



Water Rate Study

City of Yamhill

Final Report

August 2023



Prepared by:
Oregon Association of Water Utilities

Table of Contents

Executive Summary	i-vii
Introduction	1
Cost Evaluation	5
Rate Study Approach	5
Affordability Index	6
Historical Rates	7
System Data	7
System Data Spreadsheet	9
Existing Rates	10
Existing Rate Spreadsheet	11
Preliminary Observations	12
Preliminary Observations Spreadsheet	13
Meter Multiplier	14
Meter Multiplier Spreadsheet	16
Increased Consumption Rate (Ascending Blocks)	17
Ascending Rate Spreadsheets	20-22
Annual Rate Adjustments	23
Summary.....	24
Table 1: Proposed Budget Information	2
Table 2: Cost per Unit for Delivery.....	3
Table 3: Current Rate Information	4
Table 4: Median Household Income	7
Table 5: System Data	8
Table 6: Existing Rates	10
Table 7: Meter Cost Equivalencies/Dollar Ratios.....	14
Table 8: Meter Multiplier Revenues.....	15
Table 9: Rate Comparison Current vs Proposed.....	18
Table 10: Tiered Structure Volume Steps	19
Table 11: Annual Rate Increase	24
Chart: Water Consumption Monthly Rate Comparisons.....	26
Chart: Example Water Tracking Chart.....	27

EXECUTIVE SUMMARY

The City of Yamhill called upon the Oregon Association of Water Utilities to conduct a water rate study to determine the adequacy of the water rates in conjunction with the adopted budget for the 2022-2023 fiscal year and anticipating the 2023-2024 budget is similar. With subsequent adjustments for the years 2024-2027, use of the consumer price index will provide examples of such adjustments. 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 water rate study stems from a justification of a single expenditure line created and managed by the city's administration office and the public works department. This figure includes personnel services, materials, and services, contingency funding, capital improvement and debt service. The capital improvement costs are reviewed in this study and implemented to align system costs to future rates. The current rates are figured using a base rate and consumption rate deployed to create revenues that match total expenditures. The rates are calculated on a single unit of water, one thousand gallons.

As water usage is charged per 1000 gallons, there is four units (4,000 gallons) allowance provided in the base rate. Table 1: Current Rate Information is a snapshot of the classification of users, numbers within each class and their respective costs associated with the 2023-24 proposed budget. The shortfall stems from the proposed budget and its requirements as it relates to future debt service.

Service Connection Size (in.)	# of connections	Allowance (Units) ¹	Base Rate	Unit Rate Cost	Average Consumption	Typical Monthly Cost
3/4 Residential	523	4	\$66.62	\$4.70 ²	5.70 ³	\$74.63
3/4 Residential - out	51	4	\$80.63		5.70	\$90.32
3/4 Commercial	0	0	NA		NA	NA
1.0 Commercial	2	0	\$45.47		NA	NA
1.5 Commercial	0	0	\$58.73		NA	NA
2.0 Commercial	11	0	\$94.55		NA	NA
3.0 Commercial	2	0	\$358.10		NA	NA
4.0 Commercial	4	0	\$455.87		NA	NA
Total Connections	246	NA		NA		
Total Annual Base			\$551,287.44 ⁴			
Total Annual Consumption			\$135,203.04			
Combined Base and Consumption			\$686,490.48	60.51 % ⁵		
Proposed Budget			\$1,134,492.00			
1- 4 units = 4,000 gallons, 2- Tier one price per unit at the onset of consumption, 3 – Average monthly usage – single family residential - SFR						
4 – Annual base is all monthly fees for all connections, minus revenues from water sales, 5 – based only on new budget, not past budget(s)						

The City of Yamhill currently uses a meter and water consumption for water revenues, the total number of service connections is 603. The City of Yamhill serves ten (10) outside water districts with varied size service connections from 1-inch to 4-inch meters All sized service connections within the city limits are charged a set base rate, while the commercial service connections are charged according to the size of the meter.

The proposed format will simply use the number of service connections the water system serves, then consider the base rate determined by the size of the meter. The meter base rate recommended with this study applies a meter ratio according to American Water Works Association (AWWA) meter ratios as it relates to infrastructure replacement costs. Meter multiplier format will be clarified on page 14 in the main document.

Current Revenues / Expenditures:

Proposed revenue requirements for the fiscal year 2023-2024 are \$1,134,492.00. This budget is aligned with a debt service at \$283,000.00 per year for the next three years. It is an adjusted cost, fixed over three years to reflect the higher priority projects listed in the AKS Engineering report. A series of scenarios were developed to align with future projects, scenarios that applied designated reserves for a prioritized list of capital projects, with an emphasis of the distribution areas with the highest concern for water loss.

The base rate revenues equal \$551,287.44 or 48.59 percent of the total proposed budget. Common practice when budgeting for a water fund is to have base rates cover fixed expenditures, which range from 60 – 75 percent, pending the size of the water system relating to total number of service connections. An annual adjustment to the base rate should be initiated, the last adjustment was September 1, 2022. The 2022 increase to the SFR user was 9.1 percent to the base rate and \$0.68 per 1,000 gallons of consumed water.¹ Using the Consumer Price Index (CPI) adjustments to water rates can match fluctuations corresponding to inflation but will not likely cover expenses associated with capital planning expenses. More details about the CPI will follow in the main report.

The existing consumption rate (a charge per unit of water) is \$4.71, with four (4) units of water allowance in the base rate for only residential customers inside the city and \$5.70 per, outside city. Considerations in creating an “increased block rate” will be provided as a means to affiliate with Oregon Water Resources rules on water conservation.

Consumption revenues equal 11.92 percent of the proposed budget or \$135,203.04 dollars. The combination of base and consumption rates total 60.51 percent of the proposed budget or \$686,490.48 dollars, with a shortfall of \$448,001.52.

The single imbalance discovered during this study is the charge per unit rate at \$4.70 per unit, while the delivery costs per unit incurred by the City is established at \$14.34 per unit. An example of the imbalance is:

- 4,000 gallons allowance – cost of production / delivery - \$57.36
- Base rate charge including 4,000 gallons - \$66.62 or \$9.26 positive revenues
- 8,000 gallons consumption – cost of production / delivery - \$114.72
- Base rate charge with consumption charges - \$85.46 or \$-29.26 negative revenues

1 – Taken from 2016-2022 price adjustment chart

User Characteristics:

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

- 523 - Single-family inside residential (SFR) = 87 percent of total users.
- 51 – Single-family outside residential.
- 18 - Classified as commercial (inside).
- 11 – Classified as commercial (outside) Water districts

Cost Evaluations:

If the operating expenditures were equally divided per the number of consumers, the cost per user for the city would be \$156.78 per month. This simplistic approach immediately proves unfair due to the average amounts of water consumed varying among all users.

\$1,134,492.00 divided by 12 months divided by 603 connections = \$156.78

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, consumption should be the decisive reason and applied across the spectrum of users, (meter size and classification of the connection). This is accomplished by means of determining 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 rate for all customers.

Rates:

Water rate designs involve outlining 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 purchased and divided the new expenditure line to determine the cost associated with producing a single unit of water (1,000-gallons). Using the production numbers from 2020-2022 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 1000 gallons (1 unit)
79,128 units (79,127,909 gallons)	\$1,134,492.00	\$14.34

The monthly allowance of water is reviewed and weighed against the current rate structure and a suggestion will be recommended in this water rate study. The position will be elaborated to demonstrate the impact from an allowance of water.

If two units of water were provided as an allowance in the current rate structure, the total expense incurred by the city would be \$28.68 ($\14.34×2) while the current rate is \$66.62 per month. A positive revenue is incurred for 90 plus percent of the users.

The average usage (5.7 units – 5,700 gallons) has an actual cost associated with delivery of water is \$81.73, while the current charges for 5.7 units will be \$84.04. If the four (4) unit allowance remains, the current monthly bill is \$74.62 or a negative revenue at \$7.10, showing an imbalance in the current rate structure. The discrepancies are only exacerbated as higher volumes of water are consumed. When the unit production cost (currently \$14.34) is more than the unit sold price, an adjustment in the rates is necessary.

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 covers 60 percent-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 Yamhill should execute sound practices in this area as current base rates equal 48.59 percent of the adopted 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 Yamhill first priority request was discerning a comparable rate for low volume users, an upcoming increase of debt service and an overall equitable approach to water rates.

Discovered were the various base rates applied to the classification of users, formatted in larger monthly base rate for the larger service connections. Current base rates assessed, and ratios utilized that correspond to industry standards were unable to be determined. The meter ratios provided with this water rate study will be provided and suggested with new proposed base rates.

Preliminary Observations:

In this example, the emphasis is on both the base rate and per unit charge, consumption rate, and how the price per unit influences, plays a role in the total proposed budget. The increase in budgetary requirements to \$423,000 (originally) was based on sustaining capital monies for the capital improvement projects (CIP) and debt for only the next three years. This figure was adjusted downward to \$395,483.00 to simply allocate \$283,000.00 for capital outlay. Necessary for the selected projects was annual funding at \approx \$360,000.00, which is achieved by using the \$80,000.00 contingency funds.

As the above proposed budget was confirmed, a review of the base rates from respective classes of users indicated a skew in relevancy according to the size of the meter. The oversight in this approach is the comparison of the same sized metered connection, yet the application is dissimilar.

With a review of the consumption rate charge, a significant increase in the unit rate is required. If no decision is made to adjust the base rates according to the various classes of users; they remain the same, then a minimum charge per unit should be increased to \$14.75 per unit. The current consumption charge per unit is \$4.71 which creates approximately \$135,000.00 (12 percent) in revenues. Consumption rates with the current base are required to cover approximately 53.7 percent of the capital required with the adopted budget.

Base rates and fixed expenses were mentioned earlier to meet a minimum 60 percent of the adopted budget and currently equates to 48.59 percent, or 12 percent below the likely range. In order to establish a minimum 60 percent base rate, the monthly fee for SFR home be raised to \$94.07, substantially increasing the current rate. This, even on a two-step (multi-year) course, would be too much for the customers. Each monthly rate would be increased \$14.00 annually for two consecutive years. The recommended base rate for the SFR user would be \$78.39 or \$11.77 increase per month.

