements of the city's resident population using other developed sources; or (b) after 15 years from the date of this agreement or 10 years from the date of approval of the management plan, whichever comes first has reached or exceeded 85% water use efficiency, yet remains unable to meet the requirements of the City's resident population using other developed sources.

9. The City will amend and resubmit it's draft water management plan, currently under department review. The parties agree that submission of the amended plan triggers the review and appeal provisions of OAR 690 Division 86. The amended plan shall include the following:

a) goal of 85% water use efficiency and a plan and time table for meeting that goal by fifteen years from the date of this agreement or ten years from plan approval, whichever comes first;

b) demand projections based on the 85% efficiency level and demand figures based upon the best practicable estimate of population and occupancy figures and seasonal average water use;

c) a schedule for water audits;

d) a commitment to continue to cooperate in efforts to develop a regional water supply;

e) an analysis of the land use approval processes which will be required to develop the two points of diversion on the Yachats River described herein, and a discussion of how and when the City intends to comply with those land use processes;

f) an analysis of the feasability of other water sources and a timeline for when the City will abandon nonviable sources or seek to transfer those sources to instream rights;

g) a curtailment plan which includes triggers for curtailment that are based upon streamflows; and

h) all elements necessary to meet the requirements of the WRD Division 86 rules.

WRD agrees to process the amended plan in a timely manner.

10. Addition of the lower diversion point shall be a permanent change.
11. In the event streamflows measured at the device described in #5 are insufficient to satisfy the junior instream water rights (Cert. 73161) or the senior instream water rights (Cert. 59739 and Cert. 69608), and the Yachats River is utilized under this permit, diversions shall not exceed 1 cfs, and those diversions shall be made at a rate not to exceed 0.50 cfs at the upper point of diversion and 0.50 cfs at the lower point of diversion.
12. The City agrees to relinquish its rights to divert 3 cfs from Marks Creek under permit 35219. The City agrees to file an affidavit of cancellation with the Department certifying that the City is the owner of the permit and that the permit has been abandoned by the owner and that the owner desires cancellation of the permit. The City shall not divert of use water under this permit until the Marks Creek Permit 35219 has been canceled.
13. The Protestants agree not to protest or appeal Department action on the City's new permit amendment to change the upper point of diversion from 14S 11W 31 1740'S 2550'E FRM NW COR (application T-7967), and agree not to protest or appeal Department action on the City's next request for an extension on this permit that is filed specifically to extend the October 1, 1998, expiration date.
14. The terms of this agreement will be incorporated into the City's water management plan and to the extent possible, into the attached draft order approving the July, 1996, permit amendment request (T-7589). Permit 51190 shall be superceded by the attached draft permit and shall include the conditions contained in the final order approving the City's July 8, 1996, permit amendment request.
15. The Department, the City, and the petitioners agree on all aspects of this agreement and the attached draft order.
16. This agreement may be executed in counterparts.

_____ _____

On Behalf of WaterWatch of Oregon Date

_____ _____

On Behalf of Yachats Area Date

Watershed Advisory Council

_____ _____

T. B. ("Dike") Dame Date

_____ _____

Ron Taves Date

_____ _____

Hans Radtke Date

_____ _____

Andrea Scharf Date

_____ _____

Paul Engelmeyer Date

_____ _____

James Adler Date

_____ _____

On Behalf of the City of Yachats Date

_____ _____

On Behalf of Oregon Water Resources Date

Department

Stipulated Final Order

Pursuant to the Agreement described above, the City's application to add a point of diversion under Permit 51190 is approved. An order, consistent with the attached draft order, shall be issued bearing the modifications to the order recorded in Special Order Volume 50, Page 578-579. The previous order approving this permit amendment is of no further force or effect.

_____ _____

Date Weisha Mize

Administrative Law Judge

Water Resources Department

STATE OF OREGON

COUNTY OF LINCOLN

ORDER APPROVING AN ADDITIONAL POINT OF DIVERSION

Pursuant to ORS 537.211, after notice given, reviewing objections, and resolving a petition for reconsideration, this order approves, as conditioned or limited herein, TRANSFER 7589 and modifies Permit 51190 in the name of CITY OF YACHATS P.O. BOX 345, YACHATS, OREGON 97498. This order is issued to modify the previous order approving T-7589 (Special Order Volume 50, Page 578- 579) and by reference incorporates the Stipulated Final Order and Agreement on Reconsideration issued August XX, 1998, by Administrative Law Judge Weisha Mize.

The permit to be modified, Permit 51190, has a priority date of March 20, 1989. The permit allows the use of the YACHATS RIVER, a tributary of the PACIFIC OCEAN, for MUNICIPAN USE. The amount of water to which this permit is entitled is limited to an amount actually beneficially used and shall not exceed 2.0 cubic feet per second, of which 1.0 cfs is not subject to instream water right Certificate 59708 minimum stream flows with a date of priority of March 26, 1974, if available at the authorized point of diversion: NE ¼ SW ¼, SECTION 31, T 14 S, R 11 W, WM; 1740 FEET SOUTH AND 2550 FEET EAST FROM THE NW CORNER OF THE SW ¼ NW ¼, SECTION 31, or its equivalent in case of rotation, measured at the point of diversion from the source.

The use shall conform to any reasonable rotation system ordered by the proper state officer.

The authorized place of use is as follows:

NE ¼ SE ¼ W ½ W ½

S ½ SE ¼ SE ¼ SW ¼

SECTION 22 SECTION 26

SW ¼ SW ¼ NE ¼

SECTION 23 N ½ SE ¼

SE ¼ SE ¼

SECTION 27

NE ¼

SECTION 34

TOWNSHIP 14 SOUTH, RANGE 12 WEST, W.M.

The right to use the water for the above purpose is restricted to beneficial use on the lands or place of use described.

