

Wastewater Rate Study



City of Yachats

Final Report

February 2021



Prepared by:

Oregon Association of Water Utilities

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Executive Summary:

Oregon Association of Water Utilities is pleased to present this report on the wastewater cost of service, rate design and capacity fee study to the City of Yachats. We are confident that the results developed, based on a cost-of-service analysis, when implemented, will result in fair and equitable sewer rates for the City's users. Secondly with equal priority, the revenue program will be in aligned with the operations of the wastewater department.

The wastewater rate study involved a review of the City's financial plan or rate structure, and usage characteristics. In addition, the study also included a review of the City's capacity in relation to the flows generated in the winter months. The adopted changes to the City's existing rate structures and capacity fees are summarized below.

Rate Structure:

Based on our review of the City's existing residential and commercial/industrial rate structures and, we propose the following:

- Continue the use of a rate structure that includes both a fixed monthly base fee and a variable charge based on water usage.
- Continue monthly single-family residential (SFR) user charges based on a minimum six-month (October – March) winter water usage, applying averages for the remaining months.
- Consider a 95 percent return factor may be applied to SFR usage to account for water use that is not returned as sewer flow. This step may complicate the billing and understanding of the rate structure.
- Continue applying the same fixed monthly fee to other classes of users, then adjust base rates for larger sized service connections to align with impartiality. The Significant Industrial Users Survey (SIUS) proved it is not necessary to create additional charges for total suspended solids (TSS) or biological oxygen demand (BOD).
 - Current commercial monthly base rates range between \$52.31-\$327.24.
 - Consider a base rate of \$60.00 per month for all commercial users equal to or greater than 1.0-inch water service connection.
- Other classification of users applies a single month water usage to determine wastewater generation. This is the current billing structure used in 2020-2021.

Recommendations for the City of Yachats to consider:

- An annual review of the flows, biological oxygen demand (BOD), total suspended solids loadings for the commercial industrial classes.
- Update and review overall operating costs.
- Look at developing an appropriate SFR class sewer cap as it is aligned with the monthly water usage.

Background:

The city retained Oregon Association of Water Utilities in July 2019 to update the cost of services for wastewater rates. A rate design to ensure a continued fair and equitable system of user charges for provided wastewater services. A review of the capital improvement planning (both short-term and long-term) using a single line-item expense to determine said monthly rates. One consideration the City should consider is the increased State mandated permits that will likely impact overall operating expenses and users' rates.

To meet the annual operating expenses required by the City's adopted budget, the City should consider a billing format developed on a strength-based billing method, which was completed in-house October 2020

Objectives:

- Revenue sufficient to meet operations and maintenance costs, capital outlay, and debt service
- Revenues to provide adequate operating funds and short-term capital reserves.
 - Smaller projects that can be completed within the timeframe of this study.
 - Revenues to cover cost of short-term small annual projects.
- Create rates that are fair and equitable for all users.
- Produce rates that meet criteria of lending agencies for the future long-term capital projects and loans.
 - Large projects that are funded through low-interest loans, grants, possible principal forgiveness.

Scope:

The scope of this study update includes the determination of wastewater user rates through an update of system costs, flows, loadings, and review of rate design. User rates facilitate the generation of adequate revenues to meet routine annual O&M and capital expenditures including debt service.

The three major processes are as follows:

Financial Planning: Revenue requirements are projected for a three-year period from FY 2021 through FY 2024. Financial planning involves assisting the city with taking a single line item for the annual O&M and capital expenditures, annual debt service and reserve requirements, operating and capital revenue sources and the determination of required annual user revenues from rates.

Cost of Service: Cost of service involves the apportioning of required annual revenues to the different user classes proportionate to their contributions of flows and loadings. Since the City has completed the SUIIS, a uniformed rate can be applied for all users. The City has an agreement with a single wastewater generator to adjust characteristics of the waste stream to meet current permit guidelines.

Rate Design: Rate design involves the development of a fixed and variable schedule of rates for each of the different user classes to equitably recover the costs attributable to them.