Meter Multiplier Base Rate:

Discoverable during the water rate study is the multi-levels of base rates, a) inside users and b) commercial users and c) outside users. Derived from the estimating base rate methodologies, water usage applied to a varied number of connections would be considered inconsistent. A comparative example is looking at SFR dwellings (one single home vs apartment dwelling). The apartment would use less water as the footprint is much smaller. Even though the similarities are evident, the total amounts of water are not.

The meter multiplier advocated for the City of Yamhill uses a 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 sized meters.

The allowances (if applied) associated with the recommended rates will follow the same meter multiplier assigned to the base rates. A three-inch meter service will receive a substantial more allowance of water than the SFR, 5/8-inch by 3/4-inch meter, thus creating a fair approach to this structure. Currently only residential users are provided a water allowance.

Using experienced approaches for community water systems, the base rate is calculated by establishing a rate for the majority of users (SFR) and centering the initial cost on the fixed expenses associated with the annual budget.

Table 3: Rate Comparison Current vs Proposed

Current Base Rates					
	Residential	Commercial	Outside	Metered	Allowances
5/8"- 3/4"	\$ 66.62	\$ 35.82	\$ -		4000
5/8"- 3/4" out		\$ -	\$ 80.63		4000
1"		\$ 45.47	\$ 68.23		
1 1/2"		\$ 58.73	\$ 88.11		
2"		\$ 94.55	\$ 141.82		
3"		\$ 358.10	\$ 537.14		
4"		\$ 455.87	\$ 683.80		
Tiers	Consumption Units		Tier Cost per Unit		
Tier One	4001+		\$ 4.71		
Tier Two	NA				
Tier Three	NA				
Tier Four	NA				
Proposed Rates				Uses Water Meter Ratios ¹	Allowances ²
	Residential	Commercial	Outside		
5/8"- 3/4"	\$ 78.39	\$ 94.07	\$ 94.07	1.0 - 1	4000
5/8"- 3/4" out		\$ 103.48	\$ 94.07	1.0 - 1	4000
1"		\$ 131.70	\$ 131.70	1.4 - 1	NA
1 1/2"		\$ 169.33	\$ 169.33	1.8 - 1	NA
2"		\$ 272.80	\$ 272.80	2.9 - 1	NA
3"		\$ 1,034.78	\$ 1,034.78	11.0 - 1	NA
4"		\$ 1,316.99	\$ 1,316.99	14.0 - 1	NA
Tiers	Consumption Units - 3/4-inch ³		Tier Cost per Unit ⁴		
Tier One	4001 - 8000		\$ 9.50		
Tier Two	8001 - 12000		\$ 11.40		
Tier Three	12001 +		\$ 13.68		
Tier Four	NA		NA		
Monthly Rate Comparison					
	Current		Proposed		Difference ⁵
Gallons Used	Res. Water Bill		Res. Water Bill		
4,000	\$ 66.62		\$ 78.39		\$ 11.77
5,700	\$ 74.63		\$ 94.40		\$ 19.78
8,000	\$ 85.46		\$ 116.39		\$ 30.93
1 - American Water Works Association standard for meter multiplier (replacement costs)					
2 - Overage charges begin after allowance has been consumed					
3 - Tiers structures to coincide with average usages, with each additional step following allowances and meter ratios					
4 - Consumption rates set for inside district limits, with outside rates at 20 percent higher.					
5 - Cost difference for a monthly user inside the district service boundary, using 3/4-inch service, average usage amount					

Consumption Rates:

With an attempt to set base rates at 50 percent of proposed budget being generated from the base rates, a new SFR base rate would be \$78.39 or \approx \$11.77 higher per month. The focus now moves to the consumption side of this structure. Additional monies (50 percent) must be generated from the sale of water. When calculating the balance of required revenues from the per unit charge, minimum charge per unit was factored at \$9.50 (inside- user) and \$11.40 (outside user).

The minimum unit rate at \$9.50 per unit (inside) will deliver a balanced budget based on the \$1,137,781.25 proposed budget. Once again, looking at an average usage of 5.7 units of water for an SFR, an average water bill per month would be \$94.54, up from the current \$74.63.

To explain the impact of the various factors (base rates, consumption rates, allowances) in the structure, if the allowance were lowered to 2 units (from 4 units) the above minimum unit rate at \$9.50 could be lowered to \approx \$7.00 per unit. The difference in the monthly costs using 5.7 units (typical SFR usage) \$94.54 vs 2 units \$104.29. If a customer were conscientious about water usage, the water bill can be a minimal increase to approximately \$85.00 per month or an increase of \$19.00 per month for SFR user.

The two points of imbalance for the City of Yamhill's water rates are a) the delivery cost at \$14.34 per unit and the charge rate at \$4.71 per unit, b) a base rate that simply generates 48 percent of the budget

The current \$66.62 per month essentially covers 4.6 units of water, then any additional water is sold at a 67 percent discount to the production-delivery costs. At \$66.62 per month, only 48 percent of the budget is covered by the base rates but applying the new SFR monthly rate at \$78.39 per month, then using the meter ratios for larger service connections raised the percent of budget to 66 percent.

For the City of Yamhill, two directions can be established, a) leave the current base rate as they are (no meter ratios) and increase the consumption rate per charge from \$4.71 to \$11.50 for tier one. A three-tier increased block rate structure will be provided in the main report.

If adopting the new recommended base rates for SFR users, applying the meter ratios, the tier one per unit rate would be increased from \$4.71 to \$9.50 per unit.

The main body of the water rate study will be set on the criteria finalized by the City Council with the figures previously portrayed in the executive summary changed to best apply rates that will be fair for all users. The small volume of purchased water will pay the minimum while those larger volume users will pay according to the amount of additional water consumed.

During the writing of the water rate study, Oregon Association of Water Utilities was informed the decision to simply increase the water rates upward by 4 percent for both the base rate and consumption rate using the cost-of-living consideration as its measurable element. This decision will eliminate the ability to generate revenues to pay for the capital improvement planning the water system requires to maintain mechanical integrity. The annual CIP established during the water rate study was \approx \$360,000.00, earmarked for specific projects mentioned in the body of this report.

Water Rate Study

Introduction:

In July 2022, the City of Yamhill authorized the 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 the Oregon Association of Water Utilities' privilege to provide this level of rate study assessment as a member service to the City of Yamhill. 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 1,000 gallons.
- Monthly costs based on the number of active meter connections and 1,000-gallon units sold.

Current budget numbers regarding this rate study indicate that a modification in the existing water rates is necessary to create a fair and equitable structure. The last formal rate review was effective July 1, 2016, with routine informal adjustments made annually.

Reserves have been created for future capital replacement 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. The contingency for the City of Yamhill is zero percent of the 2022-23 budget, the original fiscal year the study is constructed on.

As the new fiscal year approached, the figures utilized, if unchanged, would apply to the 2023-24 fiscal year. These contingencies need to be expanded to compensate for an eventual emergency incident. It is advisable to carry unused contingencies not expended over to next year's working capital expense line item.

The following fiscal year set aside a new contingency figure for the next budget cycle. The City’s water rate adjustment was arbitrarily applied when it was deemed necessary. Oregon Association of Water Utilities will recommend an annual adjustment based on the basket of services entailing water, sewer operations and maintenance.

Several water rates examples and options for the City of Yamhill’s 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 that is most pertinent 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 upon as close an estimate as can be determined from the existing records and future needs as discussed and outlined in the proposed budget.

The \$360,000.00 CIP line-item budget was a median cost associated with projects outline in the Water Master Plan. As projects are completed, using the same budgeted dollars each year, unexpended dollars can be rolled into the upcoming fiscal year, while additional projects are chosen, listed for completion.

Using the above figures estimates the overall system charges for water will equate to ≈ \$4.55 per 1,000 gallons, which can be averaged over the base rate, consumption rate or a combination of the two. Applying the CIP dollars to the consumption rate will prove the fairest method as consumers can control the water usage and manage their monthly water bills.

Table 1: Proposed Budget Information		
Personnel and Materials Services:	\$555,342.00	48.95%
Sub-total:		\$555,342.00
Contingency Reserve/Transfers: ¹	\$80,000.00	7.05%
Capital Outlay:	\$283,000.00	24.95%
Annual Debt Service: ²	\$216,150.00	19.05%
Total Expenditures:		\$1,134,492.00
1 – Minimum contingency should be ≈ \$50K, annual debt remains unless long-term loan is required to complete list in CIP.		

Additional pertinent information is as follows: approximately 603 active connections with an approximate ninety plus percent of customers are classified single family residential (SFR). Also included in the calculation of rates is the amount of averaged water produced at approximately a) 79.1 million gallons

(MG) or 79 K units (1,000-gallons) annually, b) amount of averaged water sold at 68.1 MG, or 68.1 K units, and c) amount of averaged unaccounted for water at 11.1 MG. The remaining unaccounted-for water at 14 percent is a significant achievement, as most public water systems strive for 15 percent or less unaccounted-for water.

While reviewing revenues and expenditures, the primary emphasis was directed at a) fair and equitable rates for all users, b) assure no single classified group supplements another group, c) low volume usage customers would maintain a relatively set monthly rate.

The concept of emphasizing annual short-term projects is in providing funding of maintenance for projects often tabled for a later time. This step coordinates completion of projects for the water system during the timeframes the City Council adopts resolutions for monies allocated for such. The City’s approach to short-term (low cost) projects is balancing monthly revenues against necessary maintenance. These small projects, short-term CIP, should be considered paid for through the water rates.

Two factors hinder routine maintenance, a) monies necessary to complete smaller projects to upkeep the system, i.e., equipment services and b) time allocation of the existing crew, i.e., only enough time per day to complete existing tasks. Either a lack of funds and or no time for the crew to include routine maintenance causes a ripple effect that leads to reactionary maintenance, i.e., emergencies.

Annual production and delivery of water provides insight as to the efficiency of the water system when correlating deliverables against the total operating expenses. Viewed as cost per unit of water, 1,000-gallons, the water system can determine the actual system cost as it relates to each consumer in each billing cycle.