The applicant proposes to add an additional point of diversion to:

NW ¼ SE ¼, SECTION 26, T 14 S r 12 W, MW; 295 FEET NORTH AND 420FEET EAST FROM THE NW CORNER OF THE SW ¼ SE ¼

SECTION 26

THIS CHANGE TO AN EXISTING WATER PERMIT MAY BE MADE PROVIDED THE FOLLOWING CONDITIONS ARE MET BY THE PERMIT HOLDER:

1. The quantity of water diverted at the new point of diversion, together with that diverted at the old point of diversion, shall not exceed the quantity of water lawfully available at the original point of diversion and is further limited as described below.
2. The City shall install and maintain a permanent recording measuring device on the Yachats River, the design and location of which will be specified in consultation with the Water Resources Department (WRD) and the Department of Fish and Wildlife (ODFW). The device shall be installed prior to any diversions or use of water under this permit, placed so as to accurately measure stream flows needed to meet instream water rights Cert. 59739, Cert 59608 and Cert. 73161, and be accessible to WRD and ODFW staff at all times. Maintenance of the measuring device and associated rating curve shall substantially comply with the applicable provisions of OAR 690-085-015 (4) (methods for measuring open channels) so an estimate of flow can be made at any time. Flow shall be determined prior to and during diversions under this permit, and the City shall maintain a record of flow measurements and observations.
3. Measurement, recording and reporting conditions:

A. Before water use may begin under this permit, the permittee shall install a meter or other suitable measuring device as approved by the Director at each point of diversion. The permittee shall maintain the meter or measuring device in good working order, shall keep a complete record of the volume and instantaneous rate of water used each month and shall submit a report which includes the recorded water use measurements to the Department annually or more frequently as may be required by the Director. Further, the Director may require the permittee to report general water use information, including the place and nature of use of water under the permit.

B. The permittee shall allow the watermaster access to the meter or measuring device; provided however, where the meter or measuring device is located within a private structure, the watermaster shall request access upon reasonable notice.

1. When streamflow on the Yachats River, measured at the device described in #2 above, exceeds senior and junior instream rights (Cert. 59739, Cert. 59608 and Cert. 73161) the City may exercise this permit (both [points of diversion and the full 2.0 cfs) without restriction beyond the existing terms of the permit as amended.
2. When streamflows measured at the device described above drop below the flows identified in the junior instream water right (Cert. 73161) or senior instream water rights (Cert. 59739 or Cert. 69608), use of the Yachats River under this permit may be made only in emergencies or when population growth exceeds other sources of supply. Future use due to population growth exceeding supply shall be limited by the City's compliance with its approved water management and conservation plan.
3. "Emergencies" are limited to sustained drought, accompanied by the institution of curtailment measures described in the City's water management plan that include curtailment triggers linked to streamflows; supply line breakage; firefighting; outdoor events within the City's service area which place an abnormally high demand on water supply (e.g. Cycle Oregon, outdoor festivals); catastrophic loss of use of primary water supply sources; and threats to public health, not attributable to inefficiency or chronic conditions as may be approved jointly by ODFW and WRD.

Population growth will be deemed to have "exceeded other sources of supply" only if the City : (1) is in compliance with its approved water management plan which includes the elements specified in the Stipulated Final Order and Agreement on Reconsideration (T-7589), and (2) (a) prior to 15 years from the date of approval of the management plan, whichever comes first, is either meeting the plan schedule

or has reached the goal of 85% water use efficiency, yet remains unable to meet the requirements of the City's resident population using other developed sources; or (b) after 15 years from the date of this agreement or 10 years from the date of approval of the management plan, whichever comes first has reached or exceeded 85% water use efficiency, yet remains unable to meet the requirements of the City's resident population using other developed sources.

4. Addition of the lower diversion point shall be a permanent change.
5. In the event streamflows measured at the device described in #2 above are insufficient to satisfy the junior instream water right (Cert. 73161) or the senior instream water rights (Cert. 59739 and Cert. 69608), and the Yachats River is utilized under this permit, diversions shall not exceed 1cfs, and those diversions shall be made at a rate not to exceed 0.50 cfs at the upper point of diversion and 0.50 cfs at the lower point of diversion.
6. Water may not be diverted at any point of diversion authorized under this permit until all applicable conditions of the permit have been met, including compliance with state-wide land-use goals and any local acknowledged land-use plans.
7. Water shall be acquired from the same surface water source as the original point of diversion.
8.
9. All other terms and conditions of the permit shall remain the same.

Permit 51190, in the name of the City of Yachats, is amended as described herein and a superceding permit, consistent with the attached draft permit shall be issued. Permit 51190 is of no further force or effect.

WITNESS the signature of the Water Resources Director, affixed _____.

Martha O. Pagel, Director

STATE OF OREGON

COUNTY OF LINCOLN

PERMIT TO APPROPRIATE THE PUBLIC WATERS

THIS PERMIT IS HEREBY ISSUED TO

CITY OF YACHATS

PO BOX 345

YACHATS, OREGON 97498

To use the waters of YACHATS RIVER, a tributary of PACIFIC OCEAN, for MUNICIPAL USE.

This permit is issued approving Application 69856. The date of priority is March 20, 1989. The use is limited to not more than 2.0 CUBIC FOOT PER SECOND (CFS), OF WHICH 1.0 CFS IS NOT SUBJECT TO INSTREAM WATER RIGHT Certificate 59608 OR MINIMUM STREAM FLOWS WITH A DATE OF PRIORITY OF MARCH 26, 1974, or its equivalent in cases of rotation, measured at the point of diversion from the source. The use of water under this permit is further limited as described below.

The points of diversion are located as follows:

POD 1 – NE ¼, SW ¼, SECTION 31, T14S, R11W, WM; 1740 FEET SOUTH AND 2550 FEET EAST FROM THE NW CORNER OF THE SW ¼ NW ¼, SECTION 31. POD 2 – NW ¼ SE ¼, SECTION 26, T14S, R12W, WM; 295 FEET NORTH AND 420 FEET EAST FROM THE NW CORNER OF THE SW ¼ SE ¼, SECTION 26.

Within 1 year from the date this permit is issued, the permittee shall submit a revised water management and conservation plan consistent with the Agreement and Stipulated Final Order on Reconsideration issued on September 3, 1998, and OAR Chapter 690, Division 86.

The use shall conform to such reasonable rotation system as may be ordered by the proper state officer.

A description of the proposed place of use under this permit is as follows:

- NE ¼ SE ¼
- S ½ SE ¼
- SECTION 22
- SW ¼ SW ¼
- SECTION 23
- W ½ W ½
- SE ¼ SW ¼
- SECTION 26
- NE ¼
- N ½ SE ¼
- SE ¼ SE ¼
- SECTION 27
- NE ¼
- SECTION 34
- TOWNSHIP 14 SOUTH, RANGE 12 WEST W.M.

The City shall install and maintain a permanent recording measuring device on the Yachats River, the design and location of which will be specified in consultation with the Water Resources Department (WRD) and the Department of Fish and Wildlife (ODFW). The device shall be installed prior to any diversions or use of water under this permit, placed so as to accurately measure stream flows needed to meet instream water rights Cert. 599739, Cert 59608 and Cert. 73161, and be accessible to WRD and ODFW staff at all times. Maintenance of the measuring device and associated rating curve shall substantially comply with the applicable provisions of OAR 690-085-015 (4) (methods for measuring open channels) so an estimate of flow can be made at any time. Flow shall be determined prior to and during diversions under this permit, and the City shall maintain a record of flow measurements and observations.

