City of San Clemente

2023 Wastewater Cost of Service and Rate Design Study

Final Report / June 8, 2023

RAFTELIS

June 6, 2023

Mr. Dave Rebensdorf
Utilities Director
City of San Clemente
910 Calle Negocio
San Clemente, CA 92673

Subject: 2023 Wastewater Cost of Service and Rate Design Study

Dear Mr. Rebensdorf:

Raftelis is pleased to provide this 2023 Wastewater Cost of Service and Rate Design Study Report to the City of San Clemente (City). The overall purpose of the study was to develop a proposed five-year wastewater rate schedule for Fiscal Year (FY) 2022-23 through FY 2026-27 that is fair, equitable, and funds the City's wastewater utility. The City is delay in implementing rates and the rates will be effective in July of 2023 (FY 2024).

As part of the rate study Raftelis and Staff:

- Developed a ten-year financial plan for the City's Wastewater Enterprises to ensure financial sufficiency, meet operating costs, fund long-term capital needs, and maintain prudent reserves.
- Conducted a wastewater cost of service analysis to ensure a strong nexus between proposed rates and the cost to provide services to customers.
- Developed five years of wastewater rates that we believe are defensible and equitable.

It has been a pleasure working with you and we thank you and other City staff for the support provided to Raftelis during this study.

Sincerely,

Steve Gagnon, PE (AZ)
Project Director

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Los Angeles CA 90071
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List of Abbreviations

ADA: Average Daily Attendance
AF: Acre-feet
AFY: Acre-feet per year
AWWA: American Water Works Association
AWPF: Advance Water Purification Facility
BOD: Biological Oxygen Demand
CCF: One hundred cubic feet
CIP: Capital Improvement Plan
City: City of San Clemente
COS: Cost of Service
CPI: Consumer Price Index
FY: Fiscal year
GPCD: Gallons per capita per day
GPM: Gallons per minute
GW: Groundwater
HCF: One hundred cubic feet
K: Thousand
Lbs: Pounds
M: Million
Manual M1: American Water Works Association's *Principles of Water Rates, Fees, and Charges: Manual of Water Supply Practices - M1 Seventh Edition*
Max Day: Maximum day water demand
Max Hour: Maximum hour water demand
MG: One million gallons
Mg/L: Milligrams per Liter
MGD: One million gallons per day
NPDES Permit: National Pollutant Discharge Elimination System Permit
O&M: Operations and maintenance
PPM: Parts per million
R&R: Repair and replacement
RCLD: Replacement cost less depreciation
SCADA: Supervisory control and data acquisition
SRF Loan: Clean Water State Revolving Fund Loan
SS: Suspended Solids
Study Period: the rate-setting period of this study extends through fiscal year 2025-26
WWTP: Wastewater treatment plant

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1. Executive Summary

1.1. Study Overview

The City of San Clemente (City) last updated wastewater rates in 2015. The City engaged Raftelis to conduct a wastewater cost-of-service study to establish a proposed five-year rate schedule from FY 2022-23 to FY 2026-27, which is known as the study period. Note that proposed rates cannot be implemented until formally adopted by the City after a public hearing, absent a majority protest by parcels served by the City. Proposition 218 requires that City customers be mailed a public hearing notice detailing proposed rate changes a minimum of 45 days before the public hearing.

The study's major objectives are to:

- Develop a ten-year financial plan that sufficiently funds the City's wastewater operations and maintenance (O&M) expenses, and capital expenditures while adequately funding reserves.
- Conduct a cost-of-service analysis that establishes a clear nexus between the cost to serve wastewater customers and the rates charged to customers, per Proposition 218 and industry standards.
- Develop a five-year schedule of wastewater rates that are fair and equitable.

1.2. Rate Study Process

This study was conducted using industry-standard principles outlined by the Water Environment Federation's *Financing and Charges for Wastewater Systems*. The overall process outlined below describes the process to develop wastewater rates.

1. **Financial Plan:** Develop cash flow projections for the Wastewater Enterprise to determine the amount of revenue required from wastewater rates.
2. **Cost of Service Analysis:** Allocate costs to system components and then to various customer classes based on user characteristics.
3. **Rate Design**: Calculate rates that generate sufficient revenues based on the results of the financial plan and cost-of-service analysis and communicate the policy preferences of the agency.
4. **Report Preparation:** Develop a report to document the study results.
5. **Rate Adoption:** Proposed rates may be adopted by City Council after holding a public hearing in accordance with Proposition 218's requirements.

1.3. Proposed Wastewater Financial Plan

Raftelis conducted a status quo cash flow analysis (without rate adjustments) to evaluate whether existing wastewater rates will adequately fund the Wastewater Enterprise's various expenses over the rate-setting period. Raftelis projected that, without rate increases during the five-year study period, the Wastewater Enterprise's reserves will fall below the target reserve policy by FY 2023-24, and deplete cash reserves by FY 2025-26. This demonstrates a need for revenue adjustments for the Wastewater Enterprise. Raftelis worked closely with City staff to develop the following schedule of proposed revenue adjustments over the five-year study period (see Table 1-1). The proposed revenue adjustments shown in Table 1-1 promote a self-funding utility that meets

reserve policies in the long term. The financial plan, in this report, assumes rates will be implemented on January 1, 2023. The City is delayed in implementing rates. Therefore, the financial plan depicted in this report is outdated[1], however the rates are based on the City's cost of serving wastewater, therefore the cost of service and rate design is unaffected.

Table 1-1: Proposed Wastewater Revenue Adjustments

Description	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027
Effective Date	January 1, 2023	January 1, 2024	January 1, 2025	January 1, 2026	January 1, 2027
Revenue Adjustment	9.5%	6%	5%	5%	4.5%

Key factors influencing the need for proposed Wastewater Enterprise revenue adjustments include:

- **Inflation:** Operating costs continue to increase from year to year due to inflationary factors.
- **Planned capital expenditures:** CIP projects through FY 2026-27 are shown in Figure 1-1 and include substantial repair and replacement (R&R) capital projects.

Figure 1-1 shows the proposed CIP financing plan over the study period. As proposed, the CIP is funded by cash reserves and rate revenue.

Figure 1-1: Wastewater Enterprise Capital Improvement Plan

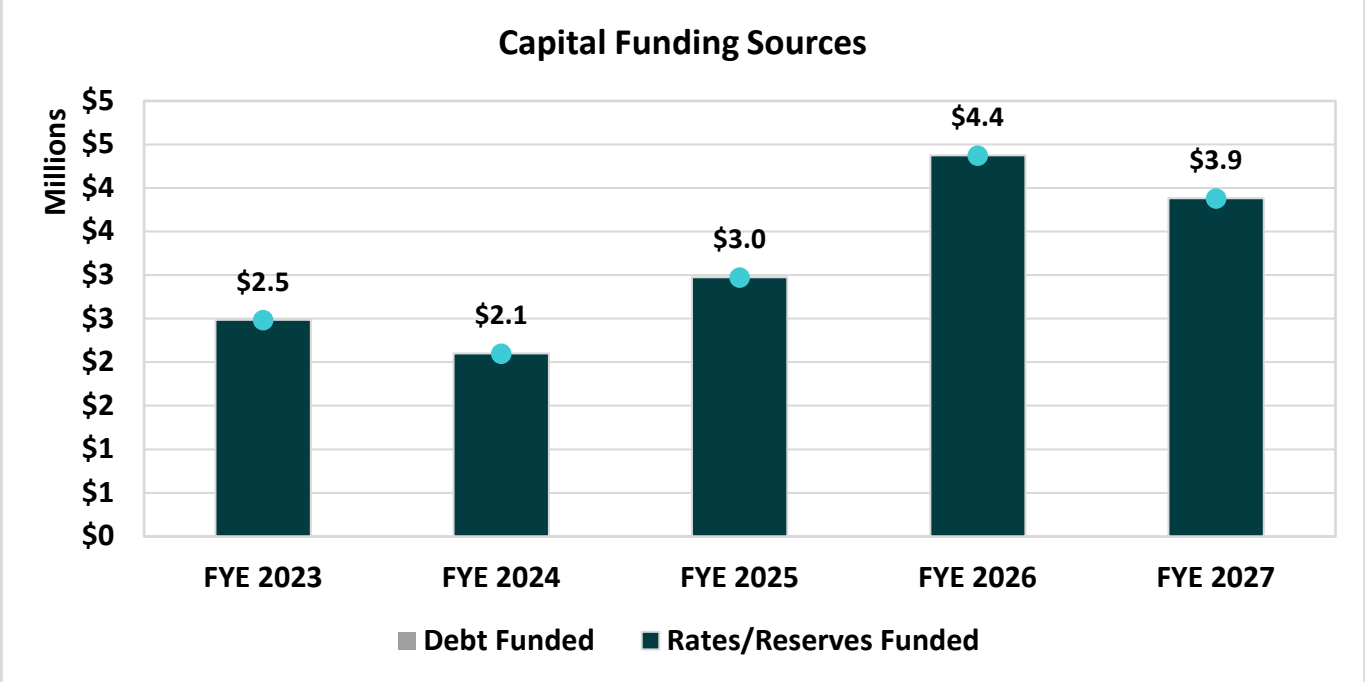
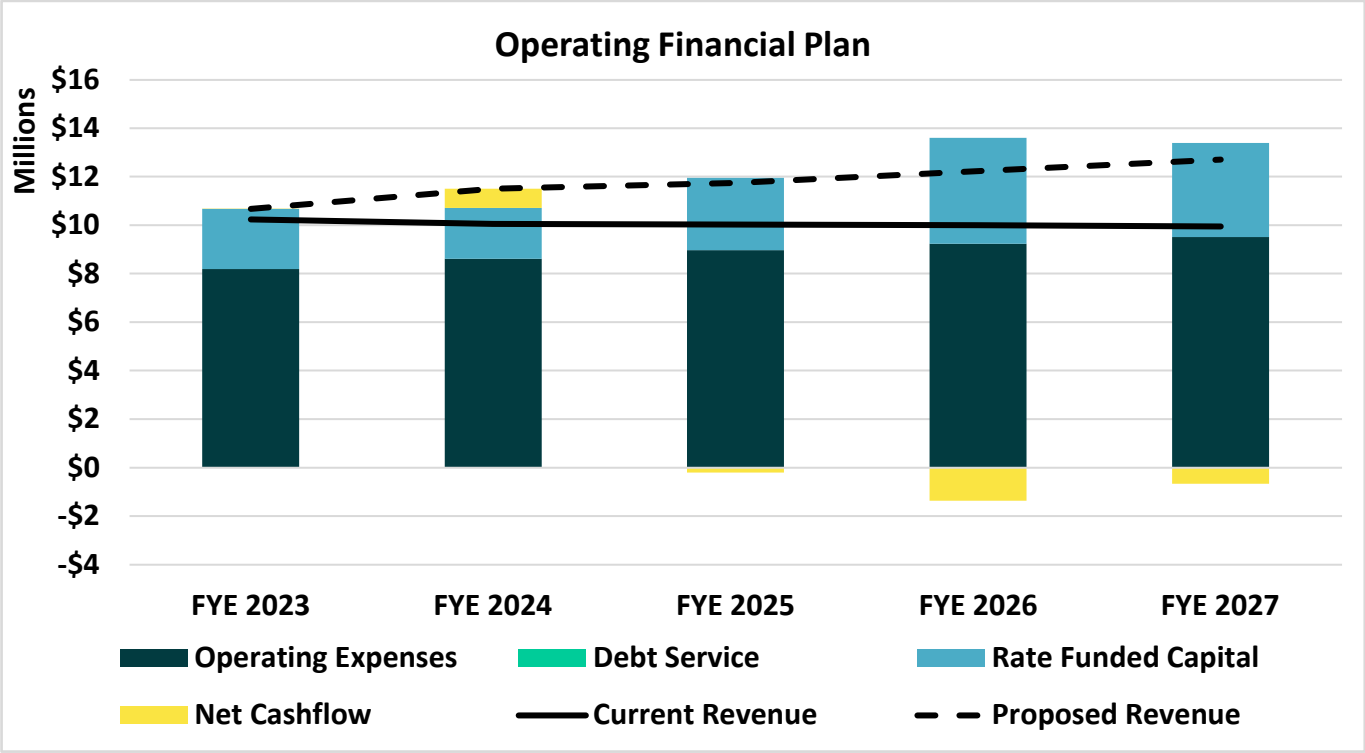