Table 2, Cost per unit for delivery is figured on a running average of all water produced over a *given period*. When water is not accounted for through meter readings, it is seen as a 100 percent loss associated with the expense to produce a unit. The exception to this is when operations can provide accurate water use

Table 2: Cost per Unit for Delivery			
Total Expenditures: Used in this study		\$1,134,492.00	
Water Sold: 68.1 MG (68,100) units			
Unaccounted for Water: 11.1 MG (11,100) units		13.98%	
Average cost per single unit (1,000-gallons)			
Expense per gallon	0.01434	Current rate per 1,000 gallons	Cost Difference
Expense per unit	\$14.34 (1,000 gals)	\$4.71	\$9.63 ¹
1- \$9.63 multiplied by 68,100 units of water would generate \$655K dollars, or \$1.2M when adding to the revenues from current base rates			

for completing maintenance tasks. This water is then considered non-billable water used rather than unaccounted for water. Water that cannot be accounted for should be considered potential lost revenues.

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 and the prospective costs differences. Second, all customers have an established frequency in billing, third, the schedule of charges will be identified and assessed.

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. A cost-of-service rate analysis develops water rates by assigning expenses to services that are provided. The above table outlines this approach to reveal how water deliverables affect 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 annual “fixed” expenditures are covered.

It is normally suggested that the base rate covers 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, measured in 1,000-gallon units and a dollar amount can be charged per said unit.

Table 3: Current Rate Information						
Service Connection Size (in.)	# of connections	Allowance (Units) ¹	Base Rate	Unit Rate Cost	Average Consumption	Typical Monthly Cost
3/4 Residential	523	4	\$66.62	\$4.71 ²	5.7 ³	\$74.63
3/4 Residential - out	51	4	\$80.63	\$5.70	NA	NA
3/4 Commercial	0	0	\$35.82	\$5.70	NA	NA
1.0 Commercial	2	0	\$45.47	\$5.70	NA	NA
1.5 Commercial	0	0	\$58.73	\$5.70	NA	NA
2.0 Commercial	17	0	\$94.55	\$5.70	NA	NA
3.0 Commercial	4	0	\$358.10	\$5.70	NA	NA
4.0 Commercial	6	0	\$943.42	\$5.70	NA	NA
Total Connections		NA		NA		
Total Annual Base			\$551,287.44 ⁴			
Total Annual Consumption			\$135,203.04			
Combined Base and Consumption			\$686,490.48	60.51% ⁵		
Proposed Budget			\$1,134,492.00			
1- allowance of water only for SFR inside city limits, 2- Set price per unit, all units, no tiers, 3 – Average monthly usage – all SFRs						
4 – Annual base is all monthly fees for all connections, minus revenues from water sales, 5 – based only on new budget, not past budget(s)						

In table 3, the City of Yamhill's revenues are derived from two factors, a) the size of the connection and an allowance of water given in the base rate, and b) the average monthly consumption per meter size, and the total approximate monthly cost. Revenues not earned from the monthly base rates; the volume (consumption) rate should create income to meet the total revenue requirements when added to the base rate income.

When developing a rate structure that meets the water system requirements, the rate study results, suggestions, and final decision to be fair to all customers will outline the following key points.

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

When these points are defined, Oregon Association of Water Utilities can utilize the gathered information, and apply it to various scenarios, providing a method to better understand the effects from an assortment of various rate approaches.

Cost Evaluations:

If the total operating expenditures are equally segregated per the number of connections, the cost per connection for the City of Yamhill would be \$119.92 per month.

\$1,134,492.00 divided by 12 months divided by 603 users = \$156.78 per month

An important factor regarding water costs is consumers paying for those costs associated with the infrastructure that provides continued high quality, safe, clean water. The costs directly relate to water consumption. 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 by means of determining the price per unit and the amount of consumption per month. The intrinsic value associated with water service and the consumption of water each billing cycle make up a fair and equitable rate for all customers.

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 revenues to expenditures and provide an informational tool for the City Council to draw on in selecting an appropriate rate structure, one that is easily adopted and understood by your customers.

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 that builds on a methodical style with the following points:

- Affordability Index – rates allowed by the affordability index and historical monthly costs.
- System Data – information relevant to the study.
- Existing Rates – current revenues and expenditures, speculation of gains and losses.
- Multi-meter Costs Rate – conservation mindset.

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. As the examples are presented, it will become evident 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, a) classification of user, b) how often and c) 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 rates are the responsibility of the utility decision makers. Even though public involvement is not required to design and approve water rates, 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 a rate policy by ordinance or resolution. The level of impact on the consumer, and the values and views of the decision makers play 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 actual total 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. As an example, a conservative decision may be made to adopt water rates that exceed expected revenues by ten percent.

The following information is designed to illustrate methods of approach that will expand the various examples and highlight specific points of relevancy. The focus of 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.

Affordability Index:

One measurement of the impact of water cost for the median household incomes (MHI) of the area is the affordability index, a tool that federal and state 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 concerns may impact economically disadvantaged areas. For certain loan processes to continue, a review of the index may establish a pre-determined rate for a specific

amount of water each month. For this rate study using the 2021 Median Household Income at \$77,256.00 and the 2021 Affordability Index of 1.25% (\$/Mo) for the 97148-zip code area, equates to \$80.47 for a monthly water bill. See Table 4

Table 4: Median Household Income – Yamhill County					
Zip Code	Certified Population 2022	U.S. Census Population 2010	Annual Growth	MHI 2021 ¹	2021 Affordability Index 1.25%
97148	108,993	99,193	0.75%	\$77,256.00	\$80.47
1 - https://www.census.gov/search-results.html?q=Yamhill+Oregon+97148					

Historical Rates:

With the initial onset of figures, the City of Yamhill water rates are \$66.62 base rate per month for a 5/8-inch by 3/4-inch service connection for all inside city users. The City of Yamhill has a single consumption rate at \$4.71 per unit (inside city) and \$5.70 per unit (outside city) for all units of water purchased. The city does not provide an allowance with the base rate for commercial entities. This structured format is labeled a multi-base rate with a flat block rate.

The City, over the past years, had adopted significant increases to cover costs associated with a new transmission line, and with the findings in this water rate study could see a total combined increase of almost 60 percent. The last formal water rate study has been completed since 2016. Prior to 2016, the City had not adjusted rates since 2010, which correlates to an approximate annual increase of 5 percent annually over the past 12 years. One recommendation is to follow the basket of services for water and wastewater maintenance associated with the consumer price index. Since 2017, the last rate increase implemented, the average annual inflation rate for water and sewer services is 3.39¹ percent or approximately \$1.81 increase. This adjustment equates to the current monthly water rate in 2023 would be ≈ \$68.44

System Data:

Information compiled in the “System Data” spreadsheet (see next page) outlines those factors that influence the required monthly revenues based on the annual proposed operating budget. Water produced, water sold, and water losses are criteria that affect the rates charged. 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 residual or deficit in revenues is associated with the current rate structure. One important factor to consider is the amount of water allowed at the base rate. All the information will relate to 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)**

1 - <https://www.in2013dollars.com/Water-and-sewerage-maintenance/price-inflation/2017-to-2021?amount=20>

Table 5: System Data			
Total Gallons Produced		79.1 MG	
Total Gallons Sold		68.1 MG	
Cost per Unit (1,000 gallons)		\$14.34	
Base Rate Revenues		\$551,287.44	
Total Operating Budget	\$1,134,492.00	% Total Budget	48.59%

Additional information that relates to the initial review of the figures associated with the City of Yamhill’s water rate study are:

- Current base rates are figured based on number of service connections at 603.
- Current base rates equal 48.59 percent of the proposed budget (standard 60-75 percent).
- Proposed base rates will be applied using 50 percent of the proposed budget.
 - SFR rates at \$78.39 for inside city users
 - Using a meter multiplier for larger service connections, base rates total 66.36 percent.
 - The City serves 11 water districts which consume 35-40 percent of all water produced.
- Current “base rates” require all units of water to be sold at \$14.58 minimum.
- Proposed annual adjustments will follow the Consumer’s Price Index (CPI).
 - Applying the baskets of services for water, wastewater operations and maintenance.
- Proposed consumptions will create a four tier levels – increased block method
- Typical 5.7 units (5,700 -gallons) consumption per month = \$97.23, an increase from \$74.63

System Data spreadsheet:



**Water Rate Study
for
City of Yamhill**

System Data

For Year: 2022-23
Date completed: August-23

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

Gallons (annual)	1000 gal units. (annual)		
79,127,909	79,128		
68,069,374	68,069		
11,058,535	11,059		13.98%

Cash Reserves

\$252,000.00

Personnel / Materials ¹

Dollars

\$555,342.00

Contingency ¹

\$80,000.00

Debt Service ¹

\$216,150.00

Capital Outlay ¹

\$283,000.00

Total Annual Budget

\$1,134,492.00

Cost per Gallon Cost Per 1000 Gals Cost Per 100 Cu.Ft.

\$0.01434

\$14.34

\$10.72

Non-Revenue Costs \$ 158,551.13 \$ 118,596.25

Connection Information
Base Rate Only

Size	# of connections		
	Residential	Commercial	Outside
5/8" - 3/4"	523		51
5/8" - 3/4" out			
1"		1	1
1 1/2"			
2"		11	6
3"		2	2
4"		4	2
6"			
8"			
10"			
			Total Connections
			603

Current Rate information (base)

	Residential	Commercial	Outside
5/8" - 3/4"	\$66.62	\$35.82	
5/8" - 3/4" out			\$80.63
1"		\$45.47	\$68.23
1 1/2"		\$58.73	\$88.11
2"		\$94.55	\$141.82
3"		\$358.10	\$537.14
4"		\$455.87	\$683.80
6"		\$683.60	\$1,025.38
8"		\$943.92	\$1,415.88
10"			
			Base Rate Revenues
			\$ 551,287.44

Residential Consumption Rate
Commercial Consumption Rate

	Residential	Commercial	Outside
Per 1000 gals.	\$4.71	\$5.70	\$5.70
Per 1000 gals.			

