

# Mammoth

## Community Water District

### **Water and Wastewater Rate Study**

Draft Report / October 18, 2021

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October 18, 2021

Mark Busby  
General Manager  
Mammoth Community Water District  
1315 Meridian Boulevard  
Mammoth Lakes, CA 93546

**Subject: Water and Wastewater Rate Study Report**

Dear Mr. Busby,

Raftelis Financial Consultants, Inc. (Raftelis) is pleased to provide this report for the Mammoth Community Water District's (District) Water and Wastewater Rate Study. The Study involved a comprehensive review of the District's Financial Plans, analysis of District water usage, and rate structure alternatives for the water and wastewater utilities. We are confident that the results to water and wastewater rates, based on cost of service principles, result in fair and equitable rates for the District's customers and meet the requirements of Proposition 218.

The major objectives of the Study include:

- » Developing long-term financial plans that sufficiently fund operating expenses and adopted reserve policies
- » Conducting cost of service analyses that fairly and equitably allocate costs of providing water and wastewater services among and between customer classes
- » Designing water and wastewater rates that fully recover costs to serve customers while minimizing rate impacts and improving equity
- » Preparing a Study Report, or administrative record, that clearly and comprehensively explains each step of the rate study process

This report details the long-term financial plans, cost of service analyses, and proposed rates for the District's water and wastewater utilities. The financial plans identify the projected revenue needs and revenue adjustments over the next 10 years, which inform five years of proposed rates for adoption.

It was a pleasure working with you, and we wish to express our thanks for your and District staff members' support during the Study. If you have any questions, please contact me at [kkostiuk@raftelis.com](mailto:kkostiuk@raftelis.com).

Sincerely,

A handwritten signature in black ink, appearing to read 'Kevin Kostiuk', with a stylized flourish at the end.

**Kevin Kostiuk**  
Manager

445 S Figueroa St, Suite 1925  
Los Angeles CA 90071

[www.raftelis.com](http://www.raftelis.com)



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# 1 Executive Summary

## Study Background

The Mammoth Community Water District (District) contracted with Raftelis to conduct a Water and Wastewater Rate Study, which includes the development of a long-term financial plan, cost of service (COS) analysis, and rate design for each of the District's utilities. The study culminates in five years of cost-based water and wastewater rate recommendations based on the results of the financial planning exercise, the COS analyses, and wastewater rate design alternatives. This Executive Summary outlines the rate proposal and contains a description of the rate study process, methodology, and recommendations for the District's water and wastewater rates.

## Objectives of the Study

The major components and objectives of the water rate study include:

1. Developing long-term financial plans that meet the water and wastewater utilities' operating revenue requirements while adequately funding reserves in accordance with industry best practices and the District's adopted policies.
2. Conducting COS analyses that establishes a nexus between the cost to serve customers and the responsibility of each class, in compliance with Proposition 218 and based on industry standard methodologies.
3. Designing five years of water and wastewater rates that comply with Proposition 218 and ensure financial sufficiency to fund operating costs over the study period.

## Rate Objectives

Raftelis worked with District staff to prioritize objectives for the proposed water and wastewater rates. These prioritized objectives include improving fairness and equity between customer classes, simplifying the rate structure to enhance customer understanding, maintaining affordability at its current level, and minimizing impacts to customers. The COS analyses reflect the updated cost allocations based on the District's most recent financial data. The proposed water rates (which maintain the existing rate structure) and the wastewater rate structure modifications are recommended to best meet these. All proposed changes were analyzed to minimize financial impacts to the greatest extent possible.

## Current Rates

### Water Rates

The District's current water rates were implemented April 1, 2020 and include a monthly service charge based on meter size and a usage rate charged for every 1,000 gallons (kgal) of water used. Water is charged at a uniform rate for multifamily, commercial, and recycled water customers as well as separate three-tiered rates for residential and irrigation customers.

Table 1-1 shows the current monthly service charges by meter size. **Table 1-2** shows the current water usage rates by customer class and monthly tiers.

**Table 1-1: Current Monthly Service Charges**

	A	B
Line	Meter Size	Current Charges
1	5/8"	\$15.05
2	3/4"	\$15.05
3	1"	\$22.79
4	1 1/2"	\$42.16
5	2"	\$65.39
6	3"	\$138.95
7	4"	\$247.39
8	6"	\$545.52
9	8"	\$932.72
10	MFR Dwelling	\$15.05

**Table 1-2: Current Water Usage Rates (\$/kgal)**

	A	B
Line	Class	Current Charges
<b>SFR</b>		
1	Tier 1 - First 4,000 Gal.	\$0.99
2	Tier 2 - Next 4,000 Gal.	\$2.32
3	Tier 3 - Above 8,000 Gal.	\$5.06
4	<b>MFR</b>	\$2.36
5	<b>Commercial</b>	\$3.13
<b>Irrigation</b>		
6	Tier 1 - 100% of MAWA	\$2.77
7	Tier 2 - 100% to 200%	\$6.19
8	Tier 3 - Above 200%	\$9.15
9	<b>Recycled</b>	\$1.83

## Wastewater Rates

The current rate structure consists of a fixed monthly charge for residential classes (per dwelling unit). All single-family residential customers pay \$21.15 per month and all multi-family units pay \$18.21 per month, per dwelling unit. Non-residential classes pay “fixture” based charges. Charges per fixture (sometimes called a *special multiplier*) may vary within customer classes. For example, restaurants and other similar businesses pay a charge per seat while hospitals and dorms pay a charge per bed. Raftelis recommends a change in structure, as discussed in more detail below. **Table 1-3** shows the current wastewater charges by customer class.

