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Wastewater Rate Study

Final Report

Prepared for:



Donovan Enterprises, Inc.
9600 SW Oak Street, Suite 335
Tigard, Oregon 97223-6596
☎ 503.517.0671
www.donovan-enterprises.com

Wastewater Rate Study

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Executive Summary

The City of Lakeside is the sole provider of wastewater collection and treatment services to customers within the urban services boundary of the City. Revenues required to fund the delivery of these services are obtained from monthly user fees which are set by the City Council via its City charter authority. This study addresses the revenue required from rates needed to support future operations and maintenance costs for the wastewater utility along with a funding plan for capital needs that will be identified in the City's newly commissioned wastewater treatment facilities plan.

With the active involvement of City staff, twenty-year planning models were developed for this project; however, the focus for the rate study is the five-year near-term forecast of fiscal 2020-21 through fiscal 2024-25. These financial models have been reviewed with the City as they were developed and will be provided to Lakeside as a project deliverable enabling the City to make future updates.

The purpose of this study is to develop a cost of service-based methodology that will accurately determine the cost the city incurs to deliver wastewater collection and treatment services. The models developed for this project have been populated with budget data for fiscal 2020, along with actuals for fiscal 2016 through 2019. During this study, the project team presented multiple rate scenarios to the City Staff for their consideration. These model runs simulated the current service levels (CSL) of the wastewater utility, and sensitivity cases for a number of funding issues facing the City's wastewater utility. The results of each model run were expressed in terms of the rate impacts on the average single family residential customer's monthly bill for wastewater utility services. Over the near-term five-year forecast horizon, wastewater system revenue requirements are projected to increase by an average of ten percent (10%) per year.

This significant rate of increase in net system revenue requirements is the result of three principal assumptions which are:

1. The City will invest an estimated \$10 million to relocate and reconstruct the current wastewater treatment plant. The current plant was placed in service in 1974, and has reached the end of its useful life. The plant is located in a FEMA flood plain and is subject to regular flooding. It will take several years to design, permit, and build the new plant. The draft funding plan for this new facility will require the City to borrow from the State of Oregon's Clean Water State Revolving Loan Program for interim financing (i.e., during construction), and for permanent financing from the USDA's Rural Utility Service's infrastructure loan program. In anticipation of this, we are recommending the City start raising rates now to build a debt service reserve for principal and interest payments on the future indebtedness.
2. The last general sewer rate increase occurred in 2007 via Resolution 2007-03. Since that time, the City has been incurring increased costs to operate and maintain the sewer collection and treatment systems. In particular, City-maintained septic tank effluent pumping (STEP) and septic tank effluent gravity (STEG) systems costs have increased over and above the costs associated with typical gravity connections. Per existing City policy, these additional costs should not be borne by all of the City users, but paid for by the STEP and STEG users. In the last sewer rate study (2002), a surcharge for STEP and STEG users was created to ensure the City rates will remain proportional to all users. We are recommending increases to the STEP and STEG surcharges to bring proportionality of use back into balance.
3. The base case financial forecast assumes a growth rate in Equivalent Dwelling Unit (EDU) connections to the sewer system at 0% per year. This is effectively an infill and redevelopment rate of growth, and is consistent with the growth rate the City has experienced over the last ten

(10) years. With a low growth rate in EDUs, the anticipated higher fixed costs of the sewer system will have to be borne by the no-growth rate base resulting in higher monthly rates.

The base case recommended alternative wastewater rate schedule is shown below in tables 1:

Table 1 - Five Year Forecast of Wastewater Rates

	Actual 2020	COSA 2020	Forecast				
			2021	2022	2023	2024	2025
Annual inflation rate			3.0%	3.0%	3.0%	3.0%	3.0%
Net WW Revenue Required from Rates net of STEP/STEG unique costs		\$ 900,943	\$ 991,041	\$ 1,090,186	\$ 1,199,189	\$ 1,319,144	\$ 1,451,088
Equivalent EDUs		1,668	1,668	1,668	1,668	1,668	1,668
Monthly City-wide WW collection and treatment charge per equivalent EDU		\$ 45.00	\$ 49.50	\$ 54.45	\$ 59.90	\$ 65.89	\$ 72.48
STEP/STEG monthly surcharges:							
Residential STEP	\$ -	\$ 9.45	\$ 9.74	\$ 10.03	\$ 10.33	\$ 10.64	\$ 10.96
Residential STEG	\$ -	\$ 4.30	\$ 4.43	\$ 4.56	\$ 4.70	\$ 4.84	\$ 4.98
SCCII, Outside City	\$ -	\$ 950.00	\$ 978.50	\$ 1,007.86	\$ 1,038.09	\$ 1,069.23	\$ 1,101.31
North Lake Resort	\$ -	\$ 113.17	\$ 116.56	\$ 120.06	\$ 123.66	\$ 127.37	\$ 131.19
Seadrift Motel	\$ -	\$ 81.67	\$ 84.12	\$ 86.64	\$ 89.24	\$ 91.92	\$ 94.67
EEL Creek Mobil Home Park	\$ -	\$ 180.00	\$ 185.40	\$ 190.96	\$ 196.69	\$ 202.59	\$ 208.67
Monthly rate differentials by user class:							
Residential gravity flow	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Residential STEP	\$ -	\$ (1.03)	\$ (1.06)	\$ (1.10)	\$ (1.13)	\$ (1.16)	\$ (1.20)
Residential STEG	\$ -	\$ (1.03)	\$ (1.06)	\$ (1.10)	\$ (1.13)	\$ (1.16)	\$ (1.20)
Commercial I	\$ -	\$ 1.38	\$ 1.42	\$ 1.46	\$ 1.51	\$ 1.55	\$ 1.60
Commercial II	\$ -	\$ 2.68	\$ 2.76	\$ 2.84	\$ 2.93	\$ 3.02	\$ 3.11
Commercial III	\$ -	\$ 4.40	\$ 4.54	\$ 4.67	\$ 4.81	\$ 4.96	\$ 5.11
Commercial IV	\$ -	\$ 50.76	\$ 52.28	\$ 53.85	\$ 55.47	\$ 57.13	\$ 58.85
Industrial	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total Recommended Wastewater Rate Schedule:							
Inside City:							
Residential gravity flow	\$ 45.00	\$ 45.00	\$ 49.50	\$ 54.45	\$ 59.90	\$ 65.89	\$ 72.48
Residential STEP	\$ 55.08	\$ 53.42	\$ 58.17	\$ 63.38	\$ 69.10	\$ 75.36	\$ 82.24
Residential STEG	\$ 46.01	\$ 48.26	\$ 52.86	\$ 57.92	\$ 63.46	\$ 69.56	\$ 76.26
Commercial I	\$ 46.53	\$ 46.38	\$ 50.92	\$ 55.92	\$ 61.40	\$ 67.44	\$ 74.08
Commercial II	\$ 47.97	\$ 47.68	\$ 52.26	\$ 57.30	\$ 62.83	\$ 68.90	\$ 75.59
Commercial III	\$ 49.88	\$ 49.40	\$ 54.04	\$ 59.12	\$ 64.71	\$ 70.85	\$ 77.58
Commercial IV	\$ 101.03	\$ 95.76	\$ 101.78	\$ 108.30	\$ 115.36	\$ 123.02	\$ 131.32
Industrial	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Outside City:							
Residential gravity flow	\$ 90.00	\$ 90.00	\$ 99.00	\$ 108.90	\$ 119.79	\$ 131.77	\$ 144.96
Residential STEP	\$ 110.16	\$ 106.84	\$ 116.34	\$ 126.77	\$ 138.19	\$ 150.73	\$ 164.48
Residential STEG	\$ 92.02	\$ 96.53	\$ 105.73	\$ 115.83	\$ 126.93	\$ 139.13	\$ 152.53
Commercial I	\$ 93.06	\$ 92.76	\$ 101.84	\$ 111.83	\$ 122.81	\$ 134.88	\$ 148.16
Commercial II	\$ 95.94	\$ 95.36	\$ 104.52	\$ 114.59	\$ 125.65	\$ 137.81	\$ 151.17
Commercial III	\$ 99.76	\$ 98.81	\$ 108.07	\$ 118.25	\$ 129.42	\$ 141.69	\$ 155.17
Commercial IV	\$ 202.06	\$ 191.52	\$ 203.57	\$ 216.61	\$ 230.73	\$ 246.04	\$ 262.65
Industrial	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

The schedules of utility rates shown above were developed through consultation with City staff and the members of the rate study project team. The study process included an evaluation of revenue requirements, cost of service, and rate design for the five-year forecast (fiscal 2021 through fiscal 2025). The revenue requirements analysis determined the amount of annual revenue needed to be generated by wastewater rates. This analysis addressed the level, rather than the structure of rates. The cost of service analysis provided an analytical basis for assigning costs to customers, and addressing equity among customer classes. Finally, the rate design element established the structure of rates for cost recovery through fixed and variable rate components. This step addressed equity within customer classes.

A number of specific conclusions and policy recommendations were developed through this collaboration, and are briefly discussed in this executive summary. Itemized below is a listing of these conclusions and recommendations.

