



# Water Rate Study

City of Nehalem

Final Report

April 2022



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**Oregon Association of Water Utilities**

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## EXECUTIVE SUMMARY

The City of Nehalem called upon the Oregon Association of Water Utilities to conduct a water rate study to decide the adequacy of the water rates in conjunction with the proposed budget for the 2022-2023 fiscal year, including adjustments proposed for years 2022-2025. The purpose of the study was to develop rates and revenues that:

- Supply examples of rates which meet the projected capital, operation, and maintenance (O&M) costs of the system
- Applies a fair cost among the different types of system users
- Encourage efficient use of the water
- Are relatively simple to understand, administer 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 and the public works department. This figure includes personnel services, materials and services, contingency funding, and capital improvement. The capital improvement costs are reviewed in this study and suggested to align system expenditures to future rates.

The current rates use a set base rate with a single tier structure charging for each unit of water beyond the allowance. Units of water are founded on 1,000 gallons per unit, with varied allowances provided in the monthly base rate. As water usage is charged per 1000 gallons (one unit), the per unit rate remains the same for all consumed water.

<b>Table 1: Current Rate Information</b>						
<b>Service Connection Size (in.)</b>	<b># Of connections</b>	<b>Allowance (Units) <sup>1</sup></b>	<b>Base Rate <sup>2</sup></b>	<b>Unit Rate Cost</b>	<b>Average Consumption</b>	<b>Typical Monthly Cost</b>
<b>Residential</b>						
3/4" – inside	156	4	\$36.60	\$4.20	3,359	\$36.60
1" – inside	1	4	\$36.60	\$4.20	NA	NA
1.5" – inside	0		NA	NA	NA	NA
3/4" – outside	539	4	\$44.60	\$4.20	3,442	\$44.60
1" – outside	1	4	\$44.60	\$4.20	NA	NA
1.5" – outside	0		NA	NA	NA	NA
<b>Commercial</b>						
3/4" – inside	42	0.5 – 7.5	\$18.30 - \$128.10	\$4.20	Varied	Varied
1" – inside	2	0.5 – 4.0	\$18.30 - \$36.60	\$4.20	NA	NA
1.5" – inside	1	5	\$183.00	\$4.20		
3/4" – outside	23	0.5 – 21.0	\$22.30 - \$312.20	\$4.20		
1" – outside	5	4.0 – 31.0	\$44.60 - \$345.65	\$4.20		
1.5" - outside	3	21.2 – 32.7	\$947.75 - \$1460.65	\$4.20		
Special Connection	3	0.5 – 2.0	NA	\$4.20		
<b>Total Connections</b>	<b>776 *</b>					
1 – Allowances set up on Equivalent Residential Units with a single ERU at 4,000 gallons per. 2 – Base Rates founded by ERUs are coded in 36 categories						
* - single connection carries resolution on long term service, actual service connections are 777						

The proposed format will simply use the number of service connections the water system serves, then consider the base rate prorated by the size of the meter. The meter base rate applies a meter ratio according to American Water Works Association (AWWA) meter ratios as it relates to infrastructure replacement costs. Meter ratios start with looking at fixed expenses of the proposed budget as it relates to a percentage, then applying said percentage to the 3/4-inch meter sized connections.

### **Current Revenues / Expenditures:**

Proposed revenue requirements for fiscal year 2022-2023 are \$702,937.00 dollars. The base rate revenues equal \$452,356.20 or 64.35 percent of the total proposed budget. The City's last rate adjustment was June 2010 and has not had an annual adjustment to the base rate for the past ten plus years. Using the Consumer Price Index (CPI) adjustments to water rates can match fluctuations corresponding to inflation and or capital planning expenses. The existing consumption rate (a charge per unit of water) is varied set among all customers, with an allowance of water provided in the base rate. Consumption revenues equal 3.21 percent of the proposed budget or \$22,433.95 dollars. The combination of base and consumption rates total 67.54 percent of proposed budget or \$474,790.15 dollars.

### **User Characteristics:**

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

- 157 - Single-family residents, residential services are 89.7 percent of total users
- 540 - Outside residential services
- 080 - Classified as commercial.

Base rates were originally set up using an equivalent residential unit (ERU), (average usage of a single-family residence) which factored as average usage of 4,000 gallons or one ERU. Rates have not been formally reviewed and/or adjusted to meet past annual budgets since June 2010. The primary change from the current to proposed rate format will be based on size of service connection from the ERU structure.

### **Cost Evaluations:**

If the total operating expenditures were divided equally per the number of consumers, the cost per user for the city would be \$75.39 per month. This simplistic approach at once proves unfair due to the average amounts of water consumed varies among all users.

$$\text{\$702,937.00 divided by 12 months divided by 777 connections} = \text{\$75.39}$$

Believed as the highest priority on water costs, all consumers pay for those costs associated with the infrastructure that supplies continued high quality, safe, clean drinking water.

When deciding 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 carried out by finding 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, with the single discrepancy of inside and outside users.

**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 potential units of water sold and divided the new expenditure line to decide the cost associated with producing a single unit of water (one-thousand gallons). Using the production numbers from 2020 and applying those same amounts to the new fiscal year expenditures, affords a way for the price per unit needed to meet proposed expenditures. See Table 2:

<i>Table 2: Cost per unit of production</i>		
Annual Production of Water	Proposed Expenditures	Cost per 1,000 gallons (1 unit)
42,637 units (42,637,416 gallons)	\$702,937.00	\$16.49

In factoring the monthly base rate, as it relates to expenditures, we match operating expenses the water department incurs to deliver a unit of water to each tap. With a \$36.60 monthly base rate (inside residential), allowing 4 units of water, one can consider the favorable revenues for the water department at these consumption levels, but an added consideration with total consumption is necessary. When the unit production cost (currently \$16.49) is more than the unit sold price, at all tiers sold, an adjustment in rates is forthcoming. With an allowance of four units a cost per unit at \$16.49, a monthly base rate should be \$65.96. The original study in 2010 illustrated a total production rate at \$13.38 per unit, and the base rate in 2010 should have been \$53.52 when the monthly base rate was set at \$36.60.

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 find rates can be applied to any study, with the basic approach examining the base rates versus consumption (volume) rates. It is typically suggested that the base rate cover 60-75 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*. From this angle, it appears the City of Nehalem has executed sound practices in this area as current base rates equal 64.35 percent of the proposed budget.

**Existing Rates:**

This first step presents a concise view of the existing rates (both base and consumption rates) which arranges the overall revenues generated using current water rates. The City of Nehalem’s first priority request was discerning a comparable rate for low volume users, upcoming capital improvements for infrastructure, annual expenses, and an overall fair approach to water rates.

Discovering a first set of figures, at once acknowledged the complexity of rate codes proven during the earlier water rate study. As base rates were inputted into analysis, 66 percent of total necessary revenues were met, yet when consumption revenues were factored, a shortfall of 32.46 percent was revealed. Current rates have 36 codes for base rates and a single (consumption charge) tier charge per unit of water at \$4.20

### **Preliminary Observations:**

This step in the process does not emphasize 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 \$702,937.00 is based on sustaining capital monies for smaller annual projects and preparing for the long-term expenses for future capital improvement planning (CIP). The City of Nehalem has a single annual debt payment at \$125,932 for the Safe Drinking Water Loan. An expense of \$70,000 is budgeted for a new public works building. The average percentage of budgets for contingencies is 10-20 percent, the city's allocation is 9.96 percent.

As the above proposed budget was confirmed, a review of the base rates from respective classes of users showed an absolute fairness in relevancy according to the charge per unit. The unit charge, being a single tier was applied across the board for all users.

Through this step of the process, two recommendations are presented for consideration, a) change the base rate, and apply a meter multiplier to the base rate which will also provide the same ratio of allowance of water for the user, b) apply a simplified tiered (increase block) rate for all consumption beyond the allowances stipulated with the meter ratios. This approach affords the per unit cost for all users, regardless of the size of the service connection for the base rates. Step two applies a conservation minded approach to the consumption rates. Table 3 makes available both the current monthly base rates and the proposed base rates. See page VI

All figures recommended in the water rate study supplies a single monthly base rate and a tiered consumption rate. The current consumption rate is not a tiered structured rate, but more or less a flat rate for all users at \$4.20 per unit. An anomaly discovered in the current structure where four service connections were solely charged for the units of consumed water without a base rate.

At a minimum, if a consensus cannot be obtained on new water rates, the minimal step necessary to have revenues match expenditures would be to increase the consumption rate from \$4.20 to \$35.00 per unit, as little water is available to sale after all allowances are met. Additionally, a likely reduction in the allowances from four units to two units is strongly recommended.

### **Meter Multiplier Base Rate:**

Discoverable during the water rate study is the 36 varied rate codes, a) inside users and b) outside users., c) a code created for a single entity, etc. 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 both single-family dwellings (one single home vs apartment dwelling). The apartment would use less water as the common area footprint is much smaller. Even though the similarities are clear, the total amounts of water used are not.

The meter multiplier advocated for the City of Nehalem uses a standard that relates a monthly cost founded on replacement of a meter and adjacent infrastructure over the life of the meter. The table (page VI) shows a comparison of both current and recommended base rates, a meter ratio applied to each of the sized meters. Using experienced approaches for community water systems, the base rate is calculated by proving a rate for the majority of users single family residents (SFR) and centering the primary cost of the fixed expenses associated with the annual budget. Once applied, the base rates equal 89.19 percent of the budget.