**Table 1-3: Current Monthly Service Charges**

	A	B
Line	Customer Unit	Current Charges
1	Single Family	\$21.15
2	Multi Family	\$18.21
3	RV Space	\$3.09
4	Motel Units	\$9.63
5	Ski Dorm/Bed	\$3.09
6	Commercial Unit	\$13.64
7	Laundry - Commercial	\$814.31
8	Laundromat - Public	\$499.45
9	Service Station	\$24.97
10	Car Wash	\$62.48
11	Restaurant Seat	\$2.55
12	Bar Seat	\$1.34
13	Theatre Seat	\$0.65
14	Public Building	\$41.72
15	Elem School	\$0.94
16	High School	\$1.15
17	Storage/Warehouse	\$18.82
18	Swimming Pool	\$12.47
19	Spa/Hot Tub	\$6.38
20	Hospital Bed	\$28.72
21	Juniper	\$13.71
22	Mill Cabins	\$21.14

## Process and Approach

Raftelis held several meetings with District staff and the Board Ad Hoc Committee to discuss and understand objectives, characteristics, and challenges of the District’s water utility to provide the recommendations and results detailed in this report. Raftelis confirmed various assumptions and inputs and used an iterative process to view several scenarios to determine the recommended financial plan and rates for service. Raftelis then designed and presented a COS and rate model to analyze various rate scenarios to fully fund both utilities’ operating revenue requirements through fair, equitable, and defensible cost-based rates.

The proposed financial plans detailed in this report follow industry standards for long-term financial planning. The financial plan relies on reasonable assumptions based on industry indices, such as general inflation based on the Consumer Price Index (CPI), and input from District staff. Raftelis worked closely with District staff to determine the most accurate methodology to project future revenues and expenses to reinforce sound fiscal management practices.

The financial plan utilizes fiscal year (FY) 2021 as the base year and then projects FY 2022 and the five-year rate-setting period between FY 2023 to FY 2027. Each fiscal year begins on April 1 and ends on March 31. For example, FY 2021 is

defined as the year beginning on April 1, 2020 and ending on March 31, 2021. The proposed rates were developed for implementation on April 1, 2022 (first day of FY 2023) and in April every year thereafter through FY 2027.

The COS analysis and resulting water and wastewater rates are developed using the principles established by the American Water Works Association's (AWWA) *Principles of Water Rates, Fees, and Charges, 7<sup>th</sup> edition* (M1 Manual) and the Water Environment Federation's *Financing and Charges for Wastewater Systems, 4<sup>th</sup> Edition* (WEF Manual). The water rates developed in this study were designed based on the industry standard Base-Extra Capacity methodology and the legal requirements set forth in the following section. This methodology allocates costs consistent with demand patterns of each customer class and for tiered rates, the demand patterns and costs to serve each tier.

## Legal Framework<sup>1</sup>

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

Proposition 218 was enacted by voters in 1996 to ensure, in part, that fees and charges imposed for ongoing delivery of a service to a property (property-related fees and charges) are proportional to, and do not exceed, the cost of providing service. Water and wastewater service fees and charges are property-related fees and charges subject to the provisions of California Constitution Article XIII D, Section 6 (Proposition 218). The principal requirements, as they relate to public water service fees and charges, are as follows:

1. Revenues derived from the fee or charge shall not exceed the costs required to provide the property-related service.
2. Revenues derived by the fee or charge shall not be used for any purpose other than that for which the fee or charge was imposed.
3. The amount of the fee or charge imposed upon any parcel shall not exceed the proportional cost of service attributable to the parcel.
4. No fee or 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 fee or charge shall be mailed to the record-owner of each parcel not less than 45 days prior to a public hearing, when the agency considers all written protests against the charge.

As stated in the M1 Manual, “water rates and charges should be recovered from classes of customers in proportion to the cost of serving those customers.” Raftelis follows industry standard rate setting methodologies set forth by the AWWA M1 Manual to ensure that the results of this study meet Proposition 218 requirements and create rates that do not exceed the proportionate cost of providing water service.

### California Constitution – Article X, Section 2

Article X, Section 2 of the California Constitution states the following:

*“It is hereby declared that because of the conditions prevailing in this State the general welfare requires that the water resources of the State be put to beneficial use to the fullest extent of which they are capable, and that the waste or unreasonable use or unreasonable method of use of water be prevented, and that the conservation of such waters is*

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<sup>1</sup> Raftelis does not practice law, nor does it provide legal advice. The above discussion provides a general overview of Raftelis' understanding as rate practitioners and is labeled “legal framework” for literary convenience only. The District should consult with its legal counsel for clarification and/or specific guidance.