Figure 1-2 shows the Wastewater Enterprise operating financial plan. Revenues under the proposed and current rates are shown by the solid and dashed black lines, respectively. Revenue requirements including O&M

[1] The City will receive less revenue than shown since the rates are delayed, and therefore reserve balances are expected to be lower.

expenses, and CIP are represented by the stacked bars. Revenue adjustments (black dashed line) are required to generate sufficient revenue to recover O&M expenses and debt service payments over the study period.

Figure 1-2: Wastewater Operating Financial Plan



1.4. Current and Proposed Wastewater Rates

The City's wastewater rate structure currently consists of a combination of fixed and volumetric charges. The City's existing rate structure is shown below in Table 1-2 and Table 1-3.

Table 1-2: Current Fixed Rate Structure ($/Month)

Meter Size	Fixed Charge
up to 1"	$23.82
1.5"	$78.60
2"	$126.62
3"	$262.02
4"	$404.92
6"	$793.18

Table 1-3: Current Commodity Rate Structure (Monthly, $/ccf)

Customer Class	Rate
Residential	
Single-Family Residential	$1.44
Multi-Family Residential	$1.44
Commercial	
Low Strength	$1.97
Medium Strength	$2.58
Medium-High Strength	$4.57
High Strength	$6.38
Mixed Use	$2.61

Table 1-4 shows the proposed fixed charge.

Table 1-4: Proposed Fixed Charge ($/Month)

Meter Size	Rate
up to 1"	$26.15
1.5"	$50.78
2"	$80.35
3"	$173.97
4"	$311.93
6"	$642.05

Table 1-5 shows the proposed monthly volumetric rates.

Table 1-5: Proposed Volumetric Rates ($/ccf)

Customer Class	Rate
Residential	
Single Family Residential	$3.05
Multi-Family Residential	$3.04
Non-Residential	
Low Strength (Includes Schools)	$1.28
Medium Strength	$2.73
Medium-High Strength	$4.27
High Strength	$7.17
Mixed Use (Comm & Residential)	$2.56

Table 1-6 shows proposed 5-year wastewater rates and charges. This report establishes rates for FY 2022-23 using a cost-of-service analysis and escalates rates for future years by the revenue adjustments shown in Table 1-1.

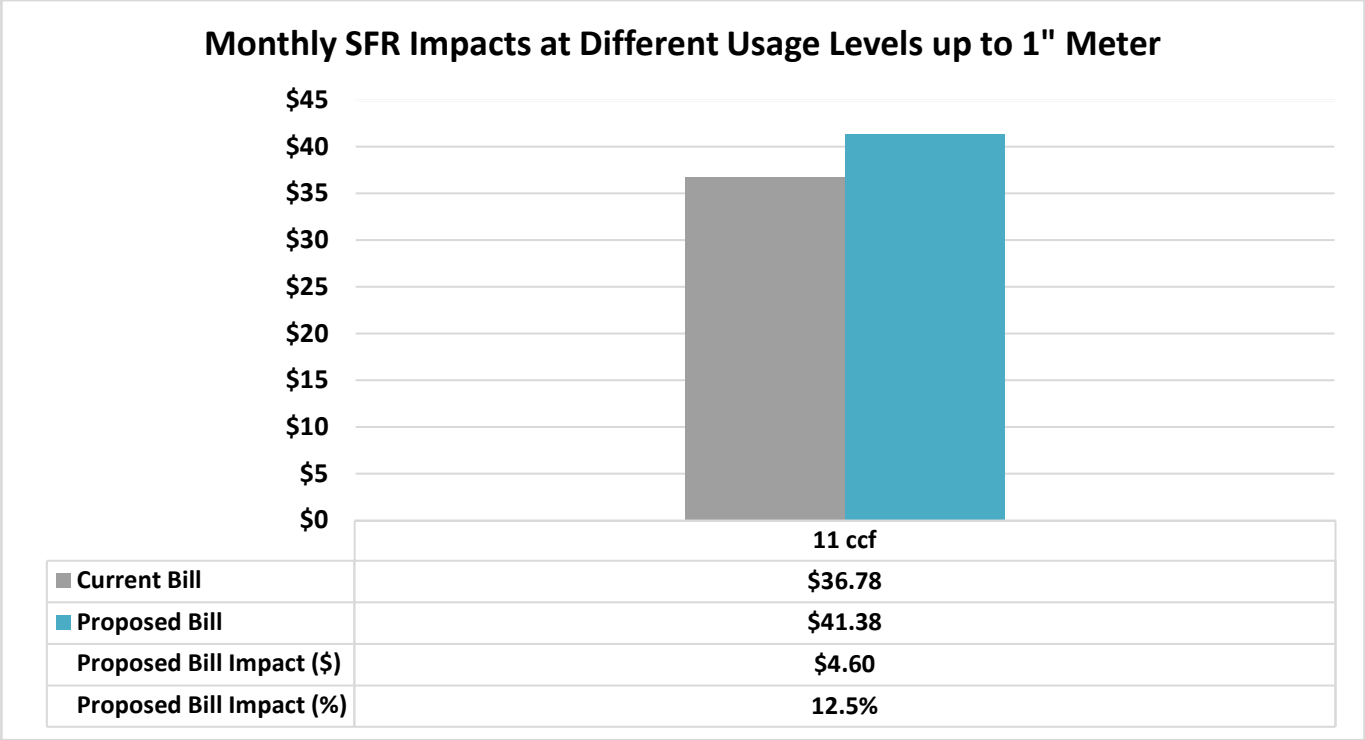
Table 1-6: Proposed Five-Year Wastewater Rate Schedule

(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
Line	Customer Class	Current Rate	FYE 2023	FYE 2024	FYE 2025	FYE 2026	FYE 2027
1	**Fixed Rates**						
2	up to 1"	$23.82	$26.15	$27.72	$29.10	$30.56	$31.93
3	1.5"	$78.60	$50.78	$53.83	$56.52	$59.35	$62.02
4	2"	$126.62	$80.35	$85.17	$89.43	$93.90	$98.12
5	3"	$262.02	$173.97	$184.40	$193.62	$203.31	$212.45
6	4"	$404.92	$311.93	$330.64	$347.18	$364.54	$380.94
7	6"	$793.18	$642.05	$680.58	$714.61	$750.34	$784.10
8	**Commodity Rates**						
9	Single Family Residential	$1.44	$3.05	$3.23	$3.39	$3.56	$3.72
10	Multi-Family Residential	$1.44	$3.04	$3.23	$3.39	$3.56	$3.72
11	Low Strength (Includes Schools)	$1.97	$1.28	$1.36	$1.42	$1.50	$1.56
12	Medium Strength	$2.58	$2.73	$2.90	$3.04	$3.19	$3.34
13	Medium-High Strength	$4.57	$4.27	$4.52	$4.75	$4.99	$5.21
14	High Strength	$6.38	$7.17	$7.60	$7.98	$8.38	$8.75
15	Mixed Use (Comm & Residential)	$2.61	$2.56	$2.71	$2.85	$2.99	$3.13

1.5. Monthly Bill Impacts

Figure 1-3 shows a sample monthly wastewater bill for Single Family residential customers under current rates and proposed rates.

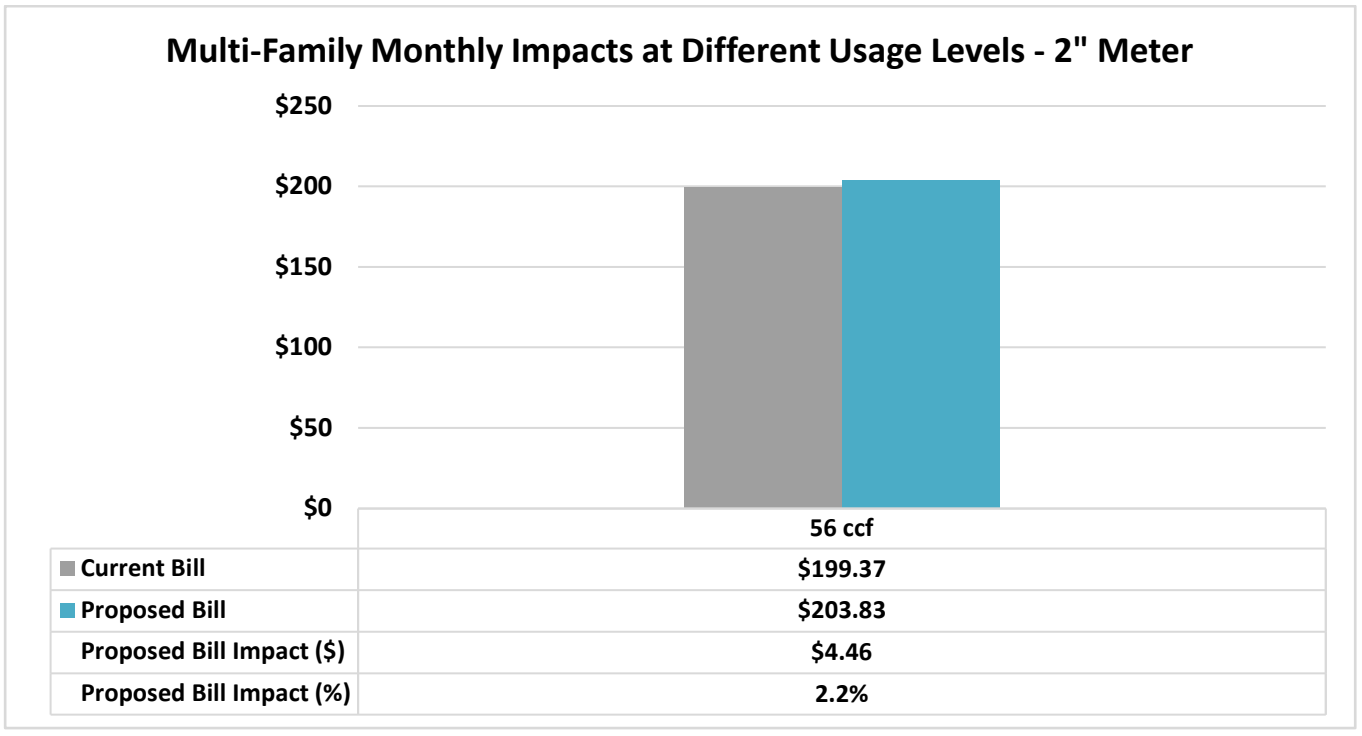
Figure 1-3: Single Family Residential Monthly Wastewater Bill Impacts



	11 ccf
Current Bill	$36.78
Proposed Bill	$41.38
Proposed Bill Impact ($)	$4.60
Proposed Bill Impact (%)	12.5%

Figure 1-4 shows monthly wastewater bill impact for an average Multi-Family customer with at 2" meter. The average monthly bill for Multi-Family customers will increase due to the proposed changes to the rate structure.

