City of Tracy

Wastewater Cost of Service and Rate Design Study

Final Report / May 12, 2023

RAFTELIS

April 18, 2023

Ms. Sara Cowell
Director of Finance
City of Tracy
333 Civic Center Plaza
Tracy, CA 95376

Subject: Wastewater Cost of Service and Rate Design Study

Dear Ms. Cowell,

Raftelis is pleased to provide this Wastewater Cost of Service and Rate Design Study Report to the City of Tracy (City). The overall purpose of the study was to develop a proposed five-year wastewater rate schedule for Fiscal Year (FY) 2023-24 through FY 2027-28 that is fair, equitable, and funds the City's wastewater utility.

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 Manager

Sarah Wingfield
Lead Analyst

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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
CIP: Capital Improvement Plan
City: City of Tracy
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 which extends through fiscal year 2025-26
WWTP: Wastewater treatment plant

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1. Executive Summary

1.1. Study Overview

The City of Tracy last conducted a wastewater study in 2013, and rates have not increased since 2013. The City of Tracy engaged Raftelis to conduct a wastewater cost of service study to establish a proposed five-year rate schedule from FY 2023-24 to FY 2027-28, which is known as the study period. 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. The City as elected to pursue Scenario 2 rates (described in detail below) at the Proposition 218 public hearing for rate adoption. Proposition 218 requires that City of Tracy customers be mailed a public hearing notice detailing proposed rate changes no fewer than 45 days before the public hearing.

The study's major objectives are to:

- Develop a ten-year financial plan that sufficiently funds City of Tracy's wastewater operations and maintenance (O&M) expenses, debt service payments, and capital expenditures while adequately funding reserves and achieving debt coverage requirements. Debt coverage requirements are a major study driver.
- 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 wastewater functions, then cost components and lastly to s customer classes based on user characteristics.
3. **Rate Design**: Develop 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 results of the rate study.
5. **Rate Adoption:** Proposed rates may be adopted by City Council only after holding a public hearing in accordance with Proposition 218 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 will not meet the debt service coverage requirements as shown in Figure 1-1. In addition, reserves

fall below the target reserve policy by FY 2023-24, and deplete cash reserves by FY 2023-24, as shown below in Figure 1-2. This demonstrates a need for revenue adjustments for the Wastewater Enterprise.

Figure 1-1: Debt Coverage under Status Quo Financial Plan

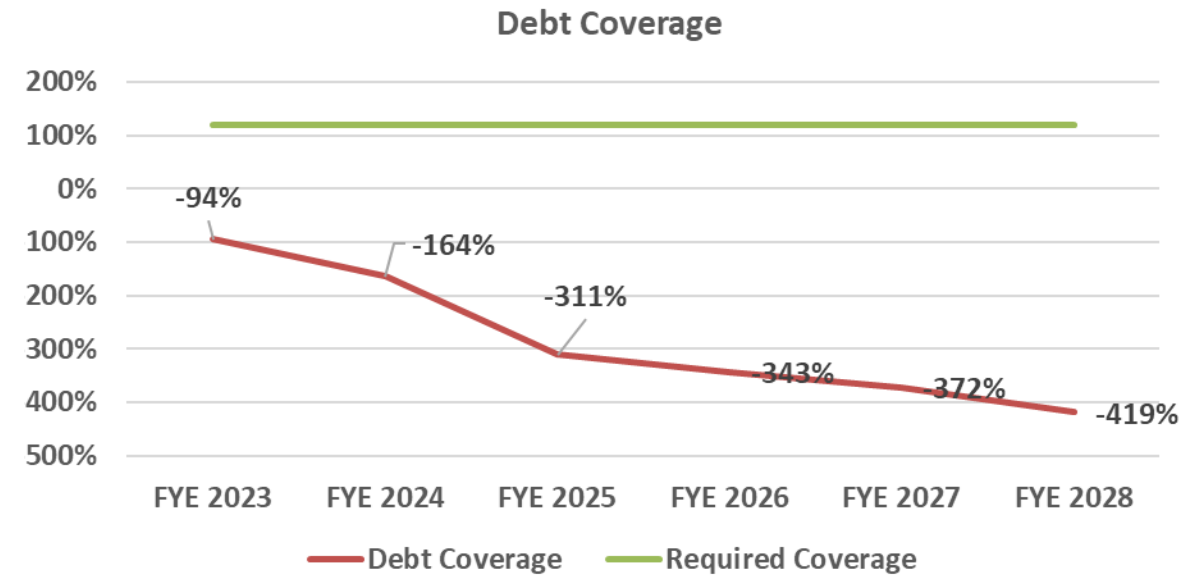
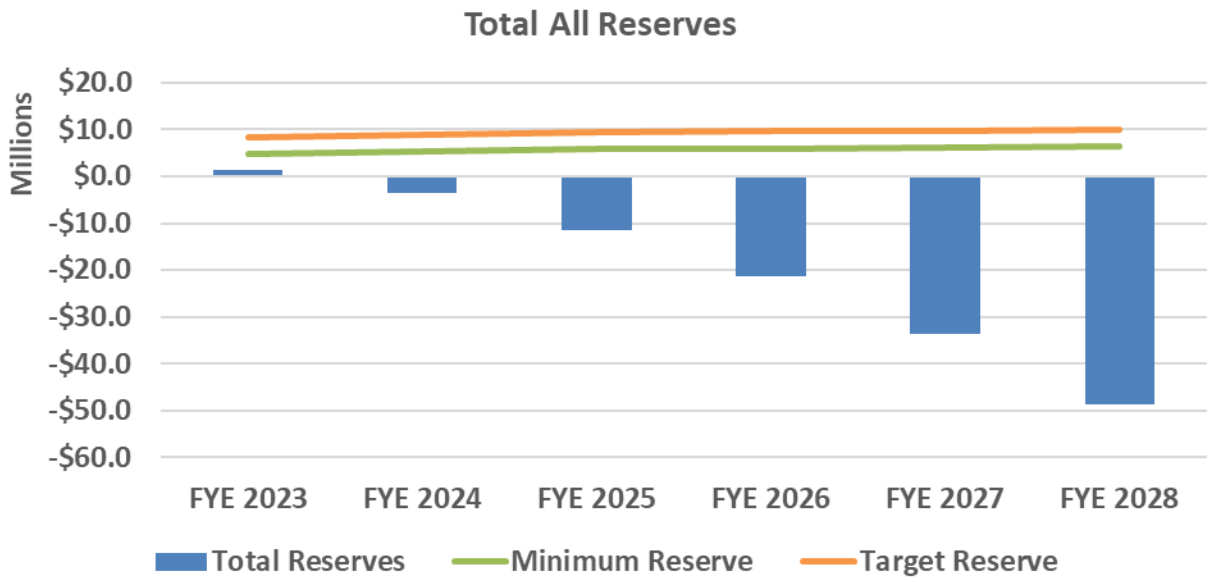


Figure 1-2: Reserve Balances under Status Quo Financial Plan



Raftelis worked closely with City staff to develop two scenarios for revenue adjustments: both governed by the need to meet debt coverage requirements. Table 1-1 shows the revenue adjustments for Scenario 1; Table 1-2 shows the revenue adjustments for Scenario 2. Both scenarios enable similar reserve levels, however Scenario 2 provides more of a buffer above the minimum debt coverage ratio of 1.20. Note that the net (uncompounded) rate increase over the study period is roughly equal: 82.5% in Scenario 1 and 82% in Scenario 2).

Both scenarios were presented to City Council on April 18th, 2023 and the Council selected Scenario 2. Therefore, Scenario 2 is the scenario that will be considered at the public hearing.

Table 1-1: Proposed Wastewater Revenue Adjustments, Scenario 1

Description	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Effective Date	August 1, 2023	July 1, 2024	July 1, 2025	July 1, 2026	July 1, 2027
Revenue Adjustment	40.5%	16.0%	9.0%	9.0%	8.0%

Table 1-2: Proposed Wastewater Revenue Adjustments, Scenario 2

Description	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Effective Date	August 1, 2023	July 1, 2024	July 1, 2025	July 1, 2026	July 1, 2027
Revenue Adjustment	45.0%	11.0%	9.0%	9.0%	8.0%

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 pressures.
- Additional staff
- A wastewater desalination contract
- Planned capital expenditures: CIP projects through FY 2027-28 are shown in Figure 1-1 and include substantial repair and replacement (R&R) capital projects. Note that capital projects are delayed in the first two years to minimize revenue increases and bill impacts.
- **Most importantly - Cashflow to cover debt service requirements**

Figure 1-3 shows the proposed CIP financing plan over the study period. As proposed, the CIP is funded by cash reserves and rate revenue. Note that CIP expenses are the same in both scenarios.

Figure 1-3: Wastewater Enterprise Capital Improvement Plan

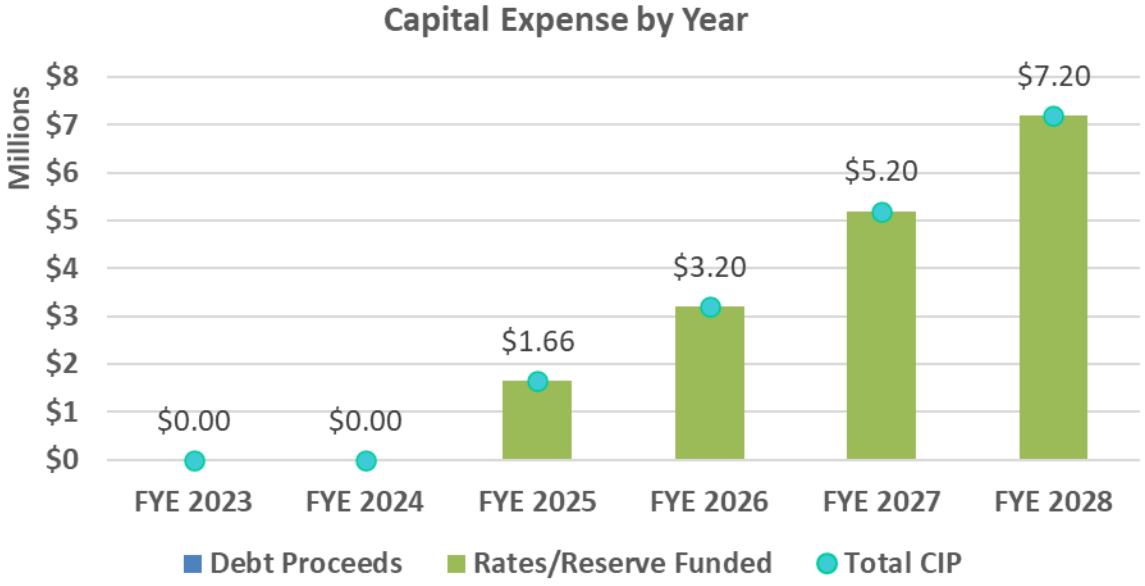


Figure 1-4 and Figure 1-5 show the debt service coverage and ending reserve balances for the Wastewater Enterprise under Scenario 1. Ending balances are determined by applying yearly net cashflow of incoming revenues (including rate revenues, miscellaneous, and revenue from rate adjustments) less expenses (debt service, CIP, and O&M costs). Note that these costs are the same under both scenarios; the revenue from rate adjustments differ under each scenario and therefore changes the outcomes of the ending balances and debt service coverage shown below. As shown, we estimate that the City is in technical default in FY 2023. Under Scenario 1, the revenue adjustment is such that the City just meets its debt coverage requirement and will not meet its minimum reserve requirement, as shown in Figure 1-5, until FY 2027.

Figure 1-4: Wastewater Debt Coverage, Scenario 1

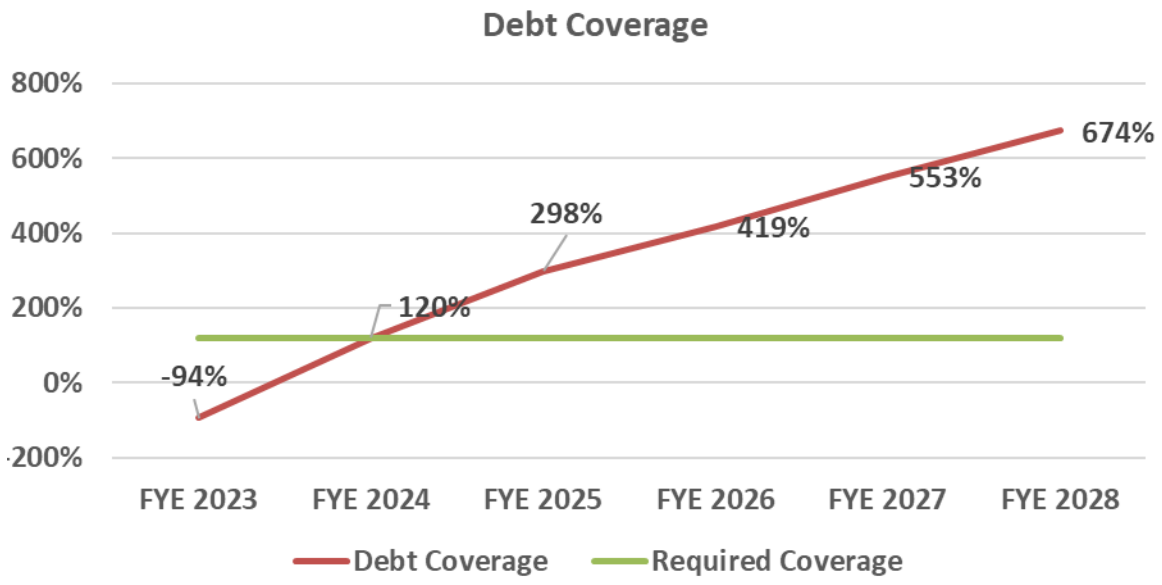


Figure 1-5: Wastewater Reserve Balances, Scenario 1

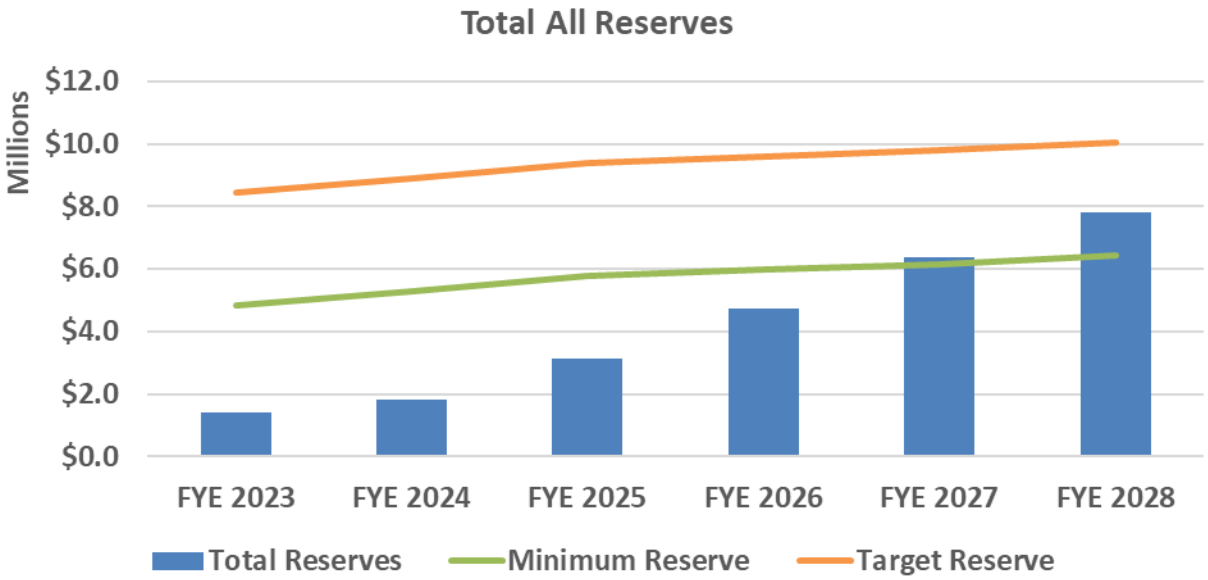


Figure 1-6 and Figure 1-7 and show the debt service coverage and ending reserve balance outcomes for Scenario 2. Scenario 2 provides better debt service coverage by "front loading" the revenue adjustments earlier. As shown the debt coverage exceed the minimum of 1.20 in FY 2024. However, reserve balances still do not meet the City's minimum target until FY 2027 as shown in Figure 1-7.