Measurement, recording and reporting conditions:

A. Before water use may begin under this permit, the permittee shall install a meter or other suitable measuring device as approved by the Director at each point of diversion. The permittee shall maintain the meter or measuring device in good working order, shall keep a complete record of the volume and instantaneous rate of water used each month and shall submit a report which includes the recorded water use measurements to the Department annually or more frequently as may be required by the Director. Further, the Director may require the permittee to report general water use information, including the place and nature of use of water under the permit.
B. The permittee shall allow the watermaster access to the meter or measuring device; provided however, where the meter or measuring device; provided however, where the meter or measuring device is located within a private structure, the watermaster shall request access upon reasonable notice.

When streamflow on the Yachats River, measured at the device described above, exceeds senior and junior instream rights (Cert. 59739, Cert. 59708, and Cert. 73161) the City may exercise this permit (both points of diversion and the full 2.0 cfs) without restriction beyond the existing terms of the permit.

When streamflows measured at the device described above drop below the flows identified in the junior instream water rights (Cert. 73161) or senior instream water rights (Cert. 59739 or Cert. 69608), use of the Yachats River under this permit may be made only in emergencies or when population growth exceeds other sources of supply. Future use due to population growth exceeding supply shall be limited by the city's compliance with its approved water management and conservation plan.

"Emergencies" are limited to: sustained drought, accompanied by the institution of curtailment measures described in the City's water management plan that include curtailment triggers linked to streamflows; supply line breakage; firefighting; outdoor events held within the City's service area which place an abnormally high demand on water supply (e.g. Cycle Oregon, outdoor festivals); catastrophic loss of use of primary water supply sources; and threats to public health, not attributable to inefficiency or chronic conditions, as may be approved jointly by ODFW and WRD.

Population growth will be deemed to have "exceeded other sources of supply" only if the City: (1) is in compliance with its approved water management plan which includes the elements specified in The Stipulated Final Order and Agreement on Reconsideration (T-7589), and (2) (a) prior to 15 years from the date of this agreement or 10 years from the date of approval of the management plan, whichever comes first, is either meeting theplan schedule or has reached the foal of 85% water use efficiency, yet remains unable to meet the requirements of the City's resident population using other developed sources; or (b) after 15 years from the date of this agreement or 10 years from the date of approval of the management plan, whichever comes first has reached or exceeded 85% water use efficiency, yet remains unable to meet the requirements of the City's resident population using other developed sources.

In the event streamflows measured at the device described above are insufficient to satisfy the junior instream water right (Cert. 73161) or the senior instream water rights (Cert. 59739 and Cert. 69608), and the Yachats River is utilized under this permit, diversions shall not exceed 1 cfs and those diversions shall be made at a rate not to exceed 0.50 cfs at the upper ponit of diversion (POD 1) and 0.50 cfs at the lower point of diversion (POD 2).

Addition of the lower diversion point (POD 2) shall be a permanent change.

Water may not be diverted at any point of diversion authorized under this permit until all applicable conditions of the permit have been met, including compliance with state-wide land-use goals and any local acknowledged land-use plans.

Actual construction shall begin on or before November 19, 1991, and shall be completed on or before October 1, 1998. Complete application of the water to the use shall be made on or before October 1, 1998 (See Special Order Volume 46, page 534 and Special Order Volume 49, page 208).

This permit is for the beneficial use of water without waste. The water user is advised that new regulations may require the use of best practical technologies or conservation practices to achieve this end.

The use of water allowed herein may be made only at times when sufficient water is available to satisfy all prior rights, including rights for maintaining instream flows.

This permit is issued to supercede permit 51190. Permit 51190 is superceded in order to incorporate the relevant portions of the Stipulated Final Order and Agreement on Reconsideration issued on September 3,

1998, by Administrative Law Judge Weisha Mize and to incorporate the conditions contained in the Order Approving An Additional Point of Diversion recorded in Special Order Volume 52, pages 767 – 771. Permit 51190 is superceded by this instrument and is of no further force or effect.

Issued September 15, 1998

Martha O. Pagel, Director

Water Resources Department

Appendix C

City of Yachats Water System Master Plan (2021) Excerpts

- *Average Day Demand (ADD)* – The total volume of water that enters the system over a period of one year, divided by 365 days.
- *Maximum Month Demand (MMD)* – The largest total volume of water that enters the system in a one-month period, divided by 30 days.
- *Peak Day Demand (PDD)* – The largest total volume of water that enters the system in a 24-hour period. PDD is commonly used to size water treatment plants, large diameter transmission mains and factors into the sizing of reservoirs.

5.3 POPULATION

Population projections serve as the basis for future wastewater flow and load projections. Much of the challenge in projecting system growth relates to the difficulty in accurately tracking or projecting actual populations. This is especially challenging in Yachats. As a tourist destination, The population in Yachats fluctuates on a seasonal basis and on a weekly basis. The population generally increases during the summer season with peaks occurring during weekends and holidays. As noted in the following subsection, the current population of Yachats is estimated to be about 760 residents. During peak holidays, the population is believed to greater than 2,000 residents. This fluctuation is significantly greater than a typical City. Therefore, traditional population estimates are of limited use and other means must be developed to track the service population in Yachats.

The population of Yachats consists of permanent residents, part time residents, and tourists. Permanent residents generally own homes in the City and reside in the City on a full-time basis. Part time residents own homes, but the homes are not occupied on a full-time basis. Tourists visit the City for short periods of time and occupy hotel rooms and vacation rentals.

5.3.1 Historical and Future Population

Historical population histories provide a tool for determining the future growth rate of the municipal water system in Yachats and were considered for this report. The population in Yachats's City Limits has steadily increased from approximately 441 people in 1970 to an estimated population of 760 in the year 2020. This trend is expected to continue during the planning period.

In June of 2017, population projections for Lincoln County were prepared by the Portland State University Population Research Center. These projections estimate the population of Yachats within the UGB to increase from 773 in 2017 to 1,061 in 2040. These projections are based on an average annual growth rate of 1.4% from 2020-2035 and 0.9% from 2035-2067. These projections will be used for planning purposes in order to conform to state-wide planning goals. As noted elsewhere in this document, the study period ends in 2041. Therefore, the 2040 population was extrapolated for one additional year for the preparation of this document. Adding an additional year of growth at a rate of 0.9% to the 2040 population of 1,061 results in a 2041 population of 1,070.