Figure 1-4: Multi-Family Monthly Wastewater Bill Impacts



	56 ccf
Current Bill	$199.37
Proposed Bill	$203.83
Proposed Bill Impact ($)	$4.46
Proposed Bill Impact (%)	2.2%

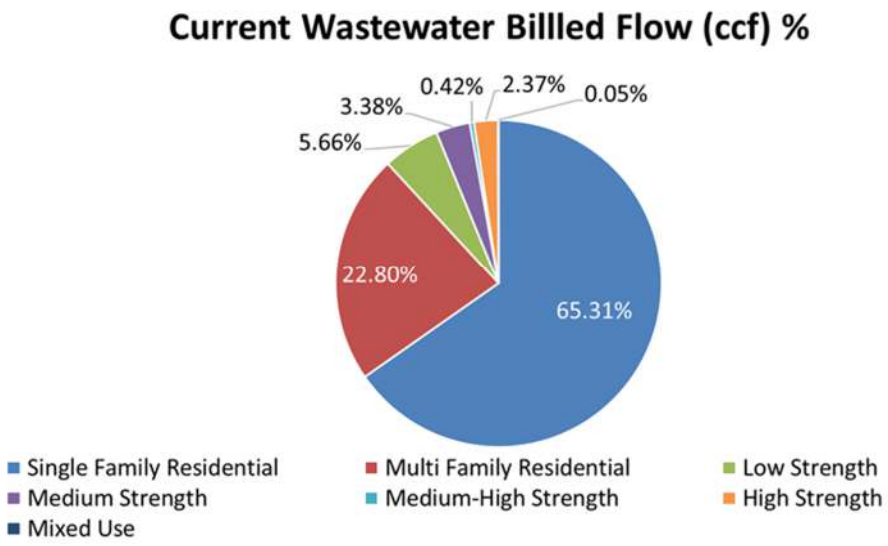
Table 1-7 shows monthly wastewater bill impacts for commercial customers with 1" and 2" meters, assuming average wastewater discharge for each meter size. The average bill for 2" meters are decreasing because a large component of a customer's bill is the fixed charge, which depends on a customer's meter size. This study propose to change the fixed charge by meter size so that they are in proportion with the current hydraulic capacity for each meter size according to the American Water Works Association (AWWA). It is standard practice to use the AWWA hydraulic capacity ratios to calculate fixed charges. The ratios are lower than the current ratios, causing the fixed charge for larger meters to decrease.

Table 1-7: Non-Residential Monthly Bill Impacts

Customer Class	Current Bill	Proposed Bill	Difference ($)
Low			
1"	$37.74	$34.19	$3.55
2"	$179.87	$110.10	($68.76)
Medium			
1"	$67.74	$70.06	$2.32
2"	$248.64	$202.35	($46.29)
Med-High			
1"	$93.28	$87.41	$5.87
2"	$406.08	$326.81	($79.27)
High			
1"	$186.13	$198.38	$12.25
2"	$588.46	$570.40	($18.06)
Mixed Use			
1"	$41.01	$42.08	$1.07
2"	$158.92	$110.27	($48.65)

Figure 1-5 shows that approximately 88% of customers are single family residential and multi-family residential and 12% are commercial customers (low, medium, medium high, and high).

Figure 1-5:Percentage of Customers by Customer Class



2. Introduction

2.1. City of San Clemente Wastewater System

The City's wastewater department provides wastewater service to approximately 16,600 customers and has approximately 180 miles of sewer lines. The City has a water reclamation plant that has been in operation since 1991. The water reclamation plant collects and treats on average 3.5 MGD of wastewater. Wastewater treatment goes through 5 processes, described below:

- Preliminary Treatment – removes grit, rags, and other inorganic heavy debris
- Primary Settling – settles the heavier organic solids
- Aeration (Activated Sludge) – aerobic bacteria consumes smaller organics called suspended solids (TSS) or biological oxygen demand (BOD)
- Secondary Settling - settles out microorganisms in the activated sludge that consumes the TSS
- Tertiary Filtration – filters out remaining waste particles through sand filtration

2.2. Study Overview

The City annually reviews its wastewater rates based on the current year's budget and a five-year financial forecast. The last rate update occurred in 2016. This study provides a five-year rate setting approach instead of annually reviewing rates. By using the cost-of-service (COS) principles as outlined in the Water Environment Federation (WEF) Manual of Practice No. 27, *Financing and Charges for Wastewater Systems,* 2004., the proposed rates outlined in this report are based on class flows and strength loadings.

The City engaged Raftelis in 2018 to conduct a wastewater cost of service study to establish a proposed five-year wastewater rate schedule from FY 2022-23 to FY 2026-27. The implementation of these rates is delayed until July 2023 (which is the start of FY 2023-24) and therefore the financial plan depicted in this study is outdated, however the proposed rates are based on cost-of-service principles. Note that proposed rates cannot be implemented until formally adopted by the City Council after a public hearing. Proposition 218 requires that City customers must be mailed a public hearing notice detailing any proposed rate changes no fewer than 45 days before the public hearing. The notice explains a customer's right to protest the rate proposal.

Study Objectives

The study's major objectives are to:

- Develop a ten-year financial plan that sufficiently funds the City's wastewater operations and maintenance (O&M) expenses, debt service payments, and capital expenditures while adequately funding reserves and achieving debt coverage requirements.
- Conduct a cost-of-service analysis that establishes a clear nexus between the cost to serve wastewater customers and the rates charged to customers, per Proposition 218 and industry standards.
- Review the City's existing wastewater rate structure to ensure that proposed rates are cost based and achieve policy objectives.
- Develop a five-year schedule of wastewater rates that are fair, equitable, and compliant with Proposition 218 requirements.

3. Legal Requirements and Rate Setting Methodology

3.1. Legal Requirements

California Constitution - Article XIII D, Section 6 (Proposition 218)

Proposition 218, reflected in the California Constitution as Article XIII D, was enacted in 1996 to ensure that rates and fees are reasonable and proportional to the cost of providing service. The principal requirements, as they relate to public water and wastewater service are as follows:

1. A property-related charge (which includes water or wastewater rates) imposed by a public agency on a parcel shall not exceed the costs required to provide the property-related service.
2. Revenues derived by the charge shall not be used for any purpose other than that for which the charge was imposed.
3. The amount of the charge imposed upon any parcel shall not exceed the proportional cost of service attributable to the parcel.
4. No charge may be imposed for a service unless that service is actually used or immediately available to the owner of the property.
5. A written notice of the proposed charge shall be mailed to both the customer of record and owner of record of each parcel at least 45 days prior to the public hearing, when the agency considers all written protests against the charge.

Raftelis follows industry standard rate setting methodologies established by the Water Environment Federation (WEF) and described in *Financing and Charges for Wastewater Systems*.

3.2. Rate-Setting Methodology

This study was conducted using industry-standard principles outlined by WEF's *Financing and Charges for Wastewater Systems*. The process and approach Raftelis utilized in the study to determine rates is informed by the City's policy objectives, the current system of rates, and the legal requirements in California (namely, Proposition 218). The resulting financial plans, cost of service analyses, and rate design process follow five steps, outlined below, to determine proposed rates that fulfill the City's objectives, meet industry standards, and comply with relevant regulations.

1. **Financial Plan:** The first step is to develop a multi-year financial plan that projects the Wastewater Enterprises' revenues, expenses, capital project financing, annual debt service, and reserve funding. The financial plan is used to determine revenue adjustments needed to recover adequate revenues to fund expenses and reserves.

2. **Revenue Requirement Determination:** After completing the financial plan, the rate-making process determines the revenue requirement for the test year, also known as the cost-of-service year. The test year for this study is FY 2022-23. The revenue requirement should sufficiently fund the Wastewater

Enterprise's operating costs, annual debt service (including coverage requirements), capital expenditures, and reserve funding needs.

3. **Cost of Service Analysis:** The annual cost of providing wastewater service (i.e., the revenue requirement) is then distributed to customer classes commensurate with their use of and burden on the system. A cost-of-service analysis involves the following steps:
    - Functionalization of costs – the different components of the revenue requirement are categorized into functions such as collection, treatment, customer service, etc.
    - Allocation to cost causation components – the functionalized costs are then allocated to cost causation components such as flow, strength, etc.
    - Development of unit costs – unit costs for each cost causation component are determined using units of service
    - Distribution of cost components – the cost components are allocated to each customer class using the unit costs in proportion to their demand and burden on the system.

    A wastewater cost of service analysis considers the amount of wastewater treatment plant influence contributed by each customer class to account for customer differences in the quantity and strength of wastewater discharges.

4. **Rate Design**: After allocating the revenue requirement to each customer class, we design rates. Rates do more than simply recover costs; within the legal framework and industry standards, properly designed rates should support and optimize the City of San Clemente's policy objectives. Rates also act as a public information tool in communicating policy objectives to customers. This process also includes a bill impact analysis.

5. **Administrative Record Preparation and Rate Adoption:** The final step in a rate study is to develop a report in conjunction with the rate adoption process. The report documents the study results and presents the methodologies, rationale, justifications, and calculations used to determine the proposed rates. A thorough and methodological report serves two important functions: maintaining defensibility in a stringent legal environment and communicating the rationale for revenue adjustments and proposed rates to customers and key stakeholders.