Figure 1-6: Wastewater Debt Coverage, Scenario 2

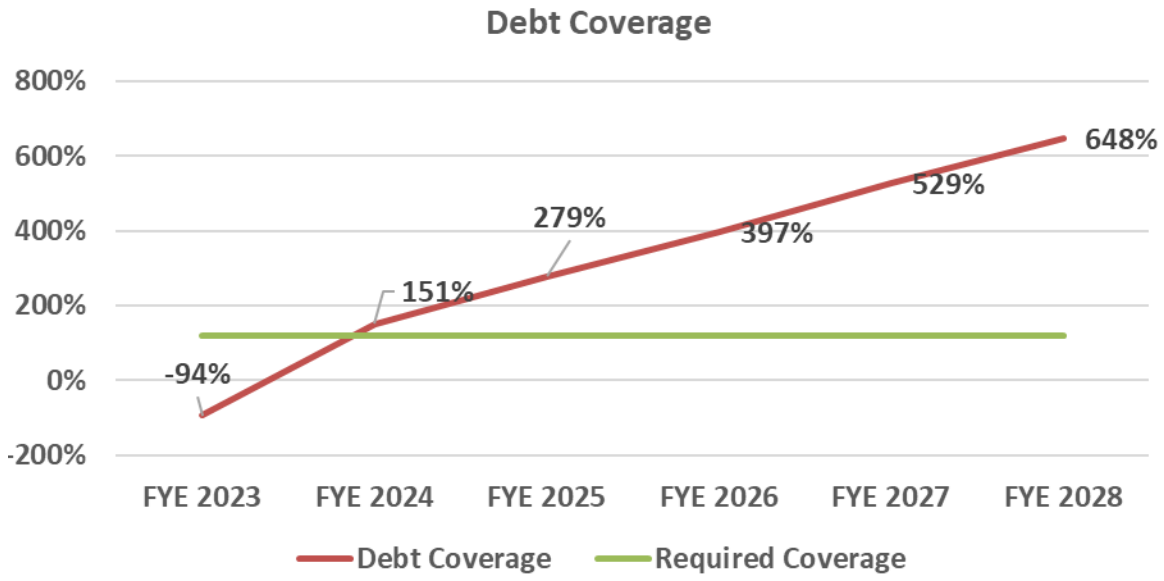
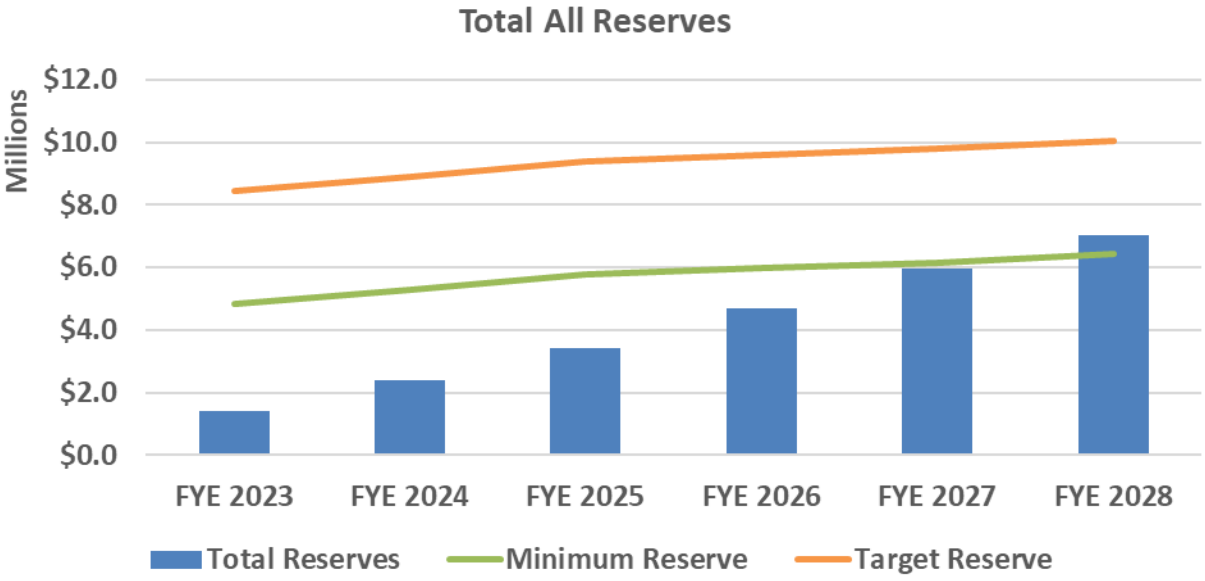


Figure 1-7: Wastewater Reserve Balances, Scenario 2



1.4. Current and Proposed Wastewater Rates

The City of Tracy's current wastewater rate structure consists of a combination of fixed and volumetric charges. Single and Multi-Family customers are charged a flat rate regardless of wastewater discharge. Other

classes have a fixed charge and a volumetric rate per hundred cubic feet (hcf) of wastewater discharge. Raftelis worked closely with City Staff to evaluate potential changes to the existing wastewater rate structure. The City's existing rate structure for all customers except Leprino and Septic Disposal is shown below in Table 1-3.

Table 1-3: Current Rate Structure

Line	Customer Class	Fixed Charge ($ / month)	Volumetric Charge ($ / hcf)
1	**Residential**		
2	Single Family	$34.00	N/A
3	Multi-Family	$28.75	N/A
4			
5	**Non-Residential**		
6	Commercial I	$28.75	$1.98
7	Commercial II	$28.75	$2.91
8	Commercial III	$28.75	$4.89

Table 1-4 shows the current rate structure for the City's Industrial class (Leprino is currently the only industrial customer) and Septic Disposal customers.

Table 1-4: Current Wastewater Industrial Capacity and Use Charges

Industrial Class	Units	Charge
Capacity Charges		
Flow	($/MGD per year)	$258,289
BOD	($/lb)	$28.23
TSS	($/lb)	$43.13
Use Charges		
Flow	($/MG)	$334.00
BOD	($/1,000 lbs)	$489.19
TSS	($/1,000 lbs)	$232.35
Septic Disposal Charge		
Septic Disposal	($/1,000 gal)	$66.90

Table 1-5 shows the proposed rate structure for test year FY 2023-24. The City requested that the Multi-Family class have a combined fixed charge and a volumetric rate as shown. The rate structure shown is a common one, in which Single Family has a flat charge (fixed charge) and the remaining classes have a fixed charge and a volumetric rate. The calculations used to develop these rates are explained in detail in Table 6-1 and Table 6-3.

Table 1-5: Proposed Rate Structure for Test Year FY 2023-24

Line	Customer Class	Fixed Charge ($ / month)	Volumetric Charge ($ / hcf)
1	**Residential**		
2	Single Family	$42.92	N/A
3	Multi-Family	$5.94	$3.45
4			
5	**Non-Residential**		
6	Commercial I	$24.42	$3.55
7	Commercial II	$24.42	$6.00
8	Commercial III	$24.42	$9.50
9	Industrial – Leprino	N/A	$0.97
10	Septic Disposal	N/A	$56.80

Table 1-6 shows proposed wastewater rates through FY 2027-28 for Scenario 1. Table 1-7 shows the proposed rates for Scenario 2. This report establishes rates for FY 2023-24 using a cost of service analysis and escalates rates for future years (FY 2024-25 to FY 2027-28) by the revenue adjustments. The fixed charge shown for Multi-Family customers is per dwelling unit.

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

Customer Class	Current	Proposed FY 2024	Proposed FY 2025	Proposed FY 2026	Proposed FY 2027	Proposed FY 2028
Fixed Charges ($ / month)						
Single Family Residential	$34.00	$46.55	$54.00	$58.86	$64.16	$69.29
Multi-Family Residential	$28.75	$3.91	$4.54	$4.94	$5.39	$5.82
Commercial I	$28.75	$26.61	$30.87	$33.64	$36.67	$39.60
Commercial II	$28.75	$26.61	$30.87	$33.64	$36.67	$39.60
Commercial III	$28.75	$26.61	$30.87	$33.64	$36.67	$39.60
Volumetric Charges ($ / hcf)						
Single Family Residential	NA	NA	NA	NA	NA	NA
Multi-Family Residential	$0.00	$4.24	$4.92	$5.36	$5.85	$6.31
Commercial I	$1.98	$3.41	$3.96	$4.32	$4.70	$5.08
Commercial II	$2.91	$6.07	$7.04	$7.67	$8.36	$9.03
Commercial III	$4.89	$9.90	$11.48	$12.52	$13.64	$14.73
Septage ($/hcf)	$0.00	$73.57	$103.37	$119.91	$130.70	$142.46

Table 1-7: Proposed Five-Year Wastewater Rate Schedule, Scenario 2

Customer Class	Current	Proposed FY 2024	Proposed FY 2025	Proposed FY 2026	Proposed FY 2027	Proposed FY 2028
Fixed Charges ($ / month)						
Single Family Residential	$34.00	$48.05	$53.34	$58.14	$63.37	$68.44
Multi-Family Residential	$28.75	$4.05	$4.49	$4.90	$5.34	$5.77
Commercial I	$28.75	$27.46	$30.48	$33.22	$36.21	$39.10
Commercial II	$28.75	$27.46	$30.48	$33.22	$36.21	$39.10
Commercial III	$28.75	$27.46	$30.48	$33.22	$36.21	$39.10
Volumetric Charges ($ / hcf)						
Single Family Residential	NA	NA	NA	NA	NA	NA
Multi-Family Residential	$0.00	$4.38	$4.86	$5.29	$5.77	$6.23
Commercial I	$1.98	$3.52	$3.91	$4.26	$4.65	$5.02
Commercial II	$2.91	$6.26	$6.95	$7.57	$8.26	$8.92
Commercial III	$4.89	$10.21	$11.33	$12.35	$13.46	$14.54
Septage ($/hcf)	$0.00	$75.89	$110.05	$122.15	$133.15	$145.13

1.5. Summary of Monthly Bill Impacts

Figure 1-8 and Figure 1-9 show the expected change in the monthly wastewater bill for Single Family residential customers for each scenario.

Figure 1-8: Single Family Residential Monthly Wastewater Bill Impacts (FY 2023-24), Scenario 1

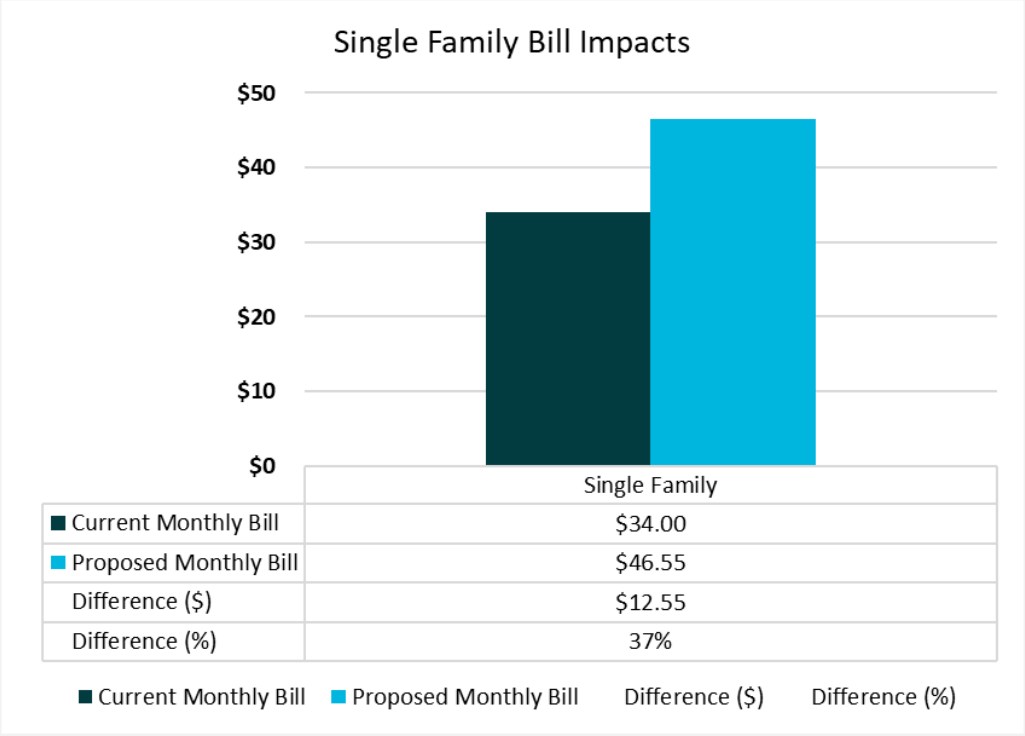


Figure 1-9: Single Family Residential Monthly Wastewater Bill Impacts (FY 2023-24), Scenario 2

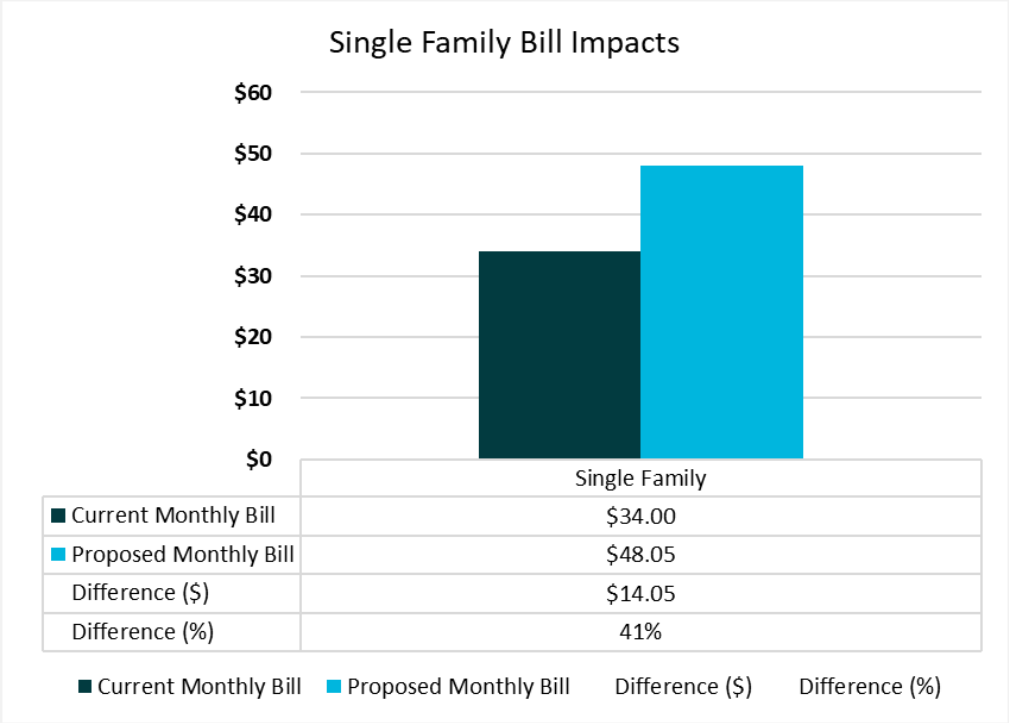


Figure 1-10 and Figure 1-11 show the monthly wastewater bill impacts for a Multi-Family customer that has an average of **7 dwelling units** and discharges approximately 5 hcf of sewage per dwelling unit, per month. For test year 2023-24, the average monthly bill for Multi-Family customers will decrease. This is due to the proposed changes to the rate structure, which will shift charges from a per dwelling unit cost ($28.75) to a smaller fixed charge and volumetric rate which aligns Multi-Family bills with actual discharge to the wastewater treatment plant. Note again that this decrease is reflected in both Scenario 1 and Scenario 2; the magnitude of the change is merely different depending on each scenario.