*to be exercised with a view to the reasonable and beneficial use thereof in the interest of the people and for the public welfare.”*

Article X, Section 2 of the State Constitution establishes the need to preserve the state’s water supplies and to discourage the waste or unreasonable use of water by encouraging conservation. Public agencies are constitutionally mandated to maximize the beneficial use of water, prevent waste, and encourage conservation.

In addition, Section 106 of the California Water Code declares that the highest priority use of water is for domestic purposes, with irrigation water secondary. To meet the objectives of Article X, Section 2 and the California Water Code, a water purveyor may utilize its water rate design to incentivize the efficient use of water. The District has established tiered water rates (also known as “inclining tier” or “inclining block”) water rates to incentivize customers to use water in an efficient manner. The inclining tier rates (as well as rates for uniform rate classes) need to be based on the proportionate costs incurred to provide water to, and within, each customer class to achieve compliance with Proposition 218.

Tiered water rate structures, when properly designed and differentiated by customer class, allow a water utility to send conservation price signals to customers while proportionately allocating the costs of service. Due to a necessity in reducing water waste and increasing efficiency, tiered water rates are ubiquitous, especially in relatively water-scarce regions like California. Tiered rates meet the requirements of Proposition 218 if the tiered rates reflect the proportionate cost of providing service *within* each tier.

## Cost-Based Rate-Setting Methodology

To develop water and wastewater rates that comply with Proposition 218, meet industry standards, and accomplish the District’s goals for the study, Raftelis followed the four major steps discussed below.

### Revenue Requirement Calculation

The first step in the rate-making process is to determine the adequate and appropriate level of funding for a given utility. This is referred to as determining the “revenue requirement” for the base year, which for this study is FY 2023 which runs from April 1, 2022 to March 31, 2023. This analysis considers the short-term and long-term service objectives of the utility over a given planning horizon, including capital facilities, operations and maintenance (O&M), non-rate sources of revenues, and financial reserve policies to determine the adequacy of a utility’s existing rates to recover its costs. Several factors affect these projections, including the number of customers served, water use trends, non-recurring revenues, conservation, use restrictions, inflation, interest rates, capital financing needs, and other changes in operating and economic conditions, among others.

### Cost of Service Analysis

The annual cost of providing service is distributed among customer classes commensurate with their service requirements. A water utility COS analysis involves the following steps (Note, a wastewater utility COS analysis follows the same progression but is omitted below for brevity):

1. **Categorize Costs into System Functions:** Utilizing an agency’s approved budget, financial reports, operating data, engineering data, and CIP, a rate study generally categorizes (i.e., functionalizes) the operating and capital costs of the water system among major system functions. Examples of system functions for a water utility include, but are not limited to water supply, pumping, treatment, distribution, meters, customer service,



conservation, and general (indirect). Wastewater functions include Administration, Finance, Information Technology, Lab, Human Resources, Maintenance Management, Engineering, Treatment, Line Maintenance, and Mechanical Maintenance.

2. **Allocate Functionalized Costs to the Appropriate System Cost Components:** Cost components represent the major pieces of a water system for which the agency incurs specific costs, with one or more functions attributable to one or more system components. For example, distribution costs (system function) are allocated to delivery, maximum day, and maximum hour (cost components) since distribution lines are sized to accommodate both average (base) demands and maximum day / maximum hour (peak) demands. The District's water system cost components include delivery, maximum day, maximum hour, meter servicing, customer, conservation, general costs. Wastewater components include Volume, Biological Oxygen Demand (BOD), and Total Suspended Solids (TSS).
3. **Determine Units of Service and Unit Costs for Cost Components:** Each cost component is associated with a specific unit of service; costs within each component are divided by the total units of service to determine the unit cost. For example, delivery costs are associated with total annual use. Dividing total annual costs by total annual use yields the unit cost of delivery under average daily demand.
4. **Distribute Cost Components to Customer Classes:** The costs of the system, allocated by system component unit costs, are distributed to customer classes and tiers in proportion to their respective demands and burdens on the system using the units of service and unit costs for each component.

## Rate Design and Derivation

Rates do more than simply recover costs. Within the legal framework and industry standards, properly designed rates should support and optimize a blend of objectives, such as revenue stability, conservation, affordability, and customer understanding, among others. Rates act as a public information tool in communicating these objectives to customers.

## Preparation of Administrative Record and Rate Adoption

Rate adoption is the last step of the rate-making process. Raftelis documents the rate study results in this report (also known as an administrative record), which reflects the basis upon which the rates were calculated, the rationale and justifications behind the proposed charges, any changes to rate structures, and anticipated financial impacts to ratepayers.

# Financial Plan Results and Recommendations

## Factors Affecting Revenue Requirements

The following items affect the water utility's revenue requirement (i.e., costs) and thus its water rates. The utility's expenses include O&M expenses, capital project costs, and reserve funding; however, the rates derived in this study are designed to recover the operating revenue requirement only- the capital revenue requirement is funded with the District's non-rate revenues.

- » **Inflationary Pressure:** The financial plan forecasts increases in the District's water operating expenses of about 3.9 percent per year, or 19 percent over the study period. This reflects a weighted average of inflation across several categories including general inflation, personnel costs, and energy costs among others.
- » **Property Tax Revenues:** The District has elected to utilize a portion of property tax (non-rate) revenues to offset water and wastewater operating expenses. The remaining property tax revenues will be utilized for the District's water utility capital improvement program (CIP). The District has planned approximately \$23 million in water and wastewater capital improvements from FY 2022 through FY 2026.