4. Inputs and Assumptions

Raftelis developed a wastewater rate model in Microsoft Excel to project the financial plan over the next ten fiscal years with projections shown in this section through the five-year rate-setting period from FY 2022-23 to FY 2026-27 (i.e., the "study period"). The City's fiscal year spans from July 1 through June 30. Projections in future years were made based on estimated FY 2021-22 data using assumptions outlined below. Assumptions were discussed with and reviewed by City staff. Note that most values shown throughout this report are rounded to the last digit shown and excel does not round – therefore a reader, doing calculations with a calculator may get slightly different results.

4.1. Current Wastewater Rates

Table 4-1, Table 4-2, and Table 4-3 show the current wastewater rates, which were developed during the prior rate update in 2016. As shown, there is a fixed service charge by meter size, and each customer class is charged a volumetric charge per hundred cubic feet (ccf).

Table 4-1: Current Wastewater Monthly Service Charges

Meter Size	Rate
up to 1"	$23.82
1.5"	$78.60
2"	$126.62
3"	$262.02
4"	$404.92
6"	$793.18

Commercial customer rates vary based on the strength of sewer discharged from each commercial customer class. Currently, the City classifies its non-residential users into five commercial groups based on the wastewater strength of each class.

Table 4-2: Current Wastewater Volumetric Charges (Monthly, $/ccf)

Customer Class	Rate
Residential	
Single-Family Residential	$1.44
Multi-Family Residential	$1.44
Commercial	
Low Strength	$1.97
Medium Strength	$2.58
Medium-High Strength	$4.57
High Strength	$6.38
Mixed Use	$2.61

All customers pay a monthly fixed charge plus a volumetric charge based on actual water use each billing period. A return to sewer factor of 90% is applied to single family customer average water use from October through March. This water use is the basis for the sewer charge for the next 12-month period. The sewer use for all other customers is 90% of the use in the current period. The return to sewer factor is a factor that considers water used for irrigation or otherwise is not discharged to the sewer.

4.2. Projected Billed Wastewater Use Under Current Rate Structure

City staff provided Raftelis with total annual wastewater use data by customer class for FY 2018-19. Raftelis worked closely with City staff to develop wastewater billed consumption projections over the study period. Table 4-3 shows projected billed consumption for FY 2023 and the study assumes a constant flow over the study period. Total water use is shown in hundred cubic feet (ccf). The below wastewater discharges we used to estimate current revenue.

Table 4-3: Projected Billed Consumption Under Existing Rate Structure

Customer Class	FY 2023
Billed Flow (ccf)	
Residential	
Single Family Residential	1,415,221
Multi-Family Residential	494,086
Non-Residential	
Low Strength (Includes Schools)	122,691
Medium Strength	73,336
Medium-High Strength	9,006
High Strength	51,421
Mixed Use (Comm & Residential)	1,079
Total Billed Flow	**2,166,840**

4.3. Wastewater Enterprise Financial Assumptions

Raftelis and City Staff developed inflationary assumptions as shown in Table 4-4 which are used to escalate operations and maintenance (O&M) expenses) beyond FY 2022-23. Salary and benefit inflationary increases were verified by City staff, as wastewater utility personnel cost increases are typically agency specific. The capital inflation factor is used to adjust uninflated capital project cost to reflect future year costs.

Table 4-4: Wastewater Enterprise Inflationary Assumptions

(A)	(B)	(C)	(D)	(E)	(F)
Escalation Factor		FY 2024	FY 2025	FY 2026	FY 2027
General	Budget	7.0%	5.0%	2.5%	2.5%
Salary	Budget	3.0%	3.0%	3.0%	3.0%
Benefits	Budget	5.0%	5.0%	5.0%	5.0%
General Utilities	Budget	5.0%	4.0%	3.0%	3.0%
Power	Budget	5.0%	5.0%	5.0%	5.0%
Capital	Budget	7.0%	5.0%	3.2%	3.2%
Non-Inflated		0.0%	0.0%	0.0%	0.0%

Raftelis calculated interest earnings using the interest rate shown in Table 4-5.

Table 4-5: Additional Wastewater Enterprise Financial Assumptions

Escalation Factor	
Annual Reserve Interest Rate	1.0%

4.4. Projected Wastewater Number of Accounts

Table 4-6 shows the projected number of wastewater accounts. Wastewater account growth projections are needed to estimate wastewater rate revenues over the study period. City staff provided Raftelis with the number of accounts by customer class for FY 2018-19. As shown the Study assumes no account growth.

Table 4-6: Projected Wastewater Accounts

(A)	(B)	(C)	(D)	(E)	(F)
Customer Class	FYE 2023	FYE 2024	FYE 2025	FYE 2026	FYE 2027
Account Growth Factors					
Single Family Residential	0%	0%	0%	0%	0%
Multi-Family Residential	0%	0%	0%	0%	0%
Commercial	0%	0%	0%	0%	0%
Number of Accounts					
Single Family Residential	12,012	12,012	12,012	12,012	12,012
Multi-Family Residential	3,658	3,658	3,658	3,658	3,658
Commercial	881	881	881	881	881

5. Wastewater Financial Plan

Section 5 details the proposed Wastewater Enterprise financial plan. The following subsections estimate annual revenues, O&M expenses, capital expenditures, and reserve funding through FY 2026-27. The financial plan's overall purpose is to determine annual wastewater rate revenue requirements to achieve adequate cash flow, maintain sufficient reserves, and meet debt coverage requirements if applicable.

5.1. Wastewater Revenue at Existing Rates

The Wastewater Enterprise's revenue consists of wastewater rates, connection fees, interest earnings on cash reserves, and other non-rate revenues. The rate revenue projections shown in this section assume that current FY 2021-22 wastewater rates are effective throughout the study period, and therefore represent estimated revenues *in the absence* of any wastewater rate increases. This status quo scenario provides a baseline from which Raftelis evaluated the need for revenue adjustments (i.e., gross rate revenue increases).

Calculated Wastewater Rate Revenues

Raftelis projected annual wastewater rate revenues based on current FY 2021-22 wastewater rates (from Table 4-1 and Table 4-2) and projected number of accounts (from Table 4-6). Table 5-1 shows projected wastewater rate revenues under current rates, calculated as follows:

Fixed Charge Revenue = [FY 2022-23 monthly charge] × [Number of accounts] × [12 Bills per year]

Variable Rate Revenue = [FY 2022-23 volumetric unit rate] × [wastewater discharge]

The revenue in Table 51 decreases because the City expects that wastewater flow will decrease by 1.5% each year.

Table 5-1: Projected Rate Revenues at Existing Rates

(A)	(B)	(C)	(D)	(E)	(F)
Customer Class	**FYE 2023**	**FYE 2024**	**FYE 2025**	**FYE 2026**	**FYE 2027**
Fixed Charge Revenues					
Total Fixed Charge Revenue (All Customer Classes)	**$5,589,204**	**$5,589,204**	**$5,589,204**	**$5,589,204**	**$5,589,204**
Commodity Rate Revenues					
Single-Family Residential	$2,037,918	$2,007,349	$1,977,239	$1,947,581	$1,918,365
Multi-Family Residential	$711,484	$700,812	$690,299	$679,945	$669,746
Commercial	$802,945	$790,901	$779,038	$767,351	$755,842
Total Commodity Rate Revenue	**$3,552,347**	**$3,499,062**	**$3,446,576**	**$3,394,877**	**$3,343,953**
Total Revenue	**$9,141,551**	**$9,088,266**	**$9,035,780**	**$8,984,081**	**$8,933,157**

5.2. Wastewater Enterprise Operations & Maintenance Expenses

Table 5-2 shows a summary of Wastewater Enterprise O&M expenses over the study period. O&M expenditures include the cost of operating and maintaining wastewater collection, treatment, disposal facilities, and other administrative costs. FY 2022-23 O&M expenses were provided by City Staff in current dollars and for future years was adjusted for inflation, based on inflationary assumptions shown in Table 4-4.

Table 5-2: Projected O&M Expenses

Expense	FYE 2023	FYE 2024	FYE 2025	FYE 2026	FYE 2027
Administration	$1,560,470	$1,651,378	$1,726,334	$1,776,335	$1,827,890
Collection	$2,364,463	$2,481,822	$2,585,569	$2,667,428	$2,752,100
Treatment	$4,263,395	$4,477,586	$4,658,951	$4,789,684	$4,924,629
Total Operating Expenditures	**$8,188,328**	**$8,610,786**	**$8,970,854**	**$9,233,447**	**$9,504,619**

5.3. Wastewater Enterprise Capital Improvement Plan

Table 5-3 shows the proposed capital improvement plan. The City expects to spend approximately $15 million on capital projects over the study period, highlighting the need to maintain adequate reserves and preserve its wastewater collection and treatment system through regular repairs. The CIP shown below assumes a 70% execution factor – which decreases the total CIP for two reasons: 1) to lower customer bills and 2) account for the fact that projects often take longer than anticipated.

Table 5-3: Capital Improvement Plan

(A)	(B)	(C)	(D)	(E)	(F)	(G)
Line	CIP Project	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027
1	WRP Electrical System Replacements	$700,000	$175,000	$1,050,000	$0	$1,500,000
2	Los Molinos Lift Station Generator Replacement	$350,000	$0	$0	$0	$0
3	WRP Odor Control Systems Replacement	$0	$0	$0	$3,150,000	$0
4	Cypress Shores PS Force Main Rehabilitation	$140,000	$560,000	$0	$0	$0
5	Recycled Water Storage Bay Rehabilitation	$0	$140,000	$840,000	$0	$0
6	Primary Clarifier 1, 2 & 3 Rehabilitation	$350,000	$0	$0	$0	$0
7	Secondary Clarifier 1, 2 & 3 Rehabilitation	$0	$0	$0	$420,000	$0
8	Secondary Clarifier 4, 5 & 6 Rehabilitation	$0	$0	$0	$420,000	$0
9	Digester #2 Structural & Mechanical Rehabilitation	$350,000	$0	$0	$0	$0
10	WRP DIP Replacement	$175,000	$700,000	$0	$0	$0
11	Sewer System Rehabilitation	$210,000	$210,000	$210,000	$210,000	$0
12	Sewer System Lining	$175,000	$175,000	$175,000	$175,000	$0
13	Los Molinos Wet Well Lining	$0	$140,000	$560,000	$0	$0
14	Sewer Asset Management	$35,000	$0	$0	$0	$0
15	WRP and Sewer Facility Pavement Rehabilitation	$0	$0	$140,000	$0	$0
16	WRP DIP Replacement					$2,300,000
17	**Total**	**$2,485,000**	**$2,100,000**	**$2,975,000**	**$4,375,000**	**$3,800,000**

The City plans to fund all its CIP projects with cash reserves generated from rates (i.e. pay-as-you-go).

