

Water Rate Study



City of Yachats

Final Report

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Prepared by:

Oregon Association of Water Utilities



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EXECUTIVE SUMMARY

The City of Yachats called upon the Oregon Association of Water Utilities to conduct a water / wastewater rate study to determine the adequacy of the water/wastewater rates in conjunction with the proposed budget for the 2020-2021 fiscal year, with subsequent adjustments for years 2022-2024. The purpose of the study was to develop financial assistance and rates that:

- Provide examples of rates which meet the projected capital and operation and maintenance (O&M) costs of the system
- Determine equitable costs among the different types of system users
- Encourage efficient use of the water
- Are relatively simple to administer, understand, and are consistent with industry standards

The rate study stems from a justification of a single expenditure line created and managed by the city's administration office. This figure includes personnel services, materials and services, contingency funding, and capital improvement. The capital improvement costs are reviewed in this study and implemented to align system costs to future rates.

Table 1: Current Rate Information						
Service Connection Size (in.)	# of connections	Allowance (Units) ^{1,2}	Base Rate	Unit Rate Cost	Average Consumption ₃	Typical Monthly Cost
5/8 Residential	704	2	\$48.24	\$5.33	5.44	\$77.23 ⁴
5/8 Residential	11	2	\$72.37	\$8.02	NA	NA
5/8 Commercial ⁵	136	2	\$48.24	\$5.33	NA	NA
5/8 Commercial	28	2	\$48.24	\$5.33	NA	NA
2.0 Commercial	7	2	Varies ⁷	\$5.33		NA
3.0 Commercial ⁶	1	2	\$94.54	\$5.33	210	\$1,213.84
4.0 Commercial ⁶	1	2	\$70.78	\$5.33	96.1	\$582.99
Total Connections	888	NA		NA		
Total Annual Base			\$522,925.08			
Total Annual Consumption			\$195,127.54			
Combined Base and Consumption			\$718,052.62	94.99 %		
Proposed Budget			\$755,900.00			
<small>1 – One unit of water = 748 gallons, 2-1,496 gallons allowance per month 3 – figures taken from various calculations provided by Public Works Committee, 4-cost average based on average usage of all 5/8-inch meters, with 3.44 units of water costs at \$5.33 per unit, 5 – Service connection associated with rental housing, 6 – Figures taken from 2015 calculation of Yachats's 53 largest consumers, 7- base rate varies from \$94.54 to \$305.69,</small>						

Current Revenues / Expenditures:

Proposed revenue requirements for fiscal year 2020-2021 are \$755,900.00 dollars. The base rate revenues equal \$522,925.08 or 69.18 percent of the total proposed budget. An annual adjustment to the base rate has been initiated since 2016 and should be continued as fluctuations in capital planning changes with each succeeding year.

The existing consumption rate (a charge per unit of water) is \$5.33, with an allowance of water provided in the base rate. The allowance of water included is two units or 1,496 gallons per month. All water consumed after the allowance is charged at \$5.33 per unit. Consumption revenues equal 25.81 percent of the proposed budget or \$195,127.54 dollars. The combination of base and consumption rates total 94.99 percent of proposed budget or \$718,052.62 dollars.

With figures based on averages of water produced and delivered to the consumers, the current budget has an estimated shortfall of \$37,847.38 or approximately 5 percent.

User Characteristics:

Equitable fees assessed to customers begin with a determination of the type of users. For the City of Yachats, the classification of customers is categorized as follows:

- 715 - Single-family residents, 80 percent of total users
- 136 - Vacation units, 15 percent of all users
- 37 – Classified as commercial.

It appears there are discrepancies among users in the volume of water consumed monthly. Single family residential dwellings on average use approximately 5.44 units or 4,000 gallons per month, with the commercial users' diverse consumptions total from 10,000 gallons to over 200,000 gallons per month. The large users account for approximately 52 percent of total water sales. One note to mention is the 7.5 percent of total produced water is used at the water and wastewater treatment facilities. This is mentioned to look at both water/wastewater system upgrades, cost associated with and revenues required for such projects.

Cost Evaluations:

If the total operating expenditures were equally divided per the number of consumers, the cost per user for the city would be \$70.94 per month. This simplistic approach immediately proves unfair due to the extreme averages of water consumed and the major differences between residential and commercial consumptions.

$$\text{\$755,900.00 divided by 12 months divided by 888 connections} = \text{\$70.94}$$

Believed as the highest priority regarding water costs, all consumers pay for those costs associated with the infrastructure that provides continued high quality, safe, clean drinking water. When determining the cost for water, equity centered on water consumption should be applied across the spectrum of users. Reclassifying users specific to meter size accentuates this point, relies on the price per unit and the amount of consumption per month. The intrinsic value associated with water service and the consumption of water during each billing cycle make up a fair and equitable rate for all customers.

Rates:

Water rate designs include city customers and outside urban growth boundary services, totaling charges necessary to generate a level of revenue to meet proposed budget forecasts for the water system. At this point, we reviewed the amount of water produced and divided the new expenditure line to determine the cost associated with producing a single unit of water (one hundred cubic feet or 748-gallons). Using the production numbers from 2019 and applying those same amounts to the new fiscal year expenditures, provides a way for the price per unit required to meet proposed expenditures. See Table 2:

Table 2: Cost per unit of production		
Annual Production of Water	Proposed Expenditures	Cost per 748 gallons (1 unit)
62,895 units (47,045,460 gallons)	\$755,900.00	\$12.02

Looking at the monthly allowance of water and applying the cost per unit to the number of units, two units at \$12.02 cost per, equates to \$24.04 monthly cost for the water department to provide this allowance. With a \$48.24 monthly base rate, one can speculate the favorable revenues for the water department at these consumption levels, but an additional consideration with total consumption is necessary to consider when the unit price (currently \$5.33) is less than fifty percent the production cost per unit.

When a typical residential bill has an average consumption of 5.44 units of water, operating cost to deliver those units would be \$65.38 dollars. This approach is applied when estimating the actual cost per residential customer, and revenues required to meet budgetary concerns.

One main interest within this study was the equitability of usage for all customers and their charges, respectively. Fairness across the user classification is often defined in a manner that low volume consumption should pay a fair share, while large consumers should not receive a volume discount.

Several methods to determine rates can be applied to a study, with the basic approach examining the base rates versus consumption (volume) rates. It is typically suggested that the base rate cover 60 percent-to-75 percent of the annual fixed expenses of the water budget, allowing the balance of revenues to be generated by what is termed a *volume rate*. The City of Yachats has executed sound practices in this area as current base rates equal 69.18 percent of the proposed budget.

Existing Rates:

This first step provides a concise view of the existing rates (both base and consumption rates) which currently provides an indication of the overall revenues generated using current water rates. The City of Yachats, with concerns of capital improvement planning, originally strategized with the idea of upgrades to the existing system using either \$100,000.00 or \$200,000.00 as a single line item for capital improvements for the proposed budget. Using the \$200,000.00 figure, the current production cost per unit of water tallied at \$12.02 per. Consideration towards maintaining the unit cost, comparing the total

monthly bills alongside the total units consumed, indicated a vast difference in the fair and equitable approach in rate applicability as it related to both residential and commercial accounts.

At the request of the City Council, a random comparison of the two inch and larger meters, using typical levels of consumption indicated the charge per unit of water ranged from \$5.78 - \$7.22 which is significantly lower than the current production cost at \$12.02 dollars per unit. With total water sale revenues from both base and consumption rates, the city is in good condition meeting 94.99 percent of the proposed budget.

First Findings:

In this example, the emphasis is not on the base rate, but how the price per unit influences, and plays a role in the total proposed budget. The increase in budgetary requirements to a total figure of \$755,900.00 is based upon sustaining capital monies for smaller annual projects, deemed short-term.

As the above proposed budget was confirmed, a review of the base rates from the commercial classification of users indicated a distortion in how base rates are applied. Similar sized meters had different monthly base rates. Discussions with staff indicated an unclear reasoning behind how the base rates were established, but they may have been originated by how much water was being consumed. Discovered were larger metered connections paying less than smaller metered connections.