- » **Reserves Funding:** The study maintains the District’s existing water financial reserves policies, which comprise an Operating reserve of six (6) months of O&M expenses, a Capital reserve of 4 percent of water system valuation, and an Emergency reserve of one (1) million dollars.

## Water Financial Plan Results

Table 1-4 shows the proposed revenue adjustments that allow the District to maintain financial sufficiency, fund operating expenses, and achieve adopted reserve targets for the water utility over the long term. The proposed adjustments apply to the District’s rate revenues, which were projected for future years assuming .23% annual growth in customer connections, as was previously forecasted in the District’s Urban Water Management Plan (UWMP). Water demand in FY 2021 represents estimated base year water use for the District’s customers. FY 2022 and beyond incorporate a one-time reduction in water demand, based on direction from District staff. California has once again entered a period of water shortage with a growing likelihood of mandatory conservation. Further, other agencies have observed hardening of water demand in recent years at lower levels. The assumptions used reflect a conservative estimate with which to project water demands and therefore water use revenues.

The proposed revenue adjustments represent the increase to total rate revenues required to recover the water utility’s costs and not the expected impact to each customer class. Water rates developed for the base year (FY 2023) reflect the results of the COS analysis, which impacts each customer class, and tier, differently. The proposed revenue adjustment for FY 2023 is 2 percent, meaning that the resulting rates shown in the following sections recover a higher level of revenue in addition to reallocating costs between classes. Revenue adjustments in subsequent years are applied across all charges, classes, and tiers proportional to the base (rate-setting) year rates.

**Table 1-4: Proposed Water Revenue Adjustments**

	A	B	C	D	E	F
Line	Revenue Adjustment	2023	2024	2025	2026	2027
1	Effective Date	April 1, 2022	April 1, 2023	April 1, 2024	April 1, 2025	April 1, 2026
2	Percent Adjustment	2%	2%	2%	2%	2%

Figure 1-1 shows the five-year financial plan for FY 2023 through FY 2027. The stacked bars represent the costs of the water utility: O&M expenses, make up the largest portion (blue bars). Net cash flow (yellow bars) falls below zero in FY 2025 and FY 2026, meaning that the District will draw from reserves to fund a portion of expenses in those years. Current revenues (solid line) equal the projected revenues at the District’s existing water rates and proposed revenues (dotted line) equal the projected revenues with the proposed revenue adjustments in Table 1-4 applied.