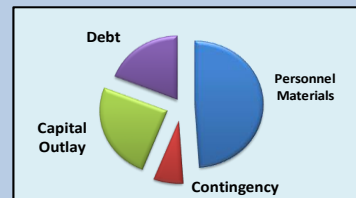
Operating Budget Outline

Personnel / Materials	\$555,342.00	48.95%
Contingency	\$80,000.00	7.05%
Capital Outlay	\$283,000.00	24.95%
Annual Debt Service	\$216,150.00	19.05%
TOTAL OPERATING EXPENDITURES	\$1,134,492.00	Base Rate % Total Cost
		48.59%

Percentage of budget without any consumption revenue

Notes:

- Water produced is averaged over 3 years, averages for January 2020, and Oct-Dec 2022 based on previous years
- Water sold figures for 2020-21 at 97.8 MG, 2021-22 at 63.4 MG, please confirm, 2020-2021 exceed WTP production
- Confirm # of meters per size with billing software
- Confirm the commercial accounts as commercial or outside water districts
- Confirm there are "no" 10-inch meters
- 1 - figures taken from 2022-23 budget item,



Existing Rates:

The “Existing Rates” spreadsheet details much of the same information as the system data spreadsheet, yet expands the details on how the base rates, consumption rates and the allowance of water included in the base rate (if applicable) effect overall budget. Since the City of Yamhill provides no allowance for water at the base rate, the consumption charge begins once the allowance is consumed. This factor will reveal the amount of revenue (or potential revenue) and the overall effect on the total revenues generated from water sales. Aligning the base rate revenue with the consumption revenue will determine any overages or deficits of the current rate structure. Included at the bottom of the “Existing rate spreadsheet” are supposed residential figures of monthly rates supported by three hypothetical levels of monthly consumption.

Table 6: Existing Rates			
Total Connections	603¹		
Total Production of Water (1,000 gal.)	79,128	Sold Water (Annual 1,000 gal.)	68,069
Consumption Charge per Unit (1 - ccf)	\$4.70	Total Billable Units	68,069
Base Rate Revenues²	\$551,287.44	Revenue Percent	48.59%
Consumption Rate Revenues³	\$135,203.34	Non-Revenue Water	11,059 units
Total Revenues	\$686,490.48	% Of Total Budget	60.51%
Total Proposed Budget	\$1,134,492.00	Budget Shortfall	\$448,001.52⁴
Findings			
Cost Per Unit	\$14.34⁵	Allowed Units	4⁶
<small>1- 11 outside water districts served, 2- Figure based on current base rates annual revenues, 3- Revenues based on remaining units sold at \$4.70 per unit, 4 – Shortfall higher due to \$360K budget increase, 5 – Total budget divided by purchased units, 6 – total units provided in the allowances for SFR inside city limits, 7 – Cost associated with allowed units delivered to the tap</small>			

Existing Rates spreadsheet:



**Water Rate Study
for**

Existing Rates

City of Yamhill

For Year: **2022-23**
Date completed: **March-23**

Amount of Water Produced
Amount of Water Sold
Unaccounted for Water

Annual Gals	Annual Units	
79,127,909	79,128	
68,069,374	68,069	
11,058,535	11,059	14%

Annual Operating Budget
Debt Service
Total Annual Budget

Dollars
\$918,342.00
\$216,150.00
\$1,134,492.00

\$156.78

Cost per 1,000 gallons
\$ 14.34

Connection information

Size	# of connections			Total Connections
	Residential	Commercial	Outside	
5/8" - 3/4"	523	0	0	603
5/8" - 3/4" out	0	0	51	
1"	0	1	1	
1 1/2"	0	0	0	
2"	0	11	6	
3"	0	2	2	
4"	0	4	2	
6"	0	0	0	
8"	0	0	0	
10"	0	0	0	
	4	0	4	

Consumption w/ base
Unit of Water = 1000 gallons
Current Rate information

Size	Cost with Allowance		
	Residential	Commercial	Outside
5/8" - 3/4"	\$66.62	\$35.82	\$0.00
5/8" - 3/4" out	\$0.00	\$0.00	\$80.63
1"	\$0.00	\$45.47	\$68.23
1 1/2"	\$0.00	\$58.73	\$88.11
2"	\$0.00	\$94.55	\$141.82
3"	\$0.00	\$358.10	\$537.14
4"	\$0.00	\$455.87	\$683.80
6"	\$0.00	\$683.60	\$1,025.38
8"	\$0.00	\$943.92	\$1,415.88
10"	\$0.00	\$0.00	\$0.00

Consumption Charge

per 1000 gals.	\$4.71		\$5.70
----------------	---------------	--	---------------

Current Base Revenue

Size	Totals		
	Residential	Commercial	Outside
5/8" - 3/4"	\$34,842.26	\$0.00	\$0.00
5/8" - 3/4" out	\$0.00	\$0.00	\$4,112.13
1"	\$0.00	\$45.47	\$68.23
1 1/2"	\$0.00	\$0.00	\$0.00
2"	\$0.00	\$1,040.05	\$850.92
3"	\$0.00	\$716.20	\$1,074.28
4"	\$0.00	\$1,823.48	\$1,367.60
6"	\$0.00	\$0.00	\$0.00
8"	\$0.00	\$0.00	\$0.00
10"	\$0.00	\$0.00	\$0.00
Total/month	\$34,842.26	\$3,625.20	\$7,473.16
12 mo. Total	\$418,107.12	\$43,502.40	\$89,677.92

Base Rate Totals

% of operating budget

	36.85%	3.83%	7.90%	48.59%
--	--------	-------	-------	---------------

Water with base charge

Total/month	2,092	0	248	2,340
12 mo. Total	25,104	0	2,976	28,080

Total Water Included in Base Rate

Available Units Tier One
Available Units Tier Two

12 mo. Total	28,080	41%	11%	39,989
				\$ 135,203.04
				11.92%

Non-Revenue Units @ 14%

11,059				\$ 686,490.48
---------------	--	--	--	----------------------

Annual Gain/Shortfall
\$ (448,001.52)

Notes:

4 units of water allowed for residential users only

60.51%
Typical Residential Water Bill

Allowance 3/4 service

Units of Water	Residential Water Bill
4.00	\$66.62
5.70	\$74.63
8.00	\$85.46

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. The figures discovered in the Preliminary Observation are focused on the SFR dwelling customer, who account for 90 plus percent of all users.

- The City of Yamhill produces nearly 6.5 MG annually to supply the needs of the community.
- Approximately 14 percent of production water is considered “non-accounted” water which for water system operations is in line with State’s guideline.
- This water equates to approximately 11K units (11.0 MG) of unaccounted (non-revenue) water that is purchased yet does not reach its destination of a consumer’s tap.
- By utilizing the current base rates, all water sold per unit should be increased to **a minimum of \$11.50.**
- Contrasting current base rates against water allowances, base rates equate 48.59 percent of total budget while the allowances of water account for 41 percent of all available water.
- Current consumption rates using the flat tier based on 5.7 units, combined with the base rates generates approximately 70 percent revenues necessary for the proposed budget
- Average usage at 5.7 units (4 units allowed) would see a monthly increase of \approx \$74.63 to \$86.04
- When using the number of service connections (603 total) and applying a base rate to match fixed expenditures (60-75 percent) the SFR monthly rate would be \$78.39 per month, established at the lower end of the range, then recommending a meter multiplier to the base structure.
- With current base rate revenues totaling 48.59 percent, by establishing the 5/8-inch by 3/4-inch meter service cost at \$78.39, then using the meter multiplier, new base rates will increase to \approx 66 percent of proposed budget.
- If the new base rates (meter multiplier structure) are incorporated into the revenue equation, all unit charges should be increased **to a minimum of \$9.50.**
- The new proposed water rates for the City of Yamhill will match the current levels of consumption using four tiers, balancing the usage in line with the cost.
 - Consumers will have the ability to manage the monthly bill by using less water
- The proposed budget will recommend keeping the water allowance to four units for SFR residential consumers, commercial and industrial users will remain at a zero allowance.
- Current rates explain the following:
 - Base rates are too low, should be in the range of \$70.00 - \$80.00 from \$66.62.
 - Keeping base rates at \$66.62 would mandate unit charges increased to \$11.50.
 - If base rates are set at \approx \$78.39, unit charges would start about \$9.50
 - The above points discern the relationship between base and consumption rates
- Preliminary Observations spreadsheet shows the current rate structure and revenues generated from both base and consumption rates, with notes further explaining the findings.

Preliminary Observation Spreadsheets:



Preliminary Observation

Rate Study
for

City of Yamhill

For Year: 2022-23
Date completed: March-23

Amount of Water Produced
Amount of Water Sold
Unaccounted for Water

Gallons MG	Annual Units	Units / Month
79,127,909	79,128	6,594
68,069,374	68,069	
11,058,535	11,059	14%

Annual Operating Budget
Annual Debt Service
Total Annual Budget

Dollars
\$918,342.00
\$216,150.00
\$1,134,492.00

Monthly Cost per Connection
\$156.78

Connection information

94,541.00

Size	# of connections		
	Residential	Commercial	Outside
5/8" - 3/4"	523	0	0
5/8" - 3/4" out	0	0	51
1"	0	1	1
1 1/2"	0	0	0
2"	0	11	6
3"	0	2	2
4"	0	4	2
6"	0	0	0
8"	0	0	0
10"	0	0	0

Cost per 1,000 gallons
\$ 14.34
Cost per 100 Cubic Feet
\$ 10.72

Consumption w/ base (cu.ft.)
Current Rate (base)

Size	Residential	Commercial	Outside
5/8" - 3/4"	4	0	4

Connections
603

Consumption Charge

Size	Residential	Commercial	Outside
5/8" - 3/4"	\$66.62	\$35.82	\$0.00
5/8" - 3/4" out	\$0.00	\$0.00	\$80.63
1"	\$0.00	\$45.47	\$68.23
1 1/2"	\$0.00	\$58.73	\$88.11
2"	\$0.00	\$94.55	\$141.82
3"	\$0.00	\$358.10	\$537.14
4"	\$0.00	\$455.87	\$683.80
6"	\$0.00	\$683.60	\$1,025.38
8"	\$0.00	\$943.92	\$1,415.88
10"	\$0.00	\$0.00	\$0.00