In table, Current vs Proposed Rates, base rates are categorized by residential and commercial, then subcategorized by inside and outside users. Using current code 1 and code 4, residential users signifying 89 percent of all users, are considered the straightforward approach to billing using the current rates. Outside users currently pay a supplementary twenty percent for delivery of water outside the city limits. This is a common practice in the industry. Newly proposed rates will follow the same practice, yet the proposed rates will also incorporate a surcharge on the unit cost.

Also outlined in the table, is the complexity of the base rates as they relate to commercial services, aligning the same complexity with the allowed units of water. The Equivalent Residential Units (ERUs) were organized in the 2010 water rate study, calculated by a series of figures found in Nehalem's Code of Ordinances, Chapter 51: Water, Subsection 51.12 Table 2, Customer Classes.

In Subsection 51.12 (E) Review of customers; classes, it says, "The city shall review its water customers and customer classes periodically to ensure that the base water rate and base monthly gallons allotment assigned to a customer is correct and reflected in the city's billing records." The rates proposed for fiscal year 2022-2023 will change the approach using an American Water Works Association (AWWA) meter multiplier ratio. This ratio is shown in Table 3 on the following page. This set up for both monthly base rates and allowances of water will be simpler to input and adjust in the future. This method creates a uniform cost for all users in a fair manner.

The last point to review is the proposed unit charges for the City of Nehalem. With consumption costs being a flat rate at \$4.20 for all units of water consumed, the proposed change is the consideration of a three-tier approach, which supports a conservation mindset. Highlighted in the lower half of the table are the cost at each tier, with the first tier designed to align with average monthly consumption of SFR customers. Tier one cost per unit for inside/outside users begins at \$7.00 and \$8.40 respectively.

Rate Comparison Current vs Proposed				
Current Base Rates				
	Residential		Meter Multiplier	Water w/Base rate <sup>1</sup>
<b>Inside City - Outside City</b>				
3/4" – inside	\$ 36.60		Currently Not Used	4,000 gals
1" – inside	\$ 36.60			4,000 gals
1.5" – inside	NA			NA
3/4" – outside	\$ 44.60			4,000 gals
1" – outside	\$ 44.60			4,000 gals
1.5" – outside	NA			NA
	<b>Commercial</b>		Allowances were based on Equivalent Residential Unit ERU <sup>2</sup>	Water w/Base rate
3/4" – inside	\$18.30 - \$128.10			2,000 - 7,500
1" – inside	\$18.30 - \$36.60			2,000 - 4,000
1.5" – inside	\$183.00			20,000
3/4" – outside	\$22.30 - \$312.20			2,000 - 85,000
1" – outside	\$44.60 - \$345.65			16,000 - 131,000
1.5" – outside	\$947.75 - \$1460.65			85,000 - 131,000
1 - Allowances (water with base rate) vary by ERU established in 2010 rate review				
2 - ERU establishes an amount of water based on a single family residential dwelling. - 4,000 gallons per 2010 study				
	<b>Unit (Consumption) Charges</b>			
	\$4.20 (all units)			
			Meter Multiplier Ratios	Water w/Base rate
<b>Proposed Base Rates</b>				
Meter size will determine base rate <sup>3</sup>				
	Residential	Commercial		
3/4" - inside	\$ 58.29	\$ 58.29	1.0 : 1	3500
1" - inside	\$ 81.61	\$ 81.61	1.4 : 1	4900
1.5" - inside	\$ 104.92	\$ 104.92	1.8 : 1	6300
<b>2.0" - inside <sup>4</sup></b>	<b>\$ 169.04</b>	<b>\$ 169.04</b>	<b>2.9 : 1</b>	<b>10150</b>
<b>3.0" - inside <sup>4</sup></b>	<b>\$ 641.19</b>	<b>\$ 641.19</b>	<b>11.0 : 1</b>	<b>38500</b>
3/4" - outside	\$ 69.95	\$ 69.95	1.0 : 1	3500
1" - outside	\$ 97.93	\$ 97.93	1.4 : 1	4900
1.5" - outside	\$ 125.91	\$ 125.91	1.8 : 1	6300
<b>2.0" - outside <sup>4</sup></b>	<b>\$ 202.86</b>	<b>\$ 202.86</b>	<b>2.9 : 1</b>	<b>10150</b>
<b>3.0" - outside <sup>4</sup></b>	<b>\$ 769.45</b>	<b>\$ 769.45</b>	<b>11.0 : 1</b>	<b>38500</b>
3 - Base rates use the 3/4-inch meter as a starting point, then utilizes meter ratios according to size (AWWA standard)				
4 - Larger meter sizes provided for possible future sized connections with meter multiplier, currently 1.5" is the city's largest meter				
	<b>Proposed Unit (Consumption) Charges <sup>5</sup></b>			
Tiers Levels	Per Unit (inside)	Per Unit (outside) <sup>6</sup>		
One	\$ 7.00	\$ 8.40		
Two	\$ 8.00	\$ 9.60		
Three	\$ 9.00	\$ 10.80		
5 - Unit charges set on average usage, budget parameters and meeting proposed expenditures. Coincides with Option 1-B MM				
6 - Proposed unit charge maintains 20 percent increase for outside service, additional cost to deliver water				



# Water Rate Study

## Introduction:

In June 2021, the City of Nehalem 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:

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

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

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

- Budgeted amounts for capital improvement
- Creation of a contingency fund for emergency purposes
- Existing expenditures based on the billing unit of 1,000 gallons
- Monthly costs based on the number of active meter connections

After an extensive evaluation of current budget numbers in this rate study, it appears that modifications in the existing water rates are necessary to create a fair structure. The last formal rate review (adjustment) was effective June 14, 2010

Reserves at eleven percent (\$70,000.00) 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 recommended that they be reviewed on a regular basis.

A recommended contingency fund for emergencies may be 10 to 20 percent of the operational part of the budget. This single line item (\$70,000.00) is 9.96 percent of the 2022-23 budget. These contingencies do not need to be expanded if not essential to match future necessities. It is advisable to carry unused contingencies and other revenues not spent over to the 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 rates have not seen an adjustment applied when it was considered necessary. Oregon Association of Water Utilities will recommend annually, an adjustment based on the basket of services entailing water, sewer operations and maintenance.

Several water rates examples and options for the City of Nehalem’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 manages 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 necessary. 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 decided from the existing records and future needs as discussed and outlined in the proposed budget. This has been provided in a one single budget expense figure at \$699,244.00 dollars.

<b>Table 1: Proposed Budget Information</b>		
Personnel and Materials Services:	\$502,005.00	71.42%
<b>Sub-total:</b>		<b>\$498,312.00</b>
Annual Debt Service:	\$125,932.00	17.92%
Capital Outlay:	\$5,000.00	0.71%
Public Works Building:	\$70,000.00	9.96%
<b>Total Expenditures:</b>		<b>\$702,937.00</b>

Other information is as follows: 777 active connections with approximately ninety percent of customers classified as residential service. Approximately 17 accounts (2.1 percent) are considered inactive. Also included in the calculation of rates is the amount of averaged water produced at approximately a) 38.89 million gallons (MG) or 39.89 thousand units annually; b) amount of averaged water sold at 42.63 MG, or 42.63 thousand units; c) amount of averaged unaccounted (non-revenue) for water at -3.74 MG (3.7 thousand units). The remaining unaccounted-for water at -9.6 percent is significant, and up-side-down. The discrepancies are attributed to inaccuracies likely with the master meter register and or service meters. Meters are read to the thousand gallons, so a meter that records a consumption of 3,300 gallons will be billed for a total consumption of 3,000 gallons. This difference is likely reported the following month but may cause some confusion for customers. The billing software used by the city has the capabilities of reading meters to the hundreds and tens.

Originally, the primary purpose for a formal water rate structure was to aid the City in developing a structure that shows a format that appeared uniform for all users. While reviewing revenues and expenditures, the primary emphasis was directed at a) fair rates for all users; b) assure no single classified group supplements another group; c) low volume usage customers would keep a relatively set monthly rate.

The concept with emphasizing annual short-term projects is in affording funding of maintenance for projects often tabled for a later time. Short-term projects are usually in step with routine maintenance and small in price. Funding for short-term projects can be prioritized annually, correspond to an average amount of monies, then placed in the budget. This step coordinates completion of projects for the water system during the timeframes the City Council adopts annual budgets. These small short-term CIPs, looking at a three-year timeline, should be considered to be paid for from the water rates.

Annual production and delivery of water offers insight to the efficiency of the water system when comparing deliverables against the total operating expenses. Viewed as cost per unit of water, 1000-gallons, the water system can figure out 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 unaccounted through meter readings, it is seen as a 100 percent loss associated with the expenditure cost for that unit. The exception to this is when operations can stipulate water spent for duties and other maintenance tasks. This water is then considered non-billable water used rather than unaccounted for water.

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 named 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. The earlier table outlines this approach to reveal how water deliverables affects the overall revenue needed.