Through this step of the process, two recommendations were provided for consideration: a) apply a meter multiplier to the base rate, which will also provide the same ratio of allowance of water for the user, and b) apply a tiered (increase block) rate for all consumption beyond the allowances stipulated with the meter ratios. This approach affords the exact per unit cost for all users, regardless of the size of the service connection for the base rates, then applies a conservation minded approach to the consumption rates. Table 3 makes available both the current monthly base rates and the Council affirmed base rate to be implemented. See page V

Another change recommended with establishing new rates is moving away from multi-line charges (capital improvement reserve) which determine total monthly costs. All figures recommended in the water rate study provides a single monthly base rate and consumption rate. The current consumption rate is a uniformed rate at \$6.00 per unit, with the potential to become a tier consumption rate. These figures were developed and calculated to include capital reserves as feathered into the consumption rate. This simplifies both the billing process and understanding of the monthly charge.

Meter Multiplier Base Rate:

Discovered during the water rate study, is the varied levels of monthly usage, as it was explained in an analysis submitted by the Public Works Commission, showing a great number of accounts using the minimum allowance of water, and twenty percent of the users consuming fifty percent of the deliverable water. Associated with the varying degrees of water usage, the cost per unit also had unique ranges. A unit of water (748 gallons) could cost one customer one amount, and a second customer could be paying a higher or lower per unit cost, which originated from current five categories of users by size and having ten different base rates.

The meter multiplier establishes for the City of Yachats uses American Water Works Association standard that relates a monthly cost based on replacement of a meter and adjacent infrastructure over the life of the meter. Table 3 on the following page shows a comparison of both current and recommended base

rates. a meter ratio applied to each of the meter sized base rates and two options for the consumption rate.

Option one, highlighted in columns 8 and 9, show new monthly costs associated with both a fixed consumption unit rate as well as a tiered structure based on levels of consumption, then compared to current costs, displayed in column 7. The key points from this table offer evidence how complex the current base rates are and the varied rates for the same type of user shown in column 2. One point that is usually overlooked is the understanding of the allowances, column 5, that matches the allowances in ratio to the recommended base rates that follow the meter multiplier. With the proposed budget set at approximately \$755,900.00 dollars, the expected unit cost would be \$6.00 for all water sold. The City Council has accepted the meter multiplier be applied to the base rates along with the unit cost be increased from \$5.33 per unit to \$6.00 per unit.

The tiered rate structure focused on conservation will be offered for the Council to entertain for July 2021 decision. This step pertains to the consumption side of revenues, which will add a conservation minded approach to the water rate structure. This method, "tiered block rate" is centered on the more water consumed, the increase per unit is applied. Oregon Association of Water Utilities will be looking at providing these figures to the city during the first quarter of 2021.

Table 3: Base Rate Comparison								
1	2	3	4	5	6	7	8	9
Meter Size	Mo. Base Rate	Mo. Base Rate		Allowances	Consumption Levels **		Using Tiers***	Unit Costs ^^
	Current Base Rate	New Base Rate*	Meter Ratio	With Base Rate		Current Costs	New Costs	New Costs
5/8"	\$ 48.24	\$ 48.24	5/8" = 1.0	2		\$ 48.24	\$48.24	\$ 48.24
5/8"	\$ 52.98	\$ 48.24	5/8" = 1.0	2	4	\$ 58.90	\$60.24	\$ 60.24
5/8"	\$ 61.87	\$ 48.24	5/8" = 1.0	2	6	\$ 69.56	\$73.24	\$ 72.24
					8	\$ 80.22	\$86.24	\$ 84.24
					10	\$ 90.92	\$100.24	\$ 96.24
1"	\$ 112.37	\$ 67.54	1" = 1.4	2.8		\$ 116.63	\$67.54	\$ 67.54
					6	\$ 133.69	\$86.84	\$ 86.74
					10	\$ 155.01	\$112.84	\$ 110.74
					15	\$ 181.66	\$148.34	\$ 140.74
2"	\$ 94.54	\$ 139.90	2" = 2.9	5.8		\$ 114.79	\$139.90	\$ 139.90
2"	\$ 133.15	\$ 139.90	2" = 2.9	5.8		\$ 153.40	\$139.90	\$ 139.90
2"	\$ 150.97	\$ 139.90	2" = 2.9	5.8		\$ 171.22	\$139.90	\$ 139.90
2"	\$ 305.69	\$ 139.90	2" = 2.9	5.8		\$ 325.94	\$139.90	\$ 139.90
					10 ^	\$ 175.79	\$165.10	\$ 165.10
					15 ^	\$ 202.44	\$199.70	\$ 195.10
					30 ^	\$ 282.39	\$298.20	\$ 285.10
3"	\$ 94.54	\$ 530.64	3" = 11.0	22		\$ 201.14	\$530.64	\$ 530.64
					45	\$ 323.73	\$680.14	\$ 668.64
					60	\$ 403.68	\$777.64	\$ 758.64
					90	\$ 563.58	\$977.64	\$ 938.64
4"	\$ 70.78	\$ 675.36	4" = 14.0	28		\$ 209.36	\$675.36	\$ 675.36
					50	\$ 326.62	\$807.36	\$ 807.36
					100	\$ 593.12	\$1,132.36	\$ 1,107.36
					150	\$ 859.62	\$1,482.36	\$ 1,407.36
					300	\$ 1,659.12	\$2,532.36	\$ 2,307.36

Notes

* - Applied meter multiplier to the base rate - starting point at \$48.24

** - Random levels of consumption and costs associated with usage

*** - Rates set using tier structure based on \$6.00, \$6.50, \$7.00

^ - Based on Base rates - \$133.15

^^ - Rates set using fixed unit costs at \$6.00 for all units of water consumed - 2 percent revenue with \$755K budget, or \$8.50 with \$855K budget

Water Rate Study

Introduction:

In July 2019, the City of Yachats authorized Oregon Association of Water Utilities to review current water rates. The purpose of this study is to develop examples of financial strategies and rates that:

- Provide adequate revenue to meet the operation and maintenance costs, capital improvement costs, as well as review contingency funding
- Determine and distribute costs among the various consumer types
- Are relatively simple to understand and implement, being consistent with industry practices

It is a privilege for Oregon Association of Water Utilities to provide this level of rate study assessment as a member service to the City of Yachats. When conducting a rate study, the best results are based on the most accurate data obtained, equity among the consumers, and revenues that meet demands and allow the water system to operate per state regulations.

After careful review of the written materials provided by the city's staff, along with discussions with key personnel, some points are necessary to mention to maintain continuity, they are:

- Changes in necessary monies for capital improvement
- Creation of a contingency fund for emergency purposes
- Existing expenditures based on billing unit of 748 gallons
- Monthly costs based on the number of active meter connections or 100 cubic feet (ccf)

After an extensive evaluation of current budget numbers regarding this rate study, it appears that an update/modification in the existing water rates are necessary to create a fair and equitable structure. The city has done well to meet the financial obligations in funding the operations of the public water system as routine annual adjustment of the water rates have been implemented. Reserves have been created for future capital improvement projects, contingencies, and for major maintenance and repairs. System Development Charges (SDCs) will not be part of this study, but it is recommended that they be reviewed on a regular basis.

A recommended contingency fund for emergencies may be 10 to 20 percent of the operational portion of the budget. This single line item (\$60,000.00) is 7.94 percent of the 2020-21 budget. These contingencies do not need to be expanded if not essential to match future endeavors. It is advisable to carry unused contingencies, and other revenues not expended, over to the next year's working capital expense line item, and again set aside a new contingency figure for the next budget year. The City annual adjustment of water rates follows the construction cost index, which has averaged 2.91 percent per year.

Several water rates examples and options for the City of Yachats' Council to review are included in this report. In addition to the general expectations of a water rate study, Oregon Association of Water Utilities considers policies, ordinances, and customer relations as factors in the development of water rates. Special interests, political climate, and an ease of understanding also play roles in the formation of rates.

Oregon Association of Water Utilities utilizes the information provided by the water system when performing a water rate study. The information includes the existing/adopted budget that consists of revenues necessary for O&M, personnel, contingency, capital outlay, loan debt service, and loan debt reserve fund if required. We also consider policies, practices, resolutions, and ordinances that have been adopted from an operational view, not a legal review or opinion. The system figures are based on an estimate from the existing records and future needs as discussed and is \$755,900.00 dollars.