5.4. Wastewater Enterprise Financial Policies

Reserve Targets

The City has an operating reserve to provide funds to meet ongoing cash flow requirements related to operating expenses. The current operating reserve target is equal to 12% of annual O&M expenses. It is also common to have capital reserves to provide available funds for CIP projects. The City currently has a formal capital reserve policy, of the average CIP over three years. Table 5-4 shows projected operating and capital reserve targets. Rate setting is informed by these reserve targets.

Table 5-4: Projected Reserve Targets

Reserve Target	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027
Operating Reserve	$1,364,721	$1,435,131	$1,495,142	$1,538,908	$1,584,103
Capital Reserve	$2,520,000	$3,150,000	$3,743,513	$4,045,360	$3,880,540
Total	**$3,884,721**	**$4,585,131**	**$5,238,656**	**$5,584,268**	**$5,464,643**

5.5. Proposed Wastewater Financial Plan

The Wastewater Enterprise must increase its revenues from wastewater rates over the study period to adequately fund its operating and capital expenditures and maintain sufficient reserve funding. Raftelis worked closely with City staff to identify financial plan options for the City's consideration. The selected proposed annual revenue adjustments are shown in Table 5-5. Revenue adjustments represent annual percentage increases in total rate revenue relative to rate revenue generated by the prior year's wastewater rates. The City is delayed in implementing the revenue adjustments shown below, therefore the financial plan is outdated. However, the City can adjust capital spending to account for the delay.

Table 5-5: Proposed Wastewater Revenue Adjustments

Description	FYE 2023	FYE 2024	FYE 2025	FYE 2026	FYE 2027
Effective Date	January 1, 2023	January 1, 2024	January 1, 2025	January 1, 2026	January 1, 2027
Revenue Adjustment	9.5%	6.0%	5.0%	5.0%	4.5%

Figure 5-1 shows the Wastewater Enterprise's projected ending balances for all reserves which include the operating reserve, the sewer depreciation reserve, and the sewer connection fee reserve with the proposed revenue adjustments. As mentioned previously, the City is delayed in implementing rates and therefore the projections below are outdated. The City can modify capital spending to adjust for the delayed rate increases. The bars indicate the ending balance. The total reserve target is represented by the green dashed line; the minimum reserve target for the operating reserve is represented by the blue line.

Figure 5-1: Projected Ending Balances

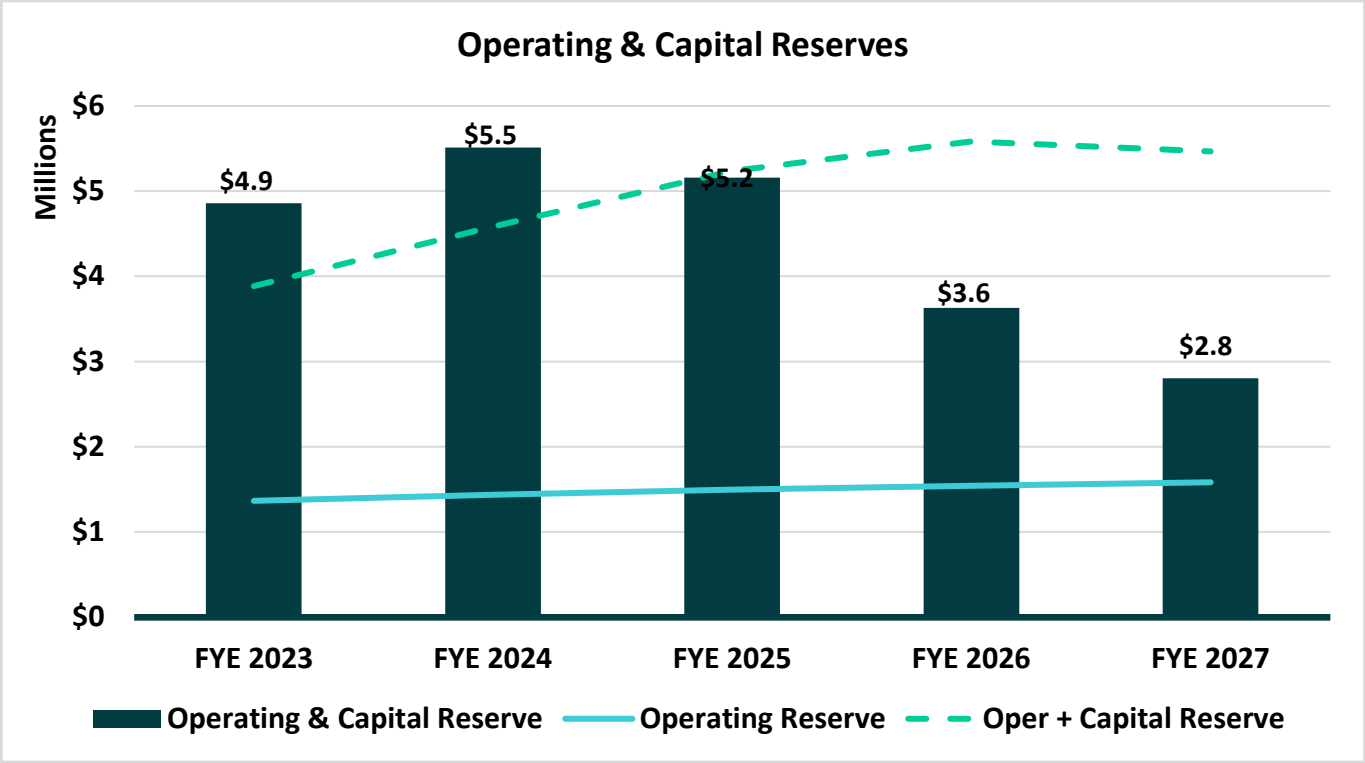
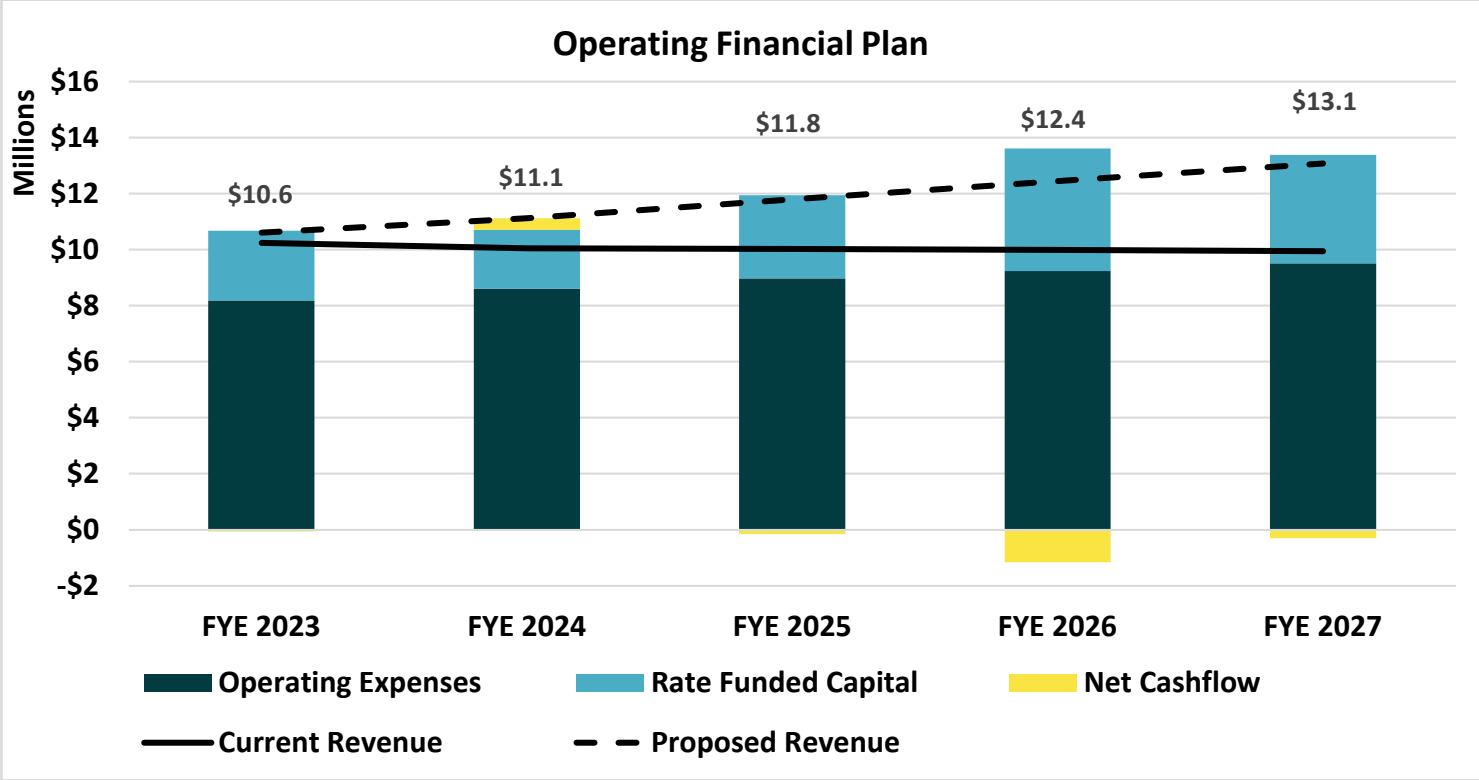


Figure 5-2 shows the financial plan – which compares revenue to expenses. Revenues under the proposed financial plan and status quo financial plan are represented by the solid and dashed black lines, respectively. Revenue requirements including O&M expenses, and reserve funding for CIP/other purposes are represented by the various stacked bars. Revenue adjustments are required to generate sufficient revenue to recover O&M expenses over the study period.

Figure 5-2: Operating Wastewater Financial Plan



6. Wastewater Cost of Service Analysis

The Cost of Service (COS) analysis allocates the overall rate revenue requirement to customer classes based on their use of and cost causation to the wastewater system. The COS provides the basis for the proposed wastewater rates through FY 2026-27.

6.1. Methodology

The methodology used to develop the COS analysis and to apportion the revenue requirement to user classes is informed by the WEF's Manual of Practice (MOP) No. 27 *Financing and Charges for Wastewater Systems*. COS analyses are specific to each wastewater system. There are three distinct steps in every COS analysis to recover costs from customers in an accurate, equitable, and defensible manner:

1. **Cost functionalization:** O&M expenses and capital assets are categorized by their function in the wastewater system. Sample functions may include collection, treatment, and customer service, among others.
2. **Allocation to Cost Components:** Functionalized costs are then allocated to cost causation components based on their burden on the wastewater system. The cost causation components include flow, biological oxygen demand (BOD), and suspended solids (SS), among other specific cost components. The revenue requirement is allocated accordingly to the cost causation components and results in the total share of the revenue requirement attributable to each cost component.
3. **Distribution of Cost Components to Each Class:** Costs are distributed to each customer class using unit cost causation components (Flow, BOD and TSS) which are multiplied by the sewer discharge and strength for each class. This analysis estimates the burden each customer class places on the wastewater system.