Cost at Base rate
\$57.35

Current Base revenue

per 1000 gals.	\$4.71	\$5.70
----------------	--------	--------

% of operating budget

Size	Residential	Commercial	Outside	Totals
5/8" - 3/4"	\$34,842.26	\$0.00	\$0.00	\$ 34,842.26
5/8" - 3/4" out	\$0.00	\$0.00	\$4,112.13	\$ 4,112.13
1"	\$0.00	\$45.47	\$68.23	\$ 113.70
1 1/2"	\$0.00	\$0.00	\$0.00	\$ -
2"	\$0.00	\$1,040.05	\$850.92	\$ 1,890.97
3"	\$0.00	\$716.20	\$1,074.28	\$ 1,790.48
4"	\$0.00	\$1,823.48	\$1,367.60	\$ 3,191.08
6"	\$0.00	\$0.00	\$0.00	\$ -
8"	\$0.00	\$0.00	\$0.00	\$ -
10"	\$0.00	\$0.00	\$0.00	\$ -
Total/month	\$34,842.26	\$3,625.20	\$7,473.16	\$ 45,940.62
12 mo. Total	\$418,107.12	\$43,502.40	\$89,677.92	\$ 551,287.44

Water with base charge

	36.85%	3.83%	7.90%	48.59%
--	--------	-------	-------	--------

Typical 5/8" Usage (gals)

	2,092	0	248	2,340
Total/month	2,092	0	248	2,340
12 mo. Total	25,104	0	2,976	28,080

Total Water Included in Base Rate
41.25%

12 mo. Total	Residential	Commercial	Other	Total Base Revenue
12 mo. Total	25,104	0	2,976	\$ 551,287.44
12 mo. Total			51,048	\$ 240,435.65
Potential Annual Revenues			69.79%	\$ 791,723.09
				\$ (342,768.91)

Available water to be sold
Consumption Revenues

Notes:

4 units of water allowed - Unit rate up to \$11.50 break even
Residential water bill (inside) is an increase of \$11.77 over existing rates
4 units - reduced to 2 unit allowance - Unit rate up to \$9.00 break even
5700 gals average per mo is in line with State averages

Total Revenue Generated

Annual Gain/(Shortfall) -30.21%

Typical Residential Water Bill

Units of Water	Res. Water Bill
4.00	\$66.62
5.70	\$86.04
8.00	\$112.32

Meter Multiplier:

With the study, using meters as the primary method of setting water rates, we once again expand on key points to better understand the approach the depth of using meter multipliers to establish base rates. Generally, meter ratios are designed from two separate theories, where meter multiplier cost ratios are used when assigning elements of costs specifically related to meters, and meter capacity ratios, are most often used when estimating the potential demand requirements from a single customer.

Customer costs by equivalent meter-and-service ratios recognize that meter-and-service costs vary, depending on considerations such as size of service pipe, materials used, locations of meters, and other local characteristics for various sized meters as compared to 5/8-inch by 3/4-inch meter service. With a 5/8-inch by 3/4-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 on the life of a meter and the infrastructure necessary to support said meter. Table 7 provides specific ratios.

Currently, the City of Yamhill has an established meter ratio in place, and the factors that verify the various monthly rates are undeterminable. The suggested meter ratios outlined in Table 7: Meter Cost Equivalencies/ Dollar Ratios will be a modification considered by the Council for the future. The ratios are constructed and found in American Water Works, Principles of Water Rates, Fees, and Charges – M1.

Size (inches)	Equivalent Cost Meter Ratio	Equivalent Dollar Ratios
5/8 - 3/4	1.1	\$1.00
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

Using Table 7, an example of a two-inch meter equivalency to the 5/8-inch by 3/4-inch meter correlates as being 2.9 times more costly to repair and or replace during the service life for the smaller meter. If a 5/8-inch by 3/4-inch meter service costs the consumer \$10.00 per month, then a two-inch meter has a monthly rate of \$29.00.

Using this approach in determining costs associated with various meter sizes places less emphasis on the distinction of class categorization, i.e., residential, commercial, or industrial. Even though the size of the meter is the focus in determining appropriate monthly base rates, increased demand from commercial and industrial users will warrant higher base rates. The classification of users will play a smaller role in rate settings applied with this study.

Another focal point using a meter cost ratio is when a water allowance is given as part of the monthly base charge; said allowances will increase proportionately with the cost ratios, especially as it relates to

the larger meters. A single-unit allowance for a 5/8-inch by 3/4-inch meter would translate to (one-unit multiplied by 2.9) or 2.9 units of water allowance.

By applying the meter equivalency structure, this technique again merges two methods into a single set of rates. Setting the rate for a 5/8-inch by 3/4-inch meter and aligning the cost to meet 60-75 percent of total expenditures will automatically synchronize the larger meters and their respective 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 by 3/4-inch meter base rate as the start point.

Calculating all water provided in the base rate will better determine the amounts of available water to be sold. Water provided at the base rate is subtracted from the total water produced. Non-accounted-for water is also subtracted from the category of available water.

The meter multiplier begins at determining the base rates solely on fixed operating expenses which are typically 60-75 percent of a water budget. Applying a 50 percent foundation to the 5/8-inch by 3/4-inch meter, we see a monthly connection rate established at \$78.39, currently the monthly charge at \$66.62 dollars.

Using the meter multiplier approach to base rates, and applying the same theory to allowances of water, with the same ratios being implemented creates fair rates for all users. This point is noted in the study for future decision makers to consider as the water system financial evolves. Currently the City of Yamhill provides an allowance for water only for SFR users both inside and outside City limits.

Total base rate revenues obtained when the larger meters are formulated using the existing meter cost ratio increases base rate revenues up from 48.59 to 66.36 percent. The remaining 33 percent of the proposed budget will be generated by water sales. Table 8 Meter Multiplier Costs provide specifics as it relates to the implementation of new rates based for 90+ percent of the users, SFRs.

Table 8: Meter Multiplier Revenues			
Total # of Connections	575	Allowance	4 units (4,000 gals)
Base Rate	\$79.39 ¹	Annual Base Revenue	\$752,866.20
Total Allowance of Water (gals.)		27,552 (27.55 MG)	
Available Water for Sale (gals.)		40,517 (40.51 MG)	
Required Balance of Revenues	\$381,625.80	Total Billable Units	40,517
Consumption Rate per Unit	\$9.50	Annual Consumption Revenue	\$384,915.05
		Total Revenues	\$1,137,781.25
Typical Monthly Cost (5/8" meter) (gals.) ²		5.7 units (5,700 gals.)	\$94.40
<small>1 – 5/8-inch by 3/4-inch meter service inside city limits, 2 – inside residential users</small>			

MM Cost Spreadsheet:



MM Cost

Rate Study
for

City of Yamhill

For Year: **2022-23**
Date completed: **March-23**

Amount of Water Produced Amount of Water Sold Unaccounted for Water	Annual Units					
	79,128					
	68,069					
	11,059	13.98%				
Annual Operating Budget Annual Debt Service Total Annual Budget	Dollars					
	\$918,342.00					
	\$216,150.00					
Connection Information		# of connections				
		Residential	Commercial	Outside		
Consumption w/ base (gal.)	Size					
	5/8"- 3/4"	523	0	0	Total Connections 603	
	5/8"- 3/4" out	0	0	51		
	1"	0	1	1		
	1 1/2"	0	0	0		
	2"	0	11	6		
	3"	0	2	2		
	4"	0	4	2		
	6"	0	0	0		
		See Units Allowed (1000 gals.)				
Units Allowed 4.0 4.0 5.6 7.2 11.6 44.0 56.0 84.0 Consumption Charge Current Base Revenue		Residential	Commercial	Outside		Meter Multiplier In Use
	5/8"- 3/4"	\$78.39	\$94.07	\$94.07	5/8" = 1.0	
	5/8"- 3/4" out	\$86.23	\$103.48	\$94.07	3/4" = 1.1	
	1"	\$109.75	\$131.70	\$131.70	1" = 1.4	
	1 1/2"	\$141.11	\$169.33	\$169.33	1 1/2" = 1.8	
	2"	\$227.34	\$272.80	\$272.80	2" = 2.9	
	3"	\$862.31	\$1,034.78	\$1,034.78	3" = 11.0	
	4"	\$1,097.49	\$1,316.99	\$1,316.99	4" = 14.0	
	6"	\$1,646.24	\$1,975.48	\$1,975.48	6" = 21.0	
	per 1000 gals	\$9.50				
		Residential	Commercial	Outside	Totals	
	5/8"- 3/4"	\$40,999.12	\$0.00	\$0.00	\$ 40,999.12	
	5/8"- 3/4" out	\$0.00	\$0.00	\$4,797.60	\$ 4,797.60	
1"	\$0.00	\$131.70	\$131.70	\$ 263.40		
1 1/2"	\$0.00	\$0.00	\$0.00	\$ -		
2"	\$0.00	\$3,000.85	\$1,636.83	\$ 4,637.68		
3"	\$0.00	\$2,069.55	\$2,069.55	\$ 4,139.11		
4"	\$0.00	\$5,267.96	\$2,633.98	\$ 7,901.93		
6"	\$0.00	\$0.00	\$0.00	\$ -		
Total/month	\$40,999.12	\$10,470.06	\$11,269.66	\$ 62,738.85		
12 mo. Total	\$491,989.48	\$125,640.76	\$135,235.96	\$ 752,866.20		
% of operating budget		43.37%	11.07%	11.92%	66.36%	
	Water with base charge	Total/month	2,092		204	2,296
		12 mo. Total	25,104	0	2,448	27,552
	Typical 3/4" Usage	Percentage of Allowed Water			40%	
Residential						
Water Consumption	12 mo. Total	25,104	Commercial	Other	Total Base Revenue	
	12 mo. Total		0	2,448	\$ 752,866.20	
	12 mo. Total			40,517	\$ 384,915.05	
Available Water to be Sold Consumption Revenues	Potential Annual Revenues			\$ 1,137,781.25		
	Total Revenue Generated			\$ 3,289.25		
Cost per 1000 gals	\$14.34	Annual Gain/(Shortfall)		0.29%		
Notes: New rates will increase average monthly usage by \$19.78	Typical Residential Water Bill					
	Gallons Used	Res. Water Bill				
	4.00	\$78.39				
	5.70	\$94.40				
	8.00	\$116.39				

Increase Consumption Rate: (Ascending Blocks)

Various State agencies are placing rules on water systems and their operations that align sustainable practices to assist in efficient use of water. Oregon Water Resources Department has a rule that states, “A rate structure under which customers' bills are based, at least in part, on the quantity of water metered at the service connections”. Currently, the City of Yamhill has a formatted structure that is deemed a “flat rate”, stating one price per unit regardless of the quantities 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). Not every block tier could be uniformed.