Assumptions:

Following are the assumptions used in the study:

- Annual O&M and capital expenditures, revenues from the customer base, and reserve requirements are based on the City’s adopted budget.
 - \$712,535.00.
- Annual average wastewater system flow is based on the City’s Wastewater Treatment Plant (WWTP) “Daily Monitoring Reports” from 2016-2019.
- Biological Oxygen Demand (BOD) and Total Suspended Solids (TSS) strength assignment for the different user classes is not used as determined by the completion of the SIUS.

Conclusions:

The City of Yachats has been outstanding in their application of wastewater rates with small incremental annual increases, using the construction cost index, which has averaged 2.63 percent annually. Current base rates produce approximately 70 percent of operating cost based on a figure \$712, 535.00. Calculations indicate a per unit (748 gallons) treatment cost at \$8.07 which is based on a total collected annual average of approximately 88,000 units. Wastewater generation rate is \$5.91 per unit which includes cost for treatment and a capital improvement reserve (CIR) of \$0.57 per unit.

Rate Structure:

- Wastewater Base Rate for all 5/8-3/4-inch water service - \$47.91
 - Usage is determined by a winter average from October through March.
- Wastewater Base Rate for one-inch and larger service - \$60.00
 - Currently there are nine separate base rate charges for large services.
 - Usage is applied for the month of water usage.
- Wastewater Generation Flow Rate per unit - \$ 6.00
 - This single figure removes the CIR per unit, follows the water rate study completed in December 2020.
- Annual adjustment based on consumer price index relating to the basket of services (water, wastewater maintenance) – averaging approximately 2.4 percent.

Wastewater Rate Study

Introduction:

In July 2019, the City of Yachats authorized the Oregon Association of Water Utilities to review current wastewater rates and determine adjustments to be considered. This coinciding with aspects of system operations and capital improvement planning. Procedures to conduct a wastewater summary began during late summer in conjunction with the water rates.

The approach of this study includes financial strategies and rates that:

- Adjust current wastewater utility revenues due to inflation, operations and maintenance modifications, and capital improvement planning.
- Review capital expenses as they relate to operational costs of the wastewater system and adopted Capital Improvement Plan projects.
- Are relatively simple to understand and implement, being consistent with industry standards and practices.

The rate summary proposal is based upon combined expenditures placed into a single total line item. These budgeted amounts are obtained from the City of Yachats' documents. This figure includes personnel services, materials and services, contingency funding, and capital improvement.

Oregon Association of Water Utilities is pleased to present this wastewater rate study to the City of Yachats. When conducting a rate study, the consideration that the best results are based on the most accurate data obtained, equity among the consumers and revenues that sustain a budget allowing the wastewater system to be operated according to State regulations.

Assumptions:

- Annual O&M and capital expenditures, revenues from the customer base and reserve requirements are based on the City's adopted budget.
- Annual average wastewater system flow is based on the city's annual report on projected flows.
- TSS strength assignment for the different user classes has been determined non-applicable as the city completed the significant industrial user's survey (SIUS).
- BOD strength assignment for the different commercial/industrial SIC classes were not part of this wastewater rate study.

Billing for sewer service coincides with the volume of wastewater a user will discharge to the sewer system. Discharge is measured by comparing water usage over a specific period as it

relates to the classification of generator. These measurements assist in defining the difference of the discharge of sewage by the users and the total volume of wastewater received at the wastewater treatment plant (WWTP). The variance between the two consists of the inflow and infiltration. Inflow and infiltration (I&I) are defined as groundwater and stormwater that enter a sewer system.

Written materials provided by the City and discussions with personnel support the key points necessary to meet the following goals:

- Establish revenues to meet budgeted expenditures.
- Changes in necessary monies for capital improvement.
- Creation of a contingency fund for emergency purposes.
- Existing revenues founded on water meter readings as outlined in section Costs of Services.
- Apply industry standards for adjustments in revenue/expenditure relations.

One point of discrepancy is the comparison of actual influent into the WWTP and how the units of measure are derived. Currently, the City of Yachats wastewater system comprises of 846 connections:

- 662 residential connections – Single-family residential (SFR).
- 39 commercial connections supplied by a 5/8-inch meter.
- 136 residential / commercial connections – vacation rentals – businesses.
- 09 commercial connections supplied by 2+ inch meters.