<b>Table 2: Cost per Unit for Delivery</b>			
Total Expenditures: Used in this study		\$702,937.00	
Water Production: 42.63 MG (42,637 units) (1,000 gallons)			
Unaccounted for Water: -3.74 MG (3,743 units) (1,000 gallons) <sup>1</sup>		-9.62%	
<b>Average cost per single unit (1,000 gallons)</b>			
Expense per gallon	0.01649	Rate per 1,000 gallons	Potential Revenue
Charge per unit <sup>2</sup>	\$4.20	\$16.49	NA <sup>3</sup>
1 – Negative # shows more water sold than produced, 2 – Current unit charge to the consumer, 3 – Potential lost revenue undeterminable until meter review is completed			

In table 3, the City of Nehalem’s revenues are derived from two factors, a) the size of the connection and allowance of water given in the base rate, and b) the average monthly consumption per meter size, deciding the total approximate monthly cost. To recover the difference in revenues not collected in the base rate, the volume (consumption) rate income should meet the total revenue requirements when added to the base rate income.

<b>Table 3: Current Rate Information</b>						
<b>Service Connection Size (in.)</b>	<b># Of connections</b>	<b>Allowance (Units) <sup>1</sup></b>	<b>Base Rate <sup>2</sup></b>	<b>Unit Rate Cost</b>	<b>Average Consumption</b>	<b>Typical Monthly Cost</b>
<b>Residential</b>						
3/4" – inside	156 <sup>3</sup>	4.0	\$36.60	\$4.20	3359	\$36.60
1" – inside	1	4.0	\$36.60	\$4.20		
1.5" – inside	0	NA	NA	\$4.20		
3/4" – outside	539 <sup>3</sup>	4.0	\$44.60	\$4.20	3442	\$44.60
1" – outside	1	4.0	Various	\$4.20		
1.5" – outside	0	NA	NA	\$4.20		
<b>Commercial</b>						
3/4" – inside	42	Various	Various	\$4.20		
1" – inside	2	2.0-4.0	Various	\$4.20		
1.5" – inside	1	20	\$183.00	\$4.20		
3/4" – outside	23	Various	Various	\$4.20		
1" – outside	5	Various	Various	\$4.20		
1.5" – outside	3	Various	Various	\$4.20		
<b>Total Connections</b>	773 <sup>4</sup>	NA		NA		
<b>Total Annual Base</b>			<b>\$452,356.20</b>			
<b>Total Annual Consumption</b>			<b>\$22,433.95</b>			
<b>Joint Base and Consumption</b>			<b>\$474,790.15</b>		<b>67.54%</b>	
Surplus or shortfall			<b>\$(228,146.85)</b>		<b>32.46%</b>	
1 – based on ERUs, 2 – various base rates based on ERUs, 3 – 90 percent of users, 4 – actual connections 777, 4 services pay only unit cost						

Historically, water services have been analyzed through many lenses, approaches, and points of view. Cost based rates that generate revenues from class-based customers in proportion to the cost to serve each class develops a method for full recovery of revenues. Full revenue requirements are a summation of operations, maintenance, and capital costs that a utility must recover during the time period for which the rates are put in place. This cost per unit for the City of Nehalem to deliver a unit of water (1,000 gallons) to the tap is \$16.49. Cost base rates, reflective of cost-of-service analysis have two general methodologies to achieve an answer, base-extra capacity, and commodity-demand capacity.

Base-extra-capacity considers the variations in costs associated with flows beyond normal quantities.<sup>1</sup> Commodity-demand-capacity costs are distributed to customer classes on the basis of total annual use.<sup>1</sup> Demand related costs are applied to various classes in proportion to a class’s total-demand capacity. This application of rates is founded on maximum-day or peak hour demand.

1- American Water Works Manual M36 Fourth Edition

These two methodologies, through a lengthy process, extract the maximum-day or peak demand supplemental costs from the simpler equation of a single cost per unit, then adds the cost to either the base rate or consumption rate.

Historically commercial and industrial users were charged a higher monthly fee due to factors that create a greater impact to the city. Outside city limit users can categorically be calculated using the same equation, and evidence is distinct, the water must be delivered beyond the city's limits and or into the urban growth boundary. Expansion of the water system beyond the city limits is a choice by Council to meet these needs yet a yes vote would create higher operating costs to the water system.

This information is provided to the decision makers to aid in estimating the monthly costs for the users, but also to assure operating expenses are met for the water department. Using the points mentioned above, decision makers should consider if the commercial accounts would be charged a rate equal with the added expenses or not. For the rate study, OAWU is recommending an approach based on meter size, and allow extra expenses compensated through the consumption unit rate.

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 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 for the City of Nehalem measure in 1,000-gallon units and a dollar amount can be charged per said unit.

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 following key points.

- Total revenues generated by base rates.
- Option of water allowed with the base rates.
- The price per unit that sets up equitability among consumers.
- Amount of available water for sale and the price per unit.
- Total revenues generated by volume (consumption) rates.

When the earlier points are defined, Oregon Association of Water Utilities can use the gathered information, and apply it to various scenarios, supplying 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 Nehalem would be \$75.39 per month.

**\$702,937.00 divided by 12 months divided by 777 users = \$75.39 per month**

Believed as the highest priority on water costs, all consumers pay for those costs associated with the infrastructure that supplies continued high quality, safe, clean water. When deciding the cost for water,

equity centered on water consumption should be decided by Council, then applied across the spectrum of users based on meter size and or classification of the connection. Finding the price per unit and the amount of consumption per month gives the essential information as the basis for monthly rates. The intrinsic value associated with water service and the consumption of water during each billing cycle make up a fair 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 deliver an informational tool for the City Council to draw on in selecting a proper rate structure, one that is easily adopted and understood by the city's customers.

Examples shown in this rate study are based on a single line budget to run and support the City's water system. While there are many approaches to figuring out 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 recognized, what percentage of revenues are generated from said base rates, and how consumption charges make up any revenue deficits. Examples stipulate both a monthly rate and an amount of water included. As the examples are presented, it will become clear that no single method satisfies all the requirements for every community.

Alternative rate structures distinguish aspects in rate studies that help in highlighting the dynamics of the water system. Although rate structures are generally composed of three components, classification of user, how often and how much, extra 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, policies on water rates are the responsibility of the utility decision makers. Even though public involvement is not a prerequisite 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 preserving and building customer trust.

Factors that affect actual total forecasted revenues include the following: water conservation, weather, economic conditions, number of actual billable customers, customers response (decrease in water consumption) to an initial increase in water rates 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 and deliver a rate structure for revenues for the water system to continue to function.

**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 figure 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 affect economically disadvantaged areas. For this rate study using the 2020 Median Household Income at \$62,334.00 and the 2020 Affordability Index of 1.25% (\$/Mo) for the 97131-zip code area, equates to \$64.94 for a monthly water bill.<sup>1</sup> See Table 4

<b>Table 4: Median Household Income</b>					
Zip Code	Certified Population 2020 <sup>1</sup>	U.S. Census Population 2010	Annual Growth	MHI 2020 <sup>2</sup>	2020 Affordability Index 1.25%
97131	285	271	0.52%	\$62,334	\$64.94
1-Population Research Center-Portland State University, 2020 Annual Oregon Population Report, 2-City-data.com/income-Nehalem-Oregon					

**Historical Rates:**

With the first figures examined, the City of Nehalem’s current water rates are a unit of measure which serves as an index to compare normal water usage of a single-family residential (SFR) customer to other multi-use and non-residential customers, to ensure that all customers are charged the same per 1,000-gallon base rate. The single-family residential customer shall be defined as having “one” equivalent residential unit (ERU), 4,000 gallons of base monthly gallons.<sup>2</sup>

Cost expenditures (2010) were reviewed and calculated using fixed costs, and variable costs. During the earlier rate study, these costs were estimated at \$9.15 per unit fixed, and \$4.23 per unit variable for a total of \$13.38 per unit (1,000-gallons) delivered to the user. These findings determined and applied a unit increase price at \$1.43. The new base rate at \$36.60, and unit cost rate at \$4.20 were an increase of \$4.00 and \$4.20 respectively.

To the best of our ability in computing figures from the 2010 water rate study, it appears the \$36.60 base rate per month for a 5/8-inch by 3/4-inch service connection was applied without using the variable cost of \$4.23 per unit (1,000 gallons). The 9.15 per unit fixed cost using four units totals \$36.60 as a base rate, yet when the base rate using the total \$13.38 (fixed and variable) per unit would total \$53.52 creates a unit expenditure/revenue balance. If the total unit cost at \$13.38, Subsection 51.12 Water Rates and Methodology (Table 1 – Breakdown by Total Base Gallons), then all units of water must meet or exceed this cost for a water system to break-even, meaning no loss or no gain in financials.

1 -<https://datausa.io/profile/geo/Nehalem-or>  
 2- Ordinance 51.03 Definitions

The minimum charge associated with four units of water should be \$53.52, and it currently is \$36.60. Currently, the consumption rate, water beyond the allowance has a unit charge at \$4.20 per 1,000 gallons. The basis for this oversight in applying water rates has yet to be resolved but it is motivation for Oregon Association of Water Utilities to offer a follow-up review of implemented water rates if called upon. A twelve-month follow-up allows confirmation of figures used in the water rate study to coordinate with actual water system operations.

The unit cost discovered during this water rate study is \$16.49 per unit. This is an increase of \$3.11 per unit or \$0.259 increase annually. The City’s water budget has increased approximately 1.8 percent annually. Between 2010 and 2021, water and sewerage maintenance experienced average inflation rate of 4.27% <sup>1</sup> per year since the last water rate study was conducted for the City of Nehalem.