Table 5-1| Historical and Projected Municipal Population

Year	Municipal Population
1970	441
1980	482
1990	533
2000	617
2010	690
2017	773
2020	797
2030	929
2040	1,061
2041	1,070

1- Data for 1970-2010 referenced from US Census data.
2- Underlined values for 2017-2040 referenced from PSU Population Research Center, Coordinated Population Forecast, 2017.

5.3.2 Seasonal Occupancy of Service Population

The City's water system demand is substantially influenced by the seasonal occupancy of the service population. Many connections served by the City are vacation homes or are utilized for tourism, such as hotels and vacation rentals of single or multifamily residences. As such, the service population fluctuates on a seasonal basis with more users during the summer months, weekends and holidays.

As previously described, peak water demand varies on an annual, monthly and daily basis. For Yachats, these demand variations are assumed to directly depend on the amount of occupancy of the service population. It is assumed that average day demand (i.e., ADD) corresponds with 70% occupancy. It is assumed that maximum month demand (i.e., MMD) corresponds with 80% occupancy. It is assumed that peak day demand (i.e., PDD) corresponds with 100% occupancy.

Table 5-2| Occupancy of Service Population by Demand Variation

Demand Variation	Occupancy of Total Service Population
Average Day Demand (ADD)	70%
Maximum Month Demand (MMD)	80%
Peak Day Demand (PDD)	100%

5.3.3 Current and Future Service Population

Water demand projections in this document are based on estimating the service population that is comprised of three different types of users. Users are categorized either as single family units, multifamily units, or hotel rooms. It is assumed that the relative amount of each of these types of users will stay constant throughout the planning period.

Therefore, each user type is assumed to grow at the same rate forecasted by PSU. Table 5-3 indicates the assumptions used to estimate the service population at full occupancy of each user type.

Table 5-3| Full Occupancy Rates by User Type

User Type	People per Connection
Single Family	1.8
Multifamily	1.8
Hotel Room	1.2

The total number of connections to the City's water system were determined from City records. The number of multifamily units was estimated. The number of hotels and their amount of rooms was determined. It is assumed that the number of single-family units is the number of total connections less the total of multifamily and hotel connections.

The current and future total service population is estimated in Table 5-4.

Table 5-4| Estimated Current and Future Users at Full Occupancy

	Units by User Type			Population by User Type			
Year	Single Family Units	Multifamily Units	Hotel Rooms	Single Family Population	Multifamily Population	Hotel Population	Total Service Population
2020	940	70	311	1,692	126	373	2,191
2025	1,008	75	334	1,815	135	400	2,350
2030	1,081	81	358	1,946	145	429	2,520
2035	1,160	86	384	2,087	155	460	2,703
2040	1,213	90	401	2,183	163	482	2,828
2041	1,224	91	405	2,203	164	486	2,853

5.4 HISTORICAL WATER DEMAND

City records of historical water production were evaluated to determine water demand, usage rates and demand fluctuations. Records from January 2017 through September 2020 were used as a basis to establish historical water demands. The information from this section combined with the population data & projections forms the basis for estimating future water demands as presented in Section 5.5.

5.4.1 Water Production Records

The City's water production is tracked using the flow meter at the water treatment plant. Figure 5-1 graphically illustrates the trends and variation in historical water production during different periods of the year. As would be expected, water production increases during the summer to meet increased demand, and decreases during the winter months.

During the peak summer months, the City produces water almost on a daily basis. However, during fall, winter, and spring months, the City will make water every other day or every third day as needed to replenish the water in the

main storage tank. This decreases the overall workload for City staff, but the daily water production curve is significantly obscured by this practice, as depicted in Figure 5-1. The water treatment plant is operated manually based on water levels in the main storage reservoir. City staff monitor the water level in the main reservoir and manually start the water plant to fill the tank.

For this study, the average daily demand (ADD), the maximum monthly demand (MMD), and the peak day demand (PDD) were determined for planning purposes. Water demand varies across seasonal periods, days of the week, and hours of the day. The establishment of an average day demand rate serves as the baseline against which other more intensified demands are measured. Maximum monthly demand rates are useful for determining seasonal demand variations. Peak day demand values are conventionally utilized to size treatment plant capacity and factor into the sizing of reservoirs. Peak day demand is typically the most critical water demand scenario and is usually the standard by which system adequacy is measured.

As shown in Figure 5-1, water production is generally intermittent, with days of no water production followed by days of higher water production. The water production data can be analyzed on an annual or monthly basis to estimate demand variations, but the data cannot be used to determine peak day demands, because there are many days where the plant is operated for long periods of time to make water for more than one day. As such, the peak day demands shown below were estimated based on an assumed water use rate of the service population during full occupancy (100 gallons per capita per day). Municipal water consumption typically averages about 100 gallons per person per day. This value is regularly observed in many municipal water systems in the region. This estimate compared well to data and information provided by the City on relatively high-water demand events, including historical peak week water demands during the summer and water plant operator observations. During the years 2017 through 2020, the City consistently produced the most amount of water per week during the 27th week of the year. This is the week of July 4^{th,} which is historically a busy time for seasonal occupancy.

The current average day and maximum month demands are listed in Table 5-6. The last column in Table 5-6 lists the existing demand per connection in the system. These values are slightly lower in Yachats than for most municipal systems. As previously described, municipal water consumption typically averages about 100 gallons per person per day. Typical household sizes or the number of people per connection typically ranges between 2.2 and 2.8. As such, average water demands per connection should be between 200 and 300 gallons per day. In Yachats, this value is 137 gallons per day (Table 5-6). This discrepancy is likely due to the fact that there are many homes in Yachats that are not occupied on a full-time basis. This is common for coastal communities where second homes are common and many residents are older with smaller family sizes. These historical use rates inform water use rates used for projecting demand. For the purposes of projecting demand variations in this report, per capita use rates were assumed as indicated in the following table.

Table 5-5| Per Capita Water Use Rates for Demand Projections

Demand Variation	Water Use Rate (gallons per capita per day)
Average Day Demand (ADD)	90
Maximum Month Demand (MMD)	100
Peak Day Demand (PDD)	100

The authors of this report are currently working on a planning document for the City's wastewater utility. The wastewater data shows that the average occupancy rate in Yachats is about 70%. The average daily demand of 170 gallons per connection per day roughly corresponds to this same occupancy rate.