6.2. Wastewater Rate Revenue Requirement

The first step in a COS analysis is to determine the revenue required from wastewater rates. The total revenue requirement results from the wastewater financial plan outlined in Section 5, and is shown in Table 6-1. Table 6-1 shows the wastewater rate revenue requirement for FY 2022-23 (Test Year). The revenue requirement is split into operating and capital categories which are later allocated based on O&M expenses and capital assets. The revenue requirements (Lines 2-5) include projected FY 2022-23 O&M expenses and rate-funded CIP expenditures. The revenue offsets (Lines 9-13) include all non-rate revenues which reduce rates because these revenues are applied as offsets to the final rate revenue requirement. The adjustment for cash balance (Line 17) is equal to FY 2022-23 negative net operating cash flow under the proposed financial plan, and accounts for the drawdown of operating reserves in FY 2022-23. All values are from the proposed wastewater financial plan operating cash flow. The final rate revenue requirement (Line 21) is calculated as follows:

Total revenue required from rates (Line 21) = Revenue requirements (Line 6) - Revenue offsets (Line 14) - Adjustments (Line 19)

Table 6-1: FY 2022-23 Wastewater Revenue Requirement

(A)	(B)	(C)	(D)	(E)
Line	Cost	Operating	Capital	Total
1	**Revenue Requirement**			
2	Administration	$1,560,470	$0	$1,560,470
3	Collection	$2,364,463	$0	$2,364,463
4	Treatment	$4,263,395	$0	$4,263,395
5	Cash Funded Capital Projects	$0	$2,485,000	$2,485,000
6	**Subtotal Operating Costs**	**$8,188,328**	**$2,485,000**	**$10,673,328**
7				
8	**Less: Revenue Offsets**			
9	Interest	$230,000	$0	$230,000
10	Fees	$6,000	$0	$6,000
11	Grants	$67,881	$0	$67,881
12	Miscellaneous	$2,000	$0	$2,000
13	Revenue from SMWD	$794,761	$0	$794,761
14	**Total Revenue Offsets**	**$1,100,641**	**$0**	**$1,100,641**
15				
16	**Less: Adjustments**			
17	Adjustment for Cash Balance	($3,089)	$0	($3,089)
18	Adjustment for Mid-Year Increase	($434,224)	$0	($434,224)
19	**Total Adjustments**	**($437,312)**	**$0**	**($437,312)**
20				
21	**Total Revenue Requirement from Rates**	**$7,524,998**	**$2,485,000**	**$10,009,998**

6.3. Functionalization and Allocation of Expenses to Cost Components

After determining the revenue requirement, the next step of the wastewater COS analysis is to allocate O&M expenses and capital assets to the following functions:

- **Collection**: costs related to the system of collection and transport of wastewater discharges from customers to the wastewater treatment plant
- **Treatment**: costs associated with the wastewater treatment facilities to treat wastewater to tertiary standards and disposal
- **Customer**: costs of billing, revenue collections, and other customer services functions
- **General:** costs for general administration and operational expenses or any other costs that do not clearly relate to another functional category (i.e., indirect costs)

The functionalization helps allocate costs to each of the cost causation components. Some cost causation components correspond directly to the functions listed above. The **cost causation** components include:

- **Flow**: costs that vary based on the quantity of wastewater generated
- **Biochemical Oxygen Demand**: costs that vary based on the BOD strength parameter of wastewater; Biochemical oxygen demand is a measure of wastewater strength based on the amount of organic matter contained in wastewater prior to treatment and measured in milligrams per liter (mg/L) or parts per

million (ppm). The more organic matter in the wastewater, the more oxygen the microorganisms needed to utilize the matter in the wastewater.

- **Suspended Solids**: costs that vary based on the SS strength parameter of wastewater; Suspended Solids are a measure of wastewater strength based on the amount of solid particles in suspension in wastewater prior to treatment also generally expressed in milligrams per liter (mg/L) or parts per million (ppm).
- **Customer**: costs directly associated with the Customer function.
- **General**: costs directly associated with the General function

6.3.1. FUNCTIONALIZATION AND ALLOCATION OF O&M COSTS

Raftelis worked with City staff to assign wastewater O&M expenses by line item to each function. As stated above, this intermediate step is necessary to allocate wastewater O&M expenses to individual cost causation components. Appendix A shows the functionalization of wastewater expenses by expense category.

Table 6-2 shows the allocation of functionalized costs to the various cost causation components. This provides the basis for allocating O&M and capital expenses in the following subsections. The Wastewater Collection function is allocated entirely to the collection cost causation component because these are collection-related costs. The remaining lines show how each function is allocated to each cost component: for example, 100% of grit removal and primary settling costs are allocated to flow because these facilities are sized based on flow.

Table 6-2: Allocation of Functions to Wastewater Cost Causation Components

(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
Line	O&M Function	Collection	BOD	TSS	Customer Billing	General	Total
1	Collection	100%	0%	0%	0%	0%	**100%**
2	Grit Removal/Primary Settling	0%	0%	100%	0%	0%	**100%**
3	Aeration	0%	100%	0%	0%	0%	**100%**
4	Secondary Settling	0%	100%	0%	0%	0%	**100%**
5	Residuals Processing & Disposal (sludge)	0%	49%	51%	0%	0%	**100%**
6	General	0%	0%	0%	11%	89%	**100%**

Using the percentages from Table 6-2, Table 6-3 shows the allocation of FY 2022-23 O&M expenses by function to each cost causation component. The total dollar amount allocated to each cost causation component is determined by multiplying the total expense (Column H) by the corresponding percentage allocation for each cost component shown in Table 6-2. The bottom of the table shows the percentages that are used to allocate the total O&M revenue requirement to the cost components.

For example, (Column C, Line 1) total wastewater collection cost is determined by multiplying the total dollar amount of O&M costs allocated to wastewater collection from Column H, Line 1 by the corresponding cost causation factor allocation (developed in Table 6-2). The same calculation is performed for the remaining functions (i.e., Column C × Column H in Lines 2-6).

Table 6-3: Allocation of O&M Expenses by Function and Cost Causation Component

(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
Line	Functions	Collection	BOD	TSS	Customer Billing	General	Total
1	Collection	$2,364,463	$0	$0	$0	$0	$2,364,463
2	Grit Removal/ Primary Settling	$0	$0	$514,040	$0	$0	$514,040
3	Aeration	$0	$816,670	$0	$0	$0	$816,670
4	Secondary Settling	$0	$375,786	$0	$0	$0	$375,786
5	Residuals Processing & Disposal (sludge)	$0	$892,807	$918,458	$0	$0	$1,811,265
6	General	$0	$0	$0	$262,284	$2,043,821	$2,306,105
7	**Total O&M Expenses**	**$2,364,463**	**$2,085,263**	**$1,432,498**	**$262,284**	**$2,043,821**	**$8,188,328**
8	Percent by Cost Component	**29%**	**25%**	**17%**	**3%**	**25%**	**100%**

6.3.2. FUNCTIONALIZATION AND ALLOCATION OF CAPITAL COSTS TO COST COMPONENTS

Capital assets are used in COS analyses to allocate the capital revenue requirement to the various cost causation components. The distribution of short-term CIP project costs can be heavily weighted to specific cost causation components based on the type of projects. The use of short-term plans to allocate capital costs may cause rates to fluctuate and result in customer confusion. The overall wastewater asset base, however, is considerably stable in the long-term, and therefore is more representative of long-term capital investment in the City's wastewater system. Thus, functionalized capital assets are used to allocate capital costs (the capital revenue requirement).

Table 6-4 summarizes FY 2018-19 capital assets by function. This intermediate step is necessary to allocate capital assets to cost causation components.

Table 6-4: Summary of Capital Assets by Functional Category

(A)	(B)	(C)	(D)
Line	Functional Category	Capital Assets	Percent of Total
1	General	$156,843	0.1%
2	Collection/Transmission	$54,444,931	42.5%
3	Treatment	$57,978,238	45.3%
4	Pumps	$10,560,689	8.2%
5	Land	$1,014,952	0.8%
6	Equipment	$3,614,236	2.8%
7	Buildings	$263,850	0.2%
8	**Total**	**$128,033,739**	**100%**

Table 6-5 shows the percentages used to allocate the wastewater assets to each cost component. Treatment costs are allocated to BOD and TSS in proportion to the O&M costs for treatment.

Table 6-5: Allocation of Assets to Cost Causation Components

Line	Sewer Assets by Function	Collection	BOD	TSS	Customer Billing	Customer	General	Total
1	General	0%	0%	0%	0%	0%	100%	100%
2	Collection/Transmission	100%	0%	0%	0%	0%	0%	100%
3	Treatment	0%	59%	41%	0%	0%	0%	100%
4	Pumps	100%	0%	0%	0%	0%	0%	100%
5	Land	0%	0%	0%	0%	0%	100%	100%
6	Equipment	0%	0%	0%	0%	0%	100%	100%
7	Buildings	0%	0%	0%	0%	0%	100%	100%

Table 6-6 shows the allocation of capital assets by function to each cost causation component. The method used is the same as explained for the allocation of O&M expenses by function to the cost components for Table 6-3.

Table 6-6: Allocation of Capital Assets by Function and Cost Causation Component

Function	Collection	BOD	TSS	Customer Billing	General	Total
General	$0	$0	$0	$0	$156,843	$156,843
Collection/Transmission	$54,444,931	$0	$0	$0	$0	$54,444,931
Treatment	$0	$34,368,421	$23,609,817	$0	$0	$57,978,238
Pumps	$10,560,689	$0	$0	$0	$0	$10,560,689
Land	$0	$0	$0	$0	$1,014,952	$1,014,952
Equipment	$0	$0	$0	$0	$3,614,236	$3,614,236
Buildings	$0	$0	$0	$0	$263,850	$263,850
Total Capital Assets	**$65,005,620**	**$34,368,421**	**$23,609,817**	**$0**	**$5,049,881**	**$128,033,739**
Capital Asset Allocation	***51%***	***27%***	***18%***	***0%***	***4%***	***100%***

6.4. Plant Mass Balance Analysis

The plant mass balance analysis estimates the flow and loadings from each class and ties it back to the total wastewater treatment plant flow and loadings. The plant mass balances is a reasonable way to estimate the flow and strength loadings from each class. We need to know the flow and strength loadings to the plant because the end goal is to multiply these flow and strength loadings by the unit cost for each cost component (flow, BOD and TSS) to allocate costs to the customer classes.

Table 6-8 shows the mass balance for the wastewater treatment plant based on City provided influent data for FY 2018-19. City staff provided:

- Total FY 2018-19 wastewater flows entering the wastewater treatment plant,
- FY 2019-20 BOD and TSS concentrations entering the plant,
- FY 2018-19 water use associated with non-residential wastewater customers.