Conclusions

- Cash reserves are adequate to fund the City's planned wastewater operating reserves. In fact, the cash balance in the wastewater operating fund has been very stable in recent years. As of June 30, 2019, the ending fund balance was \$438,497, up slightly from the prior fiscal year. In consultation with City Staff, we are projecting the City will end the current fiscal year with a balance in the wastewater operating fund of \$352,896, well above our recommended 90 days of operating expenses requirement of \$155,515.
- The wastewater capital projects fund started this fiscal year with an unencumbered cash balance of \$563,264; and is budgeted to end the year with a cash balance of \$296,764. The City has not been making cash transfers from the wastewater operating fund in support of capital improvements. This is most likely due to the fact that rates have not been increased for thirteen (13) years.
- The City started this fiscal year with \$183,939 in the sewer SDC fund. Over the balance of this fiscal year and next, it is likely the City will spend roughly \$110,000 of this balance on the new wastewater treatment master plan. It is unlikely sewer SDCs will be a meaningful funding source going forward for the cost of the new wastewater treatment plant.
- The base case financial forecast assumes the City will issue debt to fund the planning, design and construction of the new wastewater treatment plant. The specific sequencing of this indebtedness is as follows:
 - Three (3) year design/build schedule for plant relocation and construction starting late 2020. Construction completed by June 30, 2023.
 - Interim financing provided by the Oregon DEQ's Cleanwater State Revolving Loan Program. Current terms are 0.63% APR, no administration fees. At the end of construction, principal outstanding is "taken out" by permanent financing.
 - Permanent financing provided by USDA Rural Utility Service 40-year water/wastewater loan. Current terms are 2.25% APR.
 - For this analysis, we have assumed zero grants.
- As discussed above, the base case revenue requirements forecast assumes an average annual increase of 10% per year. Although overall system revenue requirements are growing at this rate, the growth in monthly sewer rates for individual customer classes varies from this level. In particular, monthly rates for STEP and STEG customers will be higher as they incur surcharges for septic tank pumping, maintenance, and equipment replacement over the forecast horizon.

- A critical component of this rate study was to perform an audit of the City’s utility billing system to verify all customers are being billed correctly. City Staff have done yeomen work performing this audit and have found billing irregularities in the commercial customer classes. In all cases, these billing irregularities relate to underbilling due to erroneous EDUs assignments. City management has been alerted to this situation, and will brief the Council through normal communication channels.

Recommendations

- In order to build a reserve for planned future principal and interest payments on an anticipated \$10 million loan, the city will have to start raising sewer rates on July 1, 2020 and every year thereafter until the new wastewater treatment plant is built and the debt starts to be serviced. In order to avoid an insurmountable rate spike in fiscal 2023-2024, we recommend the City implement general sewer rate increases of 10% per fiscal year, starting on July 1, 2020. The prescribed monthly sewer rates by customer class are shown above in Table 1.
- We recommend the City implement a customer outreach/education program concerning the pending sewer rate increases. We also strongly recommend the City correct the billing errors that have been identified in the billing system audit by contacting the customers/accounts in question directly.
- We strongly recommend the City monitor the progress of the new wastewater treatment master plan as it progresses. As more detailed and accurate capital costs are derived, the City should update the sewer rate forecast to account for these more refined and accurate capital costs.
- As soon as the wastewater treatment master plan is complete and accepted by the Oregon Department of Environmental Quality, we recommend the City Contact the Oregon Business Department (Business Oregon) and schedule a One-Stop funding meeting. Business Oregon facilitates a monthly meeting to quickly and efficiently find funding solutions for communities. One-stop meeting locations can vary depending on the topic, project or the community requesting the meeting. One-stop participants will benefit from the combined experience of participants and gain valuable contacts. As a result of the one-stop, participants will walk away with an understanding of the next steps needed for the project and be provided a variety of funding scenarios. Both DEQ Clean Water State Revolving Loan Program and USDA Rural Utility Service representatives attend One-stop meetings.

Analysis Section

Background and Study Methodology

This rate study was performed for the City of Lakeside to develop and establish an equitable user rate structure for its sewer users. To pay for the operation, maintenance, replacement, and improvement of these wastewater systems, the City charges its customers fees on a monthly basis. The purpose of this study is to evaluate the City's methodology for calculating these fees and to perform an industry standard, cost of service analysis (COSA). The process used to prepare the COSA for the City's wastewater utility follows standard ratemaking principles, as outlined by the Water Environment Federation (WEF) and the U.S. Environmental Protection Agency (EPA). The last formal wastewater COSA was completed in 2002, and the City has not raised rates since 2007. This process consists of three steps:

1. Determine revenue requirements (how much does it cost to provide service system-wide)
2. Allocate costs to customer classes (who is causing the need for the service, and in what proportion)
3. Determine rate structure and develop rates (align rates to recover costs from those causing the need)

As in the case of the 2002 COSA, for this study, it was anticipated that a new sewer rate structure could be based on water consumption data. However, this concept was not considered feasible due to legal, administrative, and logistical issues and restraints. Instead, the derived user rate structure is based on estimated usage in terms of EDUs. For a wastewater system, an EDU is defined as the average water consumption for a single-family residence. In Lakeside, an EDU is equal to 5,030 gallons per month. A single-family residence is equal to one EDU while a triplex is equal to three EDUs. The number of EDUs within the City for commercial and other users was determined using previous values adopted by City ordinance, literature and reference values, and historical water consumption

Separate rates were developed for each of the City's different user classifications in relation to the, residential class based on typical effluent BOD concentrations and their effect the City's treatment system costs. A STEP/STEG user surcharge was also developed based on the average cost and frequency of tank pumping, and for average pump maintenance. This surcharge was calculated for residential STEP and STEG users and some individual commercial and public entities.

Step 1: Determination of Revenue Requirements

Revenue requirements are the total costs of providing services to utility customers over a specific period of time (usually one year). These costs include operation and maintenance (O&M) and capital costs. O&M costs are the routine costs of operating and maintaining a utility system in order to provide service. For the purpose of rate setting, revenue requirements are projected from budgeted expenses, and adjusted based on historical cost trends and the expertise of utility staff. Examples of O&M costs are chemicals and electricity used at plants, skilled plant operator labor, and administrative expenses.

Capital costs, as defined for the City's wastewater rates structure, are the resources used to acquire or construct capital assets. These include current revenue funded (pay-as-you-go) improvements, planned annual contributions to funds for such purposes, and ongoing debt service requirements (principal and interest payments on outstanding loans and other obligations). Capital assets are defined as major assets that benefit more than a single fiscal period. Typical examples are land, improvements to land, easements, buildings, building improvements, vehicles, machinery, equipment and other infrastructure. Capital costs are projected for the rate-setting period based on the capital improvement plan, the City's bond covenants and utility staff expertise.

To determine the amount of revenue that rates must generate annually, the total revenue requirements are reduced by non-rate or other system revenues. Examples of other system revenues are unrestricted interest earnings, revenues from wholesale contract customers, and revenue from miscellaneous charges. Total requirements less other system revenues equal requirements from rates.

Step 2: Allocate Revenue Requirements to Customer Classes

Determination of the costs-of-service by customer class is a four-step process. These steps are referred to as functionalization, joint and specific groupings, classification, and allocation. Functionalization involves categorizing revenue requirements according to utility functions. Wastewater functions typically include treatment (often broken up by unit process), collection, pumping, and customer service. Utilities incur varying levels of costs to perform the different system functions needed to meet customer demands. Therefore, the first step in the cost allocation process is to determine what it costs the utility to perform different service functions. Next, functional costs are grouped by joint and specific categories. This process allows for certain types of costs (e.g., STEP and STEG costs) to be allocated directly to benefiting customers. The majority of costs are generally joint or common to all customers.

Following functionalization and joint and specific groupings, a classification process is undertaken. A fundamental objective in developing a rate system is to price utility services so that each customer pays for the service they receive in proportion to their use. Some costs incurred by the utility are a function of the quantity of wastewater discharged by customers. Other costs are associated with serving customers regardless of the quantity that flows through the system. WEF and EPA methods classify wastewater system costs according to flow (annual average and wet weather), biochemical oxygen demand¹ (BOD) loadings, total suspended solids² (TSS) loadings and customer services. Costs are classified among these service characteristics so they may then be allocated to customer classes in proportion to system demands. In the case of Lakeside, we have focused on BOD as the driver for user class differentiation. In 2002, separate user rate classifications were adopted by the City to reflect differences in the type and characteristics of wastewater generated from various users. To quantify the respective differences between the user classes, typical BOD concentrations that might be expected for each classification were compiled from City data and literature sources. The typical BOD concentration for the residential component was selected to be 170 mg/l, which is between the average concentrations (131 - 176 mg/l) observed in the City's wastewater plant influent during the wet and dry season periods (The Dyer Partnership 2002). Per the 2002 COSA, the BOD concentrations for Commercial I-III were primarily based on information provided from Metcalf & Eddy (1979), Goldstein & Moberg (1973), and Angoli (2000). An average BOD concentration for Commercial IV (RV dump station) was derived from the following sources: EPA (1999) and Brown et al. (1982).

From these typical BOD concentrations, the cost differences attributed to increased BOD concentration and loading between the Commercial I-IV and Residential STEP/STEG classifications, and the Residential gravity flow classification was calculated. For the Commercial classes, increased BOD concentrations in the wastewater influent are anticipated to affect the City's treatment plant costs for biosolids handling and disposal, oxygen (i.e. air) use for secondary treatment of the waste, and oxygen (i.e. air) use for biological sludge treatment. Likewise, the decreased costs associated with lower BOD concentrations resulting from STEP and STEG systems were also calculated. A summary of the typical BOD concentrations

¹ BOD is the quantity of oxygen used in the biochemical oxidation of organic matter in a specified time and at a specified temperature.