Figure 5-1| Historical Water Production

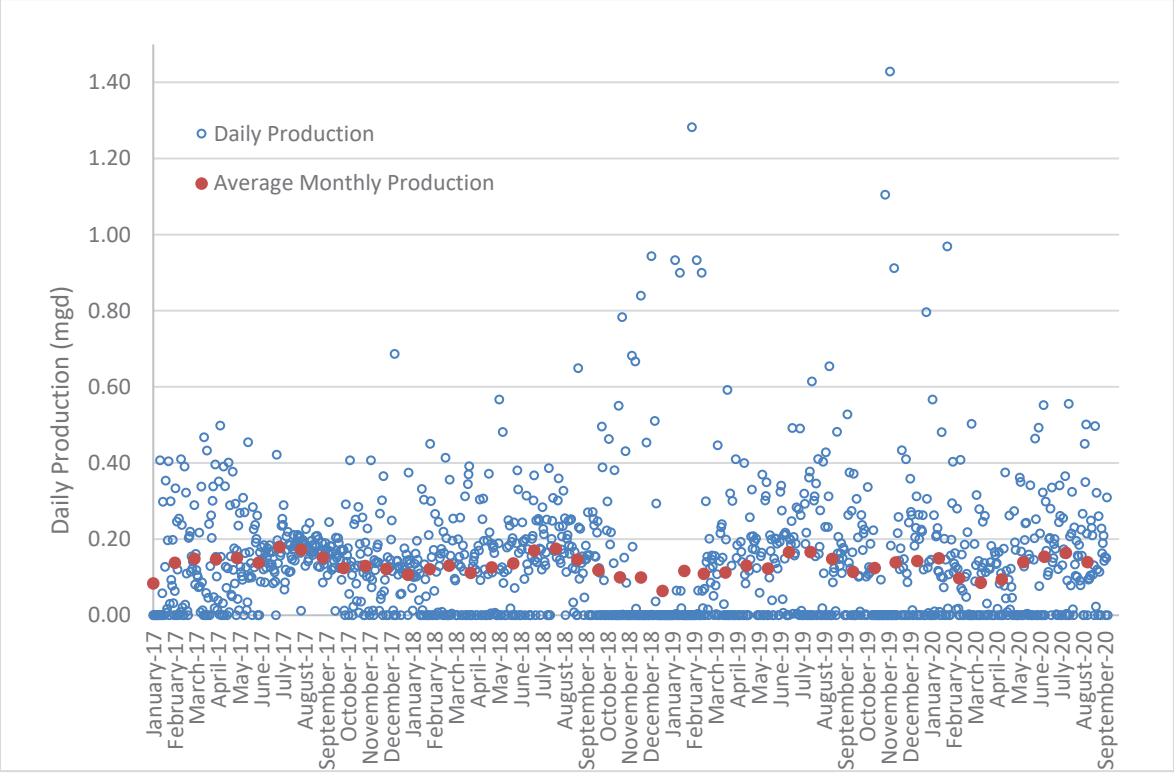

Table 5-6| Existing Water System Demands

Demand	Gallons Per Day	Gallons Per Connection Per Day[1]
Average Day	132,000	137
Maximum Month	169,000	177
Peak Week	192,000	200
Peak Day	220,000[2]	228

1 Based on 959 connections
2 Estimated to be 100 gallons per capita per day for the service population at 100% occupancy, 2,191 people (see Table 5-4).

5.4.2 Water Loss

Water loss or unaccounted-for water is comprised of the difference between the finished water produced at the treatment plant and the water consumed, and consists of all unmetered uses and system leakage. It is important to differentiate these two categories of water loss.

Unmetered use is commonly the result of incomplete or inaccurate metering of consumer demand, including the following typical categories.

- Unmetered or unauthorized connections
- Inaccurate or unrecorded flows for hydrant and main flushing
- Unmetered water for construction activities

- Unmetered water for operations & maintenance uses (street cleaning)
- Unmetered water for fire fighting
- Reservoir overflows
- Data collection errors including faulty meters (non-registering or under-registering)

System leakage, as the name implies, is water lost due to deteriorating pipe, compromised pipe joints, service connections, valves, etc. With proper record keeping and metering of water, the percentage of unaccounted-for water approaches the net volume lost to actual leakage. Conventionally acceptable rates of water loss range between 10% and 15%, although water loss for many small Oregon municipalities can be as high as 20%.

OAR 690-086-0150(4)(a) requires municipalities to conduct annual water loss audits. The City has compiled monthly data for 2018, 2019, and 2020. However, in some months the available data was either incomplete or potentially invalid. For example, in some months, the amount of water sold exceeded the amount of water produced, which would result in a negative amount of water loss. The reason for these errors is unknown and should be investigated early in the planning period. Two annual programs are recommended as a part of this plan to better determine and reduce water loss in Yachats. These programs are described in more detail in 8.4.1.

Based on the available data, the average annual water loss for the Yachats distribution system is estimated to be between 11% and 16% (Table 5-7). Reducing water loss below 15% and maintaining water loss below this amount are important goals for the City. As explained in Chapter 6, this plan recommends the construction of a new intake on the Yachats River. Based on the City's Yachats River water right and another related settlement (see section 4.1.5), the City must have system losses below 15% in order to use water from the Yachats River. Water loss below 15% is a reasonable and attainable goal. Better data management practices may show that water loss in the City is already less than 15%. If the previously mentioned programs are consistently implemented, it is expected that the City should be able to reduce and maintain water loss below 15%.

Table 5-7| Annual Water Loss Data

Year	Total Water Sold (Million Gallons) (1)	Total Water Produced (Million Gallons) (1)	Unaccounted for Water, All Data (%) (2)	Unaccounted for Water, Excluding Invalid Months (%) (3)
2018	43,575,128	47,045,400	8%	16%
2019	32,561,092	40,057,500	18%	21%
2020	39,922,986	42,468,300	6%	13%
Average	-	-	11%	16%

1- Values include all available monthly data.
2- Values calculated based on all available monthly data.
3- Values calculated by omitting months where consumption exceeded water sold or values were incomplete.

5.5 PROJECTED WATER DEMAND

This section builds on the discussions of population projections in Section 5.3 and the discussion of historical water demand as presented in Section 5.4. The basis for projecting future water demands is based in the establishment of a historical demand baseline. The growth projections of Section 5.3 will be combined with historical usage rates to forecast future water demands.