Wastewater System:

The City owns and operates a wastewater system that includes all services within the City limits. The collection system maintains approximately eight miles of main sewer pipe that are both gravity and pressurized flow, five pump stations and approximately 300 manholes. The WWTP provides primary and secondary treatment prior to an ocean outfall. The plant has a capacity to 1.9 million gallons per day peak demand. ¹

Review of the daily monitoring reports, dating from 2015 through 2019, the average daily flows are approximately 0.179 MGD with the maximum single day flow at 1.228 MGD, December 2015. Dry weather timeline, May through October, indicate average daily flows for the five-year period to equate to 0.207 MGD, while the wet weather period daily average is 0.505 MGD.

Flows into the WWTP can be summarized by those fluids being generated by users connected to the system and the I&I from rainfall or groundwater. Treatment costs are directly associated with flows (total volume) and solid loading through the WWTP. The city tracks monthly rainfall totals and compares figures with influent entering the WWTP.

Water - Wastewater Relationship

When discussing wastewater rates an applicable correlation and implementation of said rates is assumed as one with the water service. Billing for sewer service is based on the volume of wastewater a user will discharge to the sewer system. Discharge is measured by comparing water usage each month and billing on a one-to-one ratio of said usage. These measurements assist in defining the difference of the discharge of sewage by the users and the total volume of wastewater received at the WWTP.

One point of discrepancy is the comparison of actual influent into the WWTP and how the units of measure are derived. Currently, the City of Yachats is comprised of 846 connections with 94.3 percent as residential connections and the remaining 5.7 percent commercial connections.

Sixteen percent (136) of the residential dwellings are considered a business and likely generate above average sewage. These dwellings are rental units supported by marketplace companies and private party entities which promote travel. These places may have above normal occupancies, therefore consuming more water and generating more wastewater. Experience found in other studies indicate generation of waste can be fifty percent higher than normal single-family residential (SFR) dwellings.

Following the allowance of water in the water rates, two units of wastewater (1,496 gallons) are provided in the monthly base rate expense. The current unit rate for wastewater is \$5.34 for all users that generate wastewater above the allowance of 1,496 gallons (2 units).

This study does not include reviewing commercial users in comparison to a single-family resident or the review of monthly water consumption. Currently the city bills for additional water over the allotment of 1,496 gallons, which corresponds to 5/8-3/4-inch meter service connections, while larger sized connections apply a meter cost ratio. The meter cost ratio will not apply to establishing wastewater rates or allowances of additional generated wastewater. All wastewater customers will receive two units of wastewater in the base rate regardless of the size of the water service connection.

An additional \$0.57 per unit (100 cubic feet of water) (748 gallons) is added to existing consumption rate to support "capital improvement reserves". This figure will be included in the consumption rate that is recommended for the future wastewater rates. Current total unit charge is \$5.91 per unit.

The City of Yachats produces approximately four million gallons per month of drinking water with 3.6 million gallons registering through water meters.

The wastewater treatment plant (WWTP), over a five-year review, receives approximately 5.15 million gallons of wastewater per month. ¹ The additional flows, assumed from I&I, account for an additional thirty percent wastewater that is required to be treated per Federal and State rules.

The additional wastewater generated does not necessarily increase additional costs on a one-to-one ratio associated with treatment, but it will impact the total operating expenditures for the wastewater department. Stormwater may dilute the TSS and BOD strengths found in some of the wastewater generated.

System Data spreadsheet outline total documented flows, total budget based on personnel, materials, annual debt service, contingency funding, and capital improvement figures. Budget figures are displayed in table.