² TSS are solids that float on the surface of, or are in suspension in wastewater or other liquids, and are largely removable by laboratory filtering.

for each classification and associated unit cost increases per EDU (5,030 gallons per EDU) is shown later in this report.

Ideally, each customer would be charged according to the actual cost of providing service to his or her connection. However, it is impractical to estimate the cost of serving each individual customer. Therefore, it is accepted practice in the utility industry to classify customers into relatively few, reasonably homogeneous groups, and then to develop rates for each group. In the final step of the cost allocation process, the characteristics of the utilities' customers are analyzed and costs are allocated to each class. For wastewater systems, user characteristics include sewage flows, strengths and the number of customer accounts.

The user characteristics serve as the basis for allocating costs by service characteristic to each customer class. For example, if residential customers represent half of the wastewater utility's average flow, they will be allocated half of the utility's average flow-related costs. However, if this class is responsible for none of the system's STEP and STEG program costs, their allocation of these program costs will be zero. The sum of each class's proportionate cost share of each service characteristic is that class's total cost-of-service.

Step 3: Recovery of STEP & STEG Costs Through Surcharges

As discussed earlier in this report, City-maintained STEP and STEG systems have additional costs over and above the costs associated with typical gravity connections. These additional costs should not be borne by all of the City users, but paid for by the STEP and STEG users. A surcharge for STEP and STEG users ensures that the City rates will remain proportional to all users.

In the 2002 COSA, the STEP surcharge for residential systems was based on an average cost and frequency of tank pumping and for average pump maintenance. The STEP surcharge for commercial systems (e.g. SCCI, North Lake Resort, and Sea Drift Motel) requiring annual maintenance was based on average tank pumping frequency and pump maintenance. The individual costs anticipated for these commercial systems were then added to the monthly rates for each particular system. The STEG surcharge was for residential systems only and was based on an average cost and frequency of tank pumping.

For this 2020 COSA update, the project team worked with City Staff to gather fiscal 2019-2020 cost data and then compared that information to the 2002 data that is incorporated in the City's current schedule of sewer rates for STEP and STEG customers. That comparative data is shown below in Table 2.

Table 2 – Comparison of Current vs. 2002 STEP and STEG Operations and Maintenance Costs

2002 Sewer Rate Study STEP/STEG Cost Assumptions

	Cost per Year	Number of Units	Total STEP/STEG Surcharge	
			Annual	Monthly
Residential STEP	\$5,000.00	59	\$84.75	\$7.06
Residential STEG	\$250.00	15	\$16.67	\$1.39
SCCI - Commercial I, Outside City	\$10,400.00	1	\$10,400.00	\$866.67
North Lake Resort - Commercial I	\$500.00	1	\$500.00	\$41.67
Seadrift Motel - Commercial I	\$250.00	1	\$250.00	\$20.83
EEL Creek Mobil Home Park - Commercial I				
Other				
Other				
Other				
Other				

2020 Sewer Rate Study STEP/STEG Cost Assumptions

	Cost per Year	Number of Units	Total STEP/STEG Surcharge	
			Annual	Monthly
Residential STEP	\$8,280.00	73	\$113.42	\$9.45
Residential STEG	\$980.00	19	\$51.58	\$4.30
SCCI - Commercial I, Outside City	\$11,400.00	1	\$11,400.00	\$950.00
North Lake Resort - Commercial I	\$1,358.00	1	\$1,358.00	\$113.17
Seadrift Motel - Commercial I	\$980.00	1	\$980.00	\$81.67
EEL Creek Mobil Home Park - Commercial I	\$2,160.00	1	\$2,160.00	\$180.00
Other				
Other				
Other				
Other				

As the cost data in Table 2 shows, STEP and STEG operations and maintenance costs have risen considerably over the last eighteen years. Since 2002, the City has adjusted the monthly STEP surcharge to be \$10 per account per month. On a cost of service basis, this is too high. Our analysis indicates the surcharge should be \$9.45 per month. Conversely, the current STEG surcharge is \$1 per account per month. Our analysis indicates this surcharge should be \$4.30 per month.

Step 4: Determine Rate Structure and Develop Rates

The last step in the rate development process is the design of the rate structure and the development of rates. There are a variety of rate structure options available to meet a wide range of policy objectives. In the City’s case, wastewater rates generally are comprised of a fixed charge per month per EDU. Historically, the City Council’s policy on wastewater rate development stresses rate equity, revenue stability and administrative efficiency.

Once a rate structure is selected, rates are calculated based on the costs-of-service by class determined in Step 2. The end result of this rate development process is an equitable distribution of system revenue requirements to system users.

Analysis of Wastewater System Revenue Requirements

For the current budget year (fiscal 2020), it is forecast that the wastewater utility will generate sufficient revenues from rates, charges and fees to meet its obligations and produce an unappropriated ending balance in the Wastewater Operating Fund of \$352,896. The beginning balance for this same fiscal year was \$438,497. In order to establish and maintain cash balances in the Wastewater Operating Fund while continuing to pay for future capital requirements, a general wastewater rate increase is required in fiscal 2021.

For the forecast of revenue requirements, the following assumptions were made based on discussions with City staff:

Inflation in costs and growth in the customer base – Per guidance from City staff, the following factors were applied for estimating future cost escalation:

- All direct labor line items – 3.0% per year
- Pension plan contributions (City cost) – 6.0% per year
- Health insurance premiums (City cost) – 8.0% per year
- Professional services (OMI contract) – 3.0% per year
- All other operating expense line items – 3.0% per year
- The growth forecast expressed in the annual increase in Equivalent Dwelling Units (EDUs) is estimated to be 0.50% per year over the five (5) year forecast horizon.

Capital Improvement Plan Funding – In the current fiscal year, total wastewater system capital improvement costs are budgeted to be \$277,500. Out of this total, \$225,000 is for capital improvements, and \$52,500 is for capitalized materials and services costs. Funding for these improvements is assumed to come from cash in the Capital Projects Fund.

Between fiscal 2021 and 2024, the City's preliminary wastewater system capital improvement plan calls for the investment of \$10 million; spread roughly evenly in each of the four forecast years. This investment is for the design, permitting, and construction of a new wastewater treatment plant. The wastewater system financial plan calls for a two-step approach as follows:

Step 1 – upon completion and acceptance of the new wastewater treatment master plan by the Oregon DEQ, the City will enter into an interim funding facility with the Clean Water State Revolving Loan Program administered by the DEQ. This facility is in essence a construction line of credit and can last up to sixty (60) months. The current interest rate on this facility is 0.63% APR. During design and construction, the City will make draws against this line of credit to pay costs. It is assumed that during construction, the City will pay accrued interest on principal balances outstanding on the line.

Step 2 – When construction and performance testing has been completed on the new wastewater treatment plant, the construction line of credit balance will be refinanced with permanent financing provided the USDA's Rural Utilities Service Water and Environment Program (WEP). WEP provides loans, grants and loan guarantees for drinking water, sanitary sewer, solid waste and storm drainage facilities in rural areas and cities and towns of 10,000 or less. For this financial

plan, we have assumed the City will secure a 40-year loan for \$10 million at an interest rate of 2.25% on the permanent financing. It is also assumed the City will secure this permanent financing in fiscal 2023-2024.

Under the current wastewater system financial plan, by the end of fiscal 2024, the City will add an additional \$373,909 of annual revenue bond debt service to the wastewater system revenue requirements. The permanent debt sizing cash flows and resulting debt service calculations are shown below in Table 3.

Table 3 - Forecast of Future Wastewater System Borrowings and Resulting Debt Service

Capital Improvements Financing	2021	2022	2023	2024
Capital Costs to be Funded	-	-	-	10,000,000
less: Contributions from SDCs	-	-	-	-
less: Contributions From Construction Fund bal	296,764	299,138	301,531	303,943
less: Contributions From Utility Rates	-	-	-	-
less: Developer Contributions	-	-	-	-
Amount to be Financed	-	-	-	9,696,057
Long-term Borrowing:				
Revenue Bonds:				
Amount Borrowed	-	-	-	9,793,996
less: Financing Cost	-	-	-	97,940
less: Reserve Funding	-	-	-	-
less: Refunding of BANs	-	-	-	-
Net Funds from Revenue Bonds	-	-	-	9,696,057
General Obligation Bonds:				
Amount Borrowed	-	-	-	-
less: Financing Cost	-	-	-	-
less: Reserve Funding	-	-	-	-
less: Refunding of BANs	-	-	-	-
Net Funds from G.O. Bonds	-	-	-	-
New Annual Debt Service:				
Debt Service	-	-	-	373,909
Coverage	-	-	-	-
Reserve Funding	-	-	-	74,782

It should be noted, the wastewater system financial plan also assumes the City will contribute \$303,943 from the wastewater capital projects fund to buy down the principal of the WEP permanent financing loan in fiscal 2024.