Figure 1-10: Multi-Family Monthly per Dwelling Unit Wastewater Bill Impacts, Scenario 1

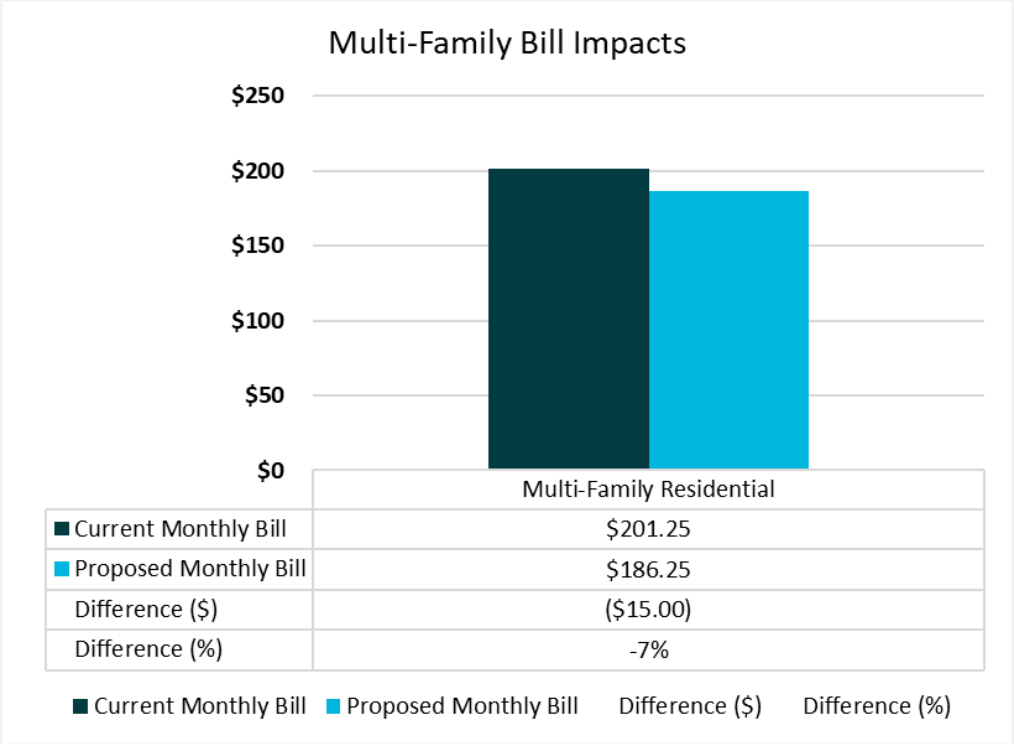


Figure 1-11: Multi-Family Monthly per Dwelling Unit Wastewater Bill Impacts, Scenario 2

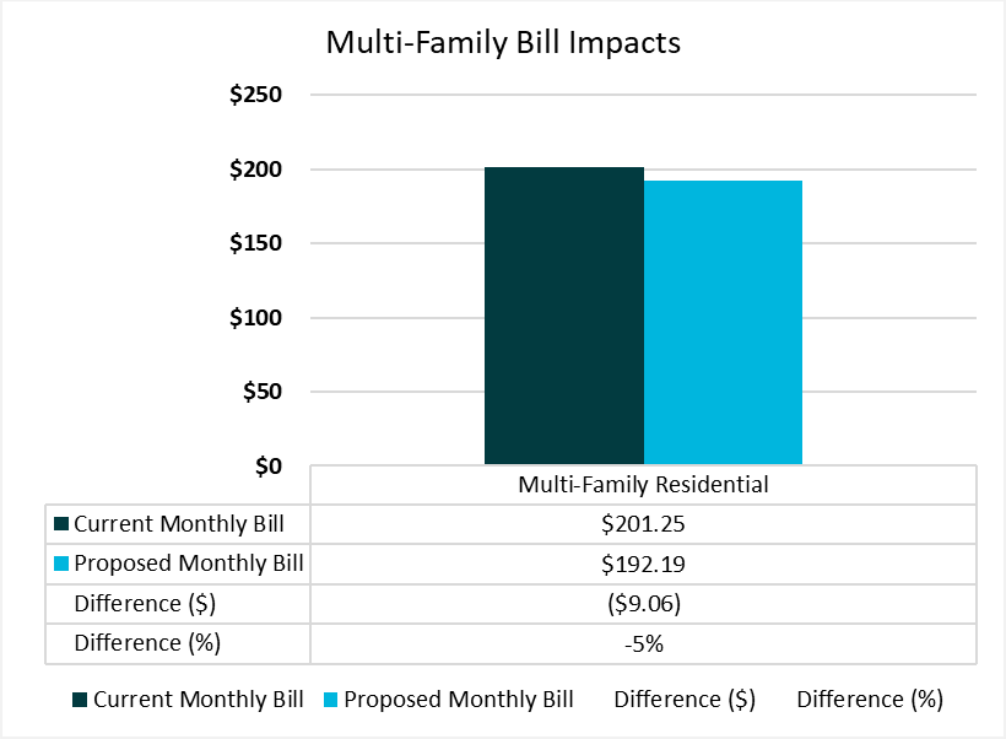
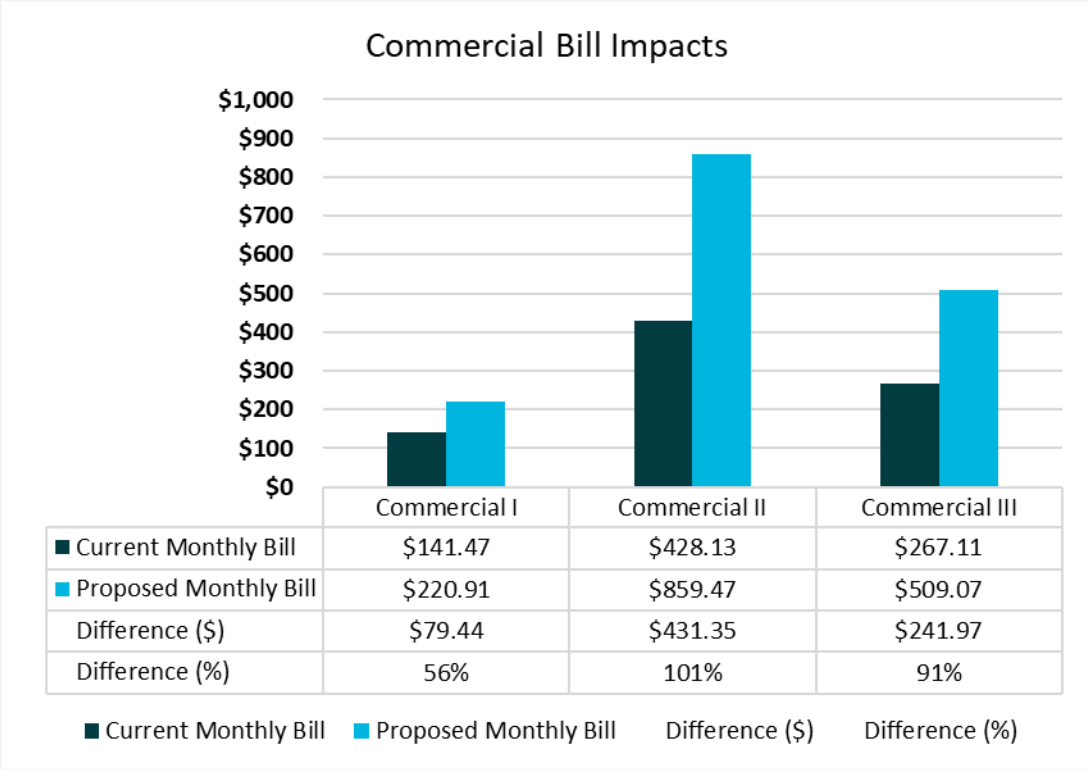


Figure 1-12 and Figure 1-13 show the monthly wastewater bill impacts for commercial customers assuming average wastewater discharge for each class under each scenario. The average wastewater discharge for each

class shown is 683, 1,647, and 585 hcf, respectively. Therefore, the average commercial business discharges a large volume of wastewater. Their bills increase as the assumed wastewater strength[1] has been revised upwards[2] and trued to the actual strength discharged to the plant.[3] Commercial I has the lowest strength; Commercial III has the highest strength. Higher strength customers discharge more BOD and TSS to the plant, which is more costly to treat than lower strength sewage.

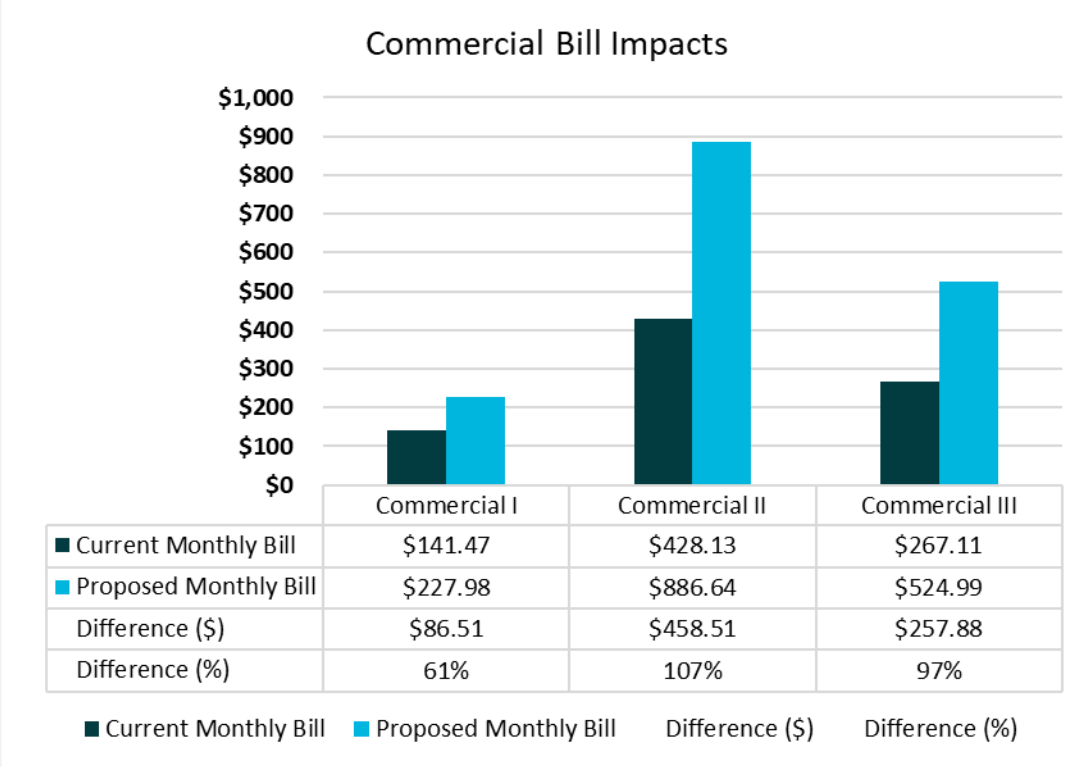
Figure 1-12: Non-Residential Monthly Wastewater Bill Impacts, Scenario 1



	Commercial I	Commercial II	Commercial III
Current Monthly Bill	$141.47	$428.13	$267.11
Proposed Monthly Bill	$220.91	$859.47	$509.07
Difference ($)	$79.44	$431.35	$241.97
Difference (%)	56%	101%	91%

[1] Strength is defined as the concentration of biochemical oxygen demand (BOD) and total suspended solids (TSS).
[2] The latest data from large sewage treatment agencies, such as Los Angeles County Sanitation Districts, shows the sewage strength has increased due to the installation of low flow water fixtures.
3 It appears that trueing up strength concentrations and actual flows to what is observed at the wastewater treatment plant was not performed in the prior study.

Figure 1-13: Non-Residential Monthly Wastewater Bill Impacts, Scenario 2



	Commercial I	Commercial II	Commercial III
Current Monthly Bill	$141.47	$428.13	$267.11
Proposed Monthly Bill	$227.98	$886.64	$524.99
Difference ($)	$86.51	$458.51	$257.88
Difference (%)	61%	107%	97%

2. Introduction

2.1. City of Tracy Wastewater System

The City of Tracy wastewater department provides wastewater service to over 23,000 residential, commercial, and industrial customers. Most City customers are located within city limits. The City's wastewater system consists of a wastewater treatment plant, 290 miles of collection pipelines, 10 miles of sewer mains, and over 10 lift stations.

The City of Tracy maintains a wastewater collection system which transports wastewater discharged from customers to its Wastewater Treatment Plant, which provides tertiary wastewater treatment to treat and dispose of the sewage collected within the City. The City also services one industrial customer and receives septic discharges (trucked in). The industrial customer (Leprino) transports wastewater to the City treatment plant through its own pipeline and therefore does not use the City's wastewater collection system. This affects the costs attributed to this industrial customer as described in Section 6 – Cost of Service.

2.2. Study Overview

The City of Tracy last conducted a water and wastewater cost of service study in 2013 and has not raised rates since 2013. Nevertheless, the City's costs to treat wastewater have increased since 2013 and require the implementation of wastewater rate adjustments.

The City of Tracy engaged Raftelis in 2020 to conduct a wastewater cost of service study to establish a proposed five-year wastewater rate schedule from FY 2023-24 to FY 2027-28. Note that proposed rates cannot be implemented until formally adopted by City Council after a public hearing. Proposition 218 requires that the City of Tracy 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 five-year financial plan that sufficiently funds the City of Tracy'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 of Tracy'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. Key Inputs and Assumptions

Raftelis developed a wastewater rate model in Microsoft Excel to project financial calculations over the next ten fiscal years with projections shown in this section through the five-year rate-setting period from FY 2023-24 to FY 2027-28 (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 key assumptions outlined below. Assumptions were discussed with and reviewed by City staff. Note that there may be small differences between a reader performing calculations with a calculator and the values shown in tables because Excel does not round to the hundredths place.

3.1. Current Wastewater Rates

The City of Tracy's current wastewater rate structure consists of a combination of fixed and volumetric charges for its customer classes. Single and Multi-Family customers are charged a flat rate regardless of wastewater discharge. Other classes have a fixed charge and a volumetric rate per hundred cubic feet (hcf) of wastewater discharge. Raftelis worked closely with City Staff to evaluate potential changes to the existing wastewater rate structure. The City's existing rate structure for all customers except Leprino and Septic Disposal is shown below in Table 3-1:

Table 3-1: Current Rate Structure

Line	Customer Class	Fixed Charge ($ / month)	Volumetric Charge ($ / hcf)
1	**Residential**		
2	Single Family	$34.00	N/A
3	Multi-Family	$28.75	N/A
4			
5	**Non-Residential**		
6	Commercial I	$28.75	$1.98
7	Commercial II	$28.75	$2.91
8	Commercial III	$28.75	$4.89

The City also services a small number of septage and industrial customers. The City's septage customers pay a dollar per hcf volumetric charge, shown in Table 3-2 below. The City of Tracy also has industrial capacity and use charges for industrial customers. Currently, Leprino Inc. is the only industrial customer. The rate structure for Leprino is shown in Table 3-3 below.

Table 3-2: Current Wastewater Volumetric Rates for Septage Customers

Non-Residential Class	Volumetric Charge ($/hcf)
Septage ($/hcf)	$56.21

Table 3-3: Current Wastewater Industrial Capacity and Use Charges (Leprino Only)

Industrial Class	Units	Charge
Capacity Charges		
Flow	($/MGD per year)	$258,289
BOD	($/lb)	$28.23
TSS	($/lb)	$43.13
Use Charges		
Flow	($/MG)	$334.00
BOD	($/1,000 lbs)	$489.19
TSS	($/1,000 lbs)	$232.35
Septic Disposal Charge		
Septic Disposal	($/1,000 gal)	$66.90

3.2.Projected Billed Wastewater Use

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 3-4 shows projected billed consumption for FY 2024 and the study assumes a constant flow over the study period. Total water use is shown in hundred cubic feet (hcf).

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

Customer Class	FY 2024
Billed Flow (hcf)	
Single Family Residential	2,437,994
Multi-Family Residential	292,421
Commercial I - Low Strength	239,787
Commercial II - Medium Strength	463,934
Commercial III - High Strength	33,165
Industrial (Leprino, hcf)	307,420
Septic Disposal (hcf)	4,438
Total Billed Flow	**3,779,159**

3.3.Wastewater Enterprise Financial Assumptions

Raftelis and City Staff developed inflationary assumptions as shown in Table 3-5 which are used to escalate operations and maintenance (O&M) expenses) beyond FY 2023-24. Salary and benefit inflationary increases were discussed with 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 3-5: Wastewater Enterprise Inflationary Assumptions

Escalation Factor	FY 2023[4]	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
General	Budget	6.0%	5.0%	3.0%	3.0%	3.0%
Salary	Budget	3.0%	3.0%	3.0%	3.0%	3.0%
Benefits	Budget	5.0%	5.0%	5.0%	5.0%	5.0%
Power	Budget	5.0%	5.0%	5.0%	5.0%	5.0%
Capital	Budget	6.0%	5.0%	3.2%	3.2%	3.2%

Raftelis also projects non-rate revenue which include interest earnings. We assumed the interest rate shown in Table 3-6.

Table 3-6: Additional Wastewater Enterprise Financial Assumptions

Interest Earnings	Value
Annual Reserve Interest Rate	0.5%

3.4. Projected Wastewater Number of Accounts and Dwelling Units

Table 4-7 shows the projected number of wastewater accounts and dwelling units. Wastewater account growth projections are needed to estimate wastewater rate revenues over the study period. City staff provided Raftelis with the number of accounts/dwelling units by customer class for FY 2018-19. Raftelis then applied the annual account growth rates shown below to each class to project accounts over the study period.