Figure 1-1: Water Financial Plan

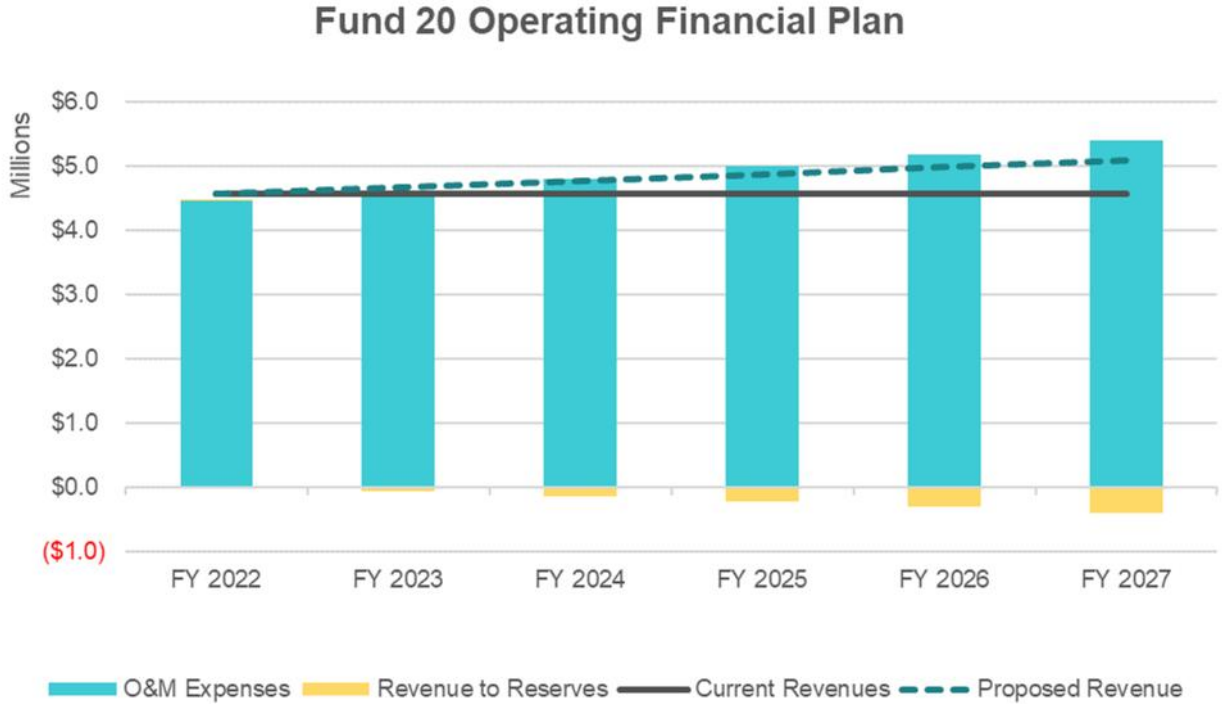


Figure 1-2 shows the ending fund balances (blue bars) for the District’s water funds from FY 2023 to FY 2027. The reserve target (dark blue line) is determined based on the existing reserve policies described above. The ending balance includes both the Operating Fund (Fund 20) and the Capital Repair and Replacement (R&R) Fund (Fund 22). The ending balance is maintained at or above the reserve target in each year through FY 2027, except for dipping just below target in FY 2025.

Figure 1-2: Water Fund 20 and 22 Fund Balance

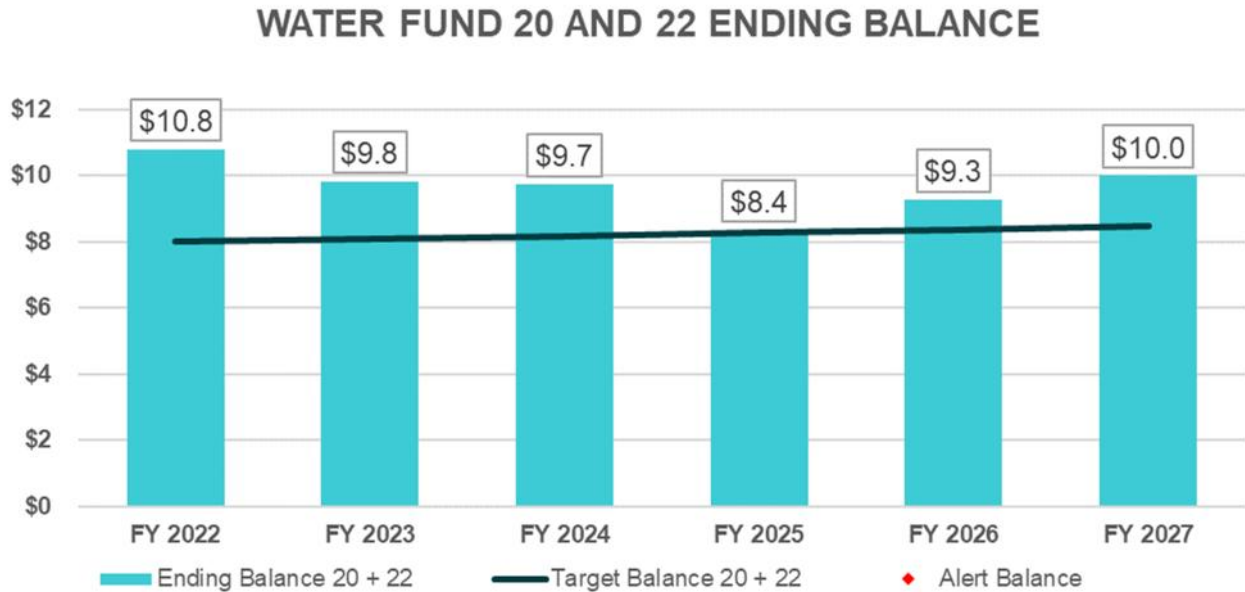
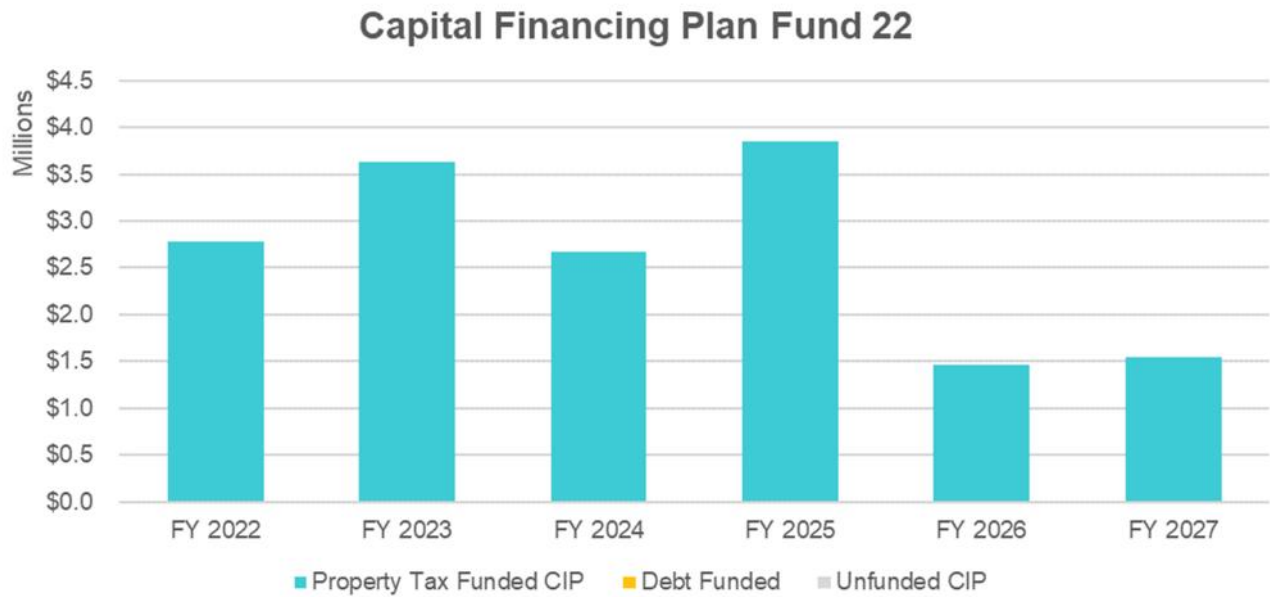