We first estimate the flows from non-residential customers. The City provided water use for non-residential customers. To estimate sewer flows, we compared winter use to summer use. It is assumed that most winter water use is indoor water use since outdoor irrigation needs are minimal. By annualizing winter water use we can estimate a return to sewer factor by comparing annualized winter water use to actual water use. The difference between annualized winter use and actual water use is assumed to be used for irrigation purposes and therefore not discharged to the sewer system. March water use was the lowest, therefore March water use was considered winter water use and annualized. Table 6-7 shows the estimated return to sewer factors for non-residential and multi-family customers.

Table 6-7: Return to Sewer Factors for Non-Residential Customers

Customer Class	Return to Sewer Factor
Multi-family Residential	85%
Low Strength (Includes Schools)	80%
Medium Strength	85%
Medium-High Strength	85%
High Strength	85%
Mixed Use (Comm & Residential)	85%

Non-residential and multi-family flow, estimated by assuming a return to sewer factor for each commercial class, is shown in column F of Table 6-8. Raftelis estimated ***residential*** flow, shown in line 13, into the WWTP by subtracting inflow and infiltration from the total plant flow shown in Line 2, Column C, and non-residential flows. In other words, the difference between total plant flow and all other customer flows is single family residential flow. A reasonable estimate of indoor water use for single family homes (which is discharged to the sewer system) is around 50 to 60 gallons per person per day (gpcd). Table 6-8 shows the mass balance calculations for the treatment plant. The estimated indoor water use is 50 gpcd (Line 14 – 724,736 ccf converted to gallons/30,000 people[2] = 50 gallons per person per day), which is a reasonable wastewater flow estimate for residential customers.

Table 6-8: Plant Balance Calculation

(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
Line	FY 2019	Flow (MG)	BOD (mg/L)	TSS (mg/L)	Flow (ccf/year)	BOD (lbs/year)	TSS (lbs/year)
1	**Total Plant Influent**	1,090	346	356	1,456,919	3,150,410	3,240,660
2	Less: I&I	22	50	50	29,138	9,095	9,095
3	**Net Customer Plant Influent**	**1,068**	**296**	**306**	**1,427,781**	**3,141,315**	**3,231,565**
4							
5	**Non-Residential**						
6	Low Strength (Includes Schools)	82	150	150	109,058	102,124	102,124
7	Medium Strength	52	300	350	69,261	129,715	151,334
8	Medium-High Strength	6	500	500	8,506	26,550	26,550
9	High Strength	36	1,000	600	48,564	303,174	181,904
10	Mixed Use	1	300	300	1,019	1,909	1,909
11	**Subtotal Non-Residential Flow**	**177**	**382**	**314**	**236,409**	**563,472**	**463,821**
12							
13	**Net Residential Flow**	**891**	**347**	**372**	**1,191,372**	**2,577,843**	**2,767,743**
14	Single Family Residential	542	1	1	724,736	1,568,377	1,683,914
15	Multi-Family Residential	349	-	-	466,636	1,009,466	1,083,829

[2] The single-family population was estimated by multiplying the number of accounts (12,012) by 2.5 people per home which was taken from census data for the City of San Clemente.

6.5. Wastewater Units of Service

Table 6-9 shows the units of service by cost component and class with the total units of service shown in line 13. The units of service are used to allocate costs to each customer class as explained in Section 6.7.

Table 6-9: FY 2022-23 Units of Service

(A)	(B)	(C)	(D)	(E)	(F)	(G)
Line	Customer Class	Collection (ccf)	BOD (lbs/year)	TSS (lbs/year)	Customer Accounts	Bills
1	**Residential**					
2	Single Family Residential	745,620	1,610,038	1,723,250	12,012	144,144
3	Multi-Family Residential	466,636	1,007,260	1,078,086	3,658	43,896
4	**Subtotal Residential**	**1,212,256**	**2,617,298**	**2,801,336**	**15,670**	**188,040**
5						
6	**Non-Residential**					
7	Low Strength (Includes Schools)	95,426	89,359	89,359	563	6,756
8	Medium Strength	65,187	122,085	142,432	196	2,352
9	Medium-High Strength	8,006	24,989	24,989	16	192
10	High Strength	45,707	285,340	171,204	96	1,152
11	Mixed Use (Comm & Residential)	1,199	2,246	2,246	10	120
12	**Subtotal Non-Residential**	**215,525**	**524,017**	**430,229**	**881**	**10,572**
13	**Total**	**1,427,781**	**3,141,315**	**3,231,565**	**16,551**	**198,612**

6.6. Wastewater Unit Costs

Table 6-10 shows the derivation of the unit costs by cost component. The table derives unit costs in Line 9. Line 1 shows the allocation of the operating revenue requirement to the cost components using the percentages derived in Table 6-3. Line 2 used capital asset allocation percentages from Table 6-6 to allocate the capital revenue requirement to the cost components. The unit costs are derived by dividing the total costs in line 5 by the units of service in line 7 which comes from Table 6-9.

Table 6-10: Derivation of Wastewater Unit Costs by Cost Component

(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
Line	FY 2023	Collection	BOD	TSS	Customer Billing	General	Total
1	Operating Cost	$2,172,919	$1,916,338	$1,316,452	$241,036	$1,878,253	$7,524,998
2	Capital Cost	$1,261,691	$667,055	$458,242	$0	$98,013	$2,485,000
3	**Total Cost of Service**	$3,434,610	$2,583,393	$1,774,694	$241,036	$1,976,265	$10,009,998
4	Allocation of General Costs	$844,900	$635,504	$436,567	$59,294	-$1,976,265	$0
5	Adjusted Cost of Service	$4,279,510	$3,218,897	$2,211,261	$300,330	$0	$10,009,998
6							
7	Units of Service	1,427,781	3,141,315	3,231,565	198,612	-	-
8							
9	**Unit Cost**	**$3.00**	**$1.02**	**$0.68**	**$1.51**		
10		ccf	lbs/yr	lbs/yr	per monthly bill		

6.7. Wastewater Cost Allocation to Customer Classes

Using the unit costs from Table 6-10, Table 6-11 shows the allocation of the rate revenue requirement by cost causation component to each customer class. This is known as the cost to serve each class. The units of service shown for each customer class for the flow, biological oxygen demand, suspended solids, and customer service cost causation components (Table 6-9, columns C-F, Lines 2-11) are multiplied by the unit costs, shown in Table 6-10, columns C-F, Line 9 to derive the cost allocations shown in Table 6-11. Note that the total cost to serve each class equals the revenue requirement derived in Table 6-1.

Table 6-11: Wastewater Cost Allocation to Customer Classes

(A)	(B)	(C)	(D)	(E)	(F)	(G)
Line	Customer Class	Collection	BOD	TSS	Customer	Total
1	**Residential**					
2	Single Family	$2,172,262	$1,607,112	$1,152,251	$217,967	$5,149,591
3	Multi-Family	$1,398,657	$1,034,397	$741,632	$66,377	$3,241,062
4	**Subtotal Residential**	**$3,570,918**	**$2,641,509**	**$1,893,882**	**$284,344**	**$8,390,653**
5						
6	**Non-Residential**					
7	Low Strength	$326,882	$104,646	$69,880	$10,216	$511,625
8	Medium Strength	$207,598	$132,919	$103,553	$3,557	$447,627
9	Medium-High Strength	$25,495	$27,206	$18,168	$290	$71,159
10	High Strength	$145,561	$310,661	$124,471	$1,742	$582,436
11	Mixed Use	$3,055	$1,956	$1,306	$181	$6,498
12	**Non-Residential Subtotal**	**$708,592**	**$577,388**	**$317,379**	**$15,986**	**$1,619,345**
13						
14	**Total**	**$4,279,510**	**$3,218,897**	**$2,211,261**	**$300,330**	**$10,009,998**

7. Proposed Wastewater Rates

Section 7 presents detailed calculations of proposed wastewater rates. All proposed rates are calculated directly from the results of the COS analysis (in Section 6).

7.1. Proposed Fixed Charges

Table 7-1 shows the calculation of monthly wastewater fixed service charge for the smallest meter size. The collection revenue requirement from Table 6-11 is divided by the total units of service in line 2 to yield the collection cost in line 3. The City elected to recover 20% of fixed treatment costs from a service charge, therefore 20% of the BOD and TSS treatment costs, from Table 6-11, are shown in line 5 of the table to be recovered through the fixed charge. The treatment charge is line 5 divided by line 6. Customer costs, line 9, are also recovered through the fixed charge and is line 9 divided by line 10. Adding lines 3, 7 and 11 yield the total fixed charge shown in line 12.

Table 7-1: Derivation of the Fixed Charge

Line	Monthly Fixed Charge by Meter Size	
1	**Flow/Collection**	$4,279,510
2	Units of Service	217,790
3	**Unit Cost**	**$19.65**
4		
5	**Treatment**	$1,086,032
6	Units of Service	217,790
7	**Unit Cost**	**$4.99**
8		
9	**Customer**	$300,330
10	Units of Service	198,612
11	**Unit Cost**	**$1.51**
12	**Total**	**$26.15**

Table 7-2 shows the derivation of the fixed service charge for larger meter sizes. The collection costs in column D, are scaled up from the lowest charge, derived in line 3 of Table 7-1, using the meter ratios shown in column C. For example, the collection charge for a 1.5" meter is $19.65 x 2 = $39.30. The treatment charge is derived in the same manner. The meter ratios are in proportion to the potential flow by meter size. For example, a 1.5" meter can flow 2 times that of a 1" inch meter. Customer costs, in column F, are the costs to answer customer calls and bill customers. These costs are not a function of meter size as shown. The total charge is the sum of columns D, E and F and is shown in column G.

Table 7-2: Proposed Monthly Fixed Service Charge Calculation

(A)	(B)	(C)	(D)	(E)	(F)	(G)
Line	Meter Size - All Customer Classes	Meter Ratio	Collection	Treatment	Customer	Total
1	up to 1"	1.00	$19.65	$4.99	$1.51	$26.15
2	1.5"	2.00	$39.30	$9.97	$1.51	$50.78
3	2"	3.20	$62.88	$15.96	$1.51	$80.35
4	3"	7.00	$137.55	$34.91	$1.51	$173.97
5	4"	12.60	$247.59	$62.83	$1.51	$311.93
6	6"	26.00	$510.89	$129.65	$1.51	$642.05

7.2. Billed Wastewater Discharge

In Section 6.4, we described the plant mass balance. We know the total flow to the wastewater treatment plant and estimate the non-residential and multi-family flows using the return to sewer factors shown in Table 6-7. It is expected that the City will apply the return to sewer factors to each classes' monthly water use as shown in Table 6-7. As mentioned in Section 6.4, the difference between total wastewater treatment plant flow and multi-family and non-residential flow is calculated as single-family residential flow, which we estimate at approximately 720,000 to 750,000 ccf per year as shown in column F of Table 6-8. It is anticipated that the City will apply a return to sewer of 75% to the lowest two month water use period, for each single-family customer, to calculate the billed wastewater discharge. The City should confirm yearly that billed wastewater discharges approximate the total flow from San Clemente customers to the wastewater treatment plant. If warranted, the City may need to adjust return to sewer factors.