Table 3-7: Projected Wastewater Accounts and Dwelling Units

Customer Class	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Account Growth Factors						
Single-Family Residential	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%
Multi-Family Residential	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%
Commercial	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Number of Accounts						
Single Family Residential	22,069	22,415	22,767	23,124	23,487	23,856
Single Family Residential - LR	1,531	1,555	1,579	1,604	1,629	1,655
Multi-Family Sewer - per dwelling unit	582	587	592	598	603	608
Multi-Family Sewer LIRA	22	23	23	23	23	23
Commercial I - Low Strength	390	390	390	390	390	390
Commercial II - Medium Strength	313	313	313	313	313	313
Commercial III - High Strength	63	63	63	63	63	63
Industrial - Leprino	1	1	1	1	1	1
Subtotal - Accounts	**24,971**	**25,347**	**25,728**	**26,116**	**26,509**	**26,909**

[4] City Staff provided its FY 2023 budget for use in Raftelis' financial planning models. For this reason, budget values were used without inflation factors for FY 2023.

4. Wastewater Financial Plan

Section 4 details the proposed Wastewater Enterprise financial plan. The following subsections estimate annual revenues, O&M expenses, debt service payments, capital expenditures, and reserve funding through FY 2027-28. The overall purpose of the financial plan is to determine annual wastewater rate revenues required to achieve sufficient cash flow, maintain adequate reserves, and meet debt coverage requirements.

4.1. Wastewater Enterprise Revenue at Existing Rates

The Wastewater Enterprise's revenue sources consist 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 over the study period based on current FY 2022-23 wastewater rates (from Table 1-6) and projected number of accounts (or dwelling units for MFR) (from Table 3-7). Table 4-1 shows projected wastewater rate revenues under current rates, calculated as follows:

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

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

Table 4-1: Projected Rate Revenues at Existing Rates

Revenue	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Single Family Residential	$9,004,079	$9,145,418	$9,288,975	$9,434,786	$9,582,886	$9,733,311
Single Family Residential - LR	$577,654	$586,722	$595,932	$605,286	$614,787	$624,438
Multi-Family Sewer & MFR LIRA	$1,571,475	$1,571,475	$1,571,475	$1,571,475	$1,571,475	$1,571,475
Commercial I - Low Strength	$134,550	$134,550	$134,550	$134,550	$134,550	$134,550
Commercial II - Medium Strength	$107,985	$107,985	$107,985	$107,985	$107,985	$107,985
Commercial III - High Strength	$21,735	$21,735	$21,735	$21,735	$21,735	$21,735
Total Fixed Charge Revenues	**$11,417,478**	**$11,567,884**	**$11,720,652**	**$11,875,817**	**$12,033,419**	**$12,193,494**
Commercial I - Low Strength						
Commercial II - Medium Strength	$527,531	$527,531	$527,531	$527,531	$527,531	$527,531
Commercial III - High Strength	$1,500,053	$1,500,053	$1,500,053	$1,500,053	$1,500,053	$1,500,053
Total Volumetric Rate Revenues	**$180,197**	**$180,197**	**$180,197**	**$180,197**	**$180,197**	**$180,197**
Industrial Revenues	$381,357	$381,357	$381,357	$381,357	$381,357	$381,357
Septic Disposal Revenues	$222,091	$222,091	$222,091	$222,091	$222,091	$222,091
Total Rate Revenue	**$14,228,706**	**$14,379,113**	**$14,531,881**	**$14,687,046**	**$14,844,647**	**$15,004,722**

4.2. Wastewater Enterprise Operations & Maintenance Expenses

Table 4-2 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, and disposal facilities. O&M expenses also include laboratory services and other administrative costs. The projected increases in O&M expenses are shown in Table 4-2 below. O&M expenses were provided by City staff for FY 2022-2023 in current dollars and then adjusted for inflation (based on inflationary assumptions shown in Table 3-5).

Table 4-2: Projected O&M Expenses

Expense	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
O&M Costs						
Administration	$1,823,953	$1,901,935	$1,983,412	$2,068,538	$2,157,499	$2,250,470
Collection	$3,228,106	$3,671,595	$4,322,234	$4,475,266	$4,612,491	$4,741,110
Treatment	$9,752,918	$10,252,158	$11,215,264	$11,567,250	$11,931,323	$12,272,701
Indirect Costs	$935,855	$992,006	$1,041,607	$1,072,855	$1,105,040	$1,132,666
Wastewater Desalination Contract	$375,000	$750,000	$750,000	$750,000	$750,000	$1,000,000
Total Operating Expenses	**$16,115,832**	**$17,567,694**	**$19,312,517**	**$19,933,909**	**$20,556,354**	**$21,396,947**

4.3.Wastewater Enterprise Debt

Table 4-3 shows the Wastewater Enterprise's projected debt service obligations. Existing debt service consists of the City's 2004 Wastewater Treatment Plant COPS Bonds and 2021 Wastewater COP Refunding Bonds.

Table 4-3: Projected Debt Service

Expense	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027
Existing Debt Service						
2004 WW Treatment Plant COPS	$1,852,530	$1,852,530	$0	$0	$0	$0
2021 WW COP Refunding	$0	$0	$1,504,650	$1,508,400	$1,502,200	$1,509,800
Total Existing Debt	$1,852,530	$1,852,530	$1,504,650	$1,508,400	$1,502,200	$1,509,800

4.4. Wastewater Enterprise Capital Improvement Plan

Table 4-4 shows the proposed capital improvement plan. The City expects to spend over $17 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 City plans to defer or reduce capital projects in FY 2022-23 and FY 2023-2024 to minimize the need for rate increases.

Table 4-4: Detailed Capital Improvement Plan

Capital Improvement Project	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Cash-Funded Capital	$0	$0	$1,660,000	$3,200,000	$5,200,000	$7,200,000
Debt-Funded Capital	$0	$0	$0	$0	$0	$0
Total CIP	**$0**	**$0**	**$1,660,000**	**$3,200,000**	**$5,200,000**	**$7,200,000**

4.5.Wastewater Enterprise Financial Policies

Required Debt Coverage

The Wastewater Enterprise has debt covenants for debt service coverage on its outstanding wastewater certificates of participation. The required debt coverage ratio is **1.20**, meaning that the Wastewater Enterprise's net operating revenues (i.e., total revenues less operating expenses) must amount to at least 1.20 times the amount of annual debt service. Failure to meet debt service coverage results in a technical default, which, without foreseeable remedial action (such as implementing rate increases), could result in a downgrade of credit rating, higher costs in future debt issuance, or even denial of credit.

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 30 percent of annual O&M expenses. It is also common to have capital reserves to provide available funds for CIP projects. The City of Tracy currently does not have a formal **capital** reserve policy, however Raftelis modeled an industry norm equal to 2% of net capital assets for the Wastewater Enterprise. Table 4-5 shows projected operating and capital reserve targets.

Table 4-5: Projected Reserve Targets

Reserve Target	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Operating Reserve	$4,834,750	$5,270,308	$5,793,755	$5,980,173	$6,166,906	$6,419,084
Capital Reserve	$3,608,496	$3,608,496	$3,608,496	$3,608,496	$3,608,496	$3,608,496
Total	**$8,443,245**	**$8,878,804**	**$9,402,251**	**$9,588,668**	**$9,775,402**	**$10,027,580**

4.6. 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, meet required debt coverage, and maintain sufficient reserve funding. Raftelis worked closely with City staff to identify financial plan options for the City's consideration. Raftelis proposed two annual revenue adjustment scenarios as shown in Table 4-6 and Table 4-7. Revenue adjustments represent annual percent increases in total rate revenue relative to rate revenue generated by the prior year's wastewater rates.

Both scenarios were presented to City Council on April 18th, 2023 and the Council selected Scenario 2. Therefore, Scenario 2 is the scenario that will be considered at the public hearing.

Table 4-6: Proposed Wastewater Revenue Adjustments, Scenario 1

Description	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Effective Date	August 1, 2023	July 1, 2024	July 1, 2025	July 1, 2026	July 1, 2027
Revenue Adjustment	40.5%	16.0%	9.0%	9.0%	8.0%

Table 4-7: Proposed Wastewater Revenue Adjustments, Scenario 2

Description	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Effective Date	August 1, 2023	July 1, 2024	July 1, 2025	July 1, 2026	July 1, 2027
Revenue Adjustment	45.0%	11.0%	9.0%	9.0%	8.0%

Table 4-8 and Table 4-9 show projected net cashflow under the proposed financial plans. The net cashflow for each year in the study is calculated by subtracting total expenses (Line 18) from total revenues (Line 5). The resulting net cashflows are shown in Line 20. Lines 21 and 22 of Table 4-8 and Table 4-9 show the starting and ending cash balances for the Wastewater Enterprise's combined capital and operating reserves.

Table 4-8: Proposed Wastewater Financial Plan, Scenario 1

Line	Line Item	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
1	**Revenue**						
2	Rate Revenue	$14,228,706	$14,379,113	$14,531,881	$14,687,046	$14,844,647	$15,004,722
3	Revenue Increases (Adjustments)	$0	$5,338,246	$9,152,178	$11,404,227	$13,900,014	$16,374,273
4	Other Revenue	$104,345	$112,161	$125,458	$138,771	$153,355	$167,376
5	**Total Revenue**	**$14,333,051**	**$19,829,520**	**$23,809,517**	**$26,230,044**	**$28,898,016**	**$31,546,371**
6							
7	Expenses						
8	O&M Expenses						
9	Administration	$1,823,953	$1,901,935	$1,983,412	$2,068,538	$2,157,499	$2,250,470
10	Collection	$3,228,106	$3,671,595	$4,322,234	$4,475,266	$4,612,491	$4,741,110
11	Treatment	$9,752,918	$10,252,158	$11,215,264	$11,567,250	$11,931,323	$12,272,701
12	Indirect Costs	$935,855	$992,006	$1,041,607	$1,072,855	$1,105,040	$1,132,666
13	Wastewater Desalination Contract	$375,000	$750,000	$750,000	$750,000	$750,000	$1,000,000
14	Subtotal – O&M Expenses	$16,115,832	$17,567,694	$19,312,517	$19,933,909	$20,556,354	$21,396,947
15							
16	Debt	$1,887,865	$1,887,900	$1,508,400	$1,502,200	$1,509,800	$1,505,600
17	Capital	$0	$0	$1,660,000	$3,200,000	$5,200,000	$7,200,000
18	**Total Expenses**	**$18,003,697**	**$19,455,594**	**$22,480,917**	**$24,636,109**	**$27,266,154**	**$30,102,547**
19							
20	**Net Cashflow**	**($3,670,646)**	**$373,926**	**$1,328,600**	**$1,593,935**	**$1,631,862**	**$1,443,824**
21	Starting Cash Balance	$5,100,000	$1,429,354	$1,803,279	$3,131,880	$4,725,814	$6,357,677
22	**Ending Cash Balance**	**$1,429,354**	**$1,803,279**	**$3,131,880**	**$4,725,814**	**$6,357,677**	**$7,801,501**

Table 4-9: Proposed Wastewater Financial Plan, Scenario 2

Line	Line Item	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
1	**Revenue**						
2	Rate Revenue	$14,228,706	$14,379,113	$14,531,881	$14,687,046	$14,844,647	$15,004,722
3	Revenue Increases (Adjustments)	$0	$5,931,384	$8,857,181	$11,079,247	$13,541,984	$15,983,431
4	Other Revenue	$104,345	$115,394	$126,913	$138,612	$151,411	$163,474
5	**Total Revenue**	**$14,333,051**	**$20,425,891**	**$23,515,975**	**$25,904,905**	**$28,538,042**	**$31,151,628**
6							
7	Expenses						
8	O&M Expenses						
9	Administration	$1,823,953	$1,901,935	$1,983,412	$2,068,538	$2,157,499	$2,250,470
10	Collection	$3,228,106	$3,671,595	$4,322,234	$4,475,266	$4,612,491	$4,741,110
11	Treatment	$9,752,918	$10,252,158	$11,215,264	$11,567,250	$11,931,323	$12,272,701
12	Indirect Costs	$935,855	$992,006	$1,041,607	$1,072,855	$1,105,040	$1,132,666
13	Wastewater Desalination Contract	$375,000	$750,000	$750,000	$750,000	$750,000	$1,000,000
14	Subtotal – O&M Expenses	$16,115,832	$17,567,694	$19,312,517	$19,933,909	$20,556,354	$21,396,947
15							
16	Debt	$1,887,865	$1,887,900	$1,508,400	$1,502,200	$1,509,800	$1,505,600
17	Capital	$0	$0	$1,660,000	$3,200,000	$5,200,000	$7,200,000
18	**Total Expenses**	**$18,003,697**	**$19,455,594**	**$22,480,917**	**$24,636,109**	**$27,266,154**	**$30,102,547**
19							
20	**Net Cashflow**	**($3,670,646)**	**$970,297**	**$1,035,058**	**$1,268,796**	**$1,271,888**	**$1,049,081**
21	Starting Cash Balance	$5,100,000	$1,429,354	$2,399,651	$3,434,709	$4,703,504	$5,975,393
22	**Ending Cash Balance**	**$1,429,354**	**$2,399,651**	**$3,434,709**	**$4,703,504**	**$5,975,393**	**$7,024,473**

Figure 4-1 and Figure 4-2 show projected debt coverage (red line) relative to the debt coverage requirement (green line) under each scenario. As shown, the City does not meet debt coverage in FY 2023. However, the revenue adjustments will ultimately meet future debt service coverage requirements in both Scenario 1 and Scenario 2. Scenario 2, as shown in Figure 4-2, provides more of a buffer in FY 2023-2024.

Figure 4-1: Projected Debt Coverage, Scenario 1

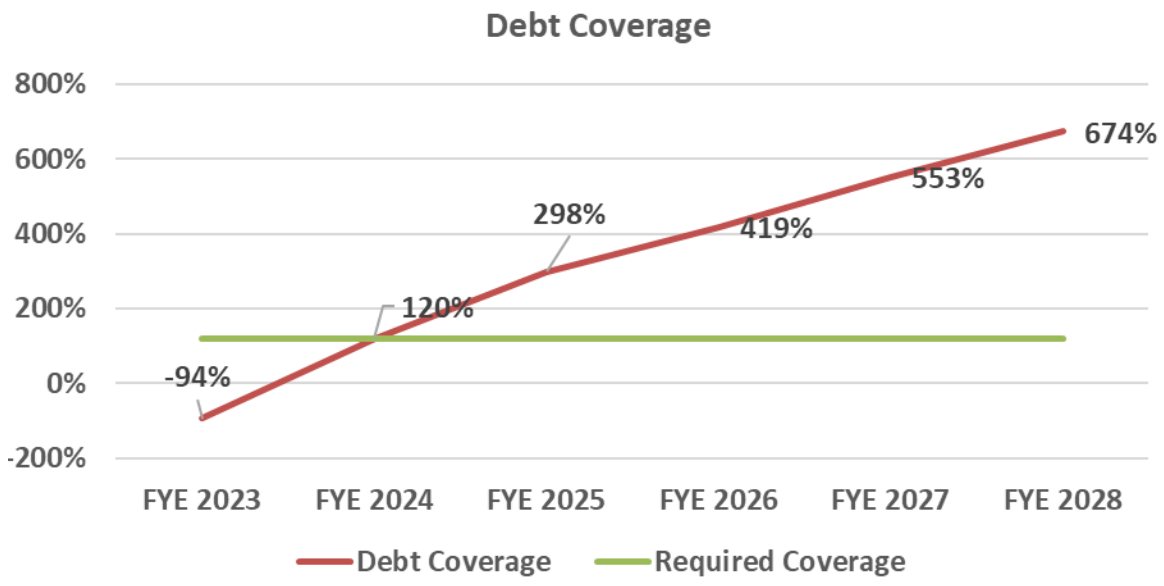


Figure 4-2: Projected Debt Coverage, Scenario 2

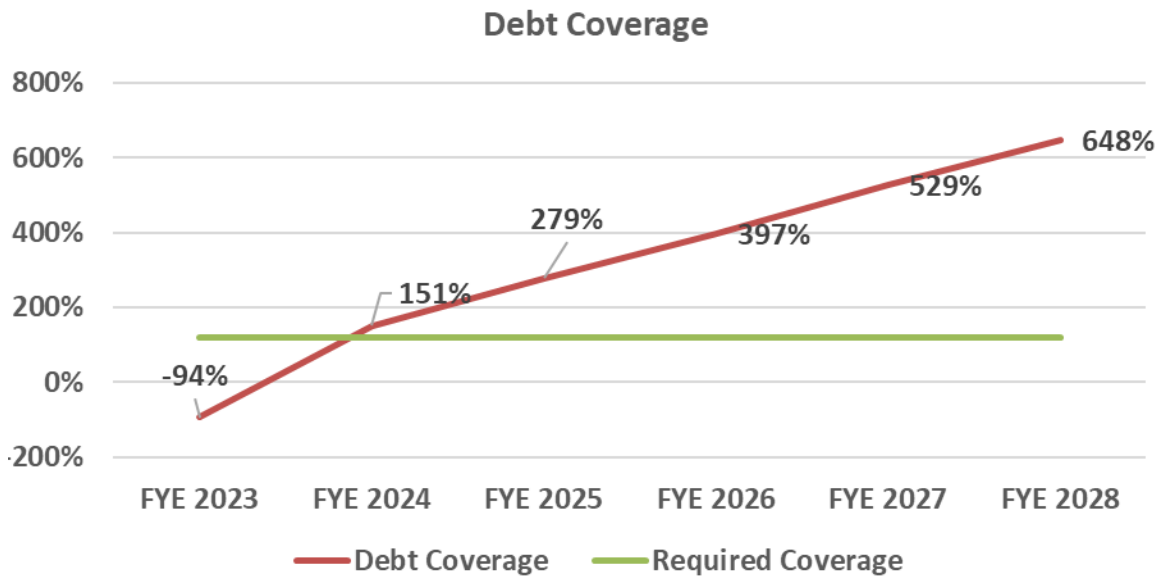


Figure 4-3 and Figure 4-4 show the Wastewater Enterprise's projected ending balance under each of the proposed financial plans. The blue bars indicate the ending balance. The total reserve target is represented by the orange line; the minimum (operating) reserve target is represented by the green line. As shown, the reserve balances are similar for each scenario.