**System Data:**

Information compiled in the “System Data” spreadsheet outlines those factors that influence the required monthly revenues based on the annual proposed operating budget. Water produced, water sold, and water losses are measures 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 help define a residual revenue 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, thereby water will be at a higher cost per unit to deliver beyond the base allowance to meet budget revenue requirements. All the information will relate to how much of the percentage of total revenues is generated from the base rate. Consumption rates will be included in the existing rate spreadsheet. **(See**

**Table 5: System Data)**

<i>Table 5: System Data</i>			
Total Gallons Produced		38,894 units	
Total Gallons Sold		42,637 units	
Cost per gallon		\$0.01649	
Cost per Unit (1,000 gallons)		\$16.49	
Base Rate Revenues		\$452,356.20 <sup>1</sup>	
Total Operating Budget	\$702,937.00	% Total Budget	64.35%
1 – Base rate revenues from using equivalent residential units (ERUs) totaling 884, actual total service connections are 777			

Other information that relates to the first review of the figures associated with the City of Nehalem’s water rate study are:

- Current base rates are set up based on total service connections – approximately 777
- Current base rates equal 64.69 percent of proposed budget (recommended 60-75 percent)
- Proposed base rates will be presented using 77 percent of proposed budget for monthly charge
- Current base rates allow 87 percent of total water produced

1-<https://www.in2013dollars.com/Water-and-sewerage-maintenance/price-inflation/2015-to-2021?amount=20>



- Proposed annual adjustments will follow the Consumer's Price Index (CPI) <sup>1</sup>
  - Applying the baskets of services for water, wastewater operations and maintenance
- Current consumption rates are considered a flat block rate at \$4.20 per unit
- Proposed rates will outline a tiered structure using three levels - \$8.00 to \$11.52
- Average usage among SFR users is approximately 3.3 units (3,300 gallons)
- SFR make up approximately 89 percent of all users while consuming 64.7 percent of all produced water

1-<https://www.in2013dollars.com/Water-and-sewerage-maintenance/price-inflation/2015-to-2021?amount=20>



**Water Rate Study  
for  
City of Nehalem**

**System Data**

For Year: **2022-2023**  
Date completed: **May-22**

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

Gallons (annual)	1000 gal units. (annual)	4 year average	
38,894,333	38,894		
42,637,416	42,637	<b>Note</b>	
-3,743,083	-3,743		-9.62%

Personnel / Materials  
PW Building  
Debt Service  
Capital Outlay  
Total Annual Budget

Dollars	Cost per Gallon	Cost Per 1000 Gals	Cost Per 100 Cu.Ft.
\$502,005.00			
\$70,000.00	\$0.01649	\$16.49	\$12.33
\$125,932.00			
\$5,000.00			
\$702,937.00	<b>Non-Revenue Costs</b> \$ (61,709.92)		\$ (46,159.02)

Connection Information  
Base Rate Only

Size	# of connections *			
	Residential	Commercial (In)	Outside (Res)	
3/4"	156	22	544	Out Residential Out Comm
3/4" out	1	7	1	
1"	1	11	1	Out Residential
1 1/2"	7	8	1	
1" Out	1	1	1	Commercial Commercial City Park
1 1/2" Out	2	5	1	
	1	1	1	
	1	1	1	777

Current Rate information (base)

	Residential	Commercial (In)	Outside (Res)	
3/4"	\$36.60	\$18.30	\$44.60	
3/4" out	\$91.50	\$22.30	\$1,126.50	
1"	\$36.00	\$36.60	\$334.50	
1 1/2"	\$89.20	\$66.90	\$947.75	
1" Out	\$73.20	\$128.10	\$183.00	
1 1/2" Out		\$54.90	\$1,460.65	
		\$312.20	\$345.65	<b>Base Rate Revenues</b>
		\$22.30	\$267.60	\$ <b>452,356.20</b>

Residential Consumption Rate  
Commercial Consumption Rate

Per 1000 gals.	\$4.20		
Per 1000 gals.	\$4.20		

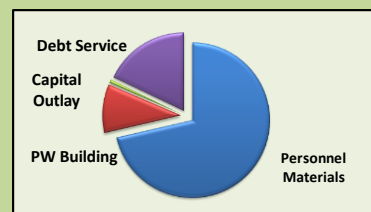
Operating Budget Outline

Personnel / Materials	\$502,005.00	71.42%
Contingency	\$70,000.00	9.96%
Capital Outlay	\$5,000.00	0.71%
Annual Debt Service	\$125,932.00	17.92%
<b>TOTAL OPERATING EXPENDITURES</b>	\$702,937.00	<b>Base Rate % Total Cost</b> <b>64.35%</b>

Percentage of budget without any consumption revenue

Notes:

Last rate adjustment - 2010  
SFR - 4,000 gallons allowance  
Residence Apartments categorized as "commercial"  
Mo. Water Allowance ranges from 1,000 to 200,000 gallons  
1" meter service base \$ range from \$22.30 - \$947.75 pending allowance  
1.5" meter service averaged, monthly base rate ranges from \$54.90 - \$334.50  
29 - Single varied categories of users, unit cost averages from \$9.15 (inside) - \$11.15 (outside)  
Figures from meter size rate codes, totaling 777 service connections, current rates based on ERUs, Equivalent Residential Units, 4-non  
1 - Capital Outlay combines \$5K for capital outlay, \$70K for PW building debt service



**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) affect the overall budget. Since the City of Nehalem offers an allowance of water in 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 reveal any surpluses or deficits of the current rate structure. Included at the bottom of the “Existing rate spreadsheet” are supposed residential (inside city) cost figures of monthly rates supported by three hypothetical levels of monthly consumption.

<b>Table 6: Existing Rates</b>			
<b>Total # of Connections</b>	<b>777</b>		
<b>Total Production of Water (annual units)</b>	<b>38,894</b>	<b>Sold Water (Annual units)</b>	<b>42,637</b>
<b>Consumption Charge per Unit (1 - ccf)</b>	<b>\$4.20 <sup>1</sup></b>	<b>Total Billable Units</b>	<b>5,341</b>
<b>Base Rate Revenues <sup>2</sup></b>	<b>\$452,356.20</b>	<b>Revenue Percent</b>	<b>64.35%</b>
<b>Consumption Rate Revenues</b>	<b>\$22,433.95</b>	<b>Non-Revenue Water</b>	<b>Non accountable</b>
<b>Total Revenues</b>	<b>\$474,790.15</b>	<b>% Of Total Budget</b>	<b>67.54</b>
<b>Total Proposed Budget</b>	<b>\$702,937.00</b>	<b>Budget Shortfall</b>	<b>35.65%</b>
<b>Findings</b>			
<b>Cost Per Unit</b>	<b>\$16.49 <sup>3</sup></b>	<b>Allowed Units (month)</b>	<b>3536 (8.3%) <sup>4</sup></b>
<b>Water Allowance Revenues</b>	<b>NA</b>	<b>% Of Total Budget</b>	<b>NA</b>
<small>1- Single price sold among user groups, actual minimum per unit charge should be \$6.90, 2- Figure based on current base rates (ERUs) per month times 12, 3- Cost per unit calculates total operating budget by total units in production, 4 – Allowed units is total monthly units provided in allowance compared to total units produced, based on ERUs (884), provided by staff, file name “Nehalem rate codes”</small>			

The average residential consumer purchases approximately 3.3 units or 3,300 gallons per month, which equates to a water charge of \$36.60 per month. The majority of SFR do not use water above the monthly allotment. The average usage for all customers (residential, commercial, and industrial) is 4.5 units per month, for SFR users the average consumption is 3.4 units.



## Water Rate Study for City of Nehalem

**Existing Rates**

For Year: **2022-2023**  
Date completed: **May-22**

Amount of Water Produced  
Amount of Water Sold  
**Unaccounted for Water**

Annual Gals	Annual Units	
38,894,333	38,894	
42,637,416	42,637	
-3,743,083	-3,743	-10%

Annual Operating Budget  
Designated Reserves  
Total Annual Budget

Dollars	Cost per 1,000 gallons
\$577,005.00	\$ 16.49
\$125,932.00	
\$702,937.00	

Connection information

Size	# of connections			Cost per 100 Cubic Feet
	Residential	Commercial (In)	Outside (Res)	\$
3/4"	156	22	544	Total ERUs 884 Total Connections 777
3/4" out	1	7	1	
1"	1	11	1	
1 1/2"	7	8	1	
1" Out	1	1	1	
1 1/2" Out	2	5	1	
	1	1	1	
	1	1	1	
Consumption w/ base	170	56	551	
Unit of Water = 1000 gallons	4	4	4	

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

Size	Residential	Commercial (In)	Outside (Res)
3/4"	\$36.60	\$18.30	\$44.60
3/4" out	\$91.50	\$22.30	\$1,126.50
1"	\$36.00	\$36.60	\$334.50
1 1/2"	\$89.20	\$66.90	\$947.75
1" Out	\$73.20	\$128.10	\$183.00
1 1/2" Out	\$0.00	\$54.90	\$1,460.65
	\$0.00	\$312.20	\$345.65
	\$0.00	\$22.30	\$267.60