Figure 1-3 shows the five-year CIP expenditures from FY 2023 through FY 2027. All planned CIPs for the five-year period are anticipated to be entirely cash funded through non-rate revenues and are omitted from the revenues required from water rates.

**Figure 1-3: Water Capital Financing Plan**



**Wastewater Financial Plan Results**

Table 1-5 shows the proposed revenue adjustments that allow the District to maintain financial sufficiency, fund operating expenses, and achieve adopted cash reserves for the wastewater utility over the long term. The proposed adjustments apply to the District’s rate revenues, which were projected for future years assuming no growth in customer accounts during the study period.

**Table 1-5: Proposed Wastewater Revenue Adjustments**

	A	B	C	D	E	F
Line	Revenue Adjustment	2023	2024	2025	2026	2027
1	Effective Date	April 1, 2023	April 1, 2024	April 1, 2025	April 1, 2026	April 1, 2027
2	Percent Adjustment	2%	2%	2%	2%	2%

The proposed revenue adjustments represent the increase to total rate revenues required to recover the wastewater utility’s costs and not the expected impact to each customer class. Wastewater rates developed for the base year (FY 2023) reflect the results of the COS analysis, which impacts each customer class, and user type, differently. The proposed revenue adjustment for FY 2023 is 2 percent, meaning that the resulting rates shown in the following sections recover a higher level of revenue in addition to designing a new rate structure. Revenue adjustments in subsequent years are applied across all charges and customer classes proportional to the base (rate-setting) year rates.

Figure 1-4 shows the five-year financial plan for FY 2023 through FY 2027. The stacked bars represent the costs of the wastewater utility: O&M expenses make up the largest portion (blue bars). Net cash flow (yellow bars) is positive through FY 2025, meaning that the District will contribute to reserves in those years. Current revenues (solid line) equal the

projected revenues at the District’s existing wastewater rates and proposed revenues (dotted line) equal the projected revenues with the proposed revenue adjustments in **Table 1-5** applied.

**Figure 1-4: Wastewater Financial Plan**

**Fund 30 Operating Financial Plan**

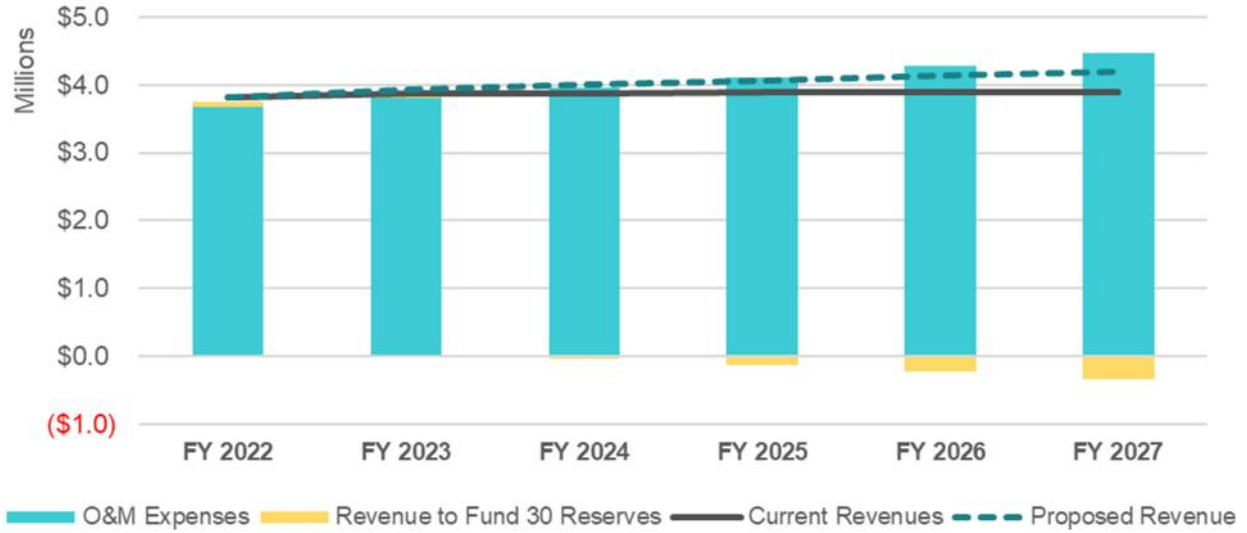


Figure 1-5 shows the ending fund balances (blue bars) for the District’s wastewater funds from FY 2023 to FY 2027. The reserve target (dark blue line) is determined based on the existing reserve policies described above. The ending balance includes both the Operating Fund (Fund 30) and the Capital Repair and Replacement (R&R) Fund (Fund 23). The ending balance is maintained at or above the reserve target in each year through FY 2027.