Figure 4-3: Projected Ending Balances, Scenario 1

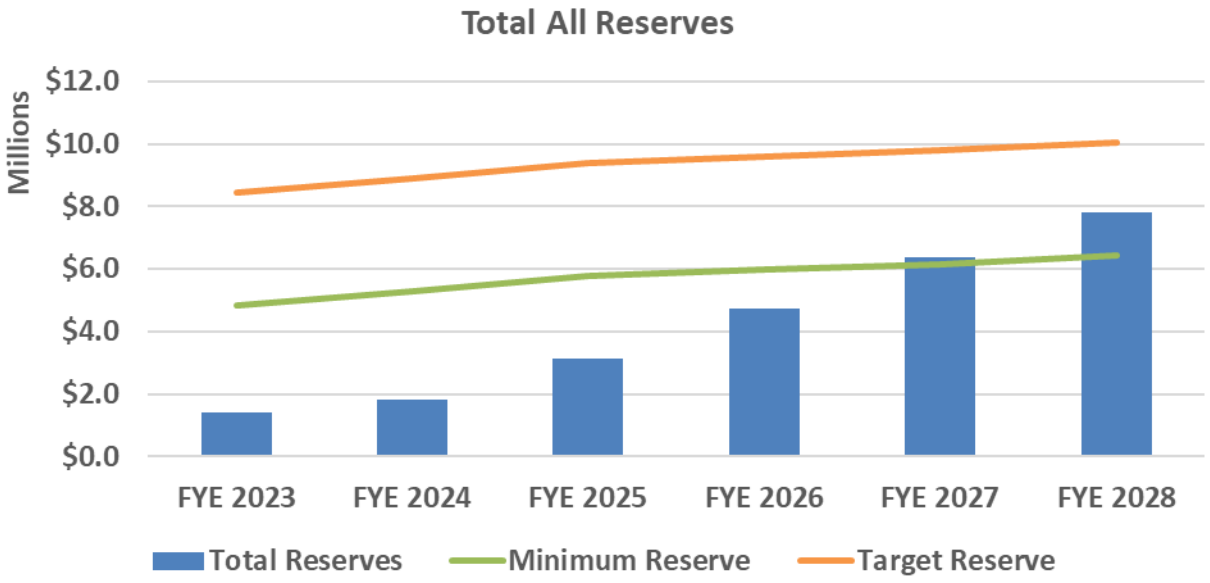


Figure 4-4: Projected Ending Balances, Scenario 2

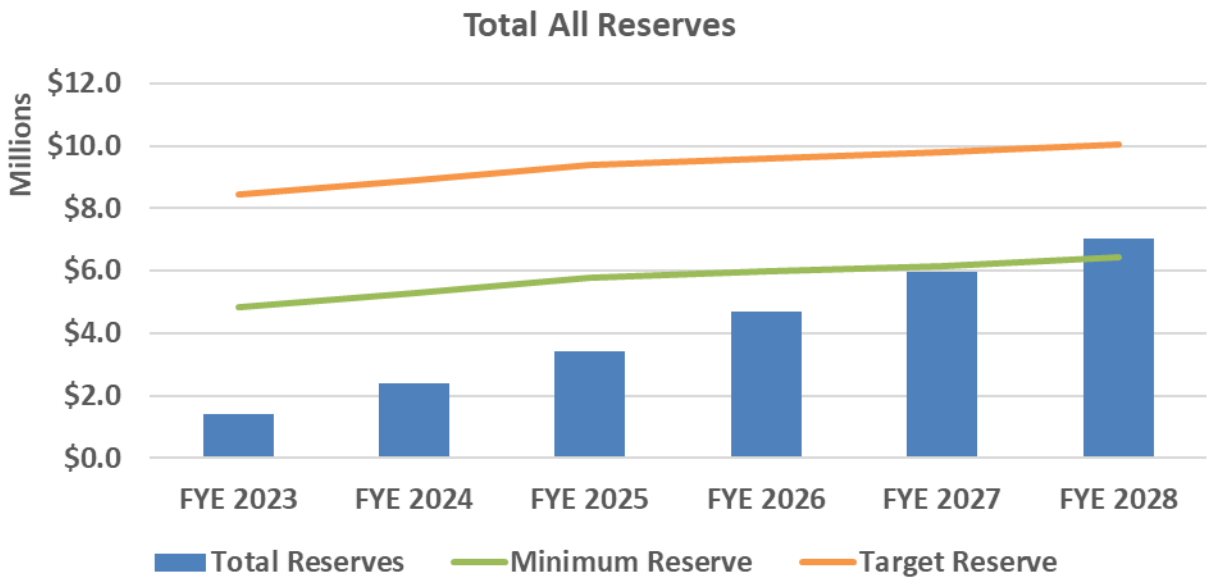


Figure 4-5 and Figure 4-6 show the financial plans for each of the two proposed scenarios in this study. Revenues under the proposed financial plan and status quo financial plan are represented by the purple and orange lines, respectively. Revenue requirements including O&M expenses, debt service, and 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 and debt service payments over the study period.

Figure 4-5: Operating Wastewater Financial Plan, Scenario 1

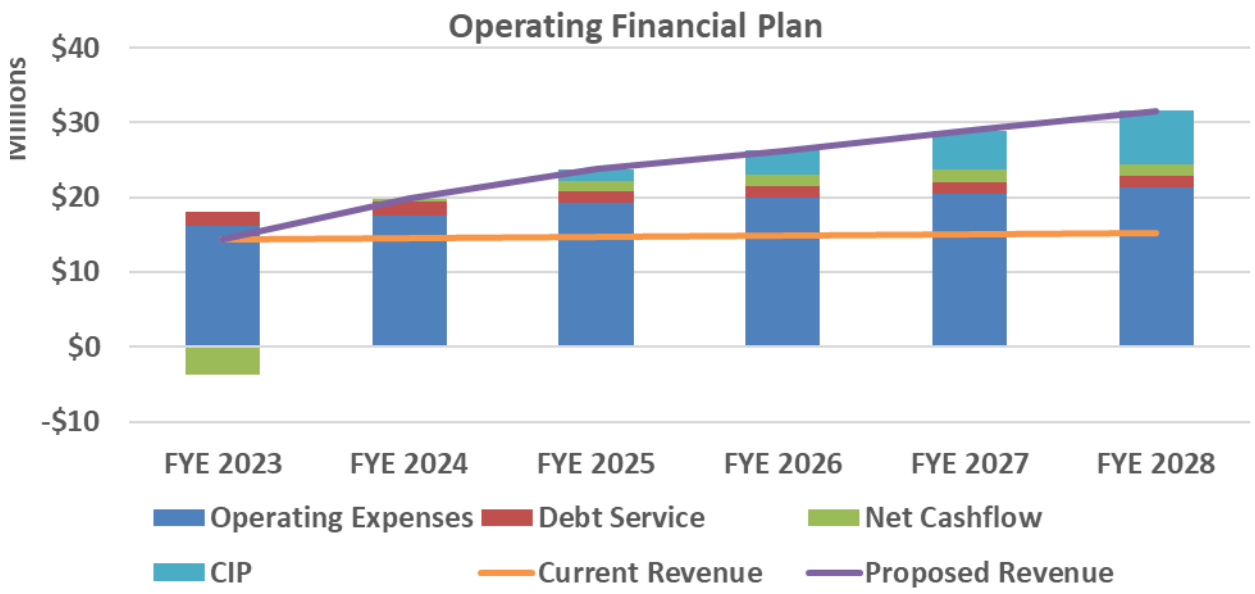
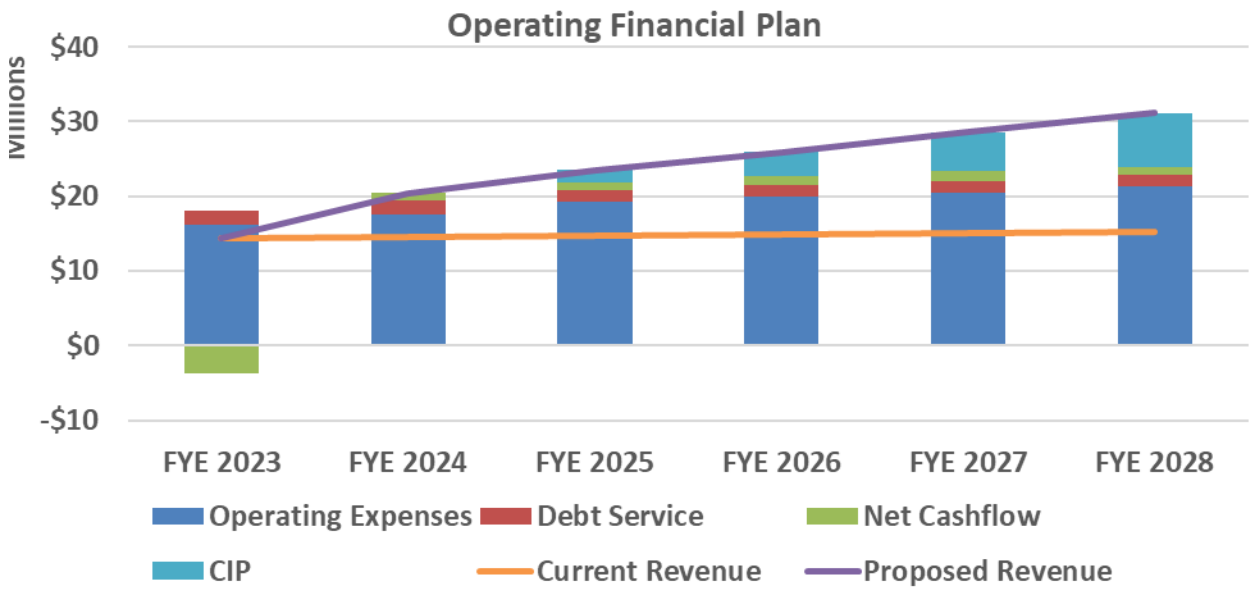


Figure 4-6: Operating Wastewater Financial Plan, Scenario 2



5. 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 2027-28.

5.1. 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. However, there are four 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.
1. **Cost causation component allocation:** 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.
2. **Mass balance analysis:** The flow and strength (BOD and SS) of wastewater treatment plant (WWTP) influent is attributed to each customer class based on water use data and wastewater generation and strength assumptions that vary by customer classification. This analysis estimates the burden each customer class places on the wastewater system.
3. **Revenue requirement distribution:** The mass balance analysis is utilized to distribute the revenue requirement for each cost causation component unit cost to customer classes based on each customer class's individual burden on the wastewater system.

5.2. 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 5-2 below. Table 5-2 shows the wastewater rate revenue requirement for FY 2023-24 (also referred to as the test year). The revenue requirement is split into operating and capital categories (Columns C-D), which are later allocated based on O&M expenses and capital assets. The revenue requirements (Lines 2-4) include projected FY 2022-23 O&M expenses, debt service, and rate-funded CIP expenditures. The revenue offsets (Line 8) include all non-rate revenues. These revenues are applied as offsets to the final rate revenue requirement. The adjustment for cash balance (Line 12) 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 (Table 4-8). The final rate revenue requirement (Line 15) is calculated as follows:

Total revenue required from rates (Line 16) = Revenue requirements (Line 5) - Revenue offsets (Line 10) - Adjustments (Line 14)

Table 5-1: FY 2023-24 Wastewater Revenue Requirement, Scenario 1

[A] Line	[B] Cost	[C] Operating	[D] Capital	[E] Total
1	Revenue Requirement			
2	O&M Expenses	$17,567,694	$0	$15,737,944
3	Total Debt Service Expenses	$0	$0	$1,887,900
4	Rate Funded Capital Projects	$0	$0	$0
5	**Total Revenue Requirement**	**$17,567,694**	**$0**	**$19,455,594**
6				
7	Revenue Offsets			
8	Miscellaneous/Non-Rate Revenues	$87,679		$87,679
9	Interest Income	$8,020		$8,020
10	**Total Revenue Offsets**	**$112,161**	**$0**	**$112,161**
11				
12	Less: Adjustments			
13	Adjustment for Cash Balance	($373,926)		($373,926)
	Adjustment for Mid-Year Increase	($485,295)		($485,295)
14	**Total Adjustments**	**($859,221)**	**$0**	**($859,221)**
15				
16	**Revenue Required from Rates**	**$18,314,754**	**$1,887,900**	**$20,202,654**

Table 5-2: FY 2023-24 Wastewater Revenue Requirement, Scenario 2

[A] Line	[B] Cost	[C] Operating	[D] Capital	[E] Total
1	Revenue Requirement			
2	O&M Expenses	$17,567,694	$0	$15,737,944
3	Total Debt Service Expenses	$0	$1,887,900	$1,887,900
4	Rate Funded Capital Projects	$0	$0	$0
5	**Total Revenue Requirement**	**$17,567,694**	**$1,887,900**	**$21,042,474**
6				
7	Revenue Offsets			
8	Miscellaneous/Non-Rate Revenues	$89,424		$89,424
9	Interest Income	$9,508		$9,508
10	**Total Revenue Offsets**	**$115,394**	**$0**	**$115,394**
11				
12	Less: Adjustments			
13	Adjustment for Cash Balance	($970,297)		($970,297)
	Adjustment for Mid-Year Increase	($539,217)		($539,217)
14	**Total Adjustments**	**($1,509,514)**	**$0**	**($1,509,514)**
15				
16	**Revenue Required from Rates**	**$18,961,814**	**$1,887,900**	**$20,849,714**

As shown in Table 5-2 above, the **operating** revenue requirement consists of all O&M expenses less all revenue offsets. The **capital** revenue requirement consists of total debt service costs and rate funded capital projects.

5.3. 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 (BOD)**: costs that vary based on the BOD strength parameter of wastewater; Biochemical oxygen demand is a measure of the oxygen needed by microorganisms to utilize the wastewater in terms of milligrams per liter (mg/L)
- **Suspended Solids (SS)**: 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).
- **Customer**: directly associated with the Customer functional category
- **General**: directly associated with the General functional category

5.3.1.FUNCTIONALIZATION AND ALLOCATION OF O&M COSTS

As stated above, the first step is to functionalize O&M expenses. Raftelis worked with City staff to assign wastewater O&M expenses by line item to each function. Table 5-3 summarizes FY 2023-24 wastewater O&M expenses by function. As stated above, this intermediate step is necessary to allocate wastewater O&M expenses to individual cost causation components. O&M costs are the same for both scenarios in the study.

Table 5-3: Summary of Wastewater Enterprise O&M Expenses by Function

[A]	[B]	[C]	[D]
Line	Functional Category	FY 2023-24 O&M Expenses	Percent of Total
1	Wastewater Collection	$1,443,386	9%
2	Grit Removal/Primary Settling/Treatment (TSS)	$2,171,733	13%
3	Aeration (BOD)	$1,503,501	9%
4	Secondary Settling/Treatment (BOD)	$3,190,029	19%
5	Residuals Proc. and Disp. (BOD & TSS)	$3,386,894	20%
6	Billing & Customer Service	$985,320	6%
7	Admin & General	$4,136,830	25%
8	**Total O&M Expenses**	**$16,817,694**	**100.0%**

Table 5-4 shows the allocation of functionalized costs to the various cost causation components. The percentages shown in Table 5-4 are used to allocate the functionalized expenses to each cost component as shown in Table 5-5. 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 5-4: Allocation of Functions to Wastewater Cost Causation Components

[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]
Line	Functional Category	Sewage Collection	Flow	BOD	TSS	Customer	General	Total
1	Wastewater Collection	100%						**100.0%**
2	Grit Removal/Primary Settling/Treatment (TSS)		100%					**100.0%**
3	Aeration (BOD)			100%				**100.0%**
4	Secondary Settling/Treatment (BOD)			100%				**100.0%**
5	Residuals Proc. and Disp. (BOD & TSS)			51%	49%			**100.0%**
6	Billing & Customer Service					100%		**100.0%**
7	Admin & General					5%	95%	**100.0%**

Using the percentages from Table 5-4, Table 5-5 shows the allocation of FY 2023-24 O&M expenses by function to each cost causation component. Total O&M expenses associated with each function (shown in Column I in Table 5-5 below) were determined in Table 5-3. The total dollar amount allocated to each cost causation component is determined by multiplying the total expense (Column I) by the corresponding percentage allocation for each cost component in Table 5-4 above. Line 8 sums the total cost by cost component.