This style of rates 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.

An example of this structure is: four-inch meter service has a 14.0-1 ratio to a 5/8-inch by 3/4-inch meter. If a 5/8-inch by 3/4-inch meter is allowed four units of water per month in the base rate, a four-inch meter is allowed 56 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, the focus 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 regarding this method of 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. Even though a water utility is in the water “business”, the perception of many consumers does not grasp the fact that water sales sustain the utility.

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 \$9.50 per unit, revenues will match the proposed budget.

The initial outline for a tier rate structure was to implement a tier format that is similar toward a tier that has proven positive with other entities yet simplify the structure. A four-tier structure is consistent with past rate structures, offering, a) adequate to curtail excesses usage, particularly when raw water sources are periodically diminishing, b) generate funds for both short and long-term projects, and c) be easily understood and interact with the current billing software.

Table 9 – New Monthly Water Rates shares a format that outlines the accepted base rates and allowances, for each designation of inside users.

Table 9: Rate Comparison Current vs Proposed

Current Base Rates					
	Residential	Commercial	Outside	Metered	Allowances
5/8"- 3/4"	\$ 66.62	\$ 35.82	\$ -		4000
5/8"- 3/4" out		\$ -	\$ 80.63		4000
1"		\$ 45.47	\$ 68.23		
1 1/2"		\$ 58.73	\$ 88.11		
2"		\$ 94.55	\$ 141.82		
3"		\$ 358.10	\$ 537.14		
4"		\$ 455.87	\$ 683.80		
Tiers	Consumption Units		Tier Cost per Unit		
Tier One	4001+		\$ 4.71		
Tier Two	NA				
Tier Three	NA				
Tier Four	NA				
Proposed Rates				Uses Water Meter Ratios ¹	Allowances ²
	Residential	Commercial	Outside		
5/8"- 3/4"	\$ 78.39	\$ 94.07	\$ 94.07	1.0 - 1	4000
5/8"- 3/4" out		\$ 103.48	\$ 94.07	1.0 - 1	4000
1"		\$ 131.70	\$ 131.70	1.4 - 1	NA
1 1/2"		\$ 169.33	\$ 169.33	1.8 - 1	NA
2"		\$ 272.80	\$ 272.80	2.9 - 1	NA
3"		\$ 1,034.78	\$ 1,034.78	11.0 - 1	NA
4"		\$ 1,316.99	\$ 1,316.99	14.0 - 1	NA
Tiers	Consumption Units - 3/4-inch ³		Tier Cost per Unit ⁴		
Tier One	4001 - 8000		\$ 9.50		
Tier Two	8001 - 12000		\$ 11.40		
Tier Three	12001 +		\$ 13.68		
Tier Four	NA		NA		
Monthly Rate Comparison					
	Current		Proposed		Difference ⁵
Gallons Used	Res. Water Bill		Res. Water Bill		
4,000	\$ 66.62		\$ 78.39		\$ 11.77
5,700	\$ 74.63		\$ 94.40		\$ 19.78
8,000	\$ 85.46		\$ 116.39		\$ 30.93
1 - American Water Works Association standard for meter multiplier (replacement costs)					
2 - Overage charges begin after allowance has been consumed					
3 - Tiers structures to coincide with average usages, with each additional step following allowances and meter ratios					
4 - Consumption rates set for inside district limits, with outside rates at 20 percent higher.					
5 - Cost difference for a monthly user inside the district service boundary, using 3/4-inch service, average usage amount					

Table 10 – Tier Structure provides the stair step arrangement for implementation of the recommended increased block structure. The set stop / start points are based on two factors, a) the average usage by the majority of users (SFRs), and b) the set stop / start points based on the size of the service meter.

Table 10: Tier Structure				
Inside - Outside City Limits				
Meter Size	Base	Tier One	Tier Two	Tier Three
5/8-inch by 3/4-inch	4000	4,001-8,000	8,001-12,000	12,000 +
1.0"	0	0-11,200	11,200-16,800	16,801 +
1.5"	0	0-14,400	14,401-21,600	21,601 +
2.0"	0	0-23,200	23,201-34,800	34,801 +
3.0"	0	0-44,000	44,001-88,000	88,001 +
4.0"	0	0-56,000	56,001-112,000	112,000 +

The following pages outline the following classification of consumers and the relationship to the budget:

- Total # of meters per class
- Percentage of revenues from the base rates
- Allowances for each block
- Price charged per unit at each block
- Typical monthly cost associated with various level of consumption
- Prospective total annual revenues
- Total percentage of revenues per class

Ascending Rates Spreadsheets:

Ascending Rate for Residential Consumers (Inside)



Connection Information											
Size	# of residential connection by size Meter Cost Multiplier Factor			Base Rate Information							
5/8"	523	1.00		\$78.39	Monthly Base Revenue						
3/4"	0	1.10		\$86.23	\$40,999.12			Annual Base Revenue			
1"	0	1.40		\$109.75							
1 1/2"	0	1.80		\$141.11							
2"	0	2.90		\$227.34							
3"	0	11.00		\$862.31							
4"	0	14.00		\$1,097.49							
6"	0	21.00		\$1,646.24							
			Total # Connections	523	\$491,989.48			43.37%			
Total Proposed Budget:											
\$ 1,134,492.00											
Allow	Tier 1 Cost / 1K	Tier 2 Cost / 1K	Tier 3 Cost / 1K	COST TO CONSUMER AT EACH TIER				Consumption Monthly Revenue	Total Consumption Monthly Revenue		
5/8"	4	\$9.50	\$11.40	\$13.68	NA	\$37.96	\$45.60	\$54.72	\$2,053.74	\$ 19,854.13	
3/4"	4	\$9.50	\$11.40	\$13.68	NA	\$37.96	\$45.60	\$54.72	\$1,418.16	\$ 23,848.80	
1"	6	\$9.50	\$11.40	\$13.68	NA	\$53.15	\$63.84	\$76.61	\$1,701.79	\$ 28,618.56	
1 1/2"	7	\$9.50	\$11.40	\$13.68	NA	\$68.33	\$82.08	\$98.50	Consumption	Total Consumption	
2"	12	\$9.50	\$11.40	\$13.68	NA	\$110.09	\$132.24	\$158.69	Annual Revenue	Annual Revenue	
3"	44	\$9.50	\$11.40	\$13.68	NA	\$417.58	\$250.80	\$300.96	\$24,644.93	\$ 238,249.51	
4"	56	\$9.50	\$11.40	\$13.68	NA	\$531.47	\$319.20	\$383.04	\$17,017.92	\$ 286,185.60	
6"	84	\$9.50	\$11.40	\$13.68	NA	\$797.20	\$478.80	\$574.56	\$20,421.50	\$ 343,422.72	
Tier Change Levels				Monthly Customer Costs				\$867,857.83			
5/8"	Included	4000	8000	12000	\$78.39	\$116.35	\$161.95	\$216.67	Base + Consumption Annual Revenue		
3/4"	Included	4000	8000	12000	\$86.23	\$124.19	\$169.79	\$224.51			
1"	Included	5600	11200	16800	\$109.75	\$162.90	\$226.74	\$303.34	43%	\$491,989.48	
1 1/2"	Included	7200	14400	21600	\$141.11	\$209.44	\$291.52	\$390.01	64%	\$730,238.99	
2"	Included	11600	23200	34800	\$227.34	\$337.43	\$469.67	\$628.36	90%	\$1,016,424.59	
3"	Included	44000	66000	88000	\$862.31	\$1,279.90	\$1,530.70	\$1,831.66	120%	\$1,359,847.31	
4"	Included	56000	84000	112000	\$1,097.49	\$1,628.96	\$1,948.16	\$2,331.20			
6"	Included	84000	126000	168000	\$1,646.24	\$2,443.44	\$2,922.24	\$3,496.80	Based on Tier 2	\$ 1,016,424.59	
Gallons begin in relationship to meter multiplier										➔	89.59%
1 Unit = 1,000 Gals.											

Ascending Rate for Commercial Consumers



Connection Information											
Size	# of residential connection by size				Base Rate Information				Consumption Monthly Revenue	Total Consumption Monthly Revenue	
	Meter Cost Multiplier Factor										
5/8"	0	1.00			\$94.07	Monthly Base Revenue				\$10,470.06 Annual Base Revenue	Total Proposed Budget: \$ 1,134,492.00
3/4"	0	1.10			\$103.48						
1"	1	1.40			\$131.70						
1 1/2"	0	1.80			\$169.33						
2"	11	2.90			\$272.80						
3"	2	11.00			\$1,034.78						
4"	4	14.00			\$1,316.99						
6"	0	21.00			\$1,975.48						
Total # Connections				18					\$125,640.76 11.07%		
Allow	Tier 1 Cost / 1K	Tier 2 Cost / 1K	Tier 3 Cost / 1K	COST TO CONSUMER AT EACH TIER							
5/8"	4	\$9.50	\$11.40	\$13.68	NA	\$37.96	\$45.60	\$54.72	\$2,053.74	\$ 4,225.17	
3/4"	4	\$9.50	\$11.40	\$13.68	NA	\$37.96	\$45.60	\$54.72	\$1,418.16	\$ 3,296.88	
1"	6	\$9.50	\$11.40	\$13.68	NA	\$53.15	\$63.84	\$76.61	\$1,701.79	\$ 3,956.26	
1 1/2"	7	\$9.50	\$11.40	\$13.68	NA	\$68.33	\$82.08	\$98.50	Consumption	Total Consumption	
2"	12	\$9.50	\$11.40	\$13.68	NA	\$110.09	\$132.24	\$158.69	Annual Revenue	Annual Revenue	
3"	44	\$9.50	\$11.40	\$13.68	NA	\$417.58	\$250.80	\$300.96	\$24,644.93	\$ 50,702.05	
4"	56	\$9.50	\$11.40	\$13.68	NA	\$531.47	\$319.20	\$383.04	\$17,017.92	\$ 39,562.56	
6"	84	\$9.50	\$11.40	\$13.68	NA	\$797.20	\$478.80	\$574.56	\$20,421.50	\$ 47,475.07	
Tier Change Levels				Monthly Customer Costs				\$137,739.68			
5/8"	Included	4000	8000	12000	\$94.07	\$132.03	\$177.63	\$232.35	Base + Consumption		
3/4"	Included	4000	8000	12000	\$103.48	\$141.44	\$187.04	\$241.76	Annual Revenue		
1"	Included	5600	11200	16800	\$131.70	\$184.85	\$248.69	\$325.29	0.110746269	\$125,640.76	
1 1/2"	Included	7200	14400	21600	\$169.33	\$237.66	\$319.74	\$418.23	16%	\$176,342.80	
2"	Included	11600	23200	34800	\$272.80	\$382.89	\$515.13	\$673.82	19%	\$215,905.36	
3"	Included	44000	66000	88000	\$1,034.78	\$1,452.36	\$1,703.16	\$2,004.12	23%	\$263,380.44	
4"	Included	56000	84000	112000	\$1,316.99	\$1,848.46	\$2,167.66	\$2,550.70	\$ 215,905.36 Based on Tier 2 19.03%		
6"	Included	84000	126000	168000	\$1,975.48	\$2,772.69	\$3,251.49	\$3,826.05			
Gallons begin in relationship to meter multiplier 1 Unit = 1,000 Gals.											