**Figure 1-5: Wastewater Fund 30 and 23 Balance**

**WASTEWATER FUND 23 AND 30 ENDING BALANCE**

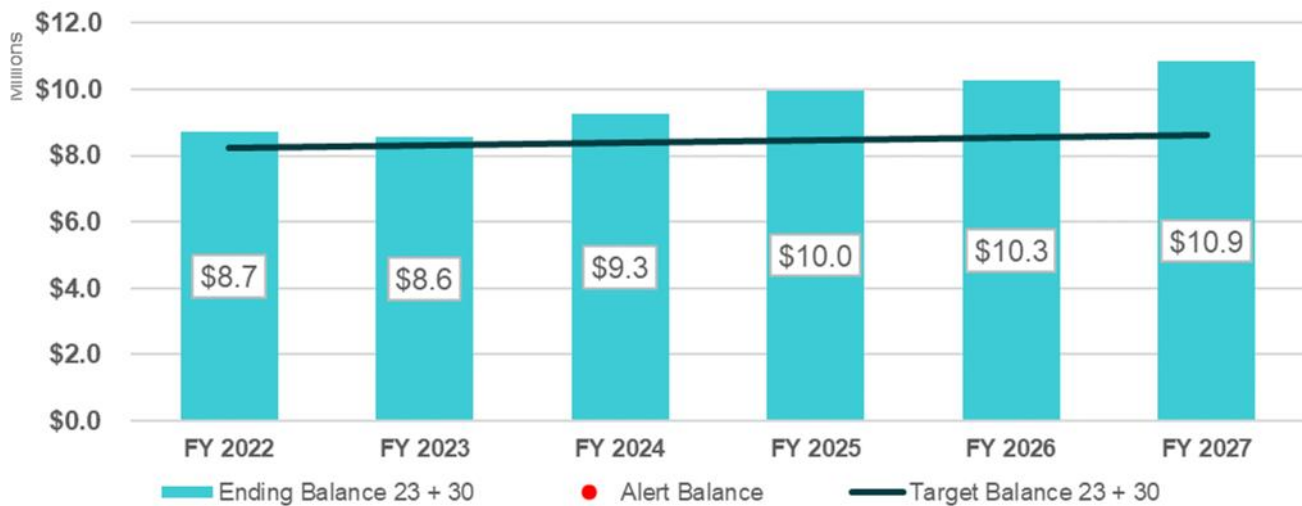
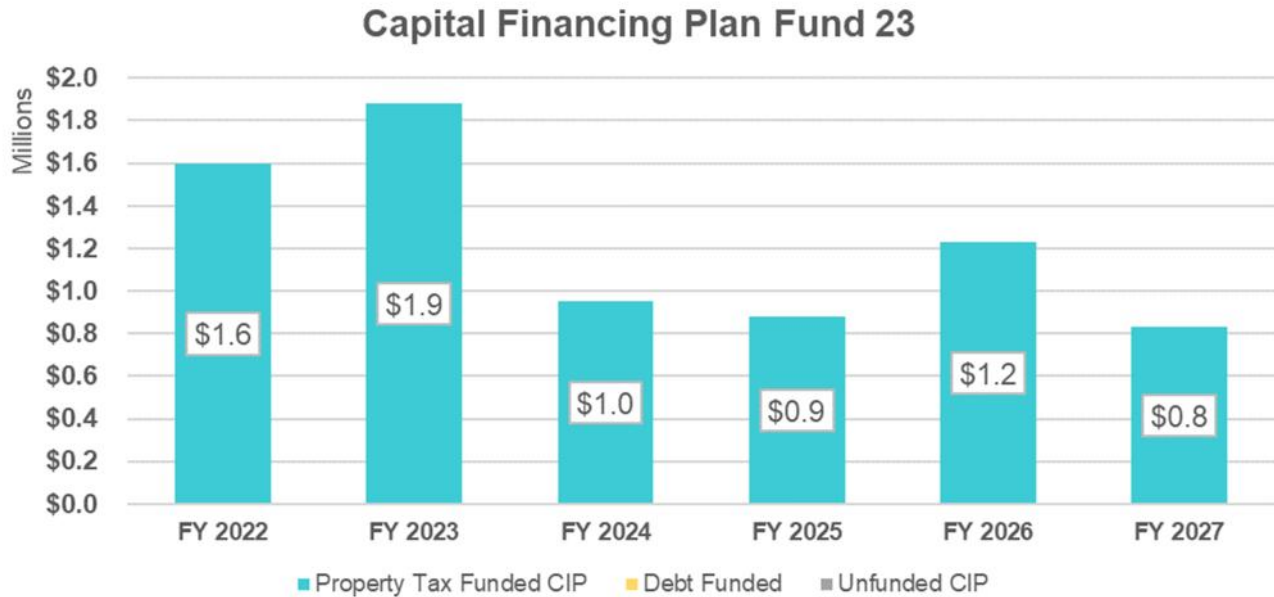


Figure 1-6 shows the five-year CIP expenditures from FY 2023 through 2027. All planned CIP expenses for the five-year period are anticipated to be entirely cash funded through non-rate revenues and are omitted from the revenues required from wastewater rates.