Table 1: City of Yachats Wastewater Rate Budget 2020-21		
Personnel / Materials	\$ 552,500.00	Figures from Fund 670 WW Dept 100 WW Systems
Contingency	\$ 60,000.00	Figures from Fund 670 WW Dept 100 WW Systems
Total Debt Service	\$ 505,035.00	Fund 155-1276 Restricted Reserves WW Plant Loan
Capital Outlay ¹	\$ 100,000.00	Fund 150 Dept 170 WW Plant *
Total Proposed Budget	\$ 1,217,535.00	
URD/F&B Tax ²	\$ 465,000.00	Speculation to the consistency of revenue
SDC/Transfers ³	\$ 40,000.00	Figures from Fund 155 WW Dept 176 WW Plant Loan
Balance Surplus / Deficient ⁴	\$ (712,535.00)	
1 - Figure adjusted down from \$368,000.00 - over four year timeline		
2 - Figure chosen as an average,		
3 - Figure consistent each year from 2017-18 fiscal year, prior year figure was \$80,000.00		
4 - Balance is figure we anticipate the rate payers will cover each year with annual adjustments based on CIP		
* - Figure close to \$95,000.00 in "City of Yachats Finance Committee" 5-YR CIP Plan		
Base Rate Revenue ^A	\$ 486,686.88	
Consumption Revenue ^B	\$ 342,314.85	
Total Revenue	\$ 829,001.73	
A - Revenues figured at \$47.94 per month x 846 users		
B - 2 units allowed (1,500 gallons) per month - all remaining units charged \$5.91 - total units sold 57,921 = 43.32 MG annually		
B - Over 5-yr timeline, average monthly inflows = 5.45 MG or 65.40 MG annually or 53% additional water for treatment.		
B - 22.08 MG "precipitation" = 29,500 units - what is actual cost to treat this capacity - impact on total revenues		



Wastewater Rate Study

for

City of Yachats

System Data

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

Wastewater Influent ¹
Water Sold ²
Potential Infiltration

Gallons (annual)	100 Cu Ft. (annual)	4 YR Total Treatment	
66,020,000	88,262	264.02	
43,325,128	57,921		
22,694,872	30,341		34.38%

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

2020-2021		Annual WWTP Flows MG	Cost per Gallon	Cost Per 1000 Gals	Cost Per 100 Cu.Ft.
Dollars					
\$ 552,500.00		2019 - 56.377			
\$ 60,000.00		2018 - 61.966			
\$ 505,035.00		2017 - 74.193	\$0.0108	\$10.79	\$8.07
\$ 100,000.00		2016 - 71.539			
\$ 1,217,535.00			Potential Treatment Cost \$ 244,939.27	\$ 244,939.27	

URD/F&B Tax ³
SDC/Transfers ³
Balance Surplus / Deficent
Connection Information
Base Rate Only

Size	Residential	# of connections Commercial	Residential (Out)	
5/8"	662	39		
3/4"		136		
1"				
1 1/2"				
2"		7		
3"		1		
4"		1		
6"				
				Total Connections ⁴
				846

Current Rate information (base)

Size	Residential	Commercial	Residential (Out)	
5/8"	\$47.94	\$47.94		
3/4"		\$47.94		
1"				
1 1/2"				
2"		\$173.25		Average base rate for 2-inch
3"		\$91.87		
4"		\$69.27		
6"				
				Base Rate Revenues
				\$497,996.04

Current Generation Rate
Per Single Family Residence

5.44	4,000	Balance
Cubic Feet	Gallons	

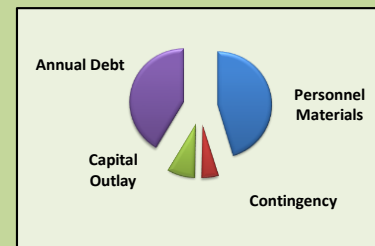
Percentage of budget without any consumption revenue

Operating Budget Outline

Personnel / Materials	\$552,500.00	77.54%
Contingency	\$60,000.00	8.42%
Capital Outlay	\$100,000.00	14.03%
Annual Debt Service	\$505,035.00	70.88%
Supplemental Revenue	\$505,000.00	
TOTAL OPERATING EXPENDITURES	\$712,535.00	Base Rate % Total Cost
		69.89%

Notes:

- WWTP Capacity design @ 1.96 MGD with minimum DEQ removal rate at 85%, achieving 98% Urban renewal contribution @ \$95,000.00
- F&B Tax contribution @ \$370,000.00
- 1- Taken from the Wastewater DMRs from 2016-2019
- 2 - Figures taken from Water Rate Study
- 3 - Figures taken from Fund 155 WW Plant Loan
- 4 - Provided by billing software



User Classification and Loading:

In a Cost-of-Service Study, the City is currently using a water consumption method to determine total flows and treatment costs associated with managing the wastewater system. Residential users have similar characteristics and therefore, assumed to have identical discharge parameters. The commercial and industrial user waste strengths vary based on the type of business that generates the waste, identifying additional parameters, total suspended solids (TSS) and biological oxygen demand (BOD) loadings. Currently, the City has completed the process of performing a Significant Industrial Users Survey (SIUS) to determine there is no single high strength waste generator connection to the sanitary system.