Operating Costs in Excess of Inflation – In most rate studies, there are certain operating cost categories that tend to grow in excess of the general price index. We have identified two such categories affecting the City’s pension costs and health care premiums. These cost categories have been accounted for in the revenue requirements model. We have not identified any other areas of concern for this forecast, but the City should monitor the cost structure of the wastewater utility on an ongoing basis. Three key areas of future concern are:

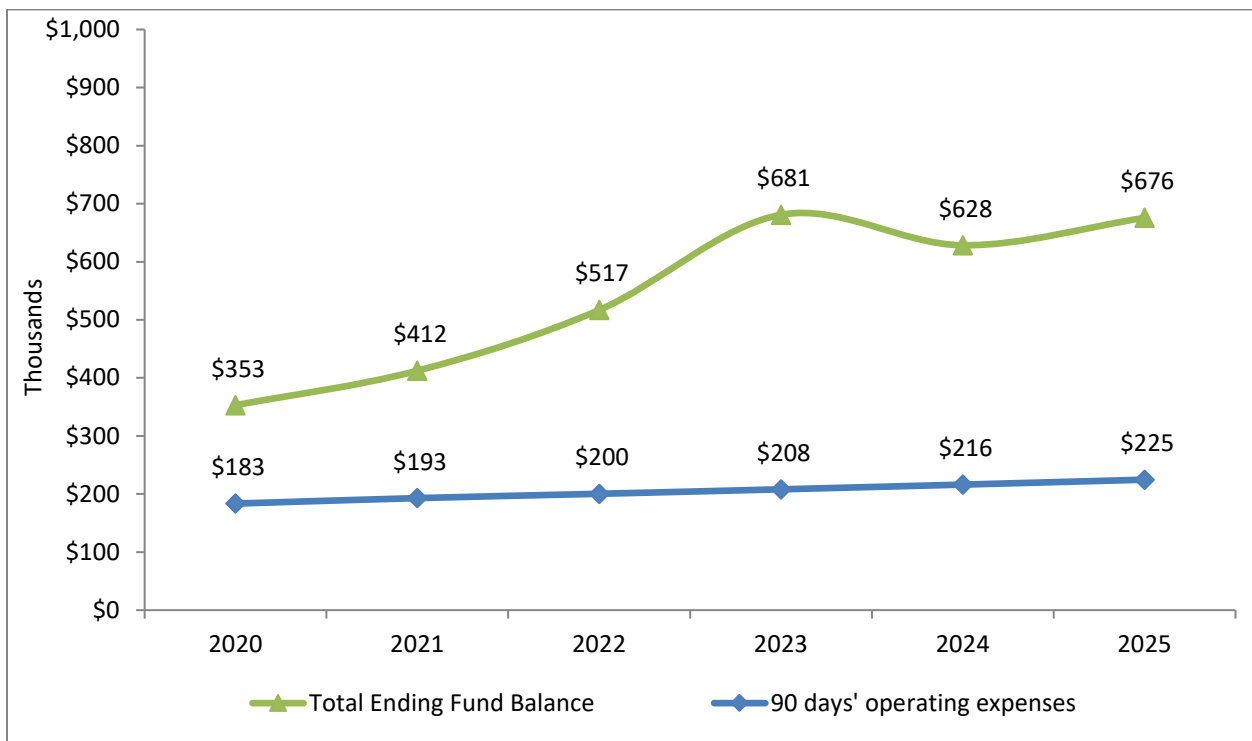
Administrative charges – We have not estimated or accounted for any unusual increases in City/general fund administrative charges. The City provides administrative services such as accounting, legal, and billing to the wastewater system. The City should monitor this situation for developments.

STEP/STEG operations and maintenance costs – As discussed above, City-maintained STEP and STEG systems have additional costs over and above the costs associated with typical gravity connections. These additional costs should not be borne by all of the City users, but paid for by the STEP and STEG users. It is very likely septic tank pumping, tank maintenance, and pump replacement costs will continue to increase at rates in excess of other sewer system (i.e., gravity) costs. The City should review STEP and STEG surcharge costs annually.

Staffing costs – We have not planned or budgeted for any additional labor. If the wastewater utility does add staff, these costs will impact the current revenue requirements forecast.

Modeling for Contingencies, Reserves, and Ending Fund Balances – As discussed above, the Wastewater Operating Fund is expected to end this fiscal year with an unappropriated ending fund balance of \$352,896; ample cash for an operating reserve. For planning purposes, we are expecting the Wastewater Operating Fund will end all forecast years with an ending fund balance well in excess of ninety days of operating expenses. This target balance gives the wastewater utility enough contingency to fund unforeseen operating cost spikes. The forecast of targeted wastewater operating fund balances and operating reserve requirements is shown below in Figure 1.

Figure 1 - Forecast of Wastewater Operating Fund Balances and Operating Reserve Requirements



Revenue Requirements Forecast & Results

All of the above cost elements are contained in the revenue requirements model and from this, the “base case” forecast was developed. The base case assumes the utility would fund the projected capital costs contained in the wastewater system capital improvement plan (discussed above). Also, the utility would fund the operating costs as adjusted for inflation. This base case resulted in the following forecast of wastewater system revenue requirements (Table 4).

Table 4 – Base Case Forecast of Wastewater System Revenue Requirements

	Actual 2019	Estimated 2020	Forecast				
			2021	2022	2023	2024	2025
Projection of Cash Flow:							
Revenues:							
Total licenses and permits	-	-	-	-	-	-	-
Total Service Charges	796,157	810,000	810,000	1,016,954	1,116,877	1,226,680	1,347,460
Total interest earned	9,886	9,500	7,058	8,247	10,337	13,619	12,569
Total other financing sources	-	-	-	-	-	-	-
Total miscellaneous income	415	1,500	1,545	1,591	1,639	1,688	1,739
Subtotal gross operating revenues	806,458	821,000	818,603	1,026,792	1,128,853	1,241,987	1,361,768
Operations & Maintenance Expense:							
Total personal services	286,066	343,714	360,128	377,480	395,828	415,240	435,784
Total materials and services	325,334	400,375	412,386	424,758	437,501	450,626	464,144
Total capital outlay	3,990	6,000	6,180	6,365	6,556	6,753	6,956
Total debt service	157,912	156,512	177,412	203,312	224,062	531,721	529,321
Transfers to other funds	-	-	10,000	10,300	10,609	10,927	11,255
Total operations and maintenance expense	773,302	906,601	966,107	1,022,215	1,074,556	1,415,267	1,447,460
(Use)/replacement of fund balance		30,500	59,450	104,500	164,100	(52,500)	47,100
Net Cash	33,156	(116,101)	(206,954)	(99,923)	(109,804)	(120,780)	(132,793)
Net Deficiency/(Surplus)	(33,156)	116,101	206,954	99,923	109,804	120,780	132,793
Test of Coverage Requirement:							
Gross Revenues:							
Operating revenues	806,458	821,000	818,603	1,026,792	1,128,853	1,241,987	1,361,768
System Development Charges	9,581	9,092	9,092	9,137	9,183	9,229	9,275
Total Gross Revenues	816,039	830,092	827,695	1,035,930	1,138,036	1,251,216	1,371,043
Operating Expenses:							
Total personal services	286,066	343,714	360,128	377,480	395,828	415,240	435,784
Total materials and services	325,334	400,375	412,386	424,758	437,501	450,626	464,144
Transfers to other funds	-	-	10,000	10,300	10,609	10,927	11,255
Transfers to/(from) the rate stabilization account	-	-	-	-	-	-	-
Total Operating Expenses	611,400	744,089	782,515	812,537	843,938	876,793	911,184
Net Revenues	204,639	86,003	45,180	223,392	294,098	374,424	459,859
Debt Service	157,912	156,512	177,412	203,312	224,062	531,721	529,321
Coverage Recognized	1.30	0.55	0.25	1.10	1.31	0.70	0.87
Coverage Required	-	-	-	-	-	-	-
Net Deficiency/(Surplus)	(204,639)	(86,003)	(45,180)	(223,392)	(294,098)	(374,424)	(459,859)
Projection of Revenue Sufficiency and Forecasted Rates:							
Maximum Deficiency	-	116,101	206,954	99,923	109,804	120,780	132,793
Revenues Recovered From Existing Rates and Charges:	796,157	810,000	810,000	1,016,954	1,116,877	1,226,680	1,347,460
add: Revenues Recovered From Rate Increase	-	116,101	206,954	99,923	109,804	120,780	132,793
Total Revenues Recovered From Rates & Charges after Increase	796,157	926,101	1,016,954	1,116,877	1,226,680	1,347,460	1,480,253

Table 4 shows forecasted annual changes in wastewater system revenue requirements average about 10% per year through fiscal 2025. Table 5 recasts the wastewater system revenue requirements to solve for costs to be recovered from all system users, and those costs that are specific to STEP and STEG customers.