Consumption Charge

per 1000 gals.	Residential	Commercial (In)	Outside (Res)
	\$4.20	\$4.20	\$4.20

Current Base Revenue

Size	Residential	Commercial (In)	Outside (Res)	Totals
3/4"	\$5,709.60	\$402.60	\$24,262.40	\$ 30,374.60
3/4" out	\$91.50	\$156.10	\$1,126.50	\$ 1,374.10
1"	\$36.00	\$402.60	\$334.50	\$ 773.10
1 1/2"	\$624.40	\$535.20	\$947.75	\$ 2,107.35
1" Out	\$73.20	\$128.10	\$183.00	\$ 384.30
1 1/2" Out	\$0.00	\$274.50	\$1,460.65	\$ 1,735.15
0.00	\$0.00	\$312.20	\$345.65	\$ 657.85
0.00	\$0.00	\$22.30	\$267.60	\$ 289.90
Total/month	\$6,534.70	\$2,233.60	\$28,928.05	\$ 37,696.35
12 mo. Total	\$78,416.40	\$26,803.20	\$347,136.60	\$ 452,356.20

Base Rate Totals

% of operating budget

	Residential	Commercial (In)	Outside (Res)	Totals
	11.16%	3.81%	49.38%	64.35%

Water with base charge

	Residential	Commercial (In)	Outside (Res)	Totals
Total/month	680	224	2,204	3,108
12 mo. Total	8,160	2,688	26,448	37,296

Total Water Included in Base Rate

12 mo. Total	37,296			
Available Units To Be Sold				5,341
Potential Lost Revenue Cost				\$ 22,433.95
Non-Revenue Units				3.19%

Notes:

777 active connections equal 884 ERUs, ERU = 4,000 gallons  
Annual allowance of H2O is 42.42 MG, 99% of available water  
5,300 units available to sell, little opportunity to increase revenues  
Remaining units must be sold at \$25.00 per  
Monthly water allowance too high, average usage is below 4 units

Annual Gain/Shortfall

\$ 474,790.15
\$ (228,146.85)
67.54%

Typical Residential Water Bill

Units of Water	Residential (in) Water Bill
3.30	\$36.60
7.00	\$49.20
10.00	\$61.80

## Preliminary Observations:

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

- The City of Nehalem produces nearly 3.5 million gallons per month to supply the needs of the community
- Un-accounted water cannot be figured due to discrepancies in the production meter. Current meters show more water sold than is produced by the water treatment plant
  - For each unit of water unaccounted for, cost associated with equals \$16.49
    - This cost is associated with budget requirements
  - Calibration or replacement of production meter should be a high priority
- With base rate revenues totaling 64.35 percent, this figure is in line with the typical percentages seen with other communities
- Analysis performed aligned unit costs to overall budget which proved with the current base rates, all water sold would be priced at a unit cost unimaginable, and
  - Above point based on 884 ERUs allowed each month or 3.54 MG
  - Water allowed with the base rate is too excessive for the base rate to support
- When figuring out total revenue from consumption rates, the \$4.20 unit charged was applied to all potential water sold beyond those assigned allowances
- The unit charge created a \$9.18 shortfall on every unit sold from the original cost of delivery at \$13.38 in 2010. Cost to deliver a single unit of water realized in this water rate study is \$16.49
- Three consumers, four service connections are only charged \$4.20 per unit, without a monthly base rate. It is unclear as to how this oversight developed, and it is a significant finding in the study
- The new proposed water rates for the City of Nehalem will apportion the consumption rates using three tiers, increasing the cost per unit in alliance with various consumption levels
- The City of Nehalem does provide an allowance of water with the base rate, at 4,000 gallons (four units) per SFR. Other allowances are founded on the SFR
- Completed water rate study will recommend water allowances in correlation with meter size, beginning with 3.5 units of water (3,500 gallons) for a 5/8-inch by 3/4-inch meter
- Typical monthly water consumption for a 5/8-inch by 3/4-inch meter connection is 3,300 gallons
- Current water rate for a 5/8-inch by 3/4-inch service connection
  - 4,000 gallons is \$36.60 – should be \$53.52 to match expense of services
- New water rate for a 5/8-inch by 3/4-inch service connection
  - 4,000 gallons is \$62.05
  - Creates consistent monthly revenues year-round, matches fixed monthly expenses
- An average monthly consumption for all consumers at 4,500 gallons, including larger users



## Meter Multiplier:

With the study, a recommendation to adjust the current rate structure to adopt a meter ratio that applies to the size of the service connection, creates a fair approach to base water rates. 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 (capacity) 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. Table 7 presents the specific ratios, taken from the American Water Works Association (AWWA) as an industry standard.

Size (inches)	Equivalent Cost Meter Ratio
5/8 - 3/4	1.1
1.0	1.4
1.5	1.8
2.0	2.9
3.0	11.0
4.0	14.0
6.0	21.0

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. 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 at \$29.00.

Using this approach in finding 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 finding proper 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. An allowance will increase proportionately with the size (cost) ratios, a significant difference from the capacity ratio, especially as it relates to the larger meters. A three-point-five-unit allowance for a 5/8-inch by 3/4-inch meter would translate to (two-units multiplied by 2.9) 10.15 units of water allowance for a two-inch meter.

The City of Nehalem has done well with keeping the water rates in line with expenses. With 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, then follow the ratios for applying base costs for the larger users.

Using all water provided in the base rate will better calculate the amounts of available water to be sold. Water provided in the base rate is subtracted from the total water produced. Production water is also subtracted from the category of available water.

The meter multiplier begins with finding the base rates solely on fixed operating expenses which are typically 60-75 percent of a water budget. Applying this percentage range foundation to the 5/8-inch by 3/4-inch meter, we see a monthly connection rate at \$58.05, currently the monthly charge is \$36.60 dollars. The large discrepancy is from the water rate study in 2010 was implemented incorrectly using only the fixed costs associated with water system operations, and not total cost per unit. Total cost per unit in 2010 was proven at \$13.38 setting base rates at \$53.52 when supplying four units of water for an SFR.

Using the meter multiplier approach to base rates, and applying the same theory to allowances of water, a total of 32,970 units will be provided with the base rate. This figure equates to 77 percent of the average available water sold during the past year. The remaining 23 percent of the water will be sold at a minimum of \$8.00 per unit, without consideration of the tiered structure.

Total base rate revenues obtained when the larger meters are formulated using the meter cost ratio will be slightly higher than the range of 60-75 percent, equaling 89.19 percent. This is due to the large percentage of outside users, which are charge a higher rate. Few water systems serve a larger group of customers outside the city and this single point will actually allow the consumption price to be set lower. The remaining 10.81 percent of the proposed budget will be generated by water sales. Table 8 Meter Multiplier Costs give specifics as it relates to the implementation of new rates based on meter size.

<b>Table 8: Meter Multiplier Costs</b>			
Total # of Connections	777	Allowance	3.5 units <sup>1</sup>
Base Rate	\$58.05 <sup>2</sup>	Annual Base Revenue	\$626,943.81
Total Allowance of Water (gals.)		32,928 units (32.92 MG)	
Available Water for Sale (gals.)		9,709 units (9.71 MG)	
Required Balance of Revenues	\$77,675.33	Total Billable Units	9,709
Consumption Rate per Unit	\$8.00 <sup>3</sup>	Annual Consumption Revenue	\$97,047.56
		Total Revenues	\$701,820.92
			\$2,576.92
<i>Typical Monthly Cost (5/8" meter) (gals.)</i>		6 units (6,000 gals.)	\$77.75
1- unit is 1,000 gallons per month, 2 – 5/8-inch by 3/4-inch meter service inside city limits, 3 – flat rate is \$8.00, unit price increase to balance budget, 3.5 units monthly cost is \$57.75, if tier structure is implemented, small reduction in unit cost will be amended			





MM ALL

Rate Study  
for

City of Nehalem

For Year: 2022-2023  
Date completed: May-22

Amount of Water Produced  
Amount of Water Sold  
Unaccounted for Water

Annual Units	38,894	
	42,637	
	-3,743	-9.62%

Annual Operating Budget  
Annual Debt Service  
Total Annual Budget

Dollars	\$577,005.00
	\$125,932.00
	\$702,937.00

# of connections

Connection Information

Size	3/4"	1.0"	1.5"
Res (inside)	156	1	0
Res (outside)	539	1	0
Com (inside)	42	2	1
Com(outside)	23	5	3
Special (out)	1	1	1

Total Connections  
776

Consumption w/ base (gal.)

See Units Allowed (1000 gals.)