For example, $1,443,386 (Column C, Line 1) is calculated by multiplying the total dollar amount of O&M costs allocated to wastewater collection from Column I, Line 1 (see Table 5-3 for derivation) by the corresponding cost causation factor allocation (developed in Table 5-4). The same calculation is performed for the remaining functions (i.e., Column C × Column I in Lines 2-7). Lines 1-7 are summed to determine the total dollar amount allocated to the flow cost causation component (Column C, Line 8).

The same calculations are repeated for the remaining cost causation components (Columns D-H) to determine the allocation of O&M expenses to each cost causation component (Line 8). The O&M allocation percentages (Line 9) are the proportion of O&M expenses allocated to each cost causation component, excluding general costs. Because general costs underlie each of the remaining five cost components, the total value for general costs (Line 8, Column H) is redistributed evenly among the other cost components in Line 9 of Table 5-5. This results in the final O&M allocation percentages shown in Columns C-H of Line 11.

Table 5-5: Allocation of O&M Expenses by Functional Category and Cost Causation Component

[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]
Line	Functional Category	Sewage Collection	Flow	BOD	TSS	Customer	General	Total
1	Wastewater Collection	$1,443,386						$1,443,386
2	Grit Removal/Primary Settling/Treatment (TSS)		$2,171,733					$2,171,733
3	Aeration (BOD)			$1,503,501				$1,503,501
4	Secondary Settling/Treatment (BOD)			$3,190,029				$3,190,029
5	Residuals Proc. and Disp. (BOD&TSS)			$1,725,106	$1,661,788			$3,386,894
6	Billing & Customer Service					$985,320		$985,320
7	Admin & General					$206,841	$3,929,988	$4,136,830
8	**Total O&M Expenses**	**$1,443,386**	**$2,171,733**	**$6,418,637**	**$1,661,788**	**$1,192,162**	**$3,929,988**	**$16,817,694**
9	O&M Allocation w/o General	11.2%	16.9%	49.8%	12.9%	9.3%		100.0%
10	Reallocation of General Costs	$1,883,533	$2,833,983	$8,375,942	$2,168,535	$1,555,700		$16,817,694
11	**O&M Allocation**	**11.2%**	**16.9%**	**49.8%**	**12.9%**	**9.3%**		**100%**

5.3.2. FUNCTIONALIZATION AND ALLOCATION OF CAPITAL COSTS

Capital assets are utilized in COS analyses to allocate the **capital** revenue requirement to the 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. 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 of Tracy's wastewater system. Thus, functionalized capital assets are used to allocate capital costs (the capital revenue requirement).

Table 5-6 summarizes FY 2018-19 capital assets by function. This intermediate step is necessary to allocate capital assets to individual cost causation components.

Table 5-6: Summary of Capital Assets by Functional Category

[A]	[B]	[C]	[D]
Line	Functional Category	FY 2018-19 Capital Assets	Percent of Total
1	Collection	$94,486,707	52%
2	Primary Trmt	$9,701,493	5%
3	Aeration	$24,289,195	13%
4	Secondary Trmt	$14,776,081	8%
5	Residuals	$8,647,200	5%
6	General WWTP	$20,848,003	12%
7	General	$7,676,103	4%
8	**Total Capital Assets**	**$180,424,781**	**100%**

Table 5-7 shows the allocation of capital assets by function to each cost causation component. The percentage allocation of each function (Columns C-H) to the various cost causation components was determined in Table 5-6. The total dollar amount allocated to each cost causation component (Line 8) is determined by multiplying the total asset value (column I) associated with each function by the corresponding percentage allocation. This is consistent with the methodology used to determine the allocation of O&M expenses to cost causation components in Table 5-5.

In Table 5-7, lines 10 and 12 reallocate general assets to the other cost causation components. Because general WWTP assets apply only to treatment related cost components, which are Flow, BOD, and TSS cost causation components, total General WWTP values are reallocated between these three components in Lines 9-10. The percentages applied in line 9 represent the percent share of total asset value for these three cost causation components. Following this step, general assets are reallocated across the remaining cost components according to the percentages shown in Line 12 (which represent the percent share of total assets for each cost component). The final capital asset allocation to cost components is shown in Line 14. These percentages are used to allocate the capital revenue requirement to the cost components.

Table 5-7: Allocation of Capital Assets by Function and Cost Causation Component

[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]
Line	Functional Category	Sewage Collection	Flow	BOD	TSS	General WWTP	General	Total
1	Collection	$94,486,707						$94,486,707
2	Primary Trmt		$9,701,493					$9,701,493
3	Aeration			$24,289,195				$24,289,195
4	Secondary Trmt			$14,776,081				$14,776,081
5	Residuals			$4,404,430	$4,242,770			$8,647,200
6	General WWTP					$20,848,003		$20,848,003
7	General						$7,676,103	$7,676,103
8	**Total Capital Assets**	**$94,486,707**	**$9,701,493**	**$43,469,705**	**$4,242,770**	**$20,848,003**	**$7,676,103**	**$180,424,781**
9	% of WWTP Assets		17%	76%	7%			100%
10	Reallocation of General WWTP Assets		$3,522,779	$15,784,601	$1,540,623			$20,848,003
11	Subtotal	$94,486,707	$13,224,272	$59,254,306	$5,783,394		$7,676,103	$180,424,781
12	Allocation w/o General	62%	6%	29%	3%			100%
13	Reallocation of General Assets	$99,261,470	$13,714,524	$61,450,991	$5,997,796			$180,424,781
14	**Final Capital Asset Allocation to Cost Components**	**55%**	**8%**	**34%**	**3%**			**100%**

5.4. Plant Mass Balance Analysis

The next step of the wastewater COS analysis is to attribute flow and strength loadings entering the City's wastewater treatment plant to the customer classes. We need to know the flow and strength loadings from each class entering the plant because the end goal is to multiply these flow and strength loadings by the unit cost for each cost component to allocate costs to the customer classes.

Table 5-8 shows Raftelis' mass balance analysis of 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

With the above known, Raftelis estimated *residential* flow into the WWTP by subtracting commercial and industrial flows from the net plant flow shown in Line 3, Column F. A reasonable estimate of residential indoor water use (which is the total amount of water flow discharged to the sewer system) is around 50 to 65 gallons per person per day (gpcd). Table 5-8 shows the mass balance calculations for the City of Tracy, which estimate an indoor water use of 61 gpcd (Line 14 -2,437,000 hcf divided by the estimated single family residential population of 82,200 and converted to gallons) - which is a reasonable wastewater flow estimate for single family residential customers.

Table 5-8: Plant Balance Calculation

[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]
Line	FY 2023	FY 2019 Flow (MG)	BOD (mg/L)	TSS (mg/L)	Flow (hcf/year)	BOD (lbs/year)	TSS (lbs/year)
1	**Total Plant Influent**	3,027	303	292	4,046,521	7,654,242	7,376,366
2	Less: I&I	200	50	50	267,362	83,454	83,454
3	**Net Plant Influent**	**2,827**			**3,779,159**	**7,570,788**	**7,292,912**
4							
5	**Non-Residential**						
6	Commercial I	179.37	250	250	239,787	374,234	374,234
7	Commercial II	347.05	500	500	463,934	1,448,118	1,448,118
8	Commercial III	24.81	1,000	600	33,165	207,042	124,225
9	Industrial - Leprino	229.95	27	54	307,420	51,814	103,627
10	Septic Disposal	3.32	5,400	12,000	4,438	149,615	332,478
11	**Subtotal Non-Residential Flow**	**784**	**7,177**	**13,404**	**1,048,744**	**2,230,822**	**2,382,682**
12							
13	**Net Residential Flow**	2,043	313	288	2,730,415	5,339,966	4,910,230
14	Single Family Residential	1,824			2,437,994	4,768,199	4,384,476
15	Multi-Family Residential	219			292,421	571,767	525,754

5.5. Wastewater Units of Service

Table 5-9 shows the units of service by cost component and class. Note that the units of service for the sewage collection system are different than the flow into the WWTP because Leprino and Septic customers do not use the collection system. The units of service are used to allocate costs to each customer class, as explained in Section 5.7.

Table 5-9: FY 2023-24 Units of Service

Line	Customer Class	Sewage Collection (hcf)	WWTP Flow (hcf)	BOD (lbs/year)	TSS (lbs/year)	Customer Accounts
1	Residential					
2	Single Family Residential	2,437,994	2,437,994	4,835,032	4,451,309	23,970
3	Multi-Family Residential	292,421	292,421	579,781	533,768	610
4	Subtotal Residential	2,730,415	2,730,415	5,414,813	4,985,077	24,580
5						
6	Non-Residential					
7	Commercial I	239,787	239,787	299,387	299,387	390
8	Commercial II	463,934	463,934	1,448,118	1,448,118	313
9	Commercial III	33,165	33,165	207,042	124,225	63
10	Industrial (Leprino)	NA	307,420	51,814	103,627	1
11	Septic Disposal	0	4,438	149,615	332,478	0
12	Subtotal Non-Residential	736,886	1,048,744	2,155,975	2,307,835	767
13	**Total**	**3,467,301**	**3,779,159**	**7,570,788**	**7,292,912**	**25,347**

5.6. Wastewater Unit Costs

Table 5-10 and Table 5-11 show the derivation of the unit costs by cost component under each scenario. Each table derives two sets of unit costs in Line 8 and Line 18. This is because Leprino and Septic customers do not use the collection system and there is therefore one set of unit costs for Leprino and Septic and unit rates for all other customers. Line 1 shows the allocation of the operating revenue requirement to the cost components. The revenue requirement (shown in Table 5-2) is allocated to the cost components using the O&M allocation percentages shown in Table 5-4. Line 2 shows the allocation of debt service, which applies the capital asset allocation percentages shown in Table 5-7. The capital asset allocation percentages from Table 5-7 are also used to allocate the capital revenue requirement to the cost components. The unit costs for Leprino and Septic are derived by dividing the total costs in Line 4 by the units of service in Line 6 (see Table 5-9 for the development of units of service). To derive rates for the remaining customer classes, the functionalized costs of capital projects that do **NOT** benefit Leprino customers are added to the total cost of service in Lines 11 and 12. The resulting total cost of service is then divided by the service units in Line 15 (which do not include Leprino or Septic). This yields the additional costs required for all other customers, listed in Line 16. These are then added to the Leprino & Septic unit costs, generating the final unit cost for all other customers (shown in Line 18). As shown, it is only the collection cost component that differs between lines 8 and 17.

Table 5-10: Derivation of Wastewater Unit Costs by Cost Component, Scenario 1

[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]
Line	FY 2024	Sewage Collection	WWTP Flow (hcf)	BOD	TSS	Customer	Total	Allocation Basis
1	Operating Cost	$2,051,200	$3,086,255	$9,121,543	$2,361,572	$1,694,184	$18,314,754	O&M Allocation
2	Existing Debt Service (2004 Debt Issue was for WWTP)	$0	$319,007	$1,429,381	$139,512	$0	$1,887,900	% of WWTP Assets
3	Capital Projects that benefit all customers	$0	$0	$0	$0	$0	$0	Capital Asset Allocation
4	**Total Cost by Cost Component**	**$2,051,200**	**$3,405,262**	**$10,550,924**	**$2,501,084**	**$1,694,184**	**$20,202,654**	
5								
6	Service Units	3,467,301	3,779,159	7,570,788	7,292,912	304,160		
7	Units	hcf	hcf	lbs/yr	lbs/yr	bills/yr		
8	**Unit Costs for Leprino & Septic (Only)**	**$0.00**	**$0.90**	**$1.39**	**$0.34**	**$5.57**		
9	Units	$/hcf	$/hcf	$/lb	$/lb	per monthly bill		
10								
11	Capital Projects that do no benefit Leprino	$0	$0	$0	$0	$0	$0	Capital Asset Allocation
12	Total Cost of Service (w/ non-Lep Capital)	$2,051,200	$3,405,262	$10,550,924	$2,501,084	$1,694,184	$20,202,654	
13								
14	Service Units	3,467,301	3,467,301	7,369,360	6,856,807			
15		hcf	hcf	lbs/yr	lbs/yr			
16	Additional Unit Cost	$0.59	$0.00	$0.00	$0.00			
17	**Total Unit Rate for All Customers Except Leprino**	**$0.59**	**$0.90**	**$1.39**	**$0.34**	**$5.57**		

Table 5-11: Derivation of Wastewater Unit Costs by Cost Component, Scenario 2

[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]
Line	FY 2024	Sewage Collection	WWTP Flow (hcf)	BOD	TSS	Customer	Total	Allocation Basis
1	Operating Cost	$2,123,668	$3,195,293	$9,443,807	$2,445,006	$1,754,040	$18,961,814	O&M Allocation
2	Existing Debt Service (2004 Debt Issue was for WWTP)	$0	$319,007	$1,429,381	$139,512	$0	$1,887,900	% of WWTP Assets
3	Capital Projects that benefit all customers	$0	$0	$0	$0	$0	$0	Capital Asset Allocation
4	**Total Cost by Cost Component**	**$2,123,668**	**$3,514,300**	**$10,873,188**	**$2,584,518**	**$1,754,040**	**$20,849,714**	
5								
6	Service Units	3,467,301	3,779,159	7,570,788	7,292,912	304,160		
7	Units	hcf	hcf	lbs/yr	lbs/yr	bills/yr		
8	**Unit Costs for Leprino & Septic (Only)**	**$0.00**	**$0.93**	**$1.44**	**$0.35**	**$5.77**		
9	Units	$/hcf	$/hcf	$/lb	$/lb	per monthly bill		
10								
11	Capital Projects that do no benefit Leprino	$0	$0	$0	$0	$0	$0	Capital Asset Allocation
12	Total Cost of Service (w/ non-Lep Capital)	$2,123,668	$3,514,300	$10,873,188	$2,584,518	$1,754,040	$20,849,714	
13								
14	Service Units	3,467,301	3,467,301	7,369,360	6,856,807			
15		hcf	hcf	lbs/yr	lbs/yr			
16	Additional Unit Cost	$0.61	$0.00	$0.00	$0.00			
17	**Total Unit Rate for All Customers Except Leprino**	**$0.61**	**$0.93**	**$1.44**	**$0.35**	**$5.77**		

The unit costs for all customers but Leprino and Septic customers in each scenario are restated below in Table 5-12 and Table 5-13.

Table 5-12: Wastewater Unit Costs (Test Year FY 2023-24), Scenario 1

[A]	[B]	[C]	[D]	[E]	[F]
Line	Cost Causation Component	COS Allocation	Units of Service	General Unit Cost	Unit Costs for Leprino & Septic
1	Sewage Collection	$2,051,200	3,467,301	$0.59	$0.00
2	WWTP Flow (hcf)	$3,405,262	3,779,159	$0.90	$0.90
3	BOD	$10,550,924	7,570,788	$1.39	$1.39
4	TSS	$2,501,084	7,292,912	$0.34	$0.34
5	Customer	$1,694,184	304,160	$5.57	$5.57
6	Total	$20,202,654			

Table 5-13: Wastewater Unit Costs (Test Year FY 2023-24), Scenario 2

[A]	[B]	[C]	[D]	[E]	[F]
Line	Cost Causation Component	COS Allocation	Units of Service	General Unit Cost	Unit Costs for Leprino & Septic
1	Sewage Collection	$2,123,668	3,467,301	$0.61	$0.00
2	WWTP Flow (hcf)	$3,514,300	3,779,159	$0.93	$0.93
3	BOD	$10,873,188	7,570,788	$1.44	$1.44
4	TSS	$2,584,518	7,292,912	$0.35	$0.35
5	Customer	$1,754,040	304,160	$5.77	$5.77
6	Total	$20,849,714			

5.7.Wastewater Cost Allocation to Customer Classes

Using the units of service from Table 5-9 and the unit costs from Table 5-10, Table 5-14 and Table 5-15 show the allocation of the rate revenue requirement by cost causation component to each customer class for each scenario. This is known as the cost to serve each class. Each value is calculated by taking the units of service for each customer class and multiplying it by the corresponding unit cost. For example, the cost allocation for Single Family Residential sewage collection for scenario 1 is calculated by multiplying the units of service for Single Family sewage collection from Table 5-9 (2,437,994 hcf) by the unit rate for Single Family sewage collection ($0.59/hcf) shown in Line 17 of Table 5-10. Note that, because Microsoft Excel does not round the unit rate ($0.59/hcf) when calculating, and due to the scale and size of the hcf multipliers (2.5 million hcf), the outcome shown in Table 5-14 will be marginally greater than a hand-calculated value.