Table 1: Proposed Budget Information		
Personnel and Materials Services:	\$447,900.00	
Sub-total:		\$447,900.00
Contingency Reserve/Transfers: ¹	\$60,000.00	7.94%
Annual Debt Service:	\$48,000.00	6.35%
Capital Outlay: ²	\$200,000.00	26.46%
Total Expenditures:		\$755,900.00
<small>1 – Contingency dollars are normally based on 10-20 percent of operating costs; actual rate is 7.94 percent of proposed budget. 2- Capital outlay should be adjusted annually based on prospective projects for the year(s) of succession</small>		

There are proposed approximately 888 active connections and eighty percent are residential customers. Also, included in the calculation of rates is the amount of averaged water produced at 47 million gallons or 62,900 hundred cubic feet (ccf) annually, the amount of water sold is 43 million gallons, or 57,900 ccf, and the unaccounted water is 3.7 million gallons. The unaccounted-for water is 7.9 percent is a significant achievement as most public water systems strive for 15 percent unaccounted-for water.

Originally, the primary purpose for a formal water rate study was to assist the city in developing a structure that is balanced for all users. Both the City Council and Public Works Committee had past rates and annual adjustments so the city could operate in the black. While reviewing revenues and expenditures, the primary emphasis was to a look at short-term (low costs) annual projects which can be supported through rates. By emphasizing annual short-term projects, we can increase maintenance of the water system and provide a report to the City Council.

Comparing annual production and delivery records of water against the operating expenses provides insight as to the efficiency of the water system. When viewed as cost per unit of water, 748 -gallons, the water system can determine the actual system cost as it relates to each consumer in a billing cycle.

Table 2, Cost per Unit of Delivery is figured on a running average of all water produced over a given period. When water is not accounted for through meter readings or other methods, it is seen as a 100 percent loss associated with the production cost for that delivered unit. The exception to this is when operations can provide accurate water usage relating to leaks, flushing, treatment plant operations and other maintenance tasks. This water is then considered non-billable used water rather than unaccounted for water. Water that cannot be sold should be considered potential lost revenues.

Table 2: Delivery Cost per Unit			
Total Expenditures: Used in this study			\$755,900.00
Water Production: 47 million gallons (62,900 ccf) units			
Unaccounted for Water: 3.7 million gallons (5,000 ccf) units			
Average cost per single unit (748 gallons)			
Expense per gallons	0.016	Current rate per 748 gallons	Potential Revenue ¹
Expense per unit	\$12.02	\$6.00 ²	\$347,400.00
1- Potential revenue based on selling 57,900 units of water at \$6.00 per unit or 45.9 percent of budget 2 - Current rate at \$6.00 was adopted during September 2020 Council meeting, increase from \$5.33			

Rate structures vary from utility to utility, but generally include three elements. First, is consideration of the classification of customers served, i.e., residential, commercial, and industrial. Second, all customers have an established frequency in billing; third, the schedule of charges will be identified and charged.

For water utilities using a cost-of-service approach, the level of the utility’s rates is a direct reflection of the utility’s costs and customer’s demands. The above table outlines this approach to reveal how water deliverables affects the overall revenue required.

Setting the base rate per size of connection, multiply by the number of connections, and then multiply by 12 (12 months/yr.) forecasts an amount that can be considered as revenue income to help ensure that most “fixed” annual expenditures are covered.

It is typically suggested that the base rate cover 60-75 percent of the annual water budget. This allows for the balance of revenues to be generated by what is termed a *volume rate*. The metered amount of water can be charged by a unit measurement in gallons or cubic feet. The meters, measure in one-hundred cubic feet (748-gallon unit) and a dollar amount can be charged per said unit.

In table 3, *Current Rate Information*, the City of Yachats revenues are derived from: the size and number of connections, the monthly base rate, allowance of water given in the base rate, if applicable, volume unit rates, and other miscellaneous revenues, i.e., late fees.

To recover the difference in revenues not earned in the base rate, the volume (consumption) rate income when added to the base rate income should meet the total revenue requirements. The current rate per unit of consumed water is \$5.33. The City now applies a construction cost index to both the base and consumption rates, fluctuating between 1.7 and 3.3 percent over the past four years.

The City of Yachats total revenues from existing rates is \$713,184.22 or 94.35 percent of the proposed budget at \$755,900.00. Base rates equate to 68.54 percent while providing 36.79 percent of the available water to be sold, while consumption revenues equate to 25.81 percent.

Table 3: Current Rate Information						
Service Connection Size (in.)	# of connections	Allowance (units)	Base Rate	Unit Rate Cost	Average Consumption	Typical Monthly Cost
5/8" Residential	715 ¹	2	\$48.24	\$5.33	5.44	\$66.58
5/8" Residential	164 ²	2	\$48.24	\$5.33 ²	10.00	\$90.92
2" Commercial	7	2	*	\$5.33	30.00	\$282.39
3" Commercial	1	2	\$94.54	\$5.33	60.00	\$403.68
4" Commercial	1	2	\$70.78	\$5.33	100.00	\$593.12
Total Connections	888					
Total Annual Base			\$522,925.08 ³			
Total Annual Consumption			\$195,127.54			
Combined Base and Consumption			\$718,052.62		94.99 %	
Proposed Budget			\$755,900.00			
1 – small number of users are outside city limits – base rate = \$72.37, 2 – Users are considered commercial accounts – unit cost is \$8.02 for outside city limits, 3- figure is based on 2" connection average monthly rate at \$129.38, *- see table 3 – page 5						

When developing a fair rate structure that meets the water system requirements, the rate study results, suggestions, and final decision are established on:

- Total revenues generated by base rates.
- Total gallons of water associated with the base rates.
- The price per unit that establishes equitability among all consumers.
- Amount of available water for sale and the price per unit.
- Total revenues generated by volume (consumption) rates.

Oregon Association of Water Utilities can use this information and apply it to various scenarios, providing a method to better understand the effects from various rate approaches.

Cost Evaluations:

If the total operating expenditures are equally divided by the number of connections, the cost per connection for the City of Yachats would be \$70.94 per month.

\$755,900.00 divided by 12 months divided by 888 users = \$70.94 per month

Consumers pay for those costs associated with the infrastructure that provides continued high quality, safe, clean water. When determining the cost for water, equity centered on water consumption should be applied across the spectrum of users, (meter size and classification of the connection) and this is accomplished through the price per unit and the amount of consumption per month.

Rate Study Approach:

Many diverse and competing models can be applied to any rate study, but when they are not well understood and evaluated, they can cause confusion among those that are affected by a change in the water utility rates. It is the goal of this water rate study to bridge key elements and provide an informational tool for the City Council and Public Works Committee in selecting an appropriate rate structure. Any rate structure has key components and aligning said approach, so it is easily understood and adopted.

Examples shown in this rate study are based on a single line budget to operate and maintain the city's water system. While there are many approaches to determining a monthly consumer's cost, this rate study uses a methodical style with the following points:

- Affordability Index – rates allowed by the affordability index and historical monthly costs ¹
- System Data – information relevant to the study
- Existing Rates – current revenues and expenditures, speculation of gains and losses.
- Recommended Rate – apply rates evenly regardless of total water consumption

The varied points will show base rates established, what percentage of revenues is generated from said base rates, and how consumption charges make up any revenue deficits. Examples provide both an amount of water included in the base rate and cost per unit of water consumed. Often as examples are presented, it will be likely that no single method satisfies all the requirements for every community.

Alternative rate structures identify aspects in rate studies that assist in highlighting the dynamics of the water system. Although rate structures are generally composed of three components, who is charged, how often and how much, additional attention is centered on the structure's consumption charge. Typically, there are four basic types of consumption charges: declining block, uniform block, inclining block, and seasonal.

As rates are adjusted, policy choices are the responsibility of the utility decision makers. Even though public involvement is not required to design a water rate structure, it is important to keep the public relations door open by allowing for comment at a public meeting, and following proper procedures for adopting policies, resolutions, or ordinances. This should take place prior to adopting rate policy by ordinance or resolution. The level of impact on the consumer, and the values and views of the decision makers plays a key role in sustaining rates that will meet the operation and maintenance of the City's water system, all the while maintaining and building customer trust.

Factors that affect forecasted revenues include the following: water conservation, weather, economic conditions, number of actual billable customers, etc. These are mentioned points to consider when forecasting revenue needs to meet budgeted expenditures.

The following information is designed to illustrate methods of approach that will expand the various examples and highlight specific points of relevancy. The focus with this water rate study is to build on all levels of understanding, create a fair and equitable approach for all consumers, and provide a rate structure frame for revenues for the water system to continue to operate.