Ascending Rate for Outside Consumers



Connection Information

Size	# of residential connection by size Meter Cost Multiplier Factor		Base Rate Information		
5/8"	0	1.00	\$94.07	Monthly Base Revenue	
3/4"	51	1.10	\$94.07	\$11,269.66	
1"	1	1.40	\$131.70		
1 1/2"	0	1.80	\$169.33		
2"	6	2.90	\$272.80		
3"	2	11.00	\$1,034.78		
4"	2	14.00	\$1,316.99		
6"	0	21.00	\$1,975.48	\$135,235.96	
		Total # Connections	62	11.92%	

Total Proposed Budget:
\$ **1,134,492.00**

Allow	Tier 1	Tier 2	Tier 3	NA	COST TO CONSUMER AT EACH TIER			Consumption	Total Consumption
	Cost / 1K	Cost / 1K	Cost / 1K		Monthly Revenue	Monthly Revenue			
5/8"	4	\$9.50	\$11.40	\$13.68	\$37.96	\$45.60	\$54.72	\$2,053.74	\$ 4,547.85
3/4"	4	\$9.50	\$11.40	\$13.68	\$37.96	\$45.60	\$54.72	\$1,418.16	\$ 4,322.88
1"	6	\$9.50	\$11.40	\$13.68	\$53.15	\$63.84	\$76.61	\$1,701.79	\$ 5,187.46
1 1/2"	7	\$9.50	\$11.40	\$13.68	\$68.33	\$82.08	\$98.50	Consumption	Total Consumption
2"	12	\$9.50	\$11.40	\$13.68	\$110.09	\$132.24	\$158.69	Annual Revenue	Annual Revenue
3"	44	\$9.50	\$11.40	\$13.68	\$417.58	\$250.80	\$300.96	\$24,644.93	\$ 54,574.17
4"	56	\$9.50	\$11.40	\$13.68	\$531.47	\$319.20	\$383.04	\$17,017.92	\$ 51,874.56
6"	84	\$9.50	\$11.40	\$13.68	\$797.20	\$478.80	\$574.56	\$20,421.50	\$ 62,249.47

Tier Change Levels

Monthly Customer Costs

\$168,698.20

5/8"	Included	4000	8000	12000	\$94.07	\$132.03	\$177.63	\$232.35	0.11920398	Base + Consumption	
3/4"	Included	4000	8000	12000	\$94.07	\$132.03	\$177.63	\$232.35		Annual Revenue	
1"	Included	5600	11200	16800	\$131.70	\$184.85	\$248.69	\$325.29		\$135,235.96	
1 1/2"	Included	7200	14400	21600	\$169.33	\$237.66	\$319.74	\$418.23		17%	\$189,810.13
2"	Included	11600	23200	34800	\$272.80	\$382.89	\$515.13	\$673.82		21%	\$241,684.69
3"	Included	44000	66000	88000	\$1,034.78	\$1,452.36	\$1,703.16	\$2,004.12		27%	\$303,934.16
4"	Included	56000	84000	112000	\$1,316.99	\$1,848.46	\$2,167.66	\$2,550.70	Based on Tier 2	\$ 241,684.69	
6"	Included	84000	126000	168000	\$1,975.48	\$2,772.69	\$3,251.49	\$3,826.05			21.30%

Gallons begin in relationship to meter multiplier

1 Unit = 1,000 Gals.

Annual Rate Adjustments:

The City of Yamhill has worked diligently during this water rate study in developing water rates that are both sustaining to the water department to perform the necessary operations, and also mindful of the consumers.

A viable alternative in keeping pace with inflation is comparing revenues against expenditures, looking at upcoming maintenance, minor upgrades, and the ability for tasks to be completed. A useful tool to assist in keeping pace with inflation is the “consumer price index” (CPI). The approach extracts specific costs associated with inflation that pertains to water and sewer operating expenses. This indicator provides an estimate of the buying power of the current dollar compared to previous years. Looking at water and sewerage maintenance prices and inflation stipulates specific costs as they relate to the previous year(s) and can be quite different from the overall CPI, or overall inflationary 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. The past ten-year cycle has averaged CPI is 3.81 percent annually.

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

The city created an implementation of rate increases for the years 2017 through 2023. In 2017, the monthly charge for a SFR customer was \$20.70. For this timeframe, the CPI based on the water maintenance criteria was 3.39 percent, while the decision makers established an annual 3.0 percent increase.

With resolution 2023-02 the city adopted a 4.0 percent annual increase to both the base rate and tap charge (loan repayment fee) ending on or about June 2028. This is the simplest form of determining an equivalent purchase power associated with water system operations over the past ten years.

To emphasize the importance of operational funding, key indicators that will amend the operational cost for the fiscal year is the listing of capital improvement plans to be completed within a given timeframe. The idea is to review a project task lists annually, rearrange the list from three perspectives, a) cost associated with the tasks matching dollars set aside for the given year, \$360K, b) dollars required to complete the tasks and c) the time necessary to complete said task(s), the time required is the ability for personnel and or contractor to complete said task in a recognized timeline.

Annually, 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 the 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.

If the monies for the annual capital improvement plan is unused at the end of the fiscal year, roll the remaining balance to the succeeding year allowing the balance to increase. As the smaller (dollar amount) projects are completed, larger more costlier projects become the targeted items, and with the idea of the monies rolled over to build for said larger projects. Table 11, Annual Rate Increases offers a speculative monthly base rate and consumption rate increase initiated for fiscal year 2024-25.

Table 11: Annual Rate Increases							
City of Yamhill				<i>Effective July 1</i>			
Monthly Water Rates	Existing ¹	Proposed ²	Allowance ³	2024 ⁴	2025	2026	CPI ⁵
5/8"- 3/4"	\$ 66.62	\$ 78.39	4000	\$ 81.28	\$ 84.16	\$ 87.05	\$ 2.88
5/8"- 3/4" - Commercial	\$ 35.82	\$ 94.07	NA	\$ 97.53	\$ 100.99	\$ 104.46	\$ 3.46
5/8"- 3/4" out	\$ 80.63	\$ 94.07	4000	\$ 97.53	\$ 100.99	\$ 104.46	\$ 3.46
1"	\$ 45.47	\$ 131.70	NA	\$ 136.55	\$ 141.39	\$ 146.24	\$ 4.85
1 1/2"	\$ 58.73	\$ 116.15	NA	\$ 120.42	\$ 124.69	\$ 128.97	\$ 4.27
2"	\$ 94.55	\$ 187.12	NA	\$ 194.01	\$ 200.90	\$ 207.78	\$ 6.89
3"	\$ 358.10	\$ 709.78	NA	\$ 735.90	\$ 762.02	\$ 788.14	\$ 26.12
4"	\$ 455.87	\$ 1,316.99	NA	\$ 1,365.45	\$ 1,413.92	\$ 1,462.38	\$ 48.47
6"	\$ 683.60	\$ 1,975.48	NA	\$ 2,048.18	\$ 2,120.88	\$ 2,193.58	\$ 72.70
Tiered Rates - In	\$ 4.71						
Outside	\$ 5.70						
Tier One ⁶	NA	\$ 9.50		\$ 9.85	\$ 10.20	\$ 10.55	\$ 0.35
Tier Two ⁶	NA	\$ 11.40		\$ 11.82	\$ 12.24	\$ 12.66	\$ 0.42
Tier Three ⁶	Na	\$ 13.68		\$ 14.18	\$ 14.69	\$ 15.19	\$ 0.50
1 - Existing rates and pricing format could not be substantiated for relevancy							
2 - Proposed rates use a meter multiplier base rate on size of service connection, replacement cost of infrastructure							
2 - Proposed rates account for increase in debt service (\$360K) for the current timeframe and completion of prioritized projects							
3 - Allowance of water provided for SFR users, both inside and outside							
4 - Base rate annual adjustment established on Consumer Price Index, basket of services for water/wastewater maintenance, see page 23							
4 - CPI is one year in arrears, 2022-23 CPI at 3.68 percent, speculating the same for years 2025, 2026, adjust annually by admin staff							
5 - CPI increase for 2023-2024 is \$2.88 (3.68%) for 3/4-inch service with meter ratio adjusting larger service connections							
6 - Tiered rates for outside service should be 20% higher than following same equation for the base rates.							

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. Water systems, though very similar in operational duties, differ more financially due to the diverse circumstances. The variables associated with other water systems sometimes will or will not apply to the City of Yamhill. A new water system completed without any debt owed is rarely seen. The age of a water system plays a bigger role in determining future cost since rebuilding is often more expensive than new development.