Projected water demands are based on the following assumptions:

- Future occupancy rates will remain approximately equal to the existing occupancy rates. As explained above, average water demands in Yachats are lower than would be expected in a typical municipal system. This is due largely to the high number of second homes and older residents with small family sizes. If future occupancy rates increase, the City may want to consider re-evaluating the demand projections presented in this plan.
- The ratio of residential to non-residential use (commercial, industrial and public uses) will remain constant. In other words, future commercial and industrial developments will track population growth.
- Long-term per capita water demands will not exceed the City's historical averages. Since the efficacy of planned water conservation programs is unknown at this time, the water demand projections of this report exclude conservation. The future success of the City's water conservation policies will serve to further increase the margins of safety used to plan and design the water system infrastructure.
- New commercial and industrial developments will not be large water users; no provision has been made for new industries with heavy water demands such as food processing or beverage production.
- The growth projections of Section 5.3 are reasonable estimates of future municipal populations and the ratio between peak month and peak day demands to average day demands will remain relatively constant during the planning period.
- Future water loss will not exceed the City's historical averages.

5.5.1 Projected Water Demand Summary

Projected water demand variations for the service population are calculated by multiplying the total service population in a given year (Table 5-4) by the corresponding unit demand per capita (Table 5-5) and the occupancy rate (Table 5-2). These results are summarized in Table 5-8 and illustrated in Figure 5-2 below.

Peak day demands have special significance because they can put stress on the water supply capabilities of the system. The water sources should be able to supply the entire water demand during the peak day of the year in addition to any required fire flows.

Table 5-8| Summary of Projected Water Demands

Year	2020	2025	2030	2035	2041
Total Service Population	2,191	2,350	2,520	2,703	2,853
Average Day Demand (ADD)					
mgd	0.132	0.142	0.153	0.164	0.174
gpm	92	99	106	114	121
Max. Month Demand (MMD)					
mgd	0.169	0.182	0.195	0.210	0.222
gpm	117	126	136	146	154
Peak Day Demand (PDD)					
mgd	0.219	0.235	0.252	0.270	0.285
gpm	152	163	175	188	198

Today's Proclamation is written by Cheris Karamarae, a loyal and longtime Yachatian. You can find her and her husband most mornings at the Green Salmon and on most Saturdays standing on 101 working for social justice. Both Mary Ellen and I are proud to consider her a friend. Mary Ellen for many years and me more recently

Cheris is a scholar in the area of women's studies and communication, with her research primarily focusing on gender, language and communication, technology, and education. She is mostly known for her contributions to muted group theory, as well as *A Feminist Dictionary*, in which she was a co-author.[1]

From 1978 Cheris taught at the University of Illinois as an associate professor, teaching speech communication. In 1991 – 1996, Cheris was the co-founder of the Women, Information Technology & Scholarship program, was the director of the Women's Studies program and served as the Jubilee Professor or Liberal Arts & Social Sciences.

In 1988, Cheris moved on to the University of Oregon, where she was the acting director for the Center for the Study of Women in Society. She is currently a visiting professor for the Center for the Study of Women in Society, at the University of Oregon, where she has been since 1996.[2]

Environmental Stewardship

Complete wetlands assessment and improvements along with the green space.
Develop a plan to acquire additional land for parks and trails.
Environmental practices and ordinances - lights, dog bags, expand recycling, net zero housing projects.
Complete wetlands inventory.
Wetland status, study and remediation of green space with native plants.
Expand city green spaces with native plants.
Review building codes and ordinances that provide guidance that encourages and incentivizes the use of sustainable build practices.
Night Sky Initiative

Improve City Services

Supervise, guide, support and evaluate city manager.
Hire trained operators for city's water plant, (and waste water)
Grant supplied for in timelines provided.
Track city complaint and request for services.
Streamline CIP process.
Complete deferred projects.
Provide any training that the staff thinks would be valuable.
Initiate, monitor, review the use of the CIP evaluation for all city projects.
Measure city service satisfaction.

Housing

Support HB4123 committee.
Create and complete plans to address the housing needs assessment and workforce housing.
Continue to support the cooperative engagement with others regarding the unhoused having protection from inclement weather.
Review funding from housing needs analysis report and identify next steps to address housing issues.
Develop plans aligned with housing study to encourage sufficient workforce housing.

Water

Develop water conservation ordinances and incentives.
Implement H2O conservation practices. identify long-term H2O, supplies and storage.
Water sufficiency - new supplies - storage evaluation.
Pursue a regional water solution.

Financial Responsibility

Refine and implement CIP process - determine how to prioritize.
Communicate financial health to community on a regular basis.
Maintain “life cycle” inventory of all capital items.
Urban renewal up date and expand.
Food and beverage tax for water projects.
Work with finance committee to extend urban renewal.
Authorize the use of food and beverage tax for H2O projects.
Inventory, capital items with purchase date and replacement.

Community

Plan and schedule master plans,
City website update.
Community survey.
Respond to community members promptly.
Welcome community input.
Identify ways for community members to provide regular feedback.

Safety

ADA access to buildings, parks, etc.
OSHA, ADA, trainings, etc.
Review findings and recommendations of parking management study and identify what can be achieved in 2023.
Complete safety projects, underway - 101 safety to and over bridge.
Repair boardwalk.
Complete walkway at Ocean view Drive.
Adequate water flow for fire safety and user needs.
Safety standards - City Hall, commons.
Assess liabilities; resolve quickly.
Support recommendations from emergency preparedness committee.
Ensure maintenance and safety issues are prioritized.
City led Mapping of Neighborhoods.

PROPOSED DRAFT: Yachats City Council Goals 2023: Catherine Whitten-Carey 01 08 2023

	S	M	A	R	T
	Specific	Measureable	Achievable	Relevant	Time-Bound

1. Provide timeliness, quality and effectiveness of city service delivery	S	M	A	R	T

a. Supervise, guide, support, and evaluate the City Manager
b. Provide the public with the City Manager's Job Description (2b below)
c. Provide 360 Degree evaluative feedback; support ways to improve
d. Ensure the City Manager is upholding all responsibilities;
   Hold City Manager accountable for positive moral and high productivity of city staff; confidentiality; timeliness of responses; ethical and moral behavior; keeping within the law
e. Provide citizens with timely feedback after any phone call, email, in person request or concern. Document same.
f. Track City Complaints and Requests for Service. What has come in, what's been done, how long did it take, did the citizen receive feedback?

g. Ensure that safety liabilities are taken care of immediately/quickly
h. Provide for necessary City Manager training(s)
i. Guide City Manager in best practices for the community
j. Support the City Manager she/he provides trainings to staff (See below 3a)
k. Ensure that available and relevant grants are applied for within timelines provided (e.g. Future Three Rivers Grants, Oregon Department of Energy Resiliency Planning Grant - due Feb. 15, 2023 [Part of a $50M Grant program], etc.)