Table 5 – Net Wastewater System Revenue Required from Rates Net of STEP/STEG Costs

	Estimated					
	2020	2021	2022	2023	2024	2025
Gross WW Revenue Requirements:						
Personal Services:	\$ 343,714	\$ 360,128	\$ 377,480	\$ 395,828	\$ 415,240	\$ 435,784
Materials and Services:	400,375	412,386	424,758	437,501	450,626	464,144
Capital Outlay:	6,000	6,180	6,365	6,556	6,753	6,956
Debt Service:	156,512	177,412	203,312	224,062	531,721	529,321
Transfers:	-	10,000	10,300	10,609	10,927	11,255
Reserves and Contingencies:	-	-	-	-	-	-
(Use)/replacement of fund balance	<u>30,500</u>	<u>59,450</u>	<u>104,500</u>	<u>164,100</u>	<u>(52,500)</u>	<u>47,100</u>
Subtotal gross WW revenue requirements	\$ 937,101	\$ 1,025,557	\$ 1,126,715	\$ 1,238,656	\$ 1,362,767	\$ 1,494,560
Non-rate Revenue Offsets:						
Licenses and Permits:	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Interest:	9,500	7,058	8,247	10,337	13,619	12,569
Other Financing Sources:	-	-	-	-	-	-
Miscellaneous:	<u>1,500</u>	<u>1,545</u>	<u>1,591</u>	<u>1,639</u>	<u>1,688</u>	<u>1,739</u>
Subtotal non-rate revenue offsets	\$ 11,000	\$ 8,603	\$ 9,838	\$ 11,976	\$ 15,307	\$ 14,308
Net WW Revenue Required from Rates	<u>\$ 926,101</u>	<u>\$ 1,016,954</u>	<u>\$ 1,116,877</u>	<u>\$ 1,226,680</u>	<u>\$ 1,347,460</u>	<u>\$ 1,480,253</u>
STEP/STEG Pumping and Maintenance Costs:						
Residential STEP	\$ 8,280	\$ 8,528	\$ 8,784	\$ 9,048	\$ 9,319	\$ 9,599
Residential STEG	980	1,009	1,040	1,071	1,103	1,136
SCCI - Commercial I, Outside City	11,400	11,742	12,094	12,457	12,831	13,216
North Lake Resort - Commercial I	1,358	1,399	1,441	1,484	1,528	1,574
Seadrift Motel - Commercial I	980	1,009	1,040	1,071	1,103	1,136
EEL Creek Mobil Home Park - Commercial I	<u>2,160</u>	<u>2,225</u>	<u>2,292</u>	<u>2,360</u>	<u>2,431</u>	<u>2,504</u>
Subtotal STEP/STEG pumping and maintenance costs	\$ 25,158	\$ 25,913	\$ 26,690	\$ 27,491	\$ 28,316	\$ 29,165
Net WW Revenue Required from Rates net of STEP/STEG unique costs	<u>\$ 900,943</u>	<u>\$ 991,041</u>	<u>\$ 1,090,186</u>	<u>\$ 1,199,189</u>	<u>\$ 1,319,144</u>	<u>\$ 1,451,088</u>

Allocation of Revenue Requirements to Customer Classes (Cost of Service)

The cost of service analysis is intended to provide the analytical basis for equitably recovering the forecasted revenue requirement from customer classes according to the demand they place on the wastewater system. Consistent with industry practice, the analysis involves a two-step process; first, capital and O&M costs are allocated to the functional categories (service functions) of the wastewater system using operational and system design criteria. Then, based on customer class characteristics derived from historical billing system data, these functionally allocated costs are distributed to the customer classes. Cost of service allocations are made for a test year considered representative of the period in which proposed rates are expected to be in effect. Fiscal 2020 has been used as the test year for the cost of service analysis.

Functional Cost Allocations

Capital and operating costs are allocated to the BOD functional cost driver based on assumed strength of discharge concentrations for each of the City's sewer customer classes. The assumed BOD strength of concentrations for each sewer customer class in Table 5.

Table 6 - Wastewater System Functional Components

User Classification/Customer Class	Strength of Discharge Assumed Concentration, mg/l
Residential (gravity sewer connection)	170
Residential STEP/STEG	110
Commercial I	250
Commercial II	325
Commercial III	425
Commercial IV	3,110

In meeting individual customer sewer needs, the City incurs a number of costs that must be recovered from customers to sustain the sewer enterprise. The cost associated to operate and maintain the City's sewer system varies in relationship to the quantities and strengths of wastewater and the number of customers served. The cost of serving customers is dependent on the characteristics of service provided to individual or groups of customers. If all the sewer user usage patterns were identical, there would be little reason to classify them, and costs could be recovered in relation to the number of users (i.e., flat rates). In reality, this ideal situation does not exist because sewer user requirements differ. As it is generally impractical to identify each user's contribution and responsibility, most utilities categorize customers with similar wastewater service requirements into a limited number of classes.

User identification and classification is principally based on wastewater flows, wastewater strength, level of service provided (e.g. retail, wholesale, inside or outside the City) or any other influencing consideration. A typical user classification includes residential, commercial, and industrial. On September 1, 2002, the City Council enacted Ordinance No. 02-237, which relates to user classifications and charges

for the public sewers. In Ordinance No. 02-237, the City adopted six different user classifications: Residential, Commercial I, Commercial II, Commercial III, Commercial IV, and Industrial.

Since 2002, several other user classifications have been added to the inventory and adopted by the City Council. The additional classifications include campgrounds, recreational vehicle (RV) parks, and STEP/STEG systems. Campgrounds and RV parks with no individual sewer connections (i.e. at each site) were considered to be within the residential classification. Campground and RV park sites with individual sewer connections were considered to be Commercial I users.

Residential users are those that reside in single-family dwellings, multi-family dwellings, mobile home parks, and travel trailer parks. Each user in this classification is based on per dwelling unit basis. For example, a 14-unit apartment complex would be charged based on 14 dwelling units. A duplex would be charged the equivalent of two dwelling units.

Commercial users include a variety of businesses such as motels, hotels, restaurants, recreational vehicle, and general retail establishments. The different commercial classifications signify potential higher strength waste contributions with Commercial I having the lowest strength and Commercial IV representing the highest strength waste. Classification within the commercial groups is dependent on such factors as the source of the waste stream, type of activity, utilization of grease traps and garbage disposals, and waste composition. A detailed list of commercial businesses within each category is shown in Ordinance No. 02-237. As of 2020, the only commercial use recognized for the Commercial IV class is RV dump stations. Septage haulers are often included in this classification by other municipalities but are not in Lakeside's because the City's wastewater facilities are not currently capable of properly handling and treating septage.

The *industrial* classification is utilized for any facility that is making a significant contribution to the City's sewer system in terms of flow or wastewater composition. The City does not have any industrial users connected to the sewer system at this time, but the industrial class is defined in Ordinance No. 02-237. An industrial user is defined as any facility that discharges effluent to the sewer for any 24-hour period that equals or exceeds any one of the following criteria:

- Flow greater than 25,000 gpd
- Biochemical oxygen demand (BOD) greater than 1,500 mg/1
- Suspended solids (SS) greater than 1,500 mg/1
- pH less than 6.0 or greater than 9.0.

Outside City sewer users do not typically bear the same ownership and fiscal responsibilities as users within the City limits. Inside City sewer users bear the risks and responsibilities of utility ownership and the cost of operation and maintenance (O&M) expenses and financing needed capital improvements. While outside users also bear the cost of O&M expenses, they are not assessed ad valorem taxes for the support of city services or financing of capital improvements (e.g. general obligation bonds). Although Lakeside does not currently assess ad valorem taxes to support its city services, City users are the backstop for the repayment of the 2017 full faith and credit sewer refunding bonds. Consequently, the outside users should pay higher rates than inside users as they directly benefit from this infrastructure.

In this COSA, the cost differentiation between customer classes is based upon the assumed cost of BOD treatment, removal, and disposal. In essence, we are calculating a mass balance of assumed BOD concentrations for all of the customer wastewater flows to arrive at a unit cost per EDU by customer class. This mass balance calculation was done in lieu of having metered water data for each customer connected to the wastewater system. The results of the 2020 mass balance analysis are shown below in Table 6.

Table 7 - Mass Balance Analysis of Costs Associated with BOD Loadings to the Lakeside WWTP

	Residential Gravity	Residential STEP/STEG	Commercial I	Commercial II	Commercial III	Commercial IV
Planning Input Assumptions:						
Assumed influent BOD concentrations mg/liter	170	110	250	325	425	3,110
Average WW flow MG	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010	0.0000010
BOD loadings to the plant in pounds per gallon	0.0014187	0.0009180	0.0020864	0.0027123	0.0035468	0.0259542
WWTP design BOD loading in pounds per gallon	0.0014187	0.0009180	0.0020864	0.0027123	0.0035468	0.0259542
Permitted effluent BOD mg/liter	10	10	10	10	10	10
EDU expressed in gallons	5,030	5,030	5,030	5,030	5,030	5,030
Assumed biosolids removal and disposal cost \$/lb.	\$ 0.56	\$ 0.56	\$ 0.56	\$ 0.56	\$ 0.56	\$ 0.56
Assumed electricity cost \$/kwh	\$ 0.10	\$ 0.10	\$ 0.10	\$ 0.10	\$ 0.10	\$ 0.10
Assumed sludge yield	65%	65%	65%	65%	65%	65%
Assumed percent volatile solids	75%	75%	75%	75%	75%	75%
Percent volatile solids reduction in digesters	45%	45%	45%	45%	45%	45%
Percent of solids not destroyed in digesters	67%	67%	67%	67%	67%	67%
Percent of BOD as supernatant	77%	77%	77%	77%	77%	77%
Biosolids Removal & Disposal Cost:						
Activated waste sludge production in pounds per gallon	0.0009222	0.0005967	0.0013561	0.0017630	0.0023054	0.0168702
Volatile solids loaded to digesters in pounds per gallon:	0.0006916	0.0004475	0.0010171	0.0013222	0.0017291	0.0126527
Volatile solids post digestion lbs./gal	0.0003112	0.0002014	0.0004577	0.0005950	0.0007781	0.0056937
Volatile solids not destroyed in digestion lbs./gal	0.0004611	0.0002983	0.0006781	0.0008815	0.0011527	0.0084351
Total volatile solids in digester sludge lbs./gal	0.0007723	0.0004997	0.0011358	0.0014765	0.0019308	0.0141288
BOD removed and disposed lbs./gal	0.0005947	0.0003848	0.0008745	0.0011369	0.0014867	0.0108792
Cost of BOD removal and disposal \$/lb.	\$ 1.68	\$ 1.09	\$ 2.47	\$ 3.21	\$ 4.20	\$ 30.73
Cost of Air for Secondary Treatment:						
Electricity demand kwh/EDU	6.20	3.89	9.29	12.23	16.09	120.14
Electricity cost \$/EDU	\$ 0.63	\$ 0.39	\$ 0.94	\$ 1.24	\$ 1.63	\$ 12.15
Cost of Air for Sludge Treatment:						
Electricity demand kwh/EDU	5.48	3.44	8.22	10.81	14.23	106.20
Electricity cost \$/EDU	\$ 0.55	\$ 0.35	\$ 0.83	\$ 1.09	\$ 1.44	\$ 10.74
Summary of Costs:						
Biosolids Removal & Disposal	\$ 1.679519	\$ 1.086748	\$ 2.469881	\$ 3.210845	\$ 4.198798	\$ 30.725319
Air for Secondary Treatment	0.627212	0.393525	0.939807	1.237227	1.627717	12.153758
Air for sludge Treatment	0.554375	0.348002	0.831562	1.093575	1.439554	10.743542
Total - \$/EDU	\$ 2.861106	\$ 1.828275	\$ 4.241250	\$ 5.541648	\$ 7.266069	\$ 53.622619
Customer class treatment cost differentials		<u>(\$1.03)</u>	<u>\$1.38</u>	<u>\$2.68</u>	<u>\$4.40</u>	<u>\$50.76</u>