Units Allowed  
3.5  
3.5  
4.9  
6.3

	3/4"	1.0"	1.5"
Res (inside)	\$58.05	\$81.27	\$104.49
Res (outside)	\$69.66	\$97.52	\$125.39
Com (inside)	\$58.05	\$81.27	\$104.49
Com(outside)	\$69.66	\$97.52	\$125.39
Special (out)	\$69.66	\$97.52	\$125.39
	Inside	Outside	
per 1000 gals	\$8.00	\$9.60	

Meter Multiplier In Use  
5/8" = 1.0  
3/4" = 1.0  
1" = 1.4  
1 1/2" = 1.8

Consumption Charge

Current Base Revenue

	3/4"	1.0"	1.5"	Totals
Res (inside)	\$9,055.86	\$81.27	\$0.00	\$ 9,137.13
Res (outside)	\$37,546.97	\$97.52	\$0.00	\$ 37,644.49
Com (inside)	\$2,438.11	\$162.54	\$104.49	\$ 2,705.15
Com(outside)	\$1,602.19	\$487.62	\$376.17	\$ 2,465.98
	\$0.00	\$0.00	\$0.00	\$ -
	\$0.00	\$0.00	\$0.00	\$ -
Special (out)	\$69.66	\$97.52	\$125.39	\$ 292.57
				\$ -
Total/month	\$50,712.79	\$926.48	\$606.05	\$ 52,245.32
12 mo. Total	\$608,553.46	\$11,117.80	\$7,272.55	\$ 626,943.81

% of operating budget

	86.57%	1.58%	1.03%	89.19%
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Water with base charge

Total/month	2,664	49	32	2,744
12 mo. Total	31,962	588	378	32,928

Typical 3/4" Usage

Percentage of Allowed Water  
77.2%

Water Consumption

	Residential	Commercial	Other	Total Base Revenue
12 mo. Total	31,962			
12 mo. Total		588		
12 mo. Total			378	\$ 626,943.81
			9,709	\$ 77,675.33

Available Water to be Sold  
Consumption Revenues

Potential Annual Revenues	\$ 704,619.14
Total Revenue Generated	\$ 1,682.14
Annual Gain/(Shortfall)	0.24%

Cost per 1000 gals

\$16.49	
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Notes:

- Variable examples slightly change a component in the study which adjusts unit price
- Using meter multipliers, base rate increases from 64 to 89 percent of budget
- Monthly charge increases from from \$36.60 to \$58.05 or \$21.45
- Single tier approach, all units of water sold at minimum \$8.00

Typical Residential Water Bill

Gallons Used	Res. Water Bill
3.30	\$58.05
7.00	\$86.05
10.00	\$110.05

### **Increase Consumption Rate:**

The approach taken in this example is a schedule of rates applicable to blocks of increasing usage corresponding with increased costs per unit. Currently the City of Nehalem has a single charge per unit formatted structure. Increasing block rates are designed based upon the customer classification founded 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” apply to a greater volume of water delivery than the preceding block(s). Block tiers are designed to be in alignment with meter ratios, average usage and parallel increases as related to the size of the allowances in the base rate.

This style of rates requires applying a judgment and utility policy on 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 three units of water per month in the base rate, a four-inch meter is allowed 42 units of water per month.

To aid in defining the “judgement” factor for consideration in applying successive block volumes, each successive block(s) can be set in step with the preceding 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 decide the various set points of each block.

Conservative in nature, this focus towards water rates creates an incentive to save water. Understand, that normal water consumption, if reduced by this approach, experience shows the future return towards normal levels prior to the rate change. One feature about 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 nor on greater conservation steps.

Tables 9 Tier Rate Recommendations shares a format that outlines the recommended 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, implementing a twenty percent increase for delivery of water beyond the city limits.

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, SFRs. In the analysis performed using the meter-multiplier example, proves if all available units can be sold at \$8.00 per unit, revenues will match the proposed budget.

Setting tier one at \$7.00 will be less impactful to the majority of the users. With the increased block rates, analysis gives evidence that if all users consumed approximately 4.5 units (4,500 gallons) average consumption among all users (residential, commercial), revenues would match expenditures.

A three-tier structure should be more than adequate to generate funds for the 2022-2023 fiscal year, be easily understood and interact with the current billing software.

Table 9 displays recommendations for the application of tiers as they relate to each sized service connections. Figures for the three ranges are the start stop set points as to how they will be placed in the billing software. Monthly base rates show differentiations between the inside city and outside city users, but noting the same allowance is used per size of connection. Unit charges per tier increase with each tier and shown in blue font. Other larger sized meters are included to aid the city if a larger sized connection were required by a new customer or a request for an upgrade by an existing customer.

<b>Table 9: Tier Rate Recommendations</b>						
Meter Size	Mo. Base Rate	Allowances	With Base Rate	Tier One	Tier Two	Tier Three
	Base Rate	With Base Rate	With Base Rate	Tier One Range <sup>1</sup>	Tier Two Range <sup>1</sup>	Tier Three Range <sup>1</sup>
<b>Inside City Limits</b>						
3/4" <sup>A</sup>	\$ 58.05	3.5	3.5	3.6 - 7.0	7.1 - 10.5	10.6 +
1" <sup>B</sup>	\$ 81.27	4.9	4.9	4.9 - 9.8	9.8 - 14.7	14.8 +
1.5" <sup>C</sup>	\$ 104.49	6.3	6.3	6.4 - 12.6	12.7 - 18.9	19.0 +
Applied tier adjustments for inside city users				<b>\$7.00</b>	<b>\$8.00</b>	<b>\$9.00</b>
<b>Outside City Limits</b>						
3/4" <sup>A</sup>	\$ 69.66	3.5	3.5	3.6 - 7.0	7.1 - 10.5	10.6 +
1" <sup>B</sup>	\$ 97.52	4.9	4.9	4.9 - 9.8	9.8 - 14.7	14.8 +
1.5" <sup>C</sup>	\$ 125.39	6.3	6.3	6.4 - 12.6	12.7 - 18.9	19.0 +
* Applied tier adjustments for outside city users				<b>\$8.40</b>	<b>\$9.60</b>	<b>\$10.80</b>
<b>Additional Size Meters for the Future</b>						
2"	\$ 168.35	10.15	10.1	20.0 - 30.0	30.0 - 40.0	40.1 +
3"	\$ 638.55	38.5	38	38.1 - 76.0	76.1 - 114.0	114.1 +
4"	\$ 812.70	49	49	49.1 - 98.0	98.1 - 147.0	147.1 +
1- structured set start-stop points for each tier						
A - service connections - inside - total 156, outside - total - 539						
B - total one inch service connections - 10						
C - total 1.5 inch service connections - 5						
* - Tiered rates for outside users synchronized with inside user increases, adjusted 20 percent higher						
2", 3", and 4" meter size cost information provided for future services connections that may require larger service lines relating to inside city limits						

The following pages depict the three classifications of users as a) 5/8-inch by 3/4-inch customers, b) one-inch customers and c) 1.5-inch customers. Even though the base rates are aligned on meter size, (not classification of users) the spreadsheets outline specifics as it relates to current categories of users. Information is:

- Total number of users per category
- The base rate for each sized meter and its impact towards total budget
- Charges per unit of consumed relating to the three tiers
- Varied monthly customer costs from allowances to 168 units

- Annual revenues and percentage of budget at each of the three tiers

The takeaway from the following pages is understanding how each user group contributes to the percentage of revenues in relation to the overall budget, \$699,244.00. SFR dwellings account for 89 percent of all users (156 inside SFR - 20 percent, 539 outside SFR - 69 percent).

When consuming 3.3 units (3,300 gallons) of water, make up 87 percent of the required revenues to meet budget. Tier two figures show revenues based on consumption of 7 units of water (7,000 gallons) each month by all users. These 7 units of water are set up in the “Ascending Rate” tables as a transitional point where tier two begins to charge the higher per unit rate. With the current average production figures used in this water rate study, (42.63 MG) usage of seven units by every customer would exceed production figures by 20,000 units.

Ascending Rate for 5/8-inch by 3/4-inch Services



Connection Information										
Size	# of residential connection by size			Base Rate Information				Units of H2O	Total Proposed Budget:	
	Meter Cost Multiplier Factor									
3/4"	156	1.00	Res Inside	\$58.05	Monthly Base Revenue				9,709	\$ 702,937.00
3/4"	539	1.00	Res Outside	\$69.66	\$50,643.13					
3/4"	42	1.00	Comm Inside	\$58.05						
3/4"	23	1.00	Comm Outside	\$69.66	Annual Base Revenue					
				\$0.00						
			Total #	\$0.00	\$607,717.53					
			Connections	\$0.00						
			760	\$0.00						
Allow	Tier 1	Tier 2	Tier 3	COST TO CONSUMER AT EACH TIER				Consumption	Total Consumption	
	Cost / 1K	Cost / 1K	Cost / 1K					Monthly Revenue	Monthly Revenue	
3/4"	3,500	\$7.00	\$8.00	\$9.00	NA	\$24.50	\$28.00	\$31.50	\$107.80	\$ 21,373.80
3/4"	3,500	\$8.40	\$9.60	\$10.80	NA	\$29.40	\$33.60	\$37.80	\$123.20	\$ 24,427.20
3/4"	3,500	\$7.00	\$8.00	\$9.00	NA	\$24.50	\$28.00	\$31.50	\$138.60	\$ 27,480.60
3/4"	3,500	\$8.40	\$9.60	\$10.80	NA	\$29.40	\$33.60	\$37.80	Consumption	Total Consumption
	0				NA	\$0.00	\$0.00	\$0.00	Annual Revenue	Annual Revenue
	0				NA	\$0.00	\$0.00	\$0.00	\$1,293.60	\$ 256,485.60
	0				NA	\$0.00	\$0.00	\$0.00	\$1,478.40	\$ 293,126.40
	0				NA	\$0.00	\$0.00	\$0.00	\$1,663.20	\$ 329,767.20
		Tier Change Levels			Monthly Customer Costs					\$879,379.20
3/4"	Included	7000	10500	14,000	\$58.05	\$82.55	\$110.55	\$142.05	86.45% 122.94% 164.64% 211.55%	Base + Consumption
3/4"	Included	7000	10500	14,000	\$69.66	\$99.06	\$132.66	\$170.46		Annual Revenue
3/4"	Included	7000	10500	14,000	\$58.05	\$82.55	\$110.55	\$142.05		\$ 607,717.53
3/4"	Included	7000	10500	14,000	\$69.66	\$99.06	\$132.66	\$170.46		\$ 864,203.13
	Included				\$0.00	\$0.00	\$0.00	\$0.00		\$ 1,157,329.53
	Included				\$0.00	\$0.00	\$0.00	\$0.00		\$ 1,487,096.73
	Included				\$0.00	\$0.00	\$0.00	\$0.00		\$ 1,157,329.53
	Included				\$0.00	\$0.00	\$0.00	\$0.00		\$ 454,392.53
Gallons begin in relationship to meter multiplier										
1 Unit = 1,000 Gals.										