2. Coordinate involvement and communication with the Community	S	M	A	R	T

a. Update/upgrade City Website (i.e. easier to navigate, transparent information, no poor connections to Zoom meetings, etc.)
b. Create transparency by making items easily accessible to the public: City Manager's Job Description (1b above); Sharing CIP progress report with the community; creating a visual dashboard about city business, etc.
c. Develop a system in which all phone calls to City Hall are answered within 3 rings; All emails to City Hall are acknowledged and answered within 12-24 hours. (See 1e)
d. Support community involvement, the City Commissions, Committees, and volunteers; Hear their ideas and provide the resources to assist in adopted plans in a timely fashion; Have City Council representation at Commission meetings.
e. Conduct a comprehensive community survey; present results to City Council and community
f. Communicate regularly with community giving updates from Commissions, Committees, Fire District, Chamber of Commerce
g. Conduct regular, periodic "coffee hours" with residents at rotating restaurants in the community

h. Create a new, rustic, aesthetically pleasing sign (no neon) outside of the Commons to deliver messages to the community.
i. Assess current residency rules for Commission Members. Consider changing to include some residents within the 97498 zip code, which would allow other enthusiastic & dedicated individuals within our community to participate.

3. Develop city staff support, education, and feedback	S	M	A	R	T

a. Develop protocol and provide trainings to all city employees & volunteers (mandatory for employees) on essential HR related issues (i.e. OSHA; ADA; Prevention of workplace Discrimination, Harassment, and Retaliation; Cultural Competency; Biases; New Employee Onboarding; Leveraging Interaction Skills; Hostile Intruder Training; Mandatory Reporting of Abuse, Conflict Management, etc.)
b. Hire appropriately trained operators for the City's water and wastewater plants; budget for appropriate Public Works' hiring that address succession planning
c. Include city staff in 360 Degree evaluation process of City Manager

4. Provide for a safe, welcoming, inclusive, legally upheld environment	S	M	A	R	T

a. Assess liabilities; Oversee that safety issues are quickly resolved. (1g above)
b. Prioritize adequate water flows for fire safety and user needs.
c. See 3a above: "Develop protocol and provide trainings to all city employees & volunteers (mandatory for employees) on essential HR related issues (i.e. OSHA; ADA; Prevention of workplace Discrimination, Harassment, and Retaliation; Cultural Competency; Biases; New Employee Onboarding; Leveraging Interaction Skills; Hostile Intruder Training; Mandatory Reporting of Abuse, Conflict Management, etc.)"
d. Support the Emergency Preparedness Committee, its recommendations and others. Implement plans for "Mapping Your Neighborhood", and other recommendations - e.g. Uphill emergency supply storage "caches", etc.
e. Ensure that all city buildings, establishments, and events are meeting ADA and Oregon regulations & standards regarding disabilities: accessibility and accommodations.
f. Support recommendations put forth by the "Wheel the World Accessibility Assessment" in Yachats and the Chamber of Commerce. This project is being funded by a $20,000 grant, through Travel Oregon, to assess ADA accessibility around town (hotels, restaurants, trails, etc.)
g. Develop safety standards and protocols for City Hall. Create a welcoming and, yet, safe & secure public building for our employees (e.g. security cameras, no line of sight from front door to the (only) back exit door, alert buttons, rotate staff on duty in order to always have the front door monitored, etc.)
h. Develop safety standards and protocols for The Commons.
i. Streets:
    - Ensure the flashing 101 pedestrian crosswalk light is repaired ASAP
    - Complete delineator project: On 101 south to Yachats River Bridge

- Maintain intersections and streets to have appropriate signage, indicating parking accessibility, trail markings, etc.
- Create defined parking spaces, markings and signage on 2nd Street and Pontiac Street (30+ parking spaces) & other areas that have accessible public parking; Review opportunity to invite visitors to park in City Hall and the Commons' parking areas during evenings, weekends and holidays.
- Investigate upgrade to dangerous sidewalk curbs within the city (liability?)
- Provide prompt (within one week) repair of any street delineator that is broken.

j. Complete Sunset Parks Project (Pocket Parks)
k. Complete Bike Rack installation
l. Complete Walk-Way project along the bay/Ocean View Drive
m. Complete Little Log Church & Museum repairs/reconstruction
n. Complete Library extension project
o. Repair wetland boardwalk
p. Ensure that the Planning Commission and other Commissions' recommendations are being heard and addressed in a timely manner; Ensure that building code standards & regulations are being adhered to.
q. Evaluate that the Code Enforcement Officer is addressing violations & concerns in a timely manner.
r. Work with ODOT to put in more 25 MPH signs, both north and south through town & exiting town; Add radar detection stating current speed going south towards bridge/over bridge; add signs/flashing light to indicate a cross-section at 101 and Lori Lane; add walkway across 101 at Lori Lane, etc.
s. Reconcile inequities within our community regarding health care;
   Search out & create new opportunities to establish health care alternatives
   with-in the city limits. (i.e. physical and mental health resources)

5. Provide financial responsibility	S	M	A	R	T

a. Refine & implement CIP process. Discuss & determine how project prioritization will be most appropriately addressed.
b. Maintain "Life Cycle" inventory of all capital items with date of purchase, installation date, and expected expiration/replacement date (e.g. when was The Commons' new heating system put in & when will it need replacing?)
c. Communicate the City's "Financial Health" with community at least quarterly through a website dash-board, presentations at City Council Meetings, and/or via the Newsletter.

6. Oversee and implement environmental responsibility in all actions and decisions	S	M	A	R	T

a. Develop a plan for acquisition of additional available lands for city parks, trails, and recreational use. Implement the same.
b. Produce wetlands assessment and improve that area
c. Develop the City's greenspace with emphasis on topographical aesthetics, enjoyment, relaxation, safety, a space for dogs to run, possible open-air venue for entertainment, and native plants
d. Upgrade lighting ordinance to direct that all lights, private and public need to abide with limited lumen, directionality, and spectrum to ensure stars can be seen at night, private homes are not invaded, citizens and visitors are safe, and that Wildlife is safe.
e. Buy environmentally safe, disintegrating doggie bags for dog waste bag receptacles

f. Create expanded recycling opportunities (i.e. recycle glass from residences, invasive species vs. non-invasive species brush pick-up, etc.)
g. Evaluate if the city can support/assist in "Net-Zero" alternatives in housing projects

7. Implement plans that ensure water security and waste water management	S	M	A	R	T

a. Evaluate long-term water supply needs and resources
b. See 3b above: "Hire appropriately trained operators for the City's water and wastewater plants; budget for appropriate hiring that address succession planning"
c. Actualize the Water & Wastewater Master Plan; See CIP Plan
d. Evaluate ways to conserve water and incentivise homeowners (e.g. gutter water-barrels, etc.)