7.3. Proposed Volumetric Rates

Table 7-3 shows the calculation of volumetric wastewater rates. The volumetric revenue requirement associated with each rate listed in column C is the difference between the fixed service charge revenue and the total revenue shown in Table 6-11. Proposed volumetric rates (Column E) are calculated by dividing the volumetric revenue requirement (column C) by wastewater flow (column D). Proposed rates are compared to current charges in columns G and H.

Table 7-3: Proposed Volumetric Rate Calculation

(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
Line	Customer Class	Revenue Requirement	Wastewater Flow (ccf)	Proposed Volumetric Rate ($/ccf)	Current Volumetric Rate	Difference ($)	Difference (%)
1	Residential						
2	Single Family Residential	$2,207,490	724,736	$3.05	$1.44	$1.61	112%
3	Multi-Family Residential	$1,420,823	466,636	$3.04	$1.44	$1.60	111%
4	**Residential Subtotal**	**$3,628,313**	**1,191,372**				
5							
6	**Non-Residential**						
7	Low Strength (Includes Schools)	$139,621	109,058	$1.28	$1.97	($0.69)	-35%
8	Medium Strength	$189,178	69,261	$2.73	$2.58	$0.15	6%
9	Medium-High Strength	$36,299	8,506	$4.27	$4.57	($0.30)	-7%
10	High Strength	$348,106	48,564	$7.17	$6.38	$0.79	12%
11	Mixed Use	$2,610	1,019	$2.56	$2.61	($0.05)	-2%
12	**Non-Residential Subtotal**	**$715,814**	**236,409**				
13							
14	**Total**	**$4,344,126**	**1,427,781**				

7.4. Proposed Monthly Five-Year Wastewater Rate Schedule

Table 7-4 shows the proposed five-year schedule of wastewater rates. The rates for FY 2022-23 were derived in Table 7-2 shows the derivation of the fixed service charge for larger meter sizes. The collection costs in column D, are scaled up from the lowest charge, derived in line 3 of Table 7-1, using the meter ratios shown in column C. For example, the collection charge for a 1.5" meter is $19.65 x 2 = $39.30. The treatment charge is derived in the same manner. The meter ratios are in proportion to the potential flow by meter size. For example, a 1.5" meter can flow 2 times that of a 1" inch meter. Customer costs, in column F, are the costs to answer customer calls and bill customers. These costs are not a function of meter size as shown. The total charge is the sum of columns D, E and F and is shown in column G.

Table 7-2 and Table 7-3. All other proposed rates in subsequent years are increased by the revenue adjustments shown in Table 5-5. All proposed rates are rounded to the nearest cent.

Table 7-4: Proposed Five-Year Monthly Wastewater Rate Schedule

Customer Class	Current Rate	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027
Fixed Rates						
up to 1"	$23.82	$26.15	$27.72	$29.10	$30.56	$31.93
1.5"	$78.60	$50.78	$53.83	$56.52	$59.35	$62.02
2"	$126.62	$80.35	$85.17	$89.43	$93.90	$98.12
3"	$262.02	$173.97	$184.40	$193.62	$203.31	$212.45
4"	$404.92	$311.93	$330.64	$347.18	$364.54	$380.94
6"	$793.18	$642.05	$680.58	$714.61	$750.34	$784.10
Commodity Rates						
Single Family Residential	$1.44	$3.05	$3.23	$3.39	$3.56	$3.72
Multi-Family Residential	$1.44	$3.04	$3.23	$3.39	$3.56	$3.72
Low Strength (Includes Schools)	$1.97	$1.28	$1.36	$1.42	$1.50	$1.56
Medium Strength	$2.58	$2.73	$2.90	$3.04	$3.19	$3.34
Medium-High Strength	$4.57	$4.27	$4.52	$4.75	$4.99	$5.21
High Strength	$6.38	$7.17	$7.60	$7.98	$8.38	$8.75
Mixed Use	$2.61	$2.56	$2.71	$2.85	$2.99	$3.13

8. Customer Bill Impacts

8.1. Monthly Wastewater Bill Impacts

Figure 8-1 shows sample monthly wastewater bills for a single-family residential customer at both current and proposed rates. The rates proposed as part of this study are different from the prior rates because they charge customers in proportion to their flow and strength as verified by plant flows and discussed in the plant mass balance section (Section 6.4). Additionally, the biggest reason for the decrease in the bills with larger meter sizes is the change in the meter ratios shown in Table 7-2. This study updates the prior ratios to use ratios put forth by the American Water Works Association that identifies the safe flow through various meter sizes. These new ratios are lower compared to the prior ratios, thus lowering bills for larger customers. The example bills below assume the most common meter size for each customer class and the average use for each customer class.

Figure 8-1 shows the bill impact for an average single-family customer who was previously billed for 9 ccf of sewer discharge (11 ccf winter water use x 90%) and is now assumed to discharge 5 ccf of sewage (using 7 ccf of water during the lowest winter month (7 x 0.75 return to sewer factor = approximately 5 ccf) and a 1" meter.

Figure 8-1: Single Family Residential Monthly Wastewater Bill Impacts

Figure 8-2 shows monthly wastewater bill impact for an average Multi-Family customer that discharges approximately 48 ccf of sewage to the treatment plant each month (but uses 56 ccf of water). For test year 2022-23, the average monthly bill for Multi-Family customers with a 1" meter will increase.

Figure 8-2: Multi-Family Monthly per Dwelling Unit Wastewater Bill Impacts

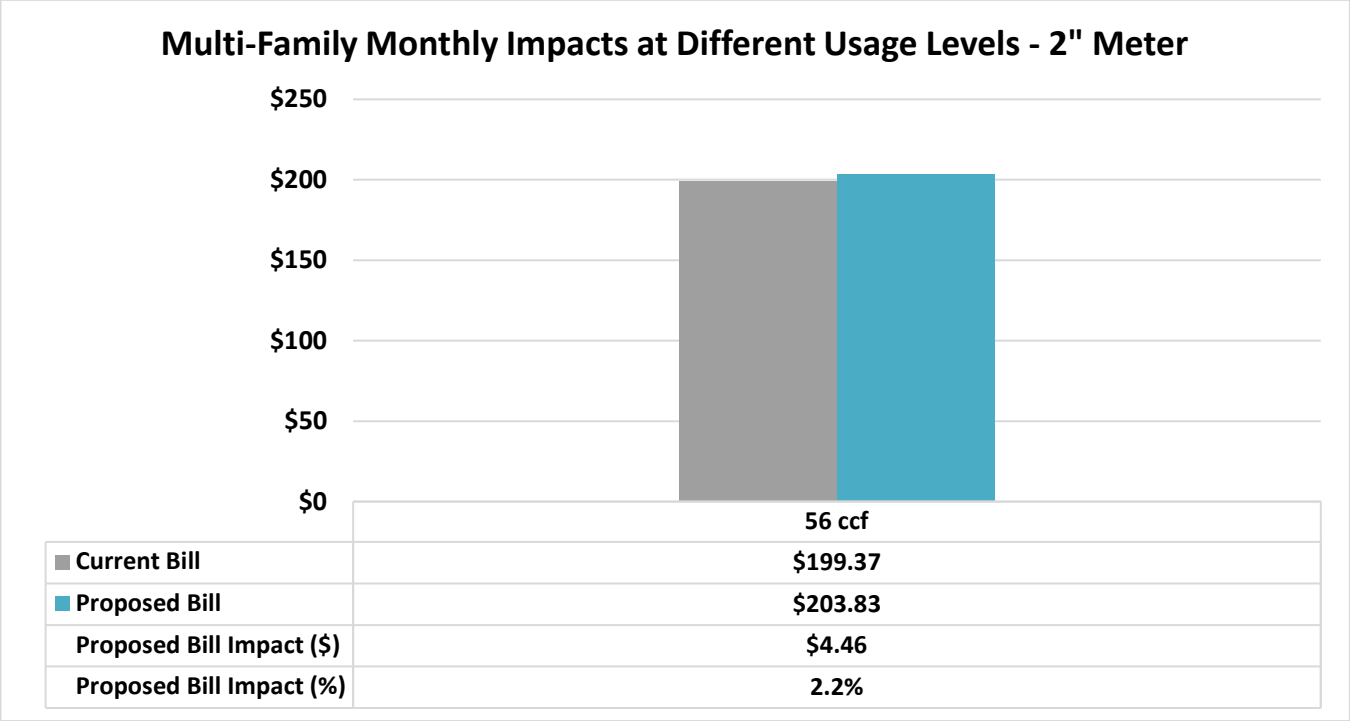


Figure 8-3 shows monthly wastewater bill impacts for commercial customers with the meter sizes shown and assuming average wastewater discharge for each class. The basis for the bill decrease for 2" meters and larger is described at the beginning of this section. Non-residential customers account for 12% of all customers.

Figure 8-3: Non-Residential Monthly Wastewater Bill Impacts

Customer Class	Current Bill	Proposed Bill	Difference ($)
Low			
1"	$37.74	$34.19	($3.55)
2"	$179.87	$110.10	($69.76)
Medium			
1"	$67.74	$70.06	$2.32
2"	$248.64	$202.35	($46.29)
Med-High			
1"	$93.28	$87.41	$5.87
2"	$406.08	$326.81	($79.27)
High			
1"	$186.13	$198.38	$12.25
2"	$588.46	$570.40	($18.06)
Mixed Use			
1"	$41.01	$42.08	$1.07
2"	$158.92	$110.27	($48.65)

APPENDIX A:

Detailed Expense Allocations to Functions

Expense Category	Collection	Grit Removal/ Primary Settling	Aeration	Secondary Settling	Residuals Processing and Disposal (sludge)	Admin	Total
Administration - Personnel						100%	100%
Administration - Supplies						100%	100%
Administration - Contractual Services						100%	100%
Administration - Other Charges						100%	100%
Administration - Interdepartmental Charges						100%	100%
Treatment - Personnel	0%	11%	27%	15%	39%	9%	100%
Treatment - Supplies	0%	20%	8%	3%	63%	6%	100%
Treatment - Contractual Services	0%	13%	24%	9%	48%	6%	100%
Treatment - Other Charges	0%	13%	9%	17%	48%	13%	100%
Treatment - Interdepartmental Charges	0%	0%	0%	0%	0%	100%	100%
Collection - Personnel	100%						100%
Collection - Supplies	100%						100%
Collection - Contractual Services	100%						100%
Collection - Other Charges	100%						100%
Collection - Interdepartmental Charges	100%						100%