1 - <https://www.oregon4biz.com/assets/docs/IFA/SDWhandbook.pdf>

Affordability Index:

The impact of water cost for median household incomes (MHI) for the area is the affordability index. A tool that state’s agencies review to determine loan interest rates, loan fees, any percentage of principal forgiveness (if possible), loan repayment periods and the effect on the single-family residential user. These are areas that may impact economically disadvantaged areas. A review of the index may be used to establish a pre-determined rate for a specific amount of water each month. For this rate study using the 2019 Median Household Income at \$49,293.00 and the 2019 Affordability Index of 1.25% (\$/Mo) for the 97498-zip code area, equates to \$51.34 for a monthly water bill. **See Table 4**

Table 4: Median Household Income Information					
Zip Code	Certified Population 2015	U.S. Census Population 2010	Annual Growth	MHI 2019	2019 Affordability Index 1.25%
97498	740	690	1.14%	\$49,293*	\$51.34
Information obtained from US Census Bureau American Community Survey 2018 – inflation adjusted for 2019, * - Average Household income - \$62,132 for Yachats service area					

Historical Rates:

The City of Yachats water rates were \$48.24 base rate per month for a 5/8-inch service connection and \$5.33 per unit (748 gallons) consumption rate for all users. This structured format is labeled a “uniform block” which gives a price signal to the customer based on increased usage, but the unit cost does not increase with higher consumptions.

The city used an annual adjustment; associated with the construction cost index, on both the base rate and consumption, which over the past four years averaged 2.91 percent increase or \$2.15 dollars. In July 2020, no adjustment to either the base rate or consumption rate was implemented due the concern of the COVID-19 pandemic. The city was looked at the impact on the community, lost revenues for operations and maintenance, and adjusted budgets to remain solvent for the rest of 2020.

System Data:

Information compiled in the “System Data” spreadsheet (see next page) outlines those factors that influence the monthly revenues based on the annual proposed operating budget. Water produced, water sold, and water losses are criteria that affect the rates. Relating the volumes of water to the operating expenses will define the cost per unit, either 1,000 gallons or 100 cubic feet (748 gallons).

The number of connections, the size of connections, and the monthly rates determine if a surplus or deficit in revenues is associated with the current rate structure. One important factor to consider is the amount of water allowed with the base rate. A larger allowance of water included in the base rate will lower the price per unit within the base, so any additional water will be at a higher cost per unit to deliver. All the information will be based on how much of the percentage of total expenditures is generated from the base rate. Consumption rates will be included in the existing rate spreadsheet. **(See Table 5: System Data)**

Table 5: System Data			
Total Gallons Produced		62,895 ccf	
Total Gallons Sold		57,921 ccf	
Cost per Unit (748 gallons)		\$12.02	
Base Rate Revenues		\$518,056.68	
Total Operating Budget	\$755,900.00	% of Total Budget	68.54

Additional information that relates to the initial review of the figures associated with the City of Yachats water rate study.

Table 6: Expensed Points			
Personnel / Materials	\$447,900.00		59.25%
Contingency	\$60,000.00		7.94%
Capital Outlay	\$200,000.00		26.46%
Annual Debt Service	\$48,000.00		6.35%
			Base Rate % Total Cost
TOTAL OPERATING EXPENDITURES	\$755,900.00		68.54%

The City’s last rate increase was July 2019, this follows the routine review of water rates the City Council has been implementing since 2016. The base rate percentage of total proposed budget falls in the range of 60 – 75 percent of fixed operating expenses. Currently, base rates are calculated using two figures, one which sets the base rate and a second figure added as a “Capital Improvement Reserve”. The new recommendation is to have the base rate designed as a single figure.



Water Rate Study
for
City of Yachats

System Data

For Year: **2020-2021**
Date completed: **December-20**

Amount of Water Produced
Amount of Water Sold
Non-Revenue Water

Gallons (annual)	100 Cubic Feet	Total Units Sold	
47,045,400	62,895		
43,325,128	57,921		
3,720,272	4,974		7.91%

Personnel / Materials
Contingency
Annual Debt Service
Capital Outlay
Proposed Annual Budget

Dollars	Cost per Gallon	Cost Per 1000 Gals	Cost Per 100 Cu.Ft.
\$447,900.00			
\$60,000.00			
\$48,000.00	\$0.01607	\$16.07	\$12.02
\$200,000.00			
\$755,900.00	Lost Production Cost		\$59,775.32

Connection Information
Base Rate Only

Size	# of connections			Vacation Rentals 5 services varied monthly cost Total Connections 888
	Residential	Commercial	Outside	
5/8"	704	28	11	
5/8"		136		
1"				
1 1/2"				
2"		7		
3"		1		
4"		1		
6"				

Current Rate information (base)

	Residential	Commercial	Outside	
5/8"	\$48.24	\$48.24	\$72.37	
5/8"		\$48.24		
1"				
1 1/2"				
2"		\$48.24	\$129.38	
3"		\$94.54		
4"		\$70.78		
6"				Base Rate Revenues \$518,056.68

Current Consumption Rate

Per 100 Cubic Feet 748 gallons per	Residential	Commercial	Outside
	\$5.33	\$5.33	\$8.02

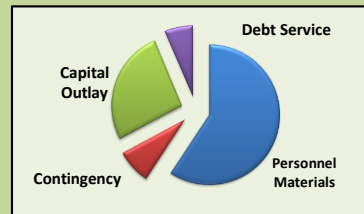
Operating Budget Outline

Personnel / Materials	\$447,900.00	59.25%
Contingency	\$60,000.00	7.94%
Capital Outlay	\$200,000.00	26.46%
Annual Debt Service	\$48,000.00	6.35%
TOTAL OPERATING EXPENDITURES	\$755,900.00	Base Rate % Total Cost 68.54%

Percentage of budget without any consumption revenue

Notes:

Last rate adjustment July 2019
Balance of reserves - \$162,000.00
Capital Improvement plans - 5-years - \$450,000.00 or \$90,000.00 annually - CIP set at \$200K annually
Contingency funded at 7.94 percent of budget
Base Rate actually \$45.99, \$2.25 is Capital Improvement Reserve - all meter sizes - inside city limits
Base Rate actually \$68.99, \$3.38 is Capital Improvement Reserve - all meters - outside city limits
Capital Improvement Reserve rates = 26 percent of proposed budget



Existing Rates:

The “Existing Rates” spreadsheet details much of the same information as the system data spreadsheet, plus expands the details on the adjustment of base rates. Applying revenues from consumption rates, allowance of water included in the base rate (if applicable) and the revenues generated by selling additional units of water. Since the City of Yachats provides an allowance of water in the base rate, the consumption charge begins once the allowance is consumed. Aligning the base rate revenue with the consumption revenue will show any surpluses or deficits of the current rate structure. Later examples will show water allowance with the base rate and how various base rates will give similar value level to the consumer. Included at the bottom of the “Existing rate spreadsheet” are residential figures of monthly rates supported by three hypothetical levels of monthly consumption.

Table 7: Existing Rates			
Total # of Connections	888		
Total Production of Water (annual ccf)	62,895^a	Sold Water (annual ccf)	57,921^b
Consumption Charge per Unit (1 - ccf)	\$5.33¹	Total Billable Units	36,609
Base Rate Revenues²	\$522,925.08	Revenue Percent	69.18%
Consumption Rate Revenues	\$195,127.54	Non-Revenue Water	3,720
Total Revenues	\$718,052.62	% of Total Budget	94.99%
Total Proposed Budget	\$755,900.00	Budget Shortfall	5.01%
Findings			
Cost Per Unit	\$12.02³	Allowed Units	23,088 (37%)⁴
Consumption Rate Revenues	\$277,517.76	% of Total Budget	37%
<small>a – Averaged units of water produced over past three years, b – average units sold over the past three years, 1- Averaged price sold among user groups, 2- Figure based on current base rates per month, 3- Cost per unit calculates total operating budget by total units in production, 4 – Allowed units is total units provided in allowance compared to total units produced,</small>			

The average consumer purchases approximately 5.44 units or 4,000 gallons per month, which equates to a water charge of \$66.58 per month. Approximately a third of all customers use 2-4 units, while ten larger customers account for 50 percent of all water sold. The water and wastewater treatment plants account for 7.3 percent of total water produced.