Ascending Rate for One-Inch Services



Connection Information										
Size	# of residential connection by size			Base Rate Information						
	Meter Cost Multiplier Factor									
1.0"	1	1.40	Res Inside	\$81.27	Monthly Base Revenue					
1.0"	1	1.40	Res Outside	\$97.52	<b>\$828.96</b>					
1.0"	2	1.40	Comm Inside	\$81.27						
1.0"	5	1.40	Comm Outside	\$97.52						
			Total # Connections		Annual Base Revenue					
			9		<b>\$9,947.51</b>					
					<b>1.42%</b>					
										<b>Total Proposed Budget:</b>
										<b>\$ 702,937.00</b>
	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	
1"	4,900	\$7.00	\$8.00	\$9.00	NA	\$34.30	\$39.20	\$44.10	\$150.92	\$ 349.86
1"	4,900	\$8.40	\$9.60	\$10.80	NA	\$41.16	\$47.04	\$52.92	\$172.48	\$ 399.84
1"	4,900	\$7.00	\$8.00	\$9.00	NA	\$34.30	\$39.20	\$44.10	\$194.04	\$ 449.82
1"	4,900	\$8.40	\$9.60	\$10.80	NA	\$41.16	\$47.04	\$52.92		
	0				NA	\$0.00	\$0.00	\$0.00	Consumption Annual Revenue	Total Consumption Annual Revenue
	0				NA	\$0.00	\$0.00	\$0.00	\$1,811.04	\$ 4,198.32
	0				NA	\$0.00	\$0.00	\$0.00	\$2,069.76	\$ 4,798.08
	0				NA	\$0.00	\$0.00	\$0.00	\$2,328.48	\$ 5,397.84
		Tier Change Levels			Monthly Customer Costs					<b>\$14,394.24</b>
1"	Included	9800	14,700	19,600	\$81.27	\$115.57	\$154.77	\$198.87		Base + Consumption Annual Revenue
1"	Included	9800	14,700	19,600	\$97.52	\$138.68	\$185.72	\$238.64		
1"	Included	9800	14,700	19,600	\$81.27	\$115.57	\$154.77	\$198.87	1.42%	\$ 9,947.51
1"	Included	9800	14,700	19,600	\$97.52	\$138.68	\$185.72	\$238.64	2.01%	\$ 14,145.83
	Included	0	0	0	\$0.00	\$0.00	\$0.00	\$0.00	2.69%	\$ 18,943.91
	Included	0	0	0	\$0.00	\$0.00	\$0.00	\$0.00	3.46%	\$ 24,341.75
	Included	0	0	0	\$0.00	\$0.00	\$0.00	\$0.00		\$ 18,943.91
	Included	0	0	0	\$0.00	\$0.00	\$0.00	\$0.00	Based on Tier 2	\$ 2.69%
	Gallons begin in relationship to meter multiplier									<b>\$ (683,993.09)</b>
	1 Unit = 1,000 Gals.									

Ascending Rate for 1.5-inch Services



Connection Information											
Size	# of residential connection by size				Base Rate Information						
	Meter Cost Multiplier Factor										
1 1/2"	0	1.80	Res Inside		\$104.49	Monthly Base Revenue					
1 1/2"	0	1.80	Res Outside		\$125.39	<b>\$773.23</b>					
1 1/2"	1	1.80	Comm Inside		\$104.49						
1 1/2"	3	1.80	Comm Outside		\$125.39						
					\$0.00						
3/4"	<b>1</b>	Billed Units Only	Total #		\$69.66	Annual Base Revenue					
1.0"	<b>1</b>		Connections		\$97.52	<b>\$9,278.77</b>					
1.5"	<b>1</b>		<b>7</b>		\$125.39	<b>1.32%</b>					
	Tier 1	Tier 2	Tier 3						Consumption	Total Consumption	
	Allow	Cost / 1K	Cost / 1K	Cost / 1K		COST TO CONSUMER AT EACH TIER				Monthly Revenue	Monthly Revenue
1.5"	6,300	\$7.00	\$8.00	\$9.00	NA	\$44.10	\$50.40	\$56.70	\$296.94	\$ 305.76	
1.5"	6,300	\$8.40	\$9.60	\$10.80	NA	\$52.92	\$60.48	\$204.12	\$339.36	\$ 349.44	
1.5"	6,300	\$7.00	\$8.00	\$9.00	NA	\$44.10	\$50.40	\$170.10	\$767.34	\$ 914.76	
1.5"	6,300	\$8.40	\$9.60	\$10.80	NA	\$52.92	\$60.48	\$204.12	Consumption Annual Revenue	Total Consumption Annual Revenue	
	0	\$7.00	\$8.00	\$9.00	NA	\$0.00	\$0.00	\$0.00			
3/4"	3,500	\$7.00	\$8.00	\$9.00	NA	\$24.50	\$28.00	\$31.50	\$3,563.28	\$ 3,669.12	
1.0"	4,900	\$7.00	\$8.00	\$9.00	NA	\$34.30	\$39.20	\$44.10	\$4,072.32	\$ 4,193.28	
1.5"	6,300	\$7.00	\$8.00	\$9.00	NA	\$44.10	\$50.40	\$56.70	\$9,208.08	\$ 10,977.12	
		Tier Change Levels			Monthly Customer Costs				\$18,839.52		
1.5"	Included	12600	18900	25200	\$104.49	\$148.59	\$198.99	\$255.69	Based on Tier 2	Base + Consumption Annual Revenue	
1.5"	Included	12600	18900	37800	\$125.39	\$178.31	\$238.79	\$442.91		1.3%	\$ 9,278.77
1.5"	Included	12600	18900	37800	\$104.49	\$148.59	\$198.99	\$369.09		1.8%	\$ 12,947.89
1.5"	Included	12600	18900	37800	\$125.39	\$178.31	\$238.79	\$442.91		2.4%	\$ 17,141.17
	Included				\$0.00	\$0.00	\$0.00	\$0.00		4.0%	\$ 28,118.29
3/4"	Included	7000	10500	14,000	\$69.66	\$94.16	\$122.16	\$153.66			\$ 17,141.17
1.0"	Included	9800	14700	19,600	\$97.52	\$131.82	\$171.02	\$215.12			\$ 28,118.29
1.5"	Included	12600	18900	25,200	\$125.39	\$169.49	\$219.89	\$276.59		2.44%	\$ (685,795.83)
	Gallons begin in relationship to meter multiplier										
	1 Unit = 1,000 Gals.										

Figures in "RED" represent the four service connections that are charged unit price only with the current rates. Break even costs for these four users would be \$16.49 per unit

## **Annual Rate Adjustments:**

The City of Nehalem has written in Ordinance 51.12 Water Rates and Methodology, (E) Review of customers' classes. The City shall review its water customers and customer classes periodically to ensure that the base water rate and base monthly gallons allotment assigned to a customer is correct and reflected in the City's billing records. (Ord. 2010-02, passed 6-14-2010)

Deciding base rates and monthly allotments are an important task, but not the single task in confirming if revenues are matching expenditures. The fluctuation in expenditures generally occur in a narrow range, unless multiple expensive repairs are needed in which reserve funds are spent. Annually a budget is adopted reflecting a single year's cost to run and support the water system. Equally important is routinely assessing the water system and those costs, which will vary, but reflect future cost for the next few years.

A workable alternative towards comparing revenues with expenditures is the "consumer price index" (CPI) that can extract specific costs associated with inflation that pertains to water and sewer operating expenses. This indicator delivers 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 it relates to the previous year(s) and can be quite different from the overall CPI, or overall inflation rate.

The past eleven-year cycle (time since last rate adjustment) has averaged CPI is 4.28 percent annually, which is significantly higher than the general inflation of 2.07 percent. The link below offers the city a method to follow the CPI as it relates to water and sewer inflation and apply any adjustment on fixed operating costs 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 to be completed within a given timeframe. Annually, this single budgeted line item will vary with each year's analysis, as projects are completed, tabled to the later time, or rescinded. Evaluating future projects can set an expense figure for capital improvement planning, supporting 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 element that increases rates drastically, causing uneasiness for most involved with setting up 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 supplying water from the source to the consumer's tap, usually varies from one water system to another. The variables associated with other water systems sometimes cannot apply to the City of Nehalem. A new water system completed without any debt owed is rarely seen. The age of a water system plays a bigger role in figuring out future cost since repairs, maintenance and rebuilding is often more expensive than new development.

The importance of looking at the future on system growth and repair or replacement of aging components and deciding an evaluation of costs can be difficult at times. Proposed costs are usually 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 water quality stemming from proper system operations and management.