Single-Family Residential Usage:

The residential classifications are homogenous in that all the users are assumed to have the same TSS and BOD strengths. Since all residential accounts are considered the same TSS and BOD strengths, they each have a single wastewater rate that includes all three parameters and are based on metered water usage. However, the volume of wastewater flows can vary among the individual users depending upon water usage. The specific variation of the SFR water usage possibly includes significant irrigation usage for yard and garden areas whereas MFR water usage includes exceptionally low irrigation usage since most MFR users have a small yard area, if any. Usually, MFR complexes that have large common green areas and pools have separate irrigation meters.

One method to differentiate actual water usage to wastewater generation is looking at winter months usage and applying the average volume of purchased water during October through March and applying the same figures to the monthly wastewater generation for the entire year. This will increase the level of responsibility on staff to ensure routine meter reading is completed within a narrow timeline.

Commercial Usage:

Typically, there is significant variability in both the volume of wastewater flows and loadings strengths, among the different types of commercial/industrial users such as food service establishments, retail stores, and supermarkets. Therefore, to ensure fair and equitable determination of wastewater service charges, the City uses separate unit rates applied to flow, TSS, and BOD loadings of users. The City's SIUS did not identify any high strength wastewater producers during the time of this study. The City should consider developing a future outline indicating parameters of normal strength waste (SFR, MFR) as well as commercial or public entities that the City determines to contribute sewage of a quality type consistent with that of domestic waste. Parameters for commercial high loading waste should be included as a guide the City can use in the future.

Revenue Requirements:

Revenue requirements from rates are the total of all expenditures, including reserve requirements for debt service. The City has a few principal sources of revenue to recover operating costs which includes the base rate and unit generation rate, Urban Renewal contribution and the Capital Reserve transfers (food and beverage tax). The annual revenue requirements for the wastewater operation and maintenance budget were established at \$1.21 million dollars. With allocated funding from the additional revenue streams, required revenues from consumer rates account for approximately \$712,000.00 annually.

Existing Rate Structure:

The City’s existing wastewater rate structures for the community include a fixed base fee and a usage (generation) rate. While the base fee is charged to each wastewater service, the usage rate is linked to a users’ water consumption, thus totaled for wastewater generated. The wastewater billed monthly are based on water sold for the current month.

Base – Consumption Fees:

In the existing rate structure, the base fee is identical for every user class except for the commercial accounts. Residential or single family residential (SFR) have a base rate of \$47.94 which includes 1,496 gallons (two-units) of wastewater discharged, a unit cost of \$5.34 with a capital improvement reserve of \$0.57 per unit. The sewer flows (generation) wastewater fee is \$5.91 per unit. The existing base rates match approximately 70 percent of the adopted budget. The City of Yachats has been diligent with managing wastewater rates in the aspect of annual rate adjustments. A small incremental annual adjustment is a recommended best management practice that is currently being implemented by the City.

Table 2: Current Wastewater Rates			
	Residential - 5/8- meter	Commercial	
Sewer w Two Units	\$ 47.94	1.0 - inch	\$ 103.15
		2.0 - inch ¹	\$ 173.24
		3.0 - inch	\$ 91.87
		4.0 - inch	\$ 69.27
Total Base	\$ 47.94		varies
Sewer Consumption (unit) ²	\$ 5.91		\$ 5.91
Capital Improvement Reserve ³	\$ 2.28		\$ 2.28
Total Consumption (unit)	\$ 6.01		\$ 5.91
Notes			
Current annual rate adjustments follow the construction cost index			
1 - Two inch sewer service base rate ranges from \$91.60 - \$327.24, average monthly rate is shown in table			
2 - Sewer consumption fees are associated with water meter readings			
3 - CIR applies to the base rate, actual base rate is \$45.63			



Wastewater Rate Study for City of Yachats

Existing Rates

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

**Wastewater Collected
Amount of Water Sold
Potential Infiltration**

100 Cu. Ft. (Annual)	Million Gallons (Annual)
88,262	66,020,000
57,921	43,325,128
30,341	34.38%

**Annual Operating Budget
Supplemental Revenue
Total Annual Budget**

Dollars	Monthly Cost per Connection
\$1,217,535.00	
\$505,000.00	\$70.19
\$712,535.00	