Water Rate Study for City of Yachats

Existing Rates

For Year: **2020-2021**
Date completed: **December-20**

Amount of Water Produced
Amount of Water Sold
Non-Revenue Water

Annual Gals	Annual Units CCF	
47,045,400	62,895	
43,325,128	57,921	
3,720,272	4,974	8%

Dollars		Cost per 1,000 gallons
Annual Operating Budget	\$707,900.00	
Debt Service	\$48,000.00	
Proposed Annual Budget	\$755,900.00	16.07

Connection information	Size	# of connections			Cost per 100 Cubic Feet	
		Residential	Commercial	Outside	12.02	
	5/8"	704	28	11	Vacation Rentals	
	5/8"	0	136	0		
	1"	0	0	0		
	1 1/2"	0	0	0		
	2"	0	7	0		
	3"	0	1	0		
	4"	0	1	0		
	6"	0	0	0		
						Total Connections 888
		2	2	2		

Consumption w/ base Water Allowance Current Rate information	Size	# of connections			33% increase	
		Residential	Commercial	Outside		
	5/8"	\$48.24	\$48.24	\$72.37	5 accts ave monthly base rate	
	5/8"	\$0.00	\$48.24	\$0.00		
	1"	\$0.00	\$0.00	\$0.00		
	1 1/2"	\$0.00	\$0.00	\$0.00		
	2"	\$0.00	\$48.24	\$129.38		
	3"	\$0.00	\$94.54	\$0.00		
	4"	\$0.00	\$70.78	\$0.00		
	6"	\$0.00	\$0.00	\$0.00		

Consumption Charge	per 748 gallons	\$5.33	\$8.02
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Current Base Revenue	Size	# of connections			Totals
		Residential	Commercial	Outside	
	5/8"	\$33,960.96	\$1,350.72	\$796.07	\$36,107.75
	5/8"	\$0.00	\$6,560.64	\$0.00	\$6,560.64
	1"	\$0.00	\$0.00	\$0.00	\$0.00
	1 1/2"	\$0.00	\$0.00	\$0.00	\$0.00
	2"	\$0.00	\$337.68	\$0.00	\$337.68
	3"	\$0.00	\$94.54	\$0.00	\$94.54
	4"	\$0.00	\$70.78	\$0.00	\$70.78
	6"	\$0.00	\$0.00	\$0.00	\$0.00
	Total/month	\$33,960.96	\$8,414.36	\$796.07	\$43,171.39
	12 mo. Total	\$407,531.52	\$100,972.32	\$9,552.84	\$518,056.68

Base Rate Totals	12 mo. Total	\$407,531.52	\$100,972.32	\$9,552.84	\$518,056.68
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% of operating budget		53.91%	13.36%	1.26%	68.54%
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Water with base charge	Total/month	1,408	346	22	1,776
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Water with base charge	12 mo. Total	16,896	4,152	264	21,312
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Total Water Included in Base Rate	12 mo. Total	21,312	36.79%
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Available Units to be sold		36,609
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Consumption Rate Revenues	Figured at \$5.33 per unit	\$	195,127.54
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Potential Lost Revenue Cost		25.81%
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Non-Revenue Units	3,720	\$59,775.32
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Total Revenue Generated	\$	713,184.22
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Annual Gain/(Shortfall)	\$	(42,715.78)
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Notes: MONTHLY USAGE -		-5.65%
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Approx 300 accts full-time average usage 2-4 units or 1,500 - 3,000 gallons		
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Approx 330 accts usage = 1 unit or 750 gallons		
--	--	--

100 accts usage = 6.5 to 16.5 units or 4,850 - 12,500 gallons		
---	--	--

10 accts usage > 200 units or 150,000 gallons		
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Typical Residential Water Bill	
Units of Water	Residential Water Bill
2.00	\$48.24
5.44	\$66.58
10.00	\$90.88

Preliminary Observations:

Expanding on “existing rates” using the figures provided by the city, some discoveries will be noted to enhance and support the methodology of a new rate structure.

- a) Approximately 7.91 percent of water is considered “non-revenue water” which for water operations is phenomenal. This amount of water equates to approximately 5,000 units of “non-revenue” water that correlates to \$60,000.00 of costs associated with water production
- b) With base rate revenues totaling 68.54 percent and current consumption rate at \$5.33 per unit or 25.81 percent; a shortfall of 5.65 percent. If the City Council wished to leave the current base rates as the July 2019 resolution, then the consumption rate would have to be increased to \$6.50 per unit for all consumers. For the average consumer using 5.44 units of water per month, this will increase the monthly charge by \$6.36 to balance the proposed budget
- c) When determining total revenue from consumption, the \$5.33 price per unit was applied to all consumed units, and cost per unit for outside users is \$8.02. Eleven users or 1.2 percent of customers are outside the city and are charged this increase per unit price for delivery, a small influence on the overall budget.
- d) Allowances of water account for 36.79 percent of total water produced, while the base rates equate 68.54 percent of total budget
- e) The first set of data provided early in the process outlined the largest monthly consumers. This information provided figures that could be related to new recommended monthly water rates and the impact on this class. While reviewing the largest consumers, operations for both the water and wastewater department impacts the revenues generated by the city as it relates to water consumed. This is non-revenue water. The two departments consume approximately 7.3 percent of total metered water or 4,275 ccf or 3.19 million gallons annually
- f) As stated in the above bullet (e) non billable water used by the water and wastewater departments account for 7.3 percent of total produced water. This equates to 4,275 units of water, annually. Normally this information is not calculated into the financial review, but the volume of water is enough to influence total cost of operations. If the units of water were taken from the “available water” category, the unit price for all water sold would increase from \$6.50 to \$7.35 per unit.
- g) Two-inch meters monthly base rates range from \$94.54 to \$305.69 (July2019) which when applying a meter multiplier (next example) all two-inch meters will be recommended at \$139.90 per month base rate. Category and meter size should be consistent for all customers in each class.
- h) The base rates for the largest two connections were substantially lower than smaller service lines, which may have been a front-end discount for total water purchased. A move towards cost-of-services approach, applying the support infrastructure to establish base rates, will provide a more fair and more equitable rate format
- i) See “Preliminary Observations” spreadsheet on the next page



Preliminary Observations

Rate Study for

City of Yachats

For Year: 2020-2021
Date completed: December-20

Amount of Water Produced	Gallons MG	Units
	47,045,400	62,895
	Amount of Water Sold	57,921
Non-Revenue Water	3,720,272	7.91%

Annual Operating Budget	Dollars
	\$707,900.00
	Debt Service
Proposed Annual Budget	\$755,900.00

Monthly Cost per Connection
\$70.94

Connection information	Size	# of connections		
		Residential	Commercial	Other
	5/8"	704	28	11
	3/4"	0	136	0
	1"	0	0	0
	1 1/2"	0	0	0
	2"	0	7	0
	3"	0	1	0
	4"	0	1	0
	6"	0	0	0
Consumption w/ base (gal.)		2	2	2
Current Rate (base)				

Cost per 1,000 gallons
16.07
Cost per 100 Cubic Feet
12.02

Connections
888

Size	Residential			Commercial	Outside
	5/8"	\$48.24	\$48.24	\$48.24	\$72.37
5/8"	\$0.00	\$48.24	\$48.24	\$0.00	
1"	\$0.00	\$0.00	\$0.00	\$0.00	
1 1/2"	\$0.00	\$0.00	\$0.00	\$0.00	
2"	\$0.00	\$48.24	\$48.24	\$129.38	
3"	\$0.00	\$94.54	\$48.24	\$0.00	
4"	\$0.00	\$70.78	\$70.78	\$0.00	
6"	\$0.00	\$0.00	\$0.00	\$0.00	

Consumption Charge ¹

per 748 gallons	\$5.33		\$8.02
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In-line with existing rates

Current Base revenue

Size	Residential	Commercial	Outside	Totals
	5/8"	\$33,960.96	\$1,350.72	\$796.07
5/8"	\$0.00	\$6,560.64	\$0.00	\$ 6,560.64
1"	\$0.00	\$0.00	\$0.00	\$ -
1 1/2"	\$0.00	\$0.00	\$0.00	\$ -
2"	\$0.00	\$337.68	\$0.00	\$ 337.68
3"	\$0.00	\$94.54	\$0.00	\$ 94.54
4"	\$0.00	\$70.78	\$0.00	\$ 70.78
6"	\$0.00	\$0.00	\$0.00	\$ -
Total/month	\$33,960.96	\$8,414.36	\$796.07	\$ 43,171.39
12 mo. Total	\$407,531.52	\$100,972.32	\$9,552.84	\$ 518,056.68