Allocations to Customer Classes

The next step in the cost of service analysis involves distribution of the functionally allocated system costs to the customer classes. A key component in the allocation of system costs to customer classes is testing the reliability and accuracy of customer statistics. This is accomplished through a review of historical billing system data and application of the rate schedule in effect for that year. City staff provided historical billing system records for fiscal 2019-20, including number of accounts and EDUs. The test of reliability is conducted by applying the detailed billing statistics to the rates in effect for that year. The total revenue generated from these customer statistics should approximate the actual revenue receipts shown in the financial statements (with minor differences due to accounts receivables, delinquencies, timing of connections and disconnections throughout the year, etc.). If the revenue estimates are within reasonable limits, statistics are determined "valid" and an adjustment factor is applied to the statistics if necessary, to account for any minor discrepancies.

When performing this test during this 2020 rate study, City Staff identified some commercial accounts that did not have correct EDU assignment, thereby understating proper revenue recovery. These mischaracterized accounts should be corrected and each customer should be notified of the error, and the future impact to their monthly sewer bills.

For ratemaking purposes, the results of this analysis indicated that the customer statistics are valid and will serve as a reasonable basis for projecting revenues and allocating system costs to the customer classes.

The estimated number of current and projected billable wastewater system EDUs is shown in Table 8.

Table 8 - Current and Projected Wastewater System EDUs

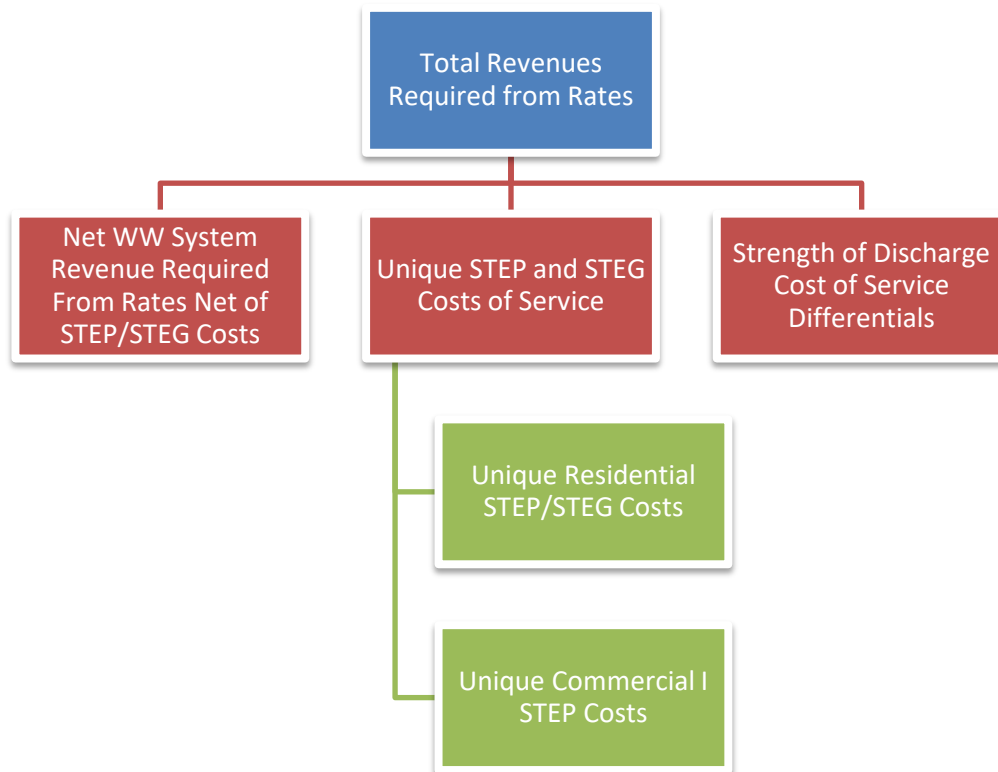
	Growth Rate	2002 Rate Study	FY 2019-20 Actual	Forecast for the Fiscal Years Ended June 30				
				2021	2022	2023	2024	2025
Inside City:								
Residential:								
Gravity	0.00%	676.40	864.00	864.00	864.00	864.00	864.00	864.00
STEP	0.00%	59.00	73.00	73.00	73.00	73.00	73.00	73.00
STEG	0.00%	<u>15.00</u>	<u>19.00</u>	<u>19.00</u>	<u>19.00</u>	<u>19.00</u>	<u>19.00</u>	<u>19.00</u>
Subtotal residential		750.40	956.00	956.00	956.00	956.00	956.00	956.00
Commercial:								
Commercial I	0.00%	103.40	118.10	118.10	118.10	118.10	118.10	118.10
Commercial II	0.00%	14.60	3.00	3.00	3.00	3.00	3.00	3.00
Commercial III	0.00%	20.00	25.33	25.33	25.33	25.33	25.33	25.33
Commercial IV	0.00%	<u>3.00</u>	<u>4.00</u>	<u>4.00</u>	<u>4.00</u>	<u>4.00</u>	<u>4.00</u>	<u>4.00</u>
Subtotal commercial		141.00	150.43	150.43	150.43	150.43	150.43	150.43
Industrial:								
Industrial extra strength		-	-	-	-	-	-	-
Subtotal industrial		-	-	-	-	-	-	-
Subtotal inside City		<u>891.40</u>	<u>1,106.43</u>	<u>1,106.43</u>	<u>1,106.43</u>	<u>1,106.43</u>	<u>1,106.43</u>	<u>1,106.43</u>
Outside City:								
Residential:								
Gravity	0.00%	23.20	-	-	-	-	-	-
STEP	0.00%	-	2.00	2.00	2.00	2.00	2.00	2.00
STEG		-	-	-	-	-	-	-
Subtotal residential		23.20	2.00	2.00	2.00	2.00	2.00	2.00
Commercial:								
Commercial I	0.00%	128.00	108.00	108.00	108.00	108.00	108.00	108.00
Commercial II	0.00%	-	170.00	170.00	170.00	170.00	170.00	170.00
Commercial III	0.00%	-	-	-	-	-	-	-
Commercial IV	0.00%	<u>1.00</u>	<u>1.00</u>	<u>1.00</u>	<u>1.00</u>	<u>1.00</u>	<u>1.00</u>	<u>1.00</u>
Subtotal commercial		129.00	279.00	279.00	279.00	279.00	279.00	279.00
Industrial:								
Industrial extra strength		-	-	-	-	-	-	-
Subtotal industrial		-	-	-	-	-	-	-
Subtotal outside City		<u>152.20</u>	<u>281.00</u>	<u>281.00</u>	<u>281.00</u>	<u>281.00</u>	<u>281.00</u>	<u>281.00</u>
Lakeside System total		<u>1,043.60</u>	<u>1,387.43</u>	<u>1,387.43</u>	<u>1,387.43</u>	<u>1,387.43</u>	<u>1,387.43</u>	<u>1,387.43</u>

The functionally allocated system-wide costs are allocated to the recommended customer classes to determine "cost shares" based on the relative demands placed on the system by each class. Test year fiscal 2020 customer statistics form the basis for this allocation. Functional costs are allocated to the customer classes as follows:

- Net wastewater system revenues required from rates net of STEP/STEG unique costs are allocated based on proportional shares of total system number of EDUs.
- STEP/STEG unique costs are allocated pro rata to residential STEP and STEG accounts and defined as the STEP/STEG surcharge.
 - ✓ For Commercial I STEP customers, unique costs to serve each customer are assigned to each of those customers as identified. The Commercial I STEP customers are:
 - SCCI – Commercial I Outside City
 - North Lake Resort – Commercial I
 - Seadrift Motel – Commercial I
 - EEL Creek Mobil Home Park – Commercial I
- Estimated BOD strength of discharge cost differentials are allocated to customer classes based on each class’s respective wastewater treatment plant loading profile (i.e., mg/liter).

A graphical rendering of the functional allocation of wastewater system revenue requirements is shown below in Figure 2

Figure 2 - Functional Allocation of Wastewater System Revenue Requirements



Determine Rate Structure and Develop Rates

The principal consideration in establishing utility rates is to obtain rates for customers that generate sufficient revenues for the utility and that are reasonably commensurate with the cost of providing service. Other considerations in designing rates should include customer equity, incentives for conservation, ease of implementation, and impact on customer bills. These considerations are consistent with the City's identified rate structure goals noted in the previous section.