Table 5-14: Wastewater Cost Allocation to Customer Classes (Test Year FY 2023-24), Scenario 1

[A] Line	[B] Customer Class	[C] Sewage Collection (hcf)	[D] WWTP Flow (hcf)	[E] BOD (lbs/year)	[F] TSS (lbs/year)	[G] Customer	[H] Total
1	**Residential**						
2	Single Family	$1,442,278	$2,196,788	$6,645,135	$1,503,644	$1,602,159	$13,390,004
3	Multi-Family	$172,992	$263,490	$796,835	$180,306	$40,758	$1,454,381
4	Subtotal Residential	$1,615,270	$2,460,278	$7,441,970	$1,683,950	$1,642,917	$14,844,385
5							
6	**Non-Residential**						
7	Commercial I	$141,854	$216,063	$521,546	$128,343	$26,068	$1,033,874
8	Commercial II	$274,456	$418,034	$2,018,149	$496,628	$20,921	$3,228,187
9	Commercial II	$19,620	$29,884	$288,541	$42,603	$4,211	$384,858
10	Industrial (Leprino)	NA	$277,005	$72,209	$35,539	$67	$384,820
11	Septic Disposal	$0	$3,999	$208,509	$114,022	$0	$326,530
12	Subtotal Non-Residential	$435,930	$944,985	$3,108,954	$817,134	$51,267	$5,358,269
13							
14	**Total**	**$2,051,200**	**$3,405,262**	**$10,550,924**	**$2,501,084**	**$1,694,184**	**$20,202,654**

Table 5-15: Wastewater Cost Allocation to Customer Classes (Test Year FY 2023-24), Scenario 2

[A] Line	[B] Customer Class	[C] Sewage Collection (hcf)	[D] WWTP Flow (hcf)	[E] BOD (lbs/year)	[F] TSS (lbs/year)	[G] Customer	[H] Total
1	**Residential**						
2	Single Family	$1,493,234	$2,267,129	$6,848,102	$1,553,804	$1,658,763	$13,821,033
3	Multi-Family	$179,103	$271,927	$821,173	$186,321	$42,198	$1,500,723
4	Subtotal Residential	$1,672,337	$2,539,056	$7,669,275	$1,740,125	$1,700,962	$15,321,756
5							
6	**Non-Residential**						
7	Commercial I	$146,866	$222,982	$537,476	$132,624	$26,989	$1,066,936
8	Commercial II	$284,152	$431,419	$2,079,791	$513,195	$21,660	$3,330,217
9	Commercial II	$20,313	$30,841	$297,354	$44,024	$4,360	$396,891
10	Industrial (Leprino)	NA	$285,875	$74,415	$36,724	$69	$397,083
11	Septic Disposal	$0	$4,127	$214,877	$117,826	$0	$336,830
12	Subtotal Non-Residential	$451,331	$975,243	$3,203,913	$844,393	$53,078	$5,527,958
13							
14	**Total**	**$2,123,668**	**$3,514,300**	**$10,873,188**	**$2,584,518**	**$1,754,040**	**$20,849,714**

6. Proposed Wastewater Rates

Section 6 presents detailed calculations of proposed wastewater rates through FY 2027-28. All proposed rates are calculated directly from the results of the COS analysis (in Section 5) for FY 2023-24 (i.e. the "test year"). Note that, absent majority protest at the Proposition 218 hearing for rate adoption, the City will implement Scenario 2 rates in the upcoming fiscal year.

6.1.Proposed Fixed Charges FY 2023-24

Table 6-1 shows the calculation of monthly wastewater rates for implementation in August, 2024 (FY 2023-24). The revenue requirement associated with each class (cost to serve each class) is listed in Column C, and was determined from the customer class cost allocations in Table 5-14. The City would like to maintain the fixed charge for Single Family Customers. For Single Family customers, the fixed charge is calculated by dividing the total revenue requirement by the number of bills. For Multi-family customers, the fixed charge is the total sewage collection and customer costs divided by the total number of dwelling units (as opposed to accounts). This provides a per dwelling unit fixed charge for Multi-Family. For all other customer classes, the fixed charge is set at the cost to serve a Multi-Family unit, which, based on flow, is 57% of a single family dwelling. In other words, the minimum fixed charge for commercial classes is 57% of an equivalent (single family) dwelling unit. Table 6-1 shows the rate derivation for Scenario 1; Table 6-2 shows the same calculation for Scenario 2.

Table 6-1: Proposed Monthly Fixed Rate Calculation for Test Year FY 2023-24, Scenario 1

[A]	[B]	[C]	[D]	[E]	[G]	[H]	[I]
Line	Customer Class	Total Revenue Requirement	Number of Dwelling Units or Accounts	Proposed Monthly Fixed Charge (per EDU)	Current Monthly Fixed Charge	Difference ($)	Difference (%)
1	Residential						
2	Single Family	$13,390,004	23,970	$46.55	$34.00	$12.55	37%
3	Multi-Family	$1,454,381	4,555	$3.91	$28.75	-$24.84	-86%
4	Subtotal Residential	$14,844,385	28,525				
5							
6	Non-Residential						
7	Commercial I	$1,033,874	390	$26.61	$28.75	-$2.14	-7%
8	Commercial II	$3,228,187	313	$26.61	$28.75	-$2.14	-7%
9	Commercial II	$384,858	63	$26.61	$28.75	-$2.14	-7%
10	Subtotal Non-Residential	$4,646,919	766				
11							
12	Total	$19,491,304	29,291				

Table 6-2: Proposed Monthly Fixed Rate Calculation for Test Year FY 2023-24, Scenario 2

[A]	[B]	[C]	[D]	[E]	[G]	[H]	[I]
Line	Customer Class	Total Revenue Requirement	Number of Dwelling Units or Accounts	Proposed Monthly Fixed Charge (per EDU)	Current Monthly Fixed Charge	Difference ($)	Difference (%)
1	Residential						
2	Single Family	$13,821,033	23,970	$48.05	$34.00	$14.05	41%
3	Multi-Family	$1,500,723	4,555	$4.05	$28.75	-$24.70	-86%
4	Subtotal Residential	$15,321,756	28,525				
5							
6	Non-Residential						
7	Commercial I	$1,066,936	390	$27.46	$28.75	-$1.29	-5%
8	Commercial II	$3,330,217	313	$27.46	$28.75	-$1.29	-5%
9	Commercial II	$396,891	63	$27.46	$28.75	-$1.29	-5%
10	Subtotal Non-Residential	$4,794,045	766				
11							
12	Total	$20,115,801	29,291				

6.2. Proposed Volumetric Rates (Test Year FY 2023-24)

Table 6-3 and Table 6-4 show the calculation of volumetric wastewater rates for FY 2023-24 in each proposed scenario. The volumetric revenue requirement associated with each rate listed in Column C was determined from the customer class cost allocations in Table 5-14 by subtracting fixed revenue from the total revenue requirement. Because single family customers pay only a monthly fixed charge, their volumetric revenue requirement is zero. Note that Single family customers are paying their fair share; however, it is currently being collected solely through a fixed charge. Thus, the volumetric revenue requirement is zero. 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 F-H. Since the commercial fixed charge is lower than the current fixed charge, the volumetric rate for commercial customers must increase to maintain recovery of the full cost to serve each commercial customer.

For commercial customers there are two things impacting their rates. First, the strength of commercial customers is revised upward to reflect the latest industry assumptions for these classes as determined by the Los Angeles County Sanitation Districts (and other large sewerage treatment agencies). Second, based on water use records provided by the City, commercial customers share of plant flows are increasing. Both assumptions increase commercial's share of wastewater system costs.

Table 6-3: Proposed Volumetric Rate Calculation for Test Year FY 2023-24, Scenario 1

[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]
Line	Customer Class	Total Volumetric Revenue Requirement	Wastewater Flow (hcf)	Proposed Volumetric Rate ($/hcf)	Current Volumetric Rate	Difference ($)	Difference (%)
1	Residential						
2	Single Family	$0	2,437,994	NA	NA	NA	NA
3	Multi-Family	$1,240,631	292,421	$4.24	NA	$4.24	NA
4	Subtotal Residential	$1,240,631	2,730,415				
5							
6	Non-Residential						
7	Commercial I	$909,350	266,430	$3.41	$1.98	$1.43	72%
8	Commercial II	$3,128,249	515,482	$6.07	$2.91	$3.16	109%
9	Commercial II	$364,743	36,850	$9.90	$4.89	$5.01	102%
10	Industrial (Leprino)	$384,820	307,420	$1.25	NA	$1.25	NA
11	Septic Disposal	$326,530	4,438	$73.57	$89.44	($15.87)	-18%
12	Subtotal Non-Residential	$5,113,690	1,130,620				
13							
14	**Total**	**$6,354,321**	**3,861,035**				

Table 6-4: Proposed Volumetric Rate Calculation for Test Year FY 2023-24, Scenario 2

[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]
Line	Customer Class	Total Volumetric Revenue Requirement	Wastewater Flow (hcf)	Proposed Volumetric Rate ($/hcf)	Current Volumetric Rate	Difference ($)	Difference (%)
1	Residential						
2	Single Family	$0	2,437,994	NA	NA	NA	NA
3	Multi-Family	$1,279,421	292,421	$4.38	NA	$4.38	NA
4	Subtotal Residential	$1,279,421	2,730,415				
5							
6	Non-Residential						
7	Commercial I	$938,444	266,430	$3.52	$1.98	$1.54	78%
8	Commercial II	$3,227,094	515,482	$6.26	$2.91	$3.35	115%
9	Commercial II	$376,135	36,850	$10.21	$4.89	$5.32	109%
10	Industrial (Leprino)	$397,083	307,420	$1.29	NA	$1.29	NA
11	Septic Disposal	$336,830	4,438	$75.89	$89.44	($13.54)	-15%
12	Subtotal Non-Residential	$5,275,586	1,130,620				
13							
14	**Total**	**$6,555,007**	**3,861,035**				

6.3.Proposed Five-Year Wastewater Rate Schedule

Table 6-5 and Table 6-6 show the proposed five-year wastewater rate schedules for FY 2023-24 to FY 2027-28 for each of the two scenarios. The rates for FY 2023-24 were derived in Table 6-1 and Table 6-3. All other proposed rates in subsequent years are increased by the revenue adjustments shown in Table 4-6 and Table 4-7, respectively. All proposed rates are rounded to the nearest cent.

Table 6-5: Proposed Five-Year Wastewater Rate Schedule, Scenario 1

Customer Class	Current	Proposed FY 2024	Proposed FY 2025	Proposed FY 2026	Proposed FY 2027	Proposed FY 2028
Fixed Charges ($ / month)						
Single Family Residential	$34.00	$46.55	$54.00	$58.86	$64.16	$69.29
Multi-Family Residential	$28.75	$3.91	$4.54	$4.94	$5.39	$5.82
Commercial I	$28.75	$26.61	$30.87	$33.64	$36.67	$39.60
Commercial II	$28.75	$26.61	$30.87	$33.64	$36.67	$39.60
Commercial III	$28.75	$26.61	$30.87	$33.64	$36.67	$39.60
Volumetric Charges ($ / hcf)						
Single Family Residential	NA	NA	NA	NA	NA	NA
Multi-Family Residential	$0.00	$4.24	$4.92	$5.36	$5.85	$6.31
Commercial I	$1.98	$3.41	$3.96	$4.32	$4.70	$5.08
Commercial II	$2.91	$6.07	$7.04	$7.67	$8.36	$9.03
Commercial III	$4.89	$9.90	$11.48	$12.52	$13.64	$14.73
Septage ($/hcf)	$0.00	$73.57	$103.37	$119.91	$130.70	$142.46

Table 6-6: Proposed Five-Year Wastewater Rate Schedule, Scenario 2

Description	Current Rates	FY 2024	FY 2025	FY2026	FY 2027	FY 2028
Fixed Rates						
Single Family Residential	$34.00	$46.55	$54.00	$58.86	$64.16	$69.29
Multi-Family Residential	$28.75	$3.91	$4.54	$4.94	$5.39	$5.82
Commercial I	$28.75	$26.61	$30.87	$33.64	$36.67	$39.60
Commercial II	$28.75	$26.61	$30.87	$33.64	$36.67	$39.60
Commercial III	$28.75	$26.61	$30.87	$33.64	$36.67	$39.60
Volumetric Rates						
Single Family Residential	$0.00	NA	NA	NA	NA	NA
Multi-Family Residential	$0.00	$4.24	$4.92	$5.36	$5.85	$6.31
Commercial I	$1.98	$3.41	$3.96	$4.32	$4.70	$5.08
Commercial II	$2.91	$6.07	$7.04	$7.67	$8.36	$9.03
Commercial III	$4.89	$9.90	$11.48	$12.52	$13.64	$14.73
Industrial (Leprino)	See Table 1-4	$1.25	$1.45	$1.58	$1.73	$1.86
Septage	NA	$75.89	$110.05	$122.15	$133.15	$145.13

7. Customer Bill Impacts

7.1. Monthly Wastewater Bill Impacts

Figure 7-1 and Figure 7-2 show the bill impact to single family customers under each scenario.

Figure 7-1 and Figure 7-2 show sample monthly wastewater bills for single family residential customers at current and proposed FY 2023-24 rates for each scenario. The proposed rates are based on updated strength and flow assumptions which impact the cost allocations to each class.

Before we show the customer impacts for each class, there are a few comparisons that can be made to check for reasonableness. The proposed rates 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). Table 7-1 shows the percentage of contributed flow versus the percentage of the revenue requirement associated with each class. For example, we note that SFR customers contribute 65% of the flow to the plant and are charged 66% of the total costs for the wastewater system. Multi-family customers contribute 8% (7.7%) of the flow and are charged 7% of total costs. This is reasonable because SFR customers are each mailed a bill and therefore are allocated more customer costs then Multi-Family customers for which the landlord receives the bill. Commercial I customers (low strength) contribute 6% of the flow, but are allocated 5% of total costs. This makes sense because their low strength sewage is less costly to treat. Commercial II customers (medium strength) contribute 12% of flow and are allocated 16% of costs. This is reasonable because commercial II customer discharge higher strength sewage. Lastly Commercial III customers (highest strength) contribute 1% of the flow and are allocated 2% of costs. Note that Septage customers contribute a greater percentage of the revenue requirement as compared flow. This is because, though Septage customers contribute a small percentage of the overall flow to the treatment plant, their strength loading is higher and thus more costly to treat than other classes. Conversely, Industrial customers (e.g., Leprino) pay a smaller percentage of the revenue requirement as compared to their overall flow contribution. This is because Leprino has their own pipe to convey sewage to the plan and does not use the City's collection system and Leprino pretreats its sewage before it is discharged to the City making it low strength sewage. Therefore, the cost to treat Leprino sewage is lower than other classes. These two factors are reflected in their proportion of flow and costs (revenue requirement).

Table 7-1: Percentage Contributed Flow vs. Revenue by Customer Class

Customer Class	% of Total Flow	% of Revenue Requirement
Single Family Residential	64.5%	66.3%
Multi-Family Residential	7.7%	7.2%
Commercial I	6.3%	5.1%
Commercial II	12.3%	16.0%
Commercial III	0.9%	1.9%
Industrial (Leprino)	8.1%	1.9%
Septage	0.1%	1.6%

Figure 7-1 and Figure 7-2 show the bill impact to single family customers under each scenario.