% of operating budget

	53.91%	13.36%	1.26%	68.54%
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Water with base charge

Total/month	1,408	346	22	1,776
12 mo. Total	16,896	4,152	264	21,312

Typical 5/8" Usage (gals)

5.44		4,275
------	--	-------

Total Water Included in Base Rate
36.79%

12 mo. Total	Residential	Commercial	Other	Total Base Revenue
	16,896	4,152	264	\$ 518,056.68
12 mo. Total			36,609	\$ 195,127.54
12 mo. Total				\$ 713,184.22

Available water to be sold
Consumption Revenues

Total Revenue Generated	\$ (42,715.78)
Annual Gain/(Shortfall)	-5.65%

Notes:
2" meter service monthly base rates range from \$94.54 to \$305.69
1 - Price per unit set to meet proposed budget - from \$5.33 to \$6.50 (Inside)
Consumption rate at \$5.33 and \$8.02, indicates a 5.65 percent deficit (\$42,715)
Average consumption per user per month = 5.44 CCF

Typical Residential Water Bill

Units of Water	Res. Water Bill
2.00	\$48.24
5.44	\$66.58
6.00	\$69.56

Meter Multiplier:

Generally, meter ratios are designed from two separate theories, a) meter multiplier cost ratios are used when assigning elements of costs specifically related to meters, and b) meter capacity ratios, are most often used when estimating the potential demand requirements from customers.

Customer costs by their meter-and-service ratios vary, depending on size of service pipe, materials used, locations of meters, and other characteristics for various sized meters as compared to 5/8-inch meter service. With a 5/8-inch meter being the starting point and using a one-to-one ratio, increasing the size of the meter increases those ratios as they relate to the cost for repair and replacement. Table 8 provides specific ratios.

Table 8: Meter Cost Equivalencies / Dollar Ratios		
Size (inches)	Equivalent Cost Meter Ratio ¹	Equivalent Dollar Ratios
5/8	1.0	\$1.00
3/4	1.1	\$1.10
1.0	1.4	\$1.40
1.5	1.8	\$1.80
2.0	2.9	\$2.90
3.0	11.0	\$11.00
4.0	14.0	\$14.00
6.0	21.0	\$21.00

1 – American Water Works Assoc – Manual M-1, Principle of Water Rates, Fees and Charges

A two-inch meter is typically 2.9 times more costly to repair and or replace during the service life than a 5/8-inch meter. If a 5/8-inch meter service costs the consumer \$10.00 per month, then a two-inch meter has a monthly rate at \$29.00.

Using this approach in determining costs associated with various meter sizes removes the distinction of class categorization, i.e., residential, commercial, or industrial. This approach places the emphasis on the size of meter and not user type. The size of the meter is the focus in determining appropriate monthly base rates.

Another focal point using a meter cost ratio is when a water allowance is given as part of the monthly base charge; they will increase proportionately with the cost ratios. A significant difference from the capacity ratio, especially as it relates to the larger meters. A two-unit allowance for a 5/8-inch meter would translate to (two-units multiplied by 2.9) 5.8 units of water allowance for a two-inch meter based on the cost ratio established using the American Water Works Association standards.

The city has done well with keeping the water rates in line with expenses. The meter equivalency structure, merges two methods into a single set of rates. Setting the rate for a 5/8-inch meter and aligning the cost to meet 60-75 percent of total expenditures. Using the ratios will synchronize the larger meters with the monthly base costs. Using the meter-multiplier cost ratio, the city's efforts on routine rate adjustments will allow the meter multiplier to be applied to the existing 5/8-inch meter base rate, then follow the ratios for applying base costs for the larger users.

Calculating all water provided in the base rate will better determine the amounts of available water to be sold. Water provided in the base rate is subtracted from the total water produced.

Using the meter multiplier approach to base rates, the city can apply the same theory to allowances of water. Current number of units provided in the allowance for all users is 21,312 which increases to 22,183 when applying the meter ratios to water allowance. The remaining available water being 62 percent (35,738 units) should be sold at a minimum of \$6.00 per unit.

Total base rate revenues obtained when the larger meters are formulated using the meter cost ratio increases base rate revenues up 2.03 percent or a total of 71.4 percent. The meter multiplier will be applied to fifteen larger accounts, that use a two-inch meter and larger. The remaining 28.79 percent of the proposed budget revenue will be generated by water sales. Tables 9 and 10 - provide specifics as it relates to the City Council implementing new rates based on meter size and the unit charged increased from \$5.33 to \$6.00 for inside city customers and \$8.02 to \$8.69 for outside city customers.

Table 9: Meter Multiplier Costs			
Total # of Connections ¹	888	Allowance	Two units ²
Base Rate ³	\$48.24	Annual Base Revenue	\$539,680.78
Total Allowance of Water		22,241 units (16.63 MG)	
Available Water for Sale		35,680 units (26.68 MG)	
Required Balance of Revenues	\$216,219.22	Total Billable Units	35,680 ²
Consumption Rate per Unit	\$6.00	Annual Consumption Revenue	\$214,082.96
		Total Revenues	\$753,763.74
			-2,136.26
Typical Monthly Cost (5/8" meter) (gals.) ³		5.44 units (4,000 gals.)	\$68.88
1 – Discovered during the writing of the rate study, 6-one-inch meters were thought to be 5/8-meters, 2- unit is 748 gals or 1,496 gallons allowance per month, 2 – 4,275 units are supplied to city entities as non-revenue 3 – 5/8-inch meter, inside city users			

Table 10: Meter Multiplier Base Rates Comparison									
1	2	3	4	5	6	7	8	9	10
Meter Size	Current Base Rate	Residential	Commercial	Vacation Rentals	Outside	Meter Ratio	New Base Rate	Allowed Units	Allowed Gallons
5/8"	\$48.24	698	28	136		5/8" = 1.0	\$48.24	2	1496
5/8"	\$72.37				11	5/8" = 1.0	\$48.24	2	1496
1"	\$67.54	5	1			1" = 1.4	\$67.54	2.8	2094
2"	varies*		7			2" = 2.9	\$139.90	5.8	4338
3"	\$94.54		1			3" = 11.0	\$530.64	22	16456
4"	\$70.78		1			4" = 14.0	\$675.36	28	20944
Notes									
* - two – inch meters current base rates range from \$94.54 - \$305.69									



MM Cost

Rate Study
for

City of Yachats

For Year: 2020-2021
Date completed: December-20

Annual Units				
Amount of Water Produced	62,895			
Amount of Water Sold	57,921			
Non-Revenue Water	4,974	7.91%		
Dollars				
Annual Operating Budget	\$707,900.00			
Debt Service	\$48,000.00			
Proposed Annual Budget	\$755,900.00			
Connection Information		# of connections		
Size	Residential	Commercial	Outside	
5/8"	698	28	11	
5/8"	0	136	0	
1"	5	1	0	
1 1/2"	0	0	0	
2"	0	7	0	
3"	0	1	0	
4"	0	1	0	
6"	0	0	0	
Consumption w/ base (gal.)	See Units Allowed (748 gals per)			
Gallons Allowed	Residential	Commercial	Outside	Meter Multiplier In Use
2.0	5/8" \$48.24	5/8" \$48.24	5/8" \$72.73	5/8" = 1.0
2.0	5/8" \$48.24	5/8" \$48.24	5/8" \$0.00	5/8" = 1.0
2.8	1" \$67.54	1" \$67.54	1" \$101.82	1" = 1.4
3.6	1 1/2" \$86.83	1 1/2" \$86.83	1 1/2" \$130.91	1 1/2" = 1.8
5.8	2" \$139.90	2" \$139.90	2" \$139.90	2" = 2.9
22.0	3" \$530.64	3" \$530.64	3" \$800.03	3" = 11.0
28.0	4" \$675.36	4" \$675.36	4" \$1,018.22	4" = 14.0
42.0	6" \$1,013.04	6" \$1,013.04	6" \$1,527.33	6" = 21.0
Consumption Charge	per 1,000 gals \$6.00		\$8.69	
Current Base Revenue	Residential	Commercial	Outside	Totals
5/8"	\$33,671.52	\$1,350.72	\$800.03	\$ 35,822.27
3/4"	\$0.00	\$6,560.64	\$0.00	\$ 6,560.64
1"	\$337.68	\$67.54	\$0.00	\$ 405.22
1 1/2"	\$0.00	\$0.00	\$0.00	\$ -
2"	\$0.00	\$979.27	\$0.00	\$ 979.27
3"	\$0.00	\$530.64	\$0.00	\$ 530.64
4"	\$0.00	\$675.36	\$0.00	\$ 675.36
6"	\$0.00	\$0.00	\$0.00	\$ -
Total/month	\$34,009.20	\$10,164.17	\$800.03	\$ 44,973.40
12 mo. Total	\$408,110.40	\$121,970.02	\$9,600.36	\$ 539,680.78
% of operating budget	53.99%	16.14%	1.27%	71.40%
Water with base charge	Total/month 1,410	421	22	1,853
	12 mo. Total 16,920	5,057	264	22,241
Typical 3/4" Usage	5.44	Percentage of Allowed Water		38%
Water Consumption	Residential	Commercial	Other	Base-Consumption Revenue
12 mo. Total	16,920			
Total Cost of Produced Water	12 mo. Total	5,057		
	12 mo. Total		264	\$ 539,680.78
Available Water to be Sold	Consumption Revenues		35,680	\$ 214,082.96
	Total Revenue Generated			\$ 753,763.74
	Annual Gain/(Shortfall)			\$ (2,136.26)
				-0.28%
Notes:	Typical Residential Water Bill			
Base Rate \$48.24, meter ratio applied = 71.4 percent of budget	Gallons Used	Res. Water Bill		
Water allowance in Base Rate = 22,241 units or 38 percent of avail H2O, 35,680 units for sale or 62%	2	\$48.24		
	5.44	\$68.88		
	10	\$96.24		