Existing Wastewater Rates

The City's current wastewater rate structure is effectively flat per EDU for the standard single-family residential customer class with a gravity connection to the wastewater collection system. As the name implies, this approach takes total system revenue requirements and divides it by the number of active customers to arrive at an average rate per customer. For all other customer classes there are strength of discharge differentials and STEP/STEG surcharges for customers with septic tanks connected to the City's wastewater collection system. The current structure and level of rates has been in force since 2007.

Proposed Rate Design Alternatives

There are a variety of wastewater rate structures in use across the state and the nation. This study seeks to establish the guiding principles to be considered during the wastewater rate setting. It is important to establish the principles in advance of undertaking the technical work of rate setting. Once the principles are established and fixed, then the rate setting process evolves from them. It must also be recognized that there needs to be a balance in how the principles are applied; e.g., a flat rate is simple, but it may not necessarily be fair and equitable if customers are not equally responsible for the cost of the system. The Review will seek to determine and evaluate alternatives by comparing the various types of rate structures against each principle to determine which structure most satisfies the principles. One must recognize that one or more principles may compete or be in direct contrast with another. Ultimately, the objective is to identify the structure that best meets as many of the principles as possible.

Any rate structure that is considered must respect current legislation and contractual commitments. The main objective is to ensure the wastewater system is sustainable over the long term, thereby ensuring the protection of the health of citizens and the environment. The concepts of user pay and full cost pricing are key elements of which the City should address in the future. The question of what each customer pays is, however, a complex issue with varying viewpoints and interests.

The following principles should be used to develop alternative rate structures for Council's consideration:

1. be fair and equitable
2. promote conservation
3. be affordable and financially sustainable
4. stabilize revenue
5. be justifiable
6. be simple to understand
7. support economic development;

The City's flat monthly rate structure for residential customers has been in place for in excess of eighteen years, and works well for the City and its customers. In fiscal 2020, active residential accounts accounted for 74% of all EDUs. The residential class drives the demands on the City's wastewater system. In that same fiscal year, the commercial customer class accounted for 26% of active EDUs. The City currently

does not serve any industrial high strength sewage customers. In this study, we propose to continue using this rate methodology. Itemized below Table 9 is our proposed sewer rate schedule for fiscal 2020-2021 and for the five-year rate forecast horizon:

Table 9 - Proposed Sewer Rate Schedule for the City of Lakeside

	Actual 2020	COSA 2020	Forecast				
			2021	2022	2023	2024	2025
Annual inflation rate			3.0%	3.0%	3.0%	3.0%	3.0%
Net WW Revenue Required from Rates net of STEP/STEG unique costs		\$ 900,943	\$ 991,041	\$ 1,090,186	\$ 1,199,189	\$ 1,319,144	\$ 1,451,088
Equivalent EDUs		1,668	1,668	1,668	1,668	1,668	1,668
Monthly City-wide WW collection and treatment charge per equivalent EDU		\$ 45.00	\$ 49.50	\$ 54.45	\$ 59.90	\$ 65.89	\$ 72.48
STEP/STEG monthly surcharges:							
Residential STEP	\$ -	\$ 9.45	\$ 9.74	\$ 10.03	\$ 10.33	\$ 10.64	\$ 10.96
Residential STEG	\$ -	\$ 4.30	\$ 4.43	\$ 4.56	\$ 4.70	\$ 4.84	\$ 4.98
SCCII, Outside City	\$ -	\$ 950.00	\$ 978.50	\$ 1,007.86	\$ 1,038.09	\$ 1,069.23	\$ 1,101.31
North Lake Resort	\$ -	\$ 113.17	\$ 116.56	\$ 120.06	\$ 123.66	\$ 127.37	\$ 131.19
Seadrift Motel	\$ -	\$ 81.67	\$ 84.12	\$ 86.64	\$ 89.24	\$ 91.92	\$ 94.67
EEL Creek Mobil Home Park	\$ -	\$ 180.00	\$ 185.40	\$ 190.96	\$ 196.69	\$ 202.59	\$ 208.67
Monthly rate differentials by user class:							
Residential gravity flow	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Residential STEP	\$ -	\$ (1.03)	\$ (1.06)	\$ (1.10)	\$ (1.13)	\$ (1.16)	\$ (1.20)
Residential STEG	\$ -	\$ (1.03)	\$ (1.06)	\$ (1.10)	\$ (1.13)	\$ (1.16)	\$ (1.20)
Commercial I	\$ -	\$ 1.38	\$ 1.42	\$ 1.46	\$ 1.51	\$ 1.55	\$ 1.60
Commercial II	\$ -	\$ 2.68	\$ 2.76	\$ 2.84	\$ 2.93	\$ 3.02	\$ 3.11
Commercial III	\$ -	\$ 4.40	\$ 4.54	\$ 4.67	\$ 4.81	\$ 4.96	\$ 5.11
Commercial IV	\$ -	\$ 50.76	\$ 52.28	\$ 53.85	\$ 55.47	\$ 57.13	\$ 58.85
Industrial	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total Recommended Wastewater Rate Schedule:							
Inside City:			110.00%	110.00%	110.00%	110.00%	110.00%
Residential gravity flow	\$ 45.00	\$ 45.00	\$ 49.50	\$ 54.45	\$ 59.90	\$ 65.89	\$ 72.48
Residential STEP	\$ 55.08	\$ 53.42	\$ 58.17	\$ 63.38	\$ 69.10	\$ 75.36	\$ 82.24
Residential STEG	\$ 46.01	\$ 48.26	\$ 52.86	\$ 57.92	\$ 63.46	\$ 69.56	\$ 76.26
Commercial I	\$ 46.53	\$ 46.38	\$ 50.92	\$ 55.92	\$ 61.40	\$ 67.44	\$ 74.08
Commercial II	\$ 47.97	\$ 47.68	\$ 52.26	\$ 57.30	\$ 62.83	\$ 68.90	\$ 75.59
Commercial III	\$ 49.88	\$ 49.40	\$ 54.04	\$ 59.12	\$ 64.71	\$ 70.85	\$ 77.58
Commercial IV	\$ 101.03	\$ 95.76	\$ 101.78	\$ 108.30	\$ 115.36	\$ 123.02	\$ 131.32
Industrial	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Outside City:							
Residential gravity flow	\$ 90.00	\$ 90.00	\$ 99.00	\$ 108.90	\$ 119.79	\$ 131.77	\$ 144.96
Residential STEP	\$ 110.16	\$ 106.84	\$ 116.34	\$ 126.77	\$ 138.19	\$ 150.73	\$ 164.48
Residential STEG	\$ 92.02	\$ 96.53	\$ 105.73	\$ 115.83	\$ 126.93	\$ 139.13	\$ 152.53
Commercial I	\$ 93.06	\$ 92.76	\$ 101.84	\$ 111.83	\$ 122.81	\$ 134.88	\$ 148.16
Commercial II	\$ 95.94	\$ 95.36	\$ 104.52	\$ 114.59	\$ 125.65	\$ 137.81	\$ 151.17
Commercial III	\$ 99.76	\$ 98.81	\$ 108.07	\$ 118.25	\$ 129.42	\$ 141.69	\$ 155.17
Commercial IV	\$ 202.06	\$ 191.52	\$ 203.57	\$ 216.61	\$ 230.73	\$ 246.04	\$ 262.65
Industrial	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Revenue Recovery from Proposed Rate Design

A critical test of the sufficiency of the proposed rate design is its ability to recover revenue from existing customers to meet the projected revenue requirements. We have performed this test, and the results for the test year 2020 and over the five-year forecast horizon are shown below in Table 10.

Table 10 - Revenue Recovery by Proposed Sewer Rate Design

	Actual	COSA	Forecast				
	2020	2020	2021	2022	2023	2024	2025
Gross Revenues to be recovered from rates		<u>\$ 937,101</u>	<u>\$ 1,025,557</u>	<u>\$ 1,126,715</u>	<u>\$ 1,238,656</u>	<u>\$ 1,362,767</u>	<u>\$ 1,494,560</u>
Estimated revenues recovered from customer classes:							
Inside City:							
Residential gravity flow		\$ 466,555	\$ 513,213	\$ 564,555	\$ 621,003	\$ 683,122	\$ 751,449
Residential STEP		46,795	50,958	55,524	60,528	66,018	72,040
Residential STEG		11,004	12,053	13,205	14,470	15,860	17,388
Commercial I		65,729	72,166	79,244	87,022	95,577	104,983
Commercial II		1,716	1,881	2,063	2,262	2,481	2,721
Commercial III		15,017	16,425	17,972	19,669	21,534	23,583
Commercial IV		4,597	4,886	5,199	5,537	5,905	6,304
Industrial		-	-	-	-	-	-
Subtotal Inside City		<u>\$ 611,414</u>	<u>\$ 671,581</u>	<u>\$ 737,761</u>	<u>\$ 810,491</u>	<u>\$ 890,497</u>	<u>\$ 978,467</u>
Outside City:							
Residential gravity flow		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Residential STEP		2,564	2,792	3,042	3,317	3,617	3,947
Residential STEG		-	-	-	-	-	-
Commercial I		120,216	131,988	144,934	159,160	174,807	192,009
Commercial II		194,535	213,223	233,766	256,327	281,130	308,388
Commercial III		-	-	-	-	-	-
Commercial IV		2,298	2,443	2,599	2,769	2,952	3,152
Industrial		-	-	-	-	-	-
Subtotal Outside City		<u>\$ 319,613</u>	<u>\$ 350,446</u>	<u>\$ 384,341</u>	<u>\$ 421,572</u>	<u>\$ 462,507</u>	<u>\$ 507,496</u>
Total revenue recovered from customer classes		<u>\$ 931,027</u>	<u>\$ 1,022,028</u>	<u>\$ 1,122,103</u>	<u>\$ 1,232,063</u>	<u>\$ 1,353,004</u>	<u>\$ 1,485,963</u>
Percent of revenue requirement recovered from rates		99.4%	99.7%	99.6%	99.5%	99.3%	99.4%

Sample Monthly Bills for Selected Customers

As discussed earlier, most of the City's sewer customers are single family residential with gravity connections. However, there are a number of commercial customers that represent a significant number of sewer EDUs. We calculated the monthly sewer bills for a selected number of these commercial customers to compare what they pay now to what they would pay under the proposed sewer rate design. These customer bill comparisons are shown below in Table 11.