Evidence discovered in the early assessment were two: a) the set base rates created an equal cost per unit of water delivered to the customer, with a distinction between the inside consumers and outside consumers, b) the price differentiation in the unit price for 1,000 gallons of water (one unit), is \$4.20 as compared to \$16.49 production unit cost based on overall budget.

On the examples presented in this rate study, it is being recommended the City of Nehalem move towards a meter multiplier base rate and simplify the existing base structure from 36 various users to three distinctions based on the size of the service line (meter). Even though a base rate accounts for a percentage of revenues, the overall total charges for the consumption of water received should meet the unit production cost in order for the water system to be fiscally responsible. Recommendations for the tier structure from a single “flat” cost per unit to an increase block rate will incentivize consumers to scrutinize water consumption and create a conservation mindset.

The following are recommendations:

- Begin an annual review of prioritized smaller projects and costs associated with
  - Apply the findings against the short-term capital improvement set asides
    - Examples – meter replacement program
  - Adjust projects to match single line-item funding, or adjust capital improvement figures
- Track water production (raw water) against water sold
  - Calibrate master meter at regular intervals
  - Pending age of services connections, start meter maintenance or replacement program
  - Attempt to confirm actual unaccounted for water
  - Budget for and start routine leak detection practice
  - Evaluate cost per unit in production \$16.49 against the difference in figures of water produced, water used in operations and water sold
- Review CPI figures and adjust the “base rate” according to the inflation index for water and sewerage maintenance, using the single past year or three average as the criteria
- Look at accuracy of water meters (production, service), replace if showing discrepancies
- Within in six months of data collection, decide if leak detection is necessary to show impact of unaccounted water.

These suggestions create uniformity in the water rates using absolute ratios to apply base rates allowing the City of Nehalem to adjust the rates in the future. Using an industry benchmark with the base rates averaging 60-75% of proposed budget, the City of Nehalem has supported fixed cost revenues as they relate to proposed budgets. Per unit costs have increase from \$13.38 to \$16.49 or a difference of \$3.11. Over a twelve-year timeline, 2011-2021, the average increase in overall expenses is twenty-five cents annually.

The following chart shows 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 tier costs presented in the water rate study for the year 2021-2022, beginning July 1, 2022.

The City of Nehalem 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 carried out by using the CPI. The aspect of water rates determination compared to future cost can be difficult to forecast. Revenues can only legally be collected from real estimated expenses and specific planned, named projects.

As the City chooses to implement the proposed rates, the homework in tallying up water produced figures, water sales, unaccounted for 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 generated during the next year. The city has been proactive in understanding items of sales, production, and expenditures, and knowing the importance of the resource that is provided to its community.

Water Consumption - Monthly Rate Comparison								2021-22 Budget
Connection Size	3/4- in	3/4- out	1.0" in	1.0" out	1.5" in	1.5" out	NA	
Base Rate Water Allowance	3.5	3.5	4.9	4.9	6.3	6.3		
Base Rate	\$58.05	\$69.66	\$81.27	\$97.52	\$104.49	\$125.39		\$ 702,937.00
Consumer Class								Totals
Residential	156	539	1	1	0	0		697
Commercial	42	23	2	5	1	3		76
	2		1		1			4
Monthly Usage and Hypothetical Cost for Consumers at Various Consumption Levels								777
Tier Rates	Tier One	\$7.00	Tier Two	\$8.00	Tier Three	\$9.00		
Consumption Levels	Outside	\$8.40	Outside	\$9.60	Outside	\$10.80		
2.00		\$ 58.05	\$ 69.66	\$ 81.27	\$ 97.52	\$ 104.49	\$ 125.39	\$ 52,254.61
2.80		\$ 58.05	\$ 69.66	\$ 81.27	\$ 97.52	\$ 104.49	\$ 125.39	\$ 56,619.97
3.50	Ave Use 3/4	\$ 58.05	\$ 69.66	\$ 81.27	\$ 97.52	\$ 104.49	\$ 125.39	\$ 52,254.61
4.00		\$ 61.55	\$ 73.86	\$ 81.27	\$ 97.52	\$ 104.49	\$ 125.39	\$ 55,315.01
4.50		\$ 65.05	\$ 78.06	\$ 81.27	\$ 97.52	\$ 104.49	\$ 125.39	\$ 58,164.03
5.00		\$ 68.55	\$ 82.26	\$ 81.97	\$ 98.36	\$ 104.49	\$ 125.39	\$ 61,443.65
6.00		\$ 75.55	\$ 90.66	\$ 88.97	\$ 106.76	\$ 104.49	\$ 125.39	\$ 67,642.85
7.00		\$ 82.55	\$ 99.06	\$ 95.97	\$ 115.16	\$ 112.49	\$ 133.79	\$ 73,883.25
10		\$ 106.55	\$ 127.86	\$ 116.97	\$ 140.36	\$ 136.49	\$ 158.99	\$ 95,227.65
11.20		\$ 116.15	\$ 139.38	\$ 126.57	\$ 151.88	\$ 146.09	\$ 169.07	\$ 103,778.85
11.60		\$ 119.35	\$ 143.22	\$ 129.77	\$ 155.72	\$ 149.29	\$ 172.43	\$ 106,629.25
12.00		\$ 122.55	\$ 147.06	\$ 132.97	\$ 159.56	\$ 152.49	\$ 175.79	\$ 109,479.65
14.00		\$ 138.55	\$ 166.26	\$ 148.97	\$ 178.76	\$ 168.49	\$ 194.99	\$ 123,738.85
18		\$ 174.55	\$ 209.46	\$ 180.97	\$ 217.16	\$ 200.49	\$ 233.39	\$ 155,754.85
19		\$ 183.55	\$ 220.26	\$ 188.97	\$ 226.76	\$ 208.49	\$ 242.99	\$ 163,758.85
20.00		\$ 192.55	\$ 231.06	\$ 196.97	\$ 236.36	\$ 216.49	\$ 252.59	\$ 171,762.85
24		\$ 228.55	\$ 274.26	\$ 232.97	\$ 279.56	\$ 248.49	\$ 290.99	\$ 203,823.65
25.00		\$ 237.55	\$ 285.06	\$ 241.97	\$ 290.36	\$ 256.49	\$ 300.59	\$ 211,838.85
28.80		\$ 271.75	\$ 326.10	\$ 276.17	\$ 331.40	\$ 286.89	\$ 337.07	\$ 242,296.61
39.58		\$ 368.77	\$ 442.52	\$ 373.19	\$ 447.83	\$ 383.91	\$ 453.49	
45.00		\$ 417.55	\$ 501.06	\$ 421.97	\$ 506.36	\$ 503.29	\$ 512.03	
50.83		\$ 470.02	\$ 564.02	\$ 474.44	\$ 569.33	\$ 566.25	\$ 574.99	
56.00		\$ 516.55	\$ 619.86	\$ 520.97	\$ 625.16	\$ 622.09	\$ 630.83	
61		\$ 561.55	\$ 673.86	\$ 565.97	\$ 679.16	\$ 676.09	\$ 684.83	
65.00		\$ 597.55	\$ 717.06	\$ 601.97	\$ 722.36	\$ 627.49	\$ 728.03	
71.33		\$ 654.52	\$ 785.42	\$ 658.94	\$ 790.73	\$ 787.65	\$ 796.39	
78		\$ 714.55	\$ 857.46	\$ 718.97	\$ 862.76	\$ 859.69	\$ 868.43	
81.00		\$ 741.55	\$ 889.86	\$ 745.97	\$ 895.16	\$ 892.09	\$ 900.83	
134.00		\$ 1,218.55	\$ 1,462.26	\$ 1,222.97	\$ 1,467.56	\$ 1,464.49	\$ 1,473.23	
250.00		\$ 2,262.55	\$ 2,715.06	\$ 2,266.97	\$ 2,720.36	\$ 2,717.29	\$ 2,726.03	
360.00		\$ 3,252.55	\$ 3,903.06	\$ 3,256.97	\$ 3,908.36	\$ 3,905.29	\$ 3,914.03	
200.00		\$ 1,812.55	\$ 2,175.06	\$ 1,816.97	\$ 2,180.36	\$ 2,177.29	\$ 2,186.03	
		BR Monthly Revenue			\$ 52,254.61			\$ 627,055.27
		T1 Monthly Revenue			\$ 61,443.65			\$ 737,323.75

As evidence presents itself during the following year, the Oregon Association of Water Utilities will return, if called upon, to review and confirm the effectiveness of the chosen scenario. With many considerations and decisions being calculated with this rate study, it is a goal of Oregon Association of Water Utilities to

aid the City of Nehalem in water rates that meet the needs of the water system, supply fair rates for all consumers.

The above chart attempts to serve two purposes, a) clarify those questions from the consumer as to the monthly cost associated with their average monthly consumption, b) show total monthly revenues and the relationship to meeting annual budget. Highlighted in “blue”, are two figures. The first, on the left of the chart, shows the average usage from 777 active users in order to meet a monthly requirement. The monthly revenue in blue, totals all users base and consumption charges into a preliminary total then carries the figure to the lower right corner, showing the total potential annual revenues. Figures are constructed from data supplied by the City of Nehalem, and total revenues reflect the four services connections noted in red at the top of the chart. These four services were paying a bulk rate of \$4.20 per unit and will align with the recommended rates and structure as other consumers. Any discrepancies from data originally entered will influence the final figures. A follow-up of monthly figures associated with this study is recommended.