**Treatment Costs
Per 1,000 gallons
\$10.79**

Connection information

Size	# of connections			Per 100 Cubic Feet \$8.07	
	Residential	Commercial	Residential (Out)		
5/8"	662	39	0	Total Connections 846	
3/4"	0	136	0		
1"	0	0	0		
1 1/2"	0	0	0		
2"	0	7	0		
3"	0	1	0		
4"	0	1	0		
6"	0	0	0		
2.00 2.00 2.00					

**Discharge allowed - Sewer Base
Current Rate information**

	Residential	Commercial	Residential (Out)
5/8"	\$47.94	\$47.94	\$0.00
3/4"	\$0.00	\$47.94	\$0.00
1"	\$0.00	\$0.00	\$0.00
1 1/2"	\$0.00	\$0.00	\$0.00
2"	\$0.00	\$173.25	\$0.00
3"	\$0.00	\$91.87	\$0.00
4"	\$0.00	\$69.27	\$0.00
6"	\$0.00	\$0.00	\$0.00

Discharge Cost Rate

per 100 cu. ft.	\$5.91
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Current Base Revenue

	Residential	Commercial	Residential (Out)	Totals
5/8"	\$31,736.28	\$1,869.66	\$0.00	\$ 33,605.94
3/4"	\$0.00	\$6,519.84	\$0.00	\$ 6,519.84
1"	\$0.00	\$0.00	\$0.00	\$ -
1 1/2"	\$0.00	\$0.00	\$0.00	\$ -
2"	\$0.00	\$1,212.75	\$0.00	\$ 1,212.75
3"	\$0.00	\$91.87	\$0.00	\$ 91.87
4"	\$0.00	\$69.27	\$0.00	\$ 69.27
6"	\$0.00	\$0.00	\$0.00	\$ -
Total/month	\$31,736.28	\$9,763.39	\$0.00	\$41,499.67
12 mo. Total	\$380,835.36	\$117,160.68	\$0.00	\$ 497,996.04

Base Rate Totals

% of operating budget

	53.45%	16.44%	0.00%	69.89%
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Water with base charge

Total/month	1,324	368	0	1,692
12 mo. Total	15,888	4,416	0	20,304

**Discharge Included in Base Rate
Additional Discharge (units)**

12 mo. Total	20,304			
	37,617	Generation Rates	\$	222,318.21

31.20%

Total Revenue Generated \$720,314.25

Annual Gain/(Shortfall) \$7,779.25

1.09%

Notes:

2" commercial service connection varies from \$91.60 - \$327.24

2" service connection figured at an average

Typical Residential Water Bill

Gallons	EDU Gen	Residential Wastewater Bill
4,000	5.44	\$68.27
7,500	10.02	\$95.34
15,000	20.05	\$154.62

[Examples of variable cost associated with additional discharges >>>>>](#)

Cost of Service Evaluation:

If the total operating expenditures were equally segregated according to the number of service connections, the revenue necessary per connections required by the authority would be \$70.19 per month.

$$\$712,535.00 \text{ divided by } 12 \text{ months divided by } 846 \text{ service connections} = \$70.19$$

When determining cost for wastewater, equity based upon the treatment of wastewater expenses are applied, and this is accomplished by means of determining the price per unit and the amount of generation per month. Additional factors, such as strength of waste stream measured in BOD and TSS can impact treatment costs. Believed as one of the highest priorities regarding wastewater rates, is that consumers should pay for their costs associated with services rendered.

If the City of Yachats looked at adopted budgets as a single line item of total required revenues, the figure can be calculated against the number of total units being processed. The adopted budget used in this wastewater study is \$712,535.00 (revenues required from user rates) and the average annual volume of wastewater treated at the WWTP is 66.02 MG.