Increase Consumption Rate:

The approach taken in this example is a schedule of rates applicable to blocks of increasing usage in which the usage in each succeeding block is charged a higher unit rate. Currently the City of Yachats has what is termed a “uniform rate” structure as a single charge per unit of volume of water for all water used, regardless of the amount of water consumed. Increasing block rates are designed based on the customer classification determined by similar usage patterns. The design of the increased block rate will be categorized by the size of the meter. Each successive block rate “may” be applicable to a greater volume of water delivery than the preceding block(s).

This rate structure requires applying a judgment and utility policy regarding the number of blocks, the point at which one block ends and the next block begins, and the relative price levels of the blocks.

From the City Council’s workshops, the accepted figures base charge for a 5/8-inch meter user monthly rate will be set at \$48.24, with an allowance of 1,496 gallons (two-units). Larger metered connections will be provided with an allowance of water that correlates to the meter ratios applied to the base rates.

An example of this structure is: four-inch meter is 14.0-1 ratio to a 5/8-inch meter. If a 5/8-inch meter is allowed two units of water per month in the base rate, a four-inch meter is allowed 28 units of water per month. To eliminate the “judgement” factor for consideration in applying successive block volumes, each subsequent block(s) can be set in step with the previous block. The total number of tiers considered for an increase block formation will vary from one service provider to another, but normal design is configured using three tiers. The base rate and allowance of water reflect a representation of the actual usage that will determine the various set points of each block.

Conservative in nature, this method applied towards water rates creates an incentive to save water. Understand, that normal water consumption, if reduced by this approach, should later return to levels prior to the rate change. One facet in setting water rates is the fact that the total revenues are calculated from the average consumption figures and not on the expectancies of greater water sales.

Table 11: Tier Rate Recommendations						
1	2	4	5	6	7	8
Meter Size	Mo. Base Rate	Allowances	With Base Rate	Tier One \$6.00 per	Tier Two \$7.00 per	Tier Three \$8.00 per
	Base Rate	With Base Rate	With Base Rate	Tier One Range ^c	Tier Two Range ^c	Tier Three Range ^c
5/8"	\$ 48.24	2	2	2.1 - 4.0	4.1 - 8.0	8.1 +
5/8"	\$ 48.24	2	2	2.1 - 4.0	4.1 - 8.0	8.1 +
5/8" ^A	\$ 72.73	2	2	2.1 - 4.0	4.1 - 8.0	8.1 +
^B	Applied tier adjustments for outside city users			\$9.19	\$10.19	\$11.19
1"	\$ 67.54	2.8	2.8	2.9 - 5.6	5.7 - 11.2	11.3 +
2"	\$ 139.90	5.8	5.8	5.9 - 11.6	11.7 - 23.2	23.2 +
3"	\$ 530.64	22	22	22.1 - 44.2	44.3 - 88.4	88.4 +
4"	\$ 675.36	28	28	28.1 - 56.2	56.3 - 112.4	112.4 +
A - service connection base rate for outside city limits - (11 total users)						
B - Tiered rates for outside users synchronized with inside user increases						
C - Typical start-stop points at each step of the tiered structure.						

Table 11 – Tier Rate Recommendations shares a format that outlines the accepted base rates and allowances, plus offers a set of ascending steps of adjustment for each sized meter in service. Note the outside city service users have the same ascending steps, but cost per unit is reflective of the original price per unit.

Costs per unit are usually set according to actual usage of like groups. The group that usually sets the foundation will likely be the majority users, single family residences. In the analysis performed using the meter-multiplier example, proves if all available units can be sold at \$6.00 per unit, revenues will be marginally lower (0.28 percent) (-\$2,136.36) than the proposed budget. Taken from the “Rate Analysis 2020 V3” spreadsheet provided by the Water Committee indicates approximately 28 percent of users use less than two units of water, while 34 percent of users consume greater than 100 units of water.

The initial outline for a tier rate structure was to implement the \$6.00 per unit for the first tier, then consider modestly increasing the unit cost as the tiers increased. A three-tier structure should be more than adequate to fund two goals, a) both short projects, those defined and funded by the capital outlay amount and b) building reserves to compensate, subsidize funds for long-term projects, i.e., new raw water storage or moving the water treatment out of the Tsunami zone.

Water Consumption Chart:

As a precursor on the tier structure for the City Council to consider, a chart is presented that outlines respective monthly costs associated with various levels of water consumption and associating said tier rates for a three-tier format. These monthly costs are associated with columns six through eight in Table 11 on the preceding page.

The chart depicts three tiers as:

- Base Rate – white area, cost associated with replacement of water service infrastructure
 - Allowance of water is included in base rate
- Tier One – yellow area, monthly cost after allowance of water is subtracted
 - \$6.00 charge per unit
- Tier Two – orange area, tier two begins with associated levels for the sized meters
 - \$7.00 charge per unit
- Tier Three – blue area, tier three begins, continues at rate for all water consumed
 - \$8.00 charge per unit

The bold red consumption levels coincide with the meter-multiplier ratios implemented with the current base rates as voted and affirmed by the City Council during the September 2020 meeting. Not every level of water consumption combined with each sized meter is calculated, but those levels that are relative to past data applied in this rate study.

With this tiered format, “increased block rate” the objective is to meet proposed budget when the average usage per customer matches past data supplied by the City of Yachats, as well as the encouragement of water conservation. Discussions indicate the City’s concern with providing water demand to its customers during the months the raw water source is limited.