For the ease of understanding the conclusion in this water rate study, the average SFR user consumes ≈ 5,700 gallons or 5.7 units of water. With existing rates, the monthly bill to the customer would be:

- Base Rate - \$66.62 (4 units of Water) + 1.7 units at \$4.71 per or \$8.00 = \$74.62
- Delivery cost – 5.7 units at \$14.34 per unit = \$81.73 vs \$74.62 or loss of \$7.11 each month

The losses continue to increase as specific customers consume larger amounts of water exacerbating the effect in lost dollars.

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 difficult at times. Proposed costs are usually lower than actual costs due to unforeseen changes. 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 set base rates created an unequal cost per unit of water delivered to the customer due to the unsubstantiated base rates, b) the set price in the unit charge for 1,000 gallons of water at \$4.70 per unit charge as compared to \$14.34 production-delivery cost per unit.

Being mindful of the upcoming water system improvements, and relaying the costs associated with chosen upgrades, the figure of \$360,000.00 was established as an annual line item. Four specific projects, related to diminishing system efficiencies amount to ≈\$980K dollars. Tackling these projects over the next three-year timeline was the deciding factor for the increase to the annual budget. Taken from the engineering estimates are the four projects selected.

Priority	ID#	Project Name	Total Estimated Cost (2018)	SDC Growth Apportionment		City's Estimated Portion
				%	Cost	
3	A	Hemlock Street Water Improvements	\$ 484,000	40%	\$ 193,600	\$ 290,400
4	E	E 3rd Street Water Improvements	\$ 344,000	20%	\$ 68,800	\$ 275,200
5	D	Olive Street Water Improvements	\$ 502,000	30%	\$ 150,600	\$ 351,400
16	Q	Water Plant SCADA Upgrades	\$ 79,000	20%	\$ 15,800	\$ 63,200

The following chart is a hypothetical monthly cost associated with various levels of consumption. It provides a generic outline on specific levels of water consumption associated with routine usage coupled with the tiers established in the water rate study.

Water Consumption - Monthly Rate Comparison								
Connection Size	5/8-3/4	5/8-3/4 out	1.0	1.5	2.0	3.0	4.0	
Base Rate Water Allowance	4	4	0.0	0.0	0.0	0.0	0.0	
Base Rate	\$78.39	\$94.07	\$131.70	\$169.33	\$272.80	\$1,034.78	\$1,316.99	
Consumer Class								
Residential	523	0	0	0	0	0	0	
Commercial	0	0	1	0	11	2	4	
Outside	0	51	1	0	6	2	2	
Monthly Usage and Hypothetical Cost at Various Consumption Levels								
Tier Rates	Tier One	\$9.50		Tier Two	\$11.40		Tier Three	\$13.68
Consumption Levels	Outside	\$11.40		\$13.68		\$16.42		
1.00	1000	\$ 78.39	\$ 94.07	\$ 141.20	\$ 178.83	\$ 282.30	\$ 1,044.28	\$ 1,326.49
2.00		\$ 78.39	\$ 94.07	\$ 150.70	\$ 188.33	\$ 291.80	\$ 1,053.78	\$ 1,335.99
3.00		\$ 78.39	\$ 94.07	\$ 141.20	\$ 197.83	\$ 301.30	\$ 1,063.28	\$ 1,345.49
4.00		\$ 78.39	\$ 94.07	\$ 150.70	\$ 207.33	\$ 310.80	\$ 1,072.78	\$ 1,354.99
5.00	5000	\$ 89.79	\$ 105.47	\$ 160.20	\$ 216.83	\$ 320.30	\$ 1,082.28	\$ 1,364.49
6.00		\$ 101.19	\$ 116.87	\$ 171.60	\$ 226.33	\$ 329.80	\$ 1,091.78	\$ 1,373.99
7.00		\$ 112.59	\$ 128.27	\$ 183.00	\$ 235.83	\$ 339.30	\$ 1,101.28	\$ 1,383.49
8.00		\$ 123.99	\$ 139.67	\$ 194.40	\$ 247.23	\$ 348.80	\$ 1,110.78	\$ 1,392.99
10.00	10000	\$ 151.35	\$ 167.03	\$ 217.20	\$ 270.03	\$ 367.80	\$ 1,129.78	\$ 1,411.99
11.00		\$ 165.03	\$ 180.71	\$ 228.60	\$ 281.43	\$ 377.30	\$ 1,139.28	\$ 1,421.49
12.00		\$ 178.71	\$ 194.39	\$ 242.28	\$ 292.83	\$ 386.80	\$ 1,148.78	\$ 1,430.99
13.00		\$ 192.39	\$ 208.07	\$ 255.96	\$ 304.23	\$ 398.20	\$ 1,158.28	\$ 1,440.49
14.00		\$ 206.07	\$ 221.75	\$ 269.64	\$ 315.63	\$ 409.60	\$ 1,167.78	\$ 1,449.99
15.00		\$ 219.75	\$ 235.43	\$ 283.32	\$ 329.31	\$ 421.00	\$ 1,177.28	\$ 1,459.49
20.00		\$ 288.15	\$ 303.83	\$ 351.72	\$ 397.71	\$ 478.00	\$ 1,224.78	\$ 1,506.99
25.00		\$ 356.55	\$ 372.23	\$ 420.12	\$ 466.11	\$ 535.00	\$ 1,272.28	\$ 1,554.49
30.00		\$ 424.95	\$ 440.63	\$ 488.52	\$ 534.51	\$ 603.40	\$ 1,319.78	\$ 1,601.99
35.00		\$ 493.35	\$ 509.03	\$ 556.92	\$ 602.91	\$ 671.80	\$ 1,367.28	\$ 1,649.49
40.00		\$ 561.75	\$ 577.43	\$ 625.32	\$ 671.31	\$ 740.20	\$ 1,414.78	\$ 1,696.99
45.00		\$ 630.15	\$ 645.83	\$ 693.72	\$ 739.71	\$ 808.60	\$ 1,462.28	\$ 1,753.99
50.00		\$ 698.55	\$ 714.23	\$ 762.12	\$ 808.11	\$ 877.00	\$ 1,509.78	\$ 1,810.99
60.00		\$ 835.35	\$ 851.03	\$ 898.92	\$ 944.91	\$ 1,013.80	\$ 1,623.78	\$ 1,924.99
70.00		\$ 972.15	\$ 987.83	\$ 1,035.72	\$ 1,081.71	\$ 1,150.60	\$ 1,737.78	\$ 1,981.99
80.00		\$ 1,108.95	\$ 1,124.63	\$ 1,172.52	\$ 1,218.51	\$ 1,287.40	\$ 1,851.78	\$ 2,095.99
90.00		\$ 1,245.75	\$ 1,261.43	\$ 1,309.32	\$ 1,355.31	\$ 1,424.20	\$ 1,965.78	\$ 2,209.99
100.00		\$ 1,382.55	\$ 1,398.23	\$ 1,446.12	\$ 1,492.11	\$ 1,561.00	\$ 2,079.78	\$ 2,323.99
125.00		\$ 1,724.55	\$ 1,740.23	\$ 1,788.12	\$ 1,834.11	\$ 1,903.00	\$ 2,364.78	\$ 2,608.99
150.00		\$ 2,066.55	\$ 2,082.23	\$ 2,130.12	\$ 2,176.11	\$ 2,245.00	\$ 2,649.78	\$ 2,893.99
175.00		\$ 2,408.55	\$ 2,424.23	\$ 2,472.12	\$ 2,518.11	\$ 2,587.00	\$ 2,991.78	\$ 3,178.99
200.00		\$ 2,750.55	\$ 2,766.23	\$ 2,814.12	\$ 2,860.11	\$ 2,929.00	\$ 3,333.78	\$ 3,463.99
225.00		\$ 3,092.55	\$ 3,108.23	\$ 3,156.12	\$ 3,202.11	\$ 3,271.00	\$ 3,675.78	\$ 3,805.99
250.00		\$ 3,434.55	\$ 3,450.23	\$ 3,498.12	\$ 3,544.11	\$ 3,613.00	\$ 4,017.78	\$ 4,147.99

The following are recommendations:

- Continue to assess and prioritize smaller projects towards systems upgrades
 - Track costs against remaining balance from loan, reassess annually
 - Publicize key projects and the positive change for the water system
- Review CPI figures and adjust the “base rate” according to the inflation index for water and sewerage maintenance, using the single past year, or a 5, 10-year running average as the criteria

The City has chosen to implement the new water rates based on a simple 10 percent increase to both the base and consumption rates. It is recommended to begin tracking specific figures, in tallying up figures for water produced, water sales, unaccounted for water, monthly revenues 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 generated during the subsequent year(s).

The City has been proactive in understanding the mentioned items of sales, production, revenues, and expenditures, knowing the importance of the resource that is provided to its community. A tracking chart (example below) will be provided as a tool to assist the city to follow those key elements relating to water department revenues, expenditures, and actual water loss.

WATER TRACKING CHART - REVENUE AND WATER LOSS									
2023-24	H2O Produced	H2O Operations	H2O Sold	Total H2O Difference	Unaccounted for H2O	Water Dept Revenue	Water Dept Expenses	Monthly \$ Difference	
	Annual Budget		\$	-		Monthly Revenue Goal	2023-24	\$	-
Units of measure are either 1,000 gallons or 100 cubic feet (748-gallons)									
Jul-23				-	█	#DIV/0!			\$ -
Aug-23				-	█	#DIV/0!			\$ -
Sep-23				-	█	#DIV/0!			\$ -
Oct-23				-	█	#DIV/0!			\$ -
Nov-23				-	█	#DIV/0!			\$ -
Dec-23				-	█	#DIV/0!			\$ -
Jan-24				-	█	#DIV/0!			\$ -
Feb-24				-	█	#DIV/0!			\$ -
Mar-24				-	█	#DIV/0!			\$ -
Apr-24				-	█	#DIV/0!			\$ -
May-24				-	█	#DIV/0!			\$ -
Jun-24				-	█	#DIV/0!			\$ -
Totals	-	-	-	-	█	#DIV/0!	\$ -	\$ -	\$ -
Mo Average	-	-	-	-					
\$ per Unit	█	#DIV/0!				\$ -	\$ -	\$ -	
\$ per gallon	█	#DIV/0!							

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 water rate structure. 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 Yamhill in water rates that meet the needs of the water system, provide fair and equitable rates for all consumers, and to ensure the water system is poised for future growth.