The 66.02 MG converted to 100 cubic feet equates to 88,262 units of wastewater. This figure is taken from the wastewater daily monitoring reports for 2016-2019 is 34 percent higher than the wastewater generated by customers. Customer generated wastewater, in line with total meter reading (water sales) sees 57,921 units of water sold. The treatment costs per unit is:

- 88,262 units divided by \$712,535.00 = \$8.07 per unit or \$0.0108 per gallon

Looking at the Existing Rates spreadsheet, a couple key facts should be pointed out:

- Current base rates equal 69.89 percent.
- Generation rates equal 31.20 percent.
 - Presumed all units of wastewater charged at \$5.91 per.
- Two-inch service connections are charged differently.

Financial Review:

- Sewer service revenues total \$712,535.00 dollars, which equates to 69.89 percent of necessary funding in the adopted budget.
- Capital outlay and contingency is figured at \$160,000.00 in preparation for future upgrades to maintain the existing wastewater system. These monies account for only thirteen percent of the entire adopted budget.
- Various costs (I&I rehabilitation, equipment purchase, etc.) are items taken from the Fund 150 – Capital Reserves, Department 170 with a total of \$368,000.00 dollars. This aligns with the annual budget figure set in the above bullet.

Technical Review:

- Total connections 846 billed monthly, average water consumption 5.44 units.
- Average monthly (actual) discharge per connection 4,069 gallons.
- Total average monthly influent into WWTP = 5.15 MG.
- Consumer generated average monthly influent, = 3.61 MG.
- Average annual influent into WWTP = 66.02 MG (2016-2019).
- Treatment cost per unit, total influent = \$8.07 or \$0.0108 per gallon.

Note: The discrepancy of consumer generated annual flows compared to total annual WWTP measurements is figured on the infiltration and inflows of groundwater and confirmed from WWTP operations. Infiltration and inflows account for an additional thirty percent of total sewer flows.

Capital improvement planning, and the funds necessary to complete future upgrades, stem from recommended improvements outlined in the City of Yachats Capital Improvement Plan (CIP) for planning cycle 2017-2018, which designates approximately \$150,000.00 annually through the year 2021.

Capital Improvement planning priority is based on a two-fold purpose, as capital improvements (increased capacities) or as a maintenance item (maintain existing capacities). With CIP, discrepancies between estimated and actual costs for construction projects will vary, depending upon several factors. These variations in construction costs may increase or decrease the timeline in which to proceed, impacting the allotment of funds.

An annual review of the projects completed, projects not completed and those not listed, but arise over time will assist in determining the single line item dedicated to meeting the goals in CIP planning.

Annual Review:

A routine review of the commercial customer's water consumption will determine any changes in sewer flows for this classification of users. A consideration for the SFR dwelling that is not a rental unit, a six-month (October through March) basis for determining an average monthly wastewater flow, which will base the 100 percent return of winter water usage to the sewer. For each SFR dwelling, the winter month's water usage should be revised annually July 1 and this usage is the basis for monthly sewer flows charges for the following twelve months

The remaining city customers' wastewater bills should follow the single month when potable water is consumed, then applied to the wastewater flows. Due to the types of businesses the city serves, majority of metered water is assumed to return to the sewer.

A wastewater utility must be monetarily self-sufficient, recuperating not only the cost of daily operations but also being able to fund capital improvements. Customers using a lot of water or

those with large seasonal variations in consumption should pay their fair share, since collection networks are sized to meet peak demands.

Artificially maintaining low rates will lead to deferring maintenance, rehabilitation, and replacement of deteriorating infrastructure and creating public health hazards in the future. There are ways to address affordability issues within rate structure designs without placing the utility in financial risk. A routine evaluation of these three bulleted points can substantiate rate structure designs.

- Operating Ratio: Operating revenues must meet operating expenses, excluding depreciation which will equate to a ratio benchmark of 1.25 or higher ¹.
- Debt Service Coverage Ratio: is calculated as operating revenues minus operating expenses divided by principal and interest and equate to a benchmark ratio of 1.20 or higher ¹.
- Contingency Reserves (Emergency Reserves): At a minimum have appropriation funds satisfy your billing period (e.g.: 2 months) or reserves to replace the single most expensive asset.

Water and wastewater utilities are very capital-intensive. Majority of expenses for a utility are tied to capital improvement and administrative costs, and not tied to the cost to collect and treat wastewater.