Table 11 - Monthly Sewer Bill Comparisons Current Rates vs. Propose Rates

	Actual	COSA	Forecast				
	2020	2020	2021	2022	2023	2024	2025
SCCI - Commercial II, Outside City:							
Billable EDUs	170.00	170	170	170	170	170	170
Commercial II outside City monthly rate	95.94	\$ 95.36	\$ 104.52	\$ 114.59	\$ 125.65	\$ 137.81	\$ 151.17
STEP monthly surcharge	\$ -	\$ 950.00	\$ 978.50	\$ 1,007.86	\$ 1,038.09	\$ 1,069.23	\$ 1,101.31
Monthly bill	\$ 16,309.80	\$ 17,161.23	\$ 18,747.12	\$ 20,488.32	\$ 22,398.66	\$ 24,496.75	\$ 26,800.27
North Lake Resort - Commercial:							
Billable EDUs:							
Commercial I, Inside City	2.60	2.60	2.60	2.60	2.60	2.60	2.60
Commercial II, Inside City	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Commercial III, Inside City	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Commercial IV, Inside City	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Monthly billing rates:							
Commercial I, Inside City	\$ 46.53	\$ 46.38	\$ 50.92	\$ 55.92	\$ 61.40	\$ 67.44	\$ 74.08
Commercial II, Inside City	\$ 47.97	\$ 47.68	\$ 52.26	\$ 57.30	\$ 62.83	\$ 68.90	\$ 75.59
Commercial III, Inside City	\$ 49.88	\$ 49.40	\$ 54.04	\$ 59.12	\$ 64.71	\$ 70.85	\$ 77.58
Commercial IV, Inside City	\$ 101.03	\$ 95.76	\$ 101.78	\$ 108.30	\$ 115.36	\$ 123.02	\$ 131.32
STEP monthly surcharge	\$ -	\$ 113.17	\$ 116.56	\$ 120.06	\$ 123.66	\$ 127.37	\$ 131.19
Monthly bill	\$ 417.71	\$ 523.68	\$ 563.34	\$ 606.59	\$ 653.75	\$ 705.24	\$ 761.46
Seadrift Motel - Commercial:							
Billable EDUs:							
Residential gravity flow	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Commercial I, Inside City	10.00	10.00	10.00	10.00	10.00	10.00	10.00
Commercial IV, Inside City	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Monthly billing rates:							
Residential gravity flow	\$ 45.00	\$ 45.00	\$ 49.50	\$ 54.45	\$ 59.90	\$ 65.89	\$ 72.48
Commercial I, Inside City	\$ 46.53	\$ 46.38	\$ 50.92	\$ 55.92	\$ 61.40	\$ 67.44	\$ 74.08
Commercial IV, Inside City	\$ 101.03	\$ 47.68	\$ 52.26	\$ 57.30	\$ 62.83	\$ 68.90	\$ 75.59
STEP monthly surcharge	\$ -	\$ 81.67	\$ 84.12	\$ 86.64	\$ 89.24	\$ 91.92	\$ 94.67
Monthly bill	\$ 611.33	\$ 638.14	\$ 695.09	\$ 757.55	\$ 826.00	\$ 901.12	\$ 983.51
EEL Creek Mobil Home Park - Commercial I:							
Billable EDUs							
Residential gravity flow	5.20	5.20	5.20	5.20	5.20	5.20	5.20
Commercial III, Inside City	0.33	0.33	0.33	0.33	0.33	0.33	0.33
Monthly billing rates:							
Residential gravity flow	\$ 45.00	\$ 45.00	\$ 49.50	\$ 54.45	\$ 59.90	\$ 65.89	\$ 72.48
Commercial III, Inside City	\$ 49.88	\$ 49.40	\$ 54.04	\$ 59.12	\$ 64.71	\$ 70.85	\$ 77.58
STEP monthly surcharge	\$ -	\$ 180.00	\$ 185.40	\$ 190.96	\$ 196.69	\$ 202.59	\$ 208.67
Monthly bill	\$ 250.46	\$ 430.30	\$ 460.63	\$ 493.62	\$ 529.50	\$ 568.59	\$ 611.16

Rate Study Conclusions and Recommendations

In the case of the wastewater system, the City appears to be in good financial shape, and our modeling indicates average annual increases in revenue requirements are projected to be 9.48% per year. The most significant conclusions and recommended changes to the current schedule of wastewater rates are:

Conclusions

- Cash reserves are adequate to fund the City’s planned wastewater operating reserves. In fact, the cash balance in the wastewater operating fund has been very stable in recent years. As of June 30, 2019, the ending fund balance was \$438,497, up slightly from the prior fiscal year. In consultation with City Staff, we are projecting the City will end the current fiscal year with a balance in the wastewater operating fund of \$352,896, well above our recommended 90 days of operating expenses requirement of \$155,515.
- The wastewater capital projects fund started this fiscal year with an unencumbered cash balance of \$563,264; and is budgeted to end the year with a cash balance of \$296,764. The City has not been making cash transfers from the wastewater operating fund in support of capital improvements. This is most likely due to the fact that rates have not been increased for thirteen (13) years.
- The City started this fiscal year with \$183,939 in the sewer SDC fund. Over the balance of this fiscal year and next, it is likely the City will spend roughly \$110,000 of this balance on the new wastewater treatment master plan. It is unlikely sewer SDCs will be a meaningful funding source going forward for the cost of the new wastewater treatment plant.
- The base case financial forecast assumes the City will issue debt to fund the planning, design and construction of the new wastewater treatment plant. The specific sequencing of this indebtedness is as follows:
 - Three (3) year design/build schedule for plant relocation and construction starting late 2020. Construction completed by June 30, 2023.
 - Interim financing provided the Oregon DEQ’s Cleanwater State Revolving Loan Program. Current terms are 0.63% APR, no administration fees. At the end of construction, principal outstanding is “taken out” by permanent financing.
 - Permanent financing provided by USDA Rural Utility Service 40-year water/wastewater loan. Current terms are 2.25% APR.
 - For this analysis, we have assumed zero grants.
- As discussed above, the base case revenue requirements forecast assumes an average annual increase of 10% per year. Although overall system revenue requirements are growing at this rate, the growth in monthly sewer rates for individual customer classes varies from this level. In particular, monthly rates for STEP and STEG customers will be significantly higher as they incur surcharges for septic tank pumping, maintenance, and equipment replacement over the forecast horizon.
- A critical component of this rate study was to perform an audit of the City’s utility billing system to verify all customers are being billed correctly. City Staff have done yeomen work performing this audit and have found billing irregularities in the commercial customer classes. In all cases, these billing irregularities relate to underbilling due to erroneous EDUs assignments. City management has been alerted to this situation, and will brief the Council through normal communication channels.

Recommendations

- In order to build a reserve for planned future principal and interest payments on an anticipated \$10 million loan, the city will have to start raising sewer rates on July 1, 2020 and every year thereafter until the new wastewater treatment plant is built and the debt starts to be serviced. In order to avoid an insurmountable rate spike in fiscal 2023-2024, we recommend the City implement general sewer rate increases of 10% per fiscal year, starting on July 1, 2020. The prescribed monthly sewer rates by customer class are shown above in Table 1.
- We recommend the City implement a customer outreach/education program concerning the pending sewer rate increases. We also strongly recommend the City correct the billing errors that have been identified in the billing system audit by contacting the customers/accounts in question directly.
- We strongly recommend the City monitor the progress of the new wastewater treatment master plan as it progresses. As more detailed and accurate capital costs are derived, the City should update the sewer rate forecast to account for these more refined and accurate capital costs.
- As soon as the wastewater treatment master plan is complete and accepted by the Oregon Department of Environmental Quality, we recommend the City Contact the Oregon Business Department (Business Oregon) and schedule at One-Stop funding meeting. Business Oregon facilitates a monthly meeting to quickly and efficiently find funding solutions for communities. One-stop meeting locations can vary depending on the topic, project or the community requesting the meeting. One-stop participants will benefit from the combined experience of participants and gain valuable contacts. As a result of the one-stop, participants will walk away with an understanding of the next steps needed for the project and be provided a variety of funding scenarios. Both DEQ Clean Water State Revolving Loan Program and USDA Rural Utility Service representative attend One-stop meetings.

Neighboring Communities' Utility Rates and SDCs

Shown below in Figures 3 is a chart that compares the current monthly sewer rates for a single-family customer in Lakeside to the same charges in similar communities in south coast Oregon.

Figure 3 - Comparison of Neighboring Communities' Monthly Wastewater Rates – May, 2020