Water Consumption - Monthly Rate Comparison							
Connection Size	5/8	5/8	1.0	2.0	3.0	4.0	
Base Rate Water Allowance	2.0	2.0	2.8	5.8	22.0	28.0	
Base Rate	\$48.24	\$48.24	\$67.54	\$139.90	\$530.64	\$675.36	
Consumer Class	Above Base Rates include Capital Improvement Reserve						
Residential	698	0	5	0	0	0	
Commercial	28	136	1	7	1	1	
Outside	11	0	0	0	0	0	
Monthly Usage and Hypothetical Cost at Various Consumption Levels							
Base Rates	Tier One	\$6.00		Tier Two	\$7.00	Tier Three	\$8.00
Consumption Levels	Gallons						
2.0	1496	\$ 48.24	\$ 48.24	\$ 67.54	\$ 139.90	\$ 530.64	\$ 675.36
2.8	2094	\$ 53.04	\$ 53.04	\$ 67.54	\$ 139.90	\$ 530.64	\$ 675.36
4.0	2992	\$ 60.24	\$ 60.24	\$ 74.74	\$ 139.90	\$ 530.64	\$ 675.36
5.6	4189	\$ 71.44	\$ 71.44	\$ 87.14	\$ 139.90	\$ 530.64	\$ 675.36
5.8	4338	\$ 72.84	\$ 72.84	\$ 88.54	\$ 139.90	\$ 530.64	\$ 675.36
7.0	5236	\$ 81.24	\$ 81.24	\$ 96.94	\$ 148.30	\$ 530.64	\$ 675.36
8.0	5984	\$ 88.24	\$ 88.24	\$ 103.94	\$ 155.30	\$ 530.64	\$ 675.36
11.2	8378	\$ 113.84	\$ 113.84	\$ 126.34	\$ 177.70	\$ 530.64	\$ 675.36
11.6	8677	\$ 117.04	\$ 117.04	\$ 136.54	\$ 180.50	\$ 530.64	\$ 675.36
12.0	8976	\$ 120.24	\$ 120.24	\$ 139.74	\$ 183.30	\$ 530.64	\$ 675.36
13	9724	\$ 128.24	\$ 128.24	\$ 147.74	\$ 190.30	\$ 530.64	\$ 675.36
22.0	16456	\$ 200.24	\$ 200.24	\$ 219.74	\$ 253.30	\$ 530.64	\$ 675.36
23.2	17354	\$ 209.84	\$ 209.84	\$ 229.34	\$ 262.90	\$ 537.84	\$ 675.36
28.0	20944	\$ 248.24	\$ 248.24	\$ 267.74	\$ 301.30	\$ 566.64	\$ 675.36
35	26180	\$ 304.24	\$ 304.24	\$ 323.74	\$ 357.30	\$ 608.64	\$ 724.36
44.0	32912	\$ 376.24	\$ 376.24	\$ 395.74	\$ 429.30	\$ 662.64	\$ 787.36
45.0	33660	\$ 384.24	\$ 384.24	\$ 403.74	\$ 437.30	\$ 669.64	\$ 794.36
46.4	34707	\$ 395.44	\$ 395.44	\$ 414.94	\$ 448.50	\$ 679.44	\$ 804.16
47.0	35156	\$ 400.24	\$ 400.24	\$ 419.74	\$ 453.30	\$ 683.64	\$ 808.36
48.0	35904	\$ 408.24	\$ 408.24	\$ 427.74	\$ 461.30	\$ 690.64	\$ 815.36
56.0	41888	\$ 472.24	\$ 472.24	\$ 491.74	\$ 525.30	\$ 746.64	\$ 871.36
75.0	56100	\$ 624.24	\$ 624.24	\$ 643.74	\$ 677.30	\$ 879.64	\$1,023.36
88.0	65824	\$ 728.24	\$ 728.24	\$ 747.74	\$ 781.30	\$ 970.64	\$1,127.36
106.0	79288	\$ 872.24	\$ 872.24	\$ 891.74	\$ 925.30	\$ 1,114.64	\$1,271.36
112.0	83776	\$ 920.24	\$ 920.24	\$ 939.74	\$ 973.30	\$ 1,162.64	\$1,319.36
120.0	89760	\$ 984.24	\$ 984.24	\$1,003.74	\$ 1,037.30	\$ 1,226.64	\$1,383.36
138.0	103224	\$ 1,128.24	\$ 1,128.24	\$1,147.74	\$ 1,181.30	\$ 1,370.64	\$1,527.36
157.0	117436	\$ 1,280.24	\$ 1,280.24	\$1,299.74	\$ 1,333.30	\$ 1,522.64	\$1,679.36
208.0	155584	\$ 1,688.24	\$ 1,688.24	\$1,707.74	\$ 1,741.30	\$ 1,930.64	\$2,087.36
230.0	172040	\$ 1,864.24	\$ 1,864.24	\$1,883.74	\$ 1,917.30	\$ 2,106.64	\$2,263.36
260.0	194480	\$ 2,104.24	\$ 2,104.24	\$2,123.74	\$ 2,157.30	\$ 2,346.64	\$2,503.36
392.0	293216	\$ 3,160.24	\$ 3,160.24	\$3,179.74	\$ 3,213.30	\$ 3,402.64	\$3,559.36

Annual Rate Adjustments:

The City of Yachats has worked diligently in developing water rates that are both sustaining to the water department to perform the necessary operations, also mindful of the consumers. Each year the city would review the “construction cost index” (CCI) and apply an increase percentage to the base rate, capital improvement reserve and the water consumption cost.

A viable alternative to the CCI is the “consumer price index” (CPI) that can extract specific costs associated with water and sewerage maintenance prices and inflation. Looking at specific costs as it relates to the previous year(s) and can be quite different from the overall CPI, or overall inflation rate.

The link below offers the City a method to follow the CPI as it relates to water and sewer inflation and apply any adjustment to the base rate.

<https://www.in2013dollars.com/Water-and-sewerage-maintenance/price-inflation/2010-to-2020?amount=20>

Key indicators that will adjust the operational cost for the fiscal year is the listing of capital improvement plans (short-term) to be completed within the timeframe. Timelines for completion of short-term projects can align with City Council elections, where Council members terms coincide with project completion.

The City of Yachats has a single line budget for CIP at \$200,000.00 which will support current projects, while future project list changes each year. The purpose of the single budget line item is to support and maintain those projects which develop in the upcoming years.

This single budgeted line item will vary with each year's analysis, as projects are completed, tabled to the subsequent year, or rescinded. Employing a set figure for capital improvement planning maintains consistency in the budget. A major impact to budgeting is the inevitable large project that is usually projected over a timeline of a loan repayment program. Large projects are usually the component that increase rates significantly, causing uneasiness for most involved with establishing the annual budget.

Summary:

There are various arrangements that can be used to reach an acceptable water rate that meets budgetary requirements. The uniqueness of communities creates challenges that may or may not work from community to community. Whatever the cost associated with providing water from the source to the consumer's tap, usually varies from one water system to another. The variables associated with other water systems may not apply to the City of Yachats. A new water system completed without any debt owed is rare. The age of a water system plays a bigger role in determining future cost since rebuilding is often more expensive than new construction.

The importance of looking at the future regarding system growth and repair, or replacement of aging components, and determining an evaluation of costs can be challenging. Proposed costs are often lower than actual costs due to various circumstances. It is important for public relations and communications to play a role in preserving consumer confidence in both water quality system operations and management.

Covered facts discovered in the initial assessment were two: a) the variations in base rates created an unequal cost per unit of water delivered, b) the price differentiation in the unit price for 748 gallons of water (one hundred cubic feet), with current per unit charge at \$5.33 as compared to \$12.02 production unit cost.

Pertaining to the examples presented in this rate study, the City of Yachats has chosen a two-step approach, with implementing a meter multiplier to establish new base rate, while employing the same ratios for water allowances and applying a slight increase to the unit cost. The following are recommendations:

- Begin an annual review of prioritized smaller projects and costs
 - Apply the findings against the identified short-term capital improvement projects
 - Adjust projects to match single line-item funding, or adjust capital improvement figures

- Review CPI figures and adjust the “base rate” according to the inflation index for water and sewerage maintenance.

These suggestions create formality in the water rates; using absolute ratios to apply base rates and allowing the City to adjust the rates in the future. Using one of the industry standards of having the base rate meet 60-75% of proposed budget, the City has performed well to maintain fixed cost revenues.

The City of Yachats has requested the Oregon Association of Water Utilities to suggest how to conclude an annual adjustment for the city’s monthly water rates, which is accomplished by using the CPI. The aspect of water rates determination relative to future cost can be difficult to forecast.

As the City chooses to implement the proposed rates, the homework in tallying up production costs figures, water sales, non-revenue water, and expenditures will begin to confirm that the “in theory” ideas presented in this study meet the “reality” of water system operational costs and revenues during the subsequent year.

It is our experience that applied fair and equitable rates provide a tool for the City of Yachats to continue service. The knowledge learned from past studies as priority one is the continued responsibility to review and evaluate recent established rates and ensure the City is on track to make necessary adjustments that balance expenditures against revenues.

As collected evidence presents itself during the subsequent year, the Oregon Association of Water Utilities will return, if called upon, to review and confirm the effectiveness of the chosen rate scenario, thus assuring the goals presented in this water rate study.

With numerous considerations and decisions being calculated with this rate study, it is an objective of Oregon Association of Water Utilities to assist the City of Yachats towards a sufficient water rate to meet the needs of the water system, provide fair and equitable rates for all consumers, and to ensure the water system is poised for the future.