Considerations:

There are ways the utility can design its rate structures to buffer against insufficient revenues, mainly through charging higher non-variable base charges. Methods require a balance between setting revenue stability-oriented rate structures and conservation-oriented rate structures. A method should reward customers financially for reducing consumption. In order to offset some of the burden of high base charges on their customers, utilities sometimes include a minimum consumption allowance with the base charge such that any use within the consumption allowance is already paid for through the base charge.

The City of Yachats has created a stable structure that combats revenue changes due to fluctuations in wastewater flows. From a perspective to maintain customer satisfaction, particularly low volume customers, the city provides two units of wastewater in the base rate.

A base charge is the amount a customer is required to pay each billing period, regardless of the amount of water that is used, or wastewater generated. This is oftentimes called a minimum charge. Base charges are highly stable sources of revenue for utilities since they are immune to customer use behavior. There is an incentive to charge as much of the fixed costs of running the utility in the base charge as possible yet reward those customers who are conservation minded.

1 – Information taken from Utility Financial Assessment Tool - NRWA

A good rule-of thumb is to have consistent revenues which match 60-75 percent of the total budget, pending the size of community served.

Due to the capital- demanding nature of wastewater utility costs and because of economies of scale, large utilities can spread their costs over a large customer base and thus are often able to charge lower base charges. Smaller utilities, however, typically rely on higher base charges to recover some of their fixed costs.

As with base charges, the higher the amount of water included in the consumption allowance, (wastewater flows) the less sensitive the total bill will be to water use reductions, and the less conservation-oriented the rate structure will be.

Unlike base charges however, the utility has no revenue stability incentive to include higher amounts of water in the consumption allowance. In fact, the more water is included in the consumption allowance, the less revenue the utility can expect to collect from most of its customers if the base charge is not adjusted similarly.

With the City of Yachats, cost for treatment is \$8.07 per unit, which associates to \$16.14 of expenditures included the base rate. Since the city collects approximately 70 percent of total budget from the base rate, it makes sense to provide an allowance, yet keep focus on the percentage changes based on the variations in expenditures.

With the City of Yachats being a destination area for tourism, the normal consumption (water) and generation flows likely does not fall into a normal range of daily usage as vacationers will be unaware of the amounts of water being consumed or wastewater generated.

With this point, the best approach to wastewater billing continues to be based monthly water usage that includes both a fixed monthly base rate and a per unit flow rate. Essentially the meters will be the measurement for the wastewater bill.

For the same reason, seasonal rates are like uniform rate structures, but the price for water associated with wastewater (\$/100 cubic feet) is higher in specific summertime months is unlikely to work for the city. The only users this approach may discourage are the local residents who see and pay the monthly bill. Seasonal rates are also appropriate for seasonal communities where demand for water is high in certain months and incredibly low in others.

In times of drought and mandatory watering restrictions, utilities' revenues are vulnerable to reductions in use, while the utilities' costs remain. The lack of revenues to reductions in use is particularly large for utilities that designed conservation-oriented rate structures. To recover some of the lost revenue during the drought and to prevent a permanent increase of rates right after the drought, some utilities have considered temporarily raising rates during the mandatory restrictions period. These are sometimes called drought surcharges. These temporary rate increases would go into effect for two simultaneous reasons:

- To recover some of the lost revenue as customers use less water (to continue paying the extremely high fixed operating costs), and
- To encourage further conservation by setting higher rates for high volume use. These temporary rate increases must be prepared for and communicated to the customers well in advance of droughts. Create an ordinance or resolution with specific rules about when the temporary rates would be implemented, when they would be removed, which blocks would be affected, and how high the rates would go.

Recommended Rate Structure:

- Wastewater Base Rate for all 5/8-3/4-inch water service - \$47.91
 - Usage is determined by a winter average from October through March.
- Wastewater Base Rate for one-inch and larger service - \$60.00
 - Currently there are nine separate base rate charges for large services.
 - Usage is applied for the month of water usage.
- Wastewater Generation Flow Rate per unit - \$ 6.00
 - This single figure removes the CIR per unit, follows the water rate study completed in December 2020.
 - Increase of \$0.09 per unit – unifies the billing software
- Annual adjustment based on consumer price index relating to the basket of services (water, wastewater maintenance) – averaging approximately 2.4 percent.

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 recommendations, thus assuring the goals presented in this wastewater rate study.

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