Figure 7-1: Single Family Residential Monthly Wastewater Bill Impacts (FY 2023-24), Scenario 1

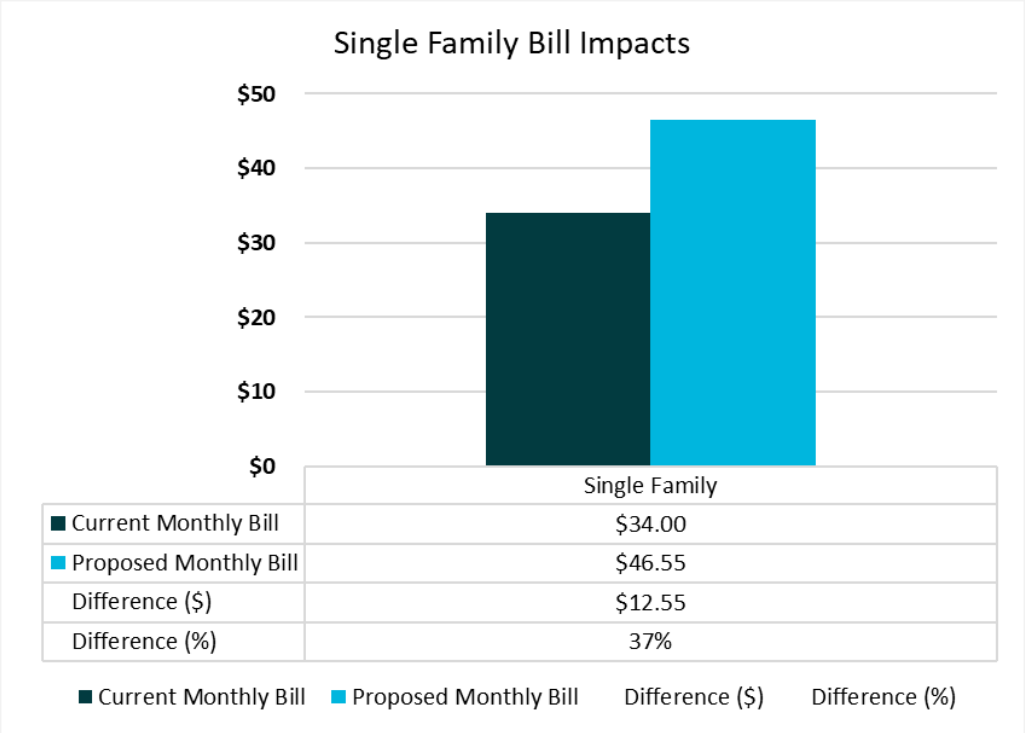


Figure 7-2: Single Family Residential Monthly Wastewater Bill Impacts (FY 2023-24), Scenario 2

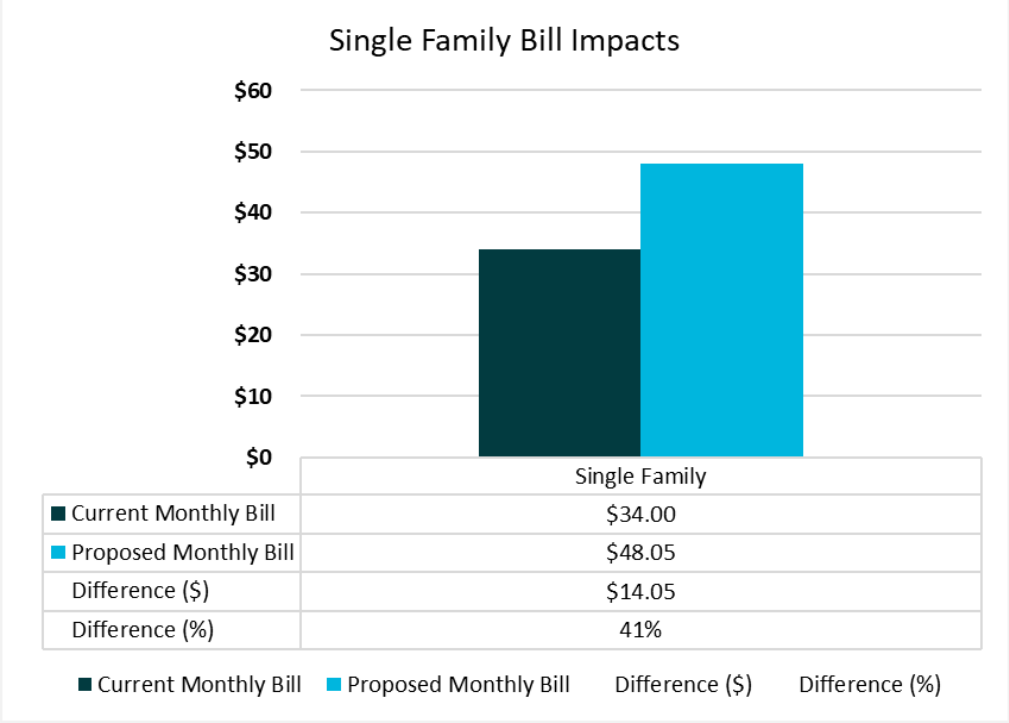


Figure 7-3 and Figure 7-4 show monthly wastewater bill impact for an average Multi-Family customer under each scenario. The bill impact assumes a Multi-Family customer with an average of 7 dwelling units and approximately 5.3 hcf of sewage discharge per dwelling unit each month. For test year 2022-23, the average monthly bill for Multi-Family customers will decrease. The City plans to shift from a per dwelling unit cost ($28.75) to a smaller fixed charge and volumetric rate that will allow Multi-Family bills to better align with actual discharges to the wastewater treatment plant.

Figure 7-3: Multi-Family Monthly per Dwelling Unit Wastewater Bill Impacts, Scenario 1

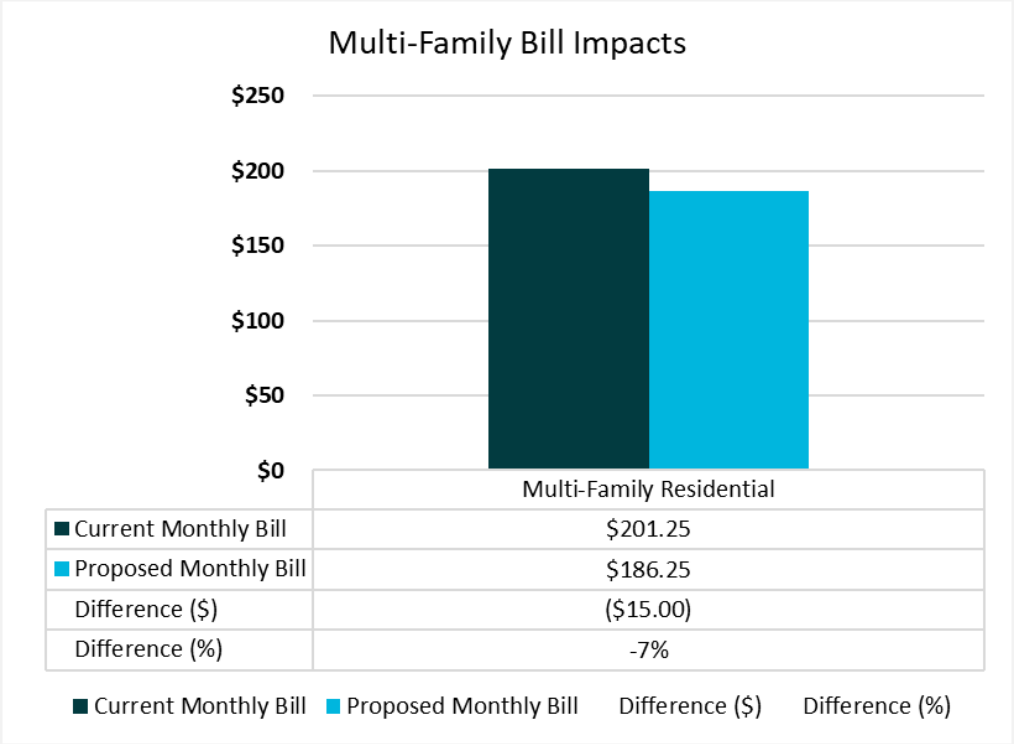


Figure 7-4: Multi-Family Monthly per Dwelling Unit Wastewater Bill Impacts, Scenario 2

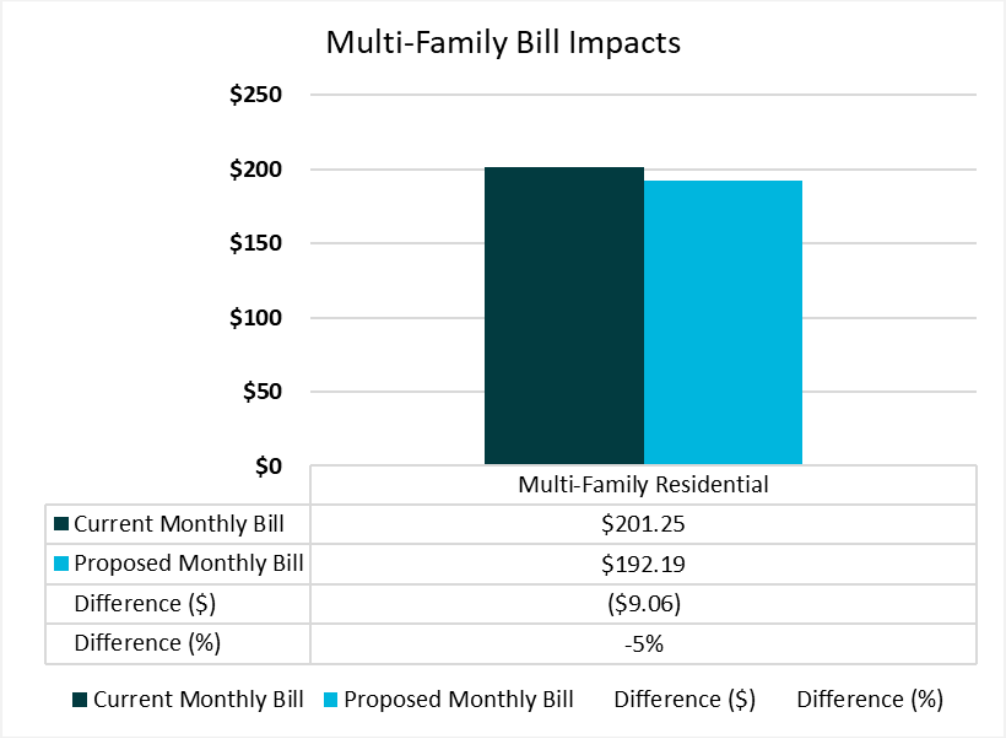
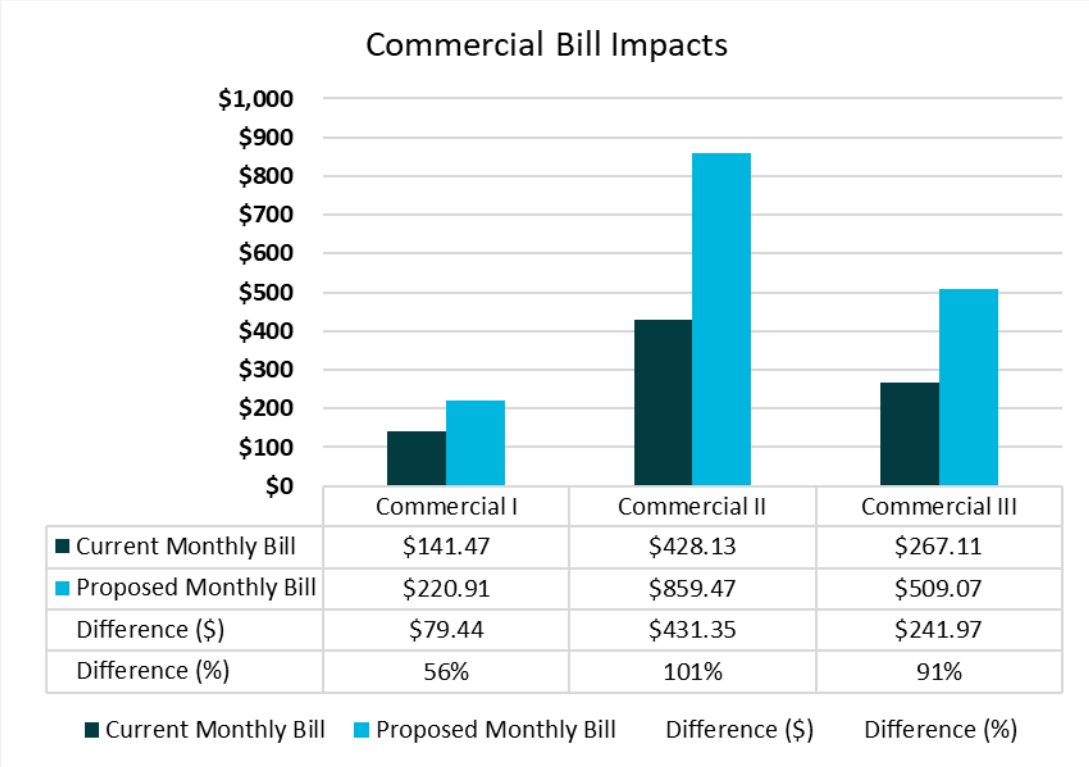


Figure 7-5 and Figure 7-6 show monthly wastewater bill impacts under each scenario for commercial customers assuming average wastewater discharge for each class. The average wastewater discharge for each class shown is 683, 1,647, and 585 hcf, respectively. These constitute large commercial businesses. Their bills must therefore increase, as the assumed wastewater strength[5] has been revised upwards[6] and trued to the actual strength discharged to the plant.[7] Commercial I has the lowest strength; Commercial III has the highest strength. Higher strength customers discharge more BOD and TSS to the plant, which is more costly to treat than lower strength sewage.

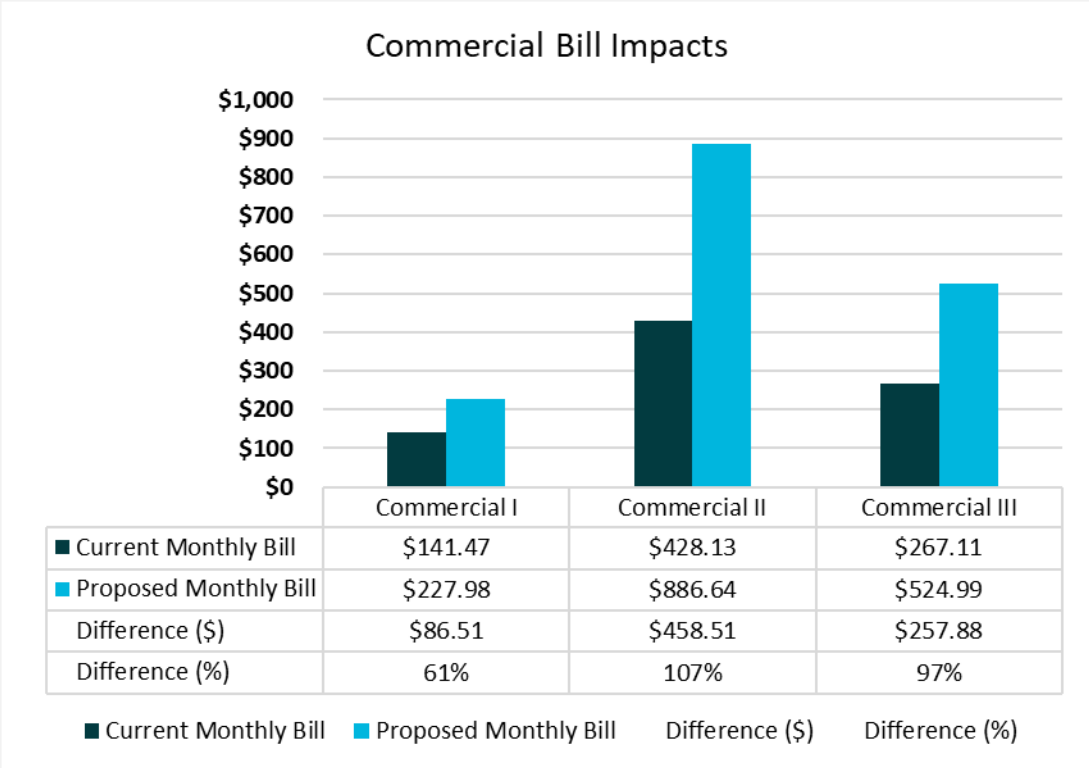
[5] Strength is defined as the concentration of biochemical oxygen demand (BOD) and total suspended solids (TSS).
[6] The latest data from large sewage treatment agencies, such as Los Angeles County Sanitation Districts, shows the sewage strength has increased due to the installation of low flow water fixtures.
[7] It appears that trueing up strength concentrations and actual flows to what is observed at the wastewater treatment plant was not performed in the prior study.

Figure 7-5: Non-Residential Monthly Wastewater Bill Impacts, Scenario 1



	Commercial I	Commercial II	Commercial III
Current Monthly Bill	$141.47	$428.13	$267.11
Proposed Monthly Bill	$220.91	$859.47	$509.07
Difference ($)	$79.44	$431.35	$241.97
Difference (%)	56%	101%	91%

Figure 7-6: Non-Residential Monthly Wastewater Bill Impacts, Scenario 2



	Commercial I	Commercial II	Commercial III
Current Monthly Bill	$141.47	$428.13	$267.11
Proposed Monthly Bill	$227.98	$886.64	$524.99
Difference ($)	$86.51	$458.51	$257.88
Difference (%)	61%	107%	97%