8. Coordinate and support housing needs	S	M	A	R	T

a. Create and complete plans to address the housing needs assessment and workforce housing needs.
b. Continue to support the cooperative engagement to supply the unhoused with protection from inclement weather in the new "Don's Place" units outside the Presbyterian Church.
c. Maintain and enhance relationships with other groups who can assist in providing

services to those in need.

d. Revisit and reassess the City's Rental Housing rules. Are these rules the most viable and beneficial for the community? Could incentives be utilized to persuade more to provide long-term, appropriately priced rentals?

PROPOSED DRAFT: Yachats City Council Goals 2023: Catherine Whitten-Carey 01 08 2023

City Council 2023 Meeting Roadmap Suggested By Mayor Berdie

January	**Work Session** Goals, Meeting format and schedule	**Meeting One** Long Range Water Security Form and Format Solicit Budget Committee Members Planning Commission: Goals, Barriers, Resources	**Meeting Two - CIP/Finance Focus** Approved CIP Item Status and Schedule Appoint Budget Committee (To date)
February	CM Report Items and Format	Water Security Ordinance Approve Additional Budget Committee Members Public Work Commission: Goals, Barriers, Resources	Finance Committee Review. Charge, Resources Finalize Budget Committe Schedule Budget Committee Meetings
March	Citizen Survey (Consultants, Questions)	Water Committee Status Library Commission: Goals, Barriers, Resources	Budget Input - Citizens, Commission, Finance
April	Shovel Ready Grant Fund and Process	Finalize Citizen Survey Parks, Trails and Commons: Goals, Barriers, Resources	Budget Status
May	Workforce Housing	Beauty, Maintenance City Campus Invasive Species Ordinance Emergency Preparation: Goals, Barriers, Resources	Budget and Finance Committee Reports Shovel Ready Grant Fund and Process
June	Houseless Services	Final Review Appropriated CIP Status Water Security: Goals, Barriers, Resources	2023/4 CIP Final Review and Approval
July	Utility Billing Cost Savings	Citizen Survey Results, Goal review and revision Planning Commission: Goals, Barriers, Resources	CIP Schedule and Sequence Review Utility Agreements, Enhanced Recycling discussion
August	Emergency Preparedness	Water Conservation Ordinance and Incentives Emergency Prepardness Assignments and Training Public Work Commission: Goals, Barriers, Resources	Storm Water Master Plan
September	Land Acquisition: Water, Parks, Conservation	Water Committee Recommendations Library Commission: Goals, Barriers, Resources	Street and Sewer Schedule Final Plans
October	Commons: Long Range Funding	 Parks, Trails and Commons: Goals, Barriers, Resources	Shovel Ready Changes to Budget Process

Mayor Berdie's Input - Council's 2023 Goals

Improve timeliness, relevance, quality and effectiveness of city service delivery

1. Track and measure resident satisfaction with City requested services.
2. Implement priority items from Water and Wastewater Master Plans.
3. Develop visual dashboards based on key indicators: Finance, Office, Project.

Prioritize and demonstrate environmental responsibility in all actions and decisions

1. Take action on CIP priorities relative to water sustainability.
2. Complete local wetland inventory and have it adopted by the state.
3. Develop and sustain city greenspaces with an emphasis on native plants
4. Explore expanded recycling opportunities

Strengthen relationships with Community

1. Conduct a comprehensive community survey and present the results.

Provide a safe environment

1. Complete engineering, let bids and initiate construction of walkway project.
2. Complete delineator project on 101 from Ocean View Drive to Yachats River
3. Ensure that intersections and streets have appropriate signage and other modifications to protect citizens and visitors. (?? Include trail markings; are there specific signs??)
4. Prioritize adequate water flows for fire safety and user needs.
5. Ensure maintenance safety issues are prioritized and quickly resolved
6. Reinvigorate Emergency Preparedness including caches and/or other practices.

Demonstrate Financial Responsibility

1. Refine and improve CIP evaluation process
2. Include "revenue" potential in financial decisions
3. Inventory all capital items with date purchased or installed and expected replacement date.

Housing

1. Complete plans to address the lack of workforce housing.
2. Develop relationships with entities to provide humane shelter and houseless services

Staffing

1. Recognizing the importance of appropriately trained operators for City's water and wastewater plants, budget for public works hiring that addresses succession planning.
2. Assign facility management responsibilities for city properties
3. Identify areas that require significant staff resources and explore tools to improve efficiency with current staff levels.

Water Security

1. Identify long-term water supplies or other means of ensuring adequate drinking water during traditional dry months. This may include the establishment of a special committee.
2. Implement water conservation ordinances and develop best practices for households and commercial users.

These suggestions are by no means comprehensive as we will be reviewing input from all the councilors and I attempted not to be repetitive.

Mary Ellen O'Shaughnessey

Complete HR process of writing job descriptions and hiring permanent staff

Identify priorities and projects that provide for the safety and sustainability of water resources for the next 20 years

Educate the community including commercial businesses, restaurants, households, vacation rentals, and hotels about best practices for water conservation

Review building codes and ordinances that provide guidance that encourages/incentivizes the use of sustainable building practices

Provide written guidance to Commissions and Committees regarding Council expectations for 2023

Undertake a survey of safety issues in our community, prioritize the findings and address the issues in a timely fashion

Review the recommendations from the Housing Needs Analysis Report and identify next steps with an awareness of our local business's desperate need for employee housing

Initiate, monitor and review the use of the CIP evaluation for all City projects in the coming year making suggested changes that add clarity and efficiencies.

Identify ways for community members to provide input on City initiatives and projects

Continue to educate City Council members and the Mayor about their roles and responsibilities in the Council-City Manager form of government

Review the Findings and Recommendations of the Parking Management Study and identify those that can be implemented before the summer of 2023

Begin forwarded message:

From: Greg Scott <coastguy46@gmail.com>
Date: January 8, 2023 at 1:04:44 PM PST
To: Craig Berdie <cberdie@gmail.com>
Cc: Heide Lambert <citymanager@yachatsmail.org>
Subject: council goals

I am only including my most critical items. I have not provided any details assuming there will be council discussion of each item during the meeting. Because I believe three of the items will require council approval, it seems appropriate to include them in the goals discussion.

2023 Council Goals

Continue to support the City Manager's administrative upgrade process.

Expand and extend the city's Urban Renewal program. Requires council action.

Authorize the use of Food & Beverage tax receipts for water projects and extend the life of this item. Requires council action.

Pursue alternate water supply options with the SW Lincoln County Water District and the City of Waldport. Will require council action for an Intergovernmental agreement at some point.