Figure 1-6: Wastewater Capital Financing Plan



## Proposed Water Rates

Table 1-6 and Table 1-7 show the proposed monthly service charges and water usage rates, respectively, for FY 2023 through FY 2027 based on the study recommendations. Rates for FY 2023 are determined based on the results of the COS analysis and include the proposed 2 percent rate adjustment. Rates for all subsequent years are determined based on the corresponding revenue adjustments in Table 1-4.

Raftelis recommends no changes to the water usage rate structure for any class. The justification for the rate structure remains the same as presented in the prior Rate Study (2015) and is reiterated below.

### Single Family Residential (SFR) Class

#### Tier 1: Efficient indoor use (4 kgal)

The State of California has targeted 55 gallons per person per day (gpcd) as an efficient indoor use goal. From 2010 US Census data, the average SFR household density in the service area is 2.31 persons. Taken together with the average monthly days of service (30) produces a value of approximately 4,000 gallons per month. In addition to being a measure of efficient indoor use, 4 kgal per month provides enough water to meet the District’s historical average winter water use, per household, for the SFR class.

#### Tier 2: Efficient summer use (total 8 kgal)

The District determined that a typical single-family lot within the service area demands approximately 500 gallons per irrigation cycle. The District recommends twice-weekly watering for eight total irrigation cycles per month. This produces 4 kgal ((500 X 8)/1,000) for efficient outdoor water use for an average single-family home.

### Tier 3: All use greater than Tier 2 (>8 kgal)

All usage greater than the sum of Tier 1 and 2 falls into the third and final tier.

## Multi-Family Residential (MFR)

The District will maintain the existing rate structure for MFR. In the prior study, and after a detailed analysis of MFR class usage, Raftelis determined that 80 percent of all MFR use falls within Tier 1. This suggested that a unique uniform commodity rate was most appropriate. Converting to a uniform rate helped to correct an inequity between user classes while achieving dual policy objectives of reducing use of Tier 1 priced water for irrigation and maintaining affordable water service for the class.

## Commercial

The District will maintain a unique uniform rate for Commercial customers reflecting its heterogeneous water demand patterns within the class.

## Irrigation

The District will maintain the existing Maximum Allowable Water Allocation (MAWA) water budget allocation for Irrigation users with no changes to the tier definitions. The water budget is calculated for each metered connection based on the landscaped meter service area of the property. Tier 1 allots enough water for the efficient level of irrigation, normalized by area. Tiers 2 and 3 represent increasing levels of inefficient irrigation practices.

## Recycled Water Rates

The District will maintain the Recycled water commodity rate at 58 percent of the commercial rate.

**Table 1-6: Proposed Monthly Water Service Charges**

Line	A	C	D	E	F	G	H
	Fiscal Year	2022	2023	2024	2025	2026	2027
	Effective Date		April 1, 2022	April 1, 2023	April 1, 2024	April 1, 2025	April 1, 2026
	Meter Size	Current	Proposed	Proposed	Proposed	Proposed	Proposed
1	5/8"	\$15.05	\$15.25	\$15.56	\$15.88	\$16.20	\$16.53
2	3/4"	\$15.05	\$15.25	\$15.56	\$15.88	\$16.20	\$16.53
3	1"	\$22.79	\$23.23	\$23.70	\$24.18	\$24.67	\$25.17
4	1 1/2"	\$42.16	\$43.17	\$44.04	\$44.93	\$45.83	\$46.75
5	2"	\$65.39	\$67.10	\$68.45	\$69.82	\$71.22	\$72.65
6	3"	\$138.95	\$142.88	\$145.74	\$148.66	\$151.64	\$154.68
7	4"	\$247.39	\$254.56	\$259.66	\$264.86	\$270.16	\$275.57
8	6"	\$545.52	\$561.66	\$572.90	\$584.36	\$596.05	\$607.98
9	8"	\$932.72	\$960.50	\$979.71	\$999.31	\$1,019.30	\$1,039.69
10	MFR Dwelling	\$15.05	\$15.25	\$15.56	\$15.88	\$16.20	\$16.53

**Table 1-7: Proposed Monthly Water Usage Rates (\$/kgal)**

	A	C	D	E	F	G	H
	Fiscal Year	2022	2023	2024	2025	2026	2027
	Effective Date		April 1, 2022	April 1, 2023	April 1, 2024	April 1, 2025	April 1, 2026
Line	Class	Current	Proposed	Proposed	Proposed	Proposed	Proposed
<b>SFR</b>							
1	Tier 1 - First 4,000 Gal.	\$0.99	\$0.95	\$0.97	\$0.99	\$1.01	\$1.04
2	Tier 2 - Next 4,000 Gal.	\$2.32	\$1.96	\$2.00	\$2.04	\$2.09	\$2.14
3	Tier 3 - Above 8,000 Gal.	\$5.06	\$4.83	\$4.93	\$5.03	\$5.14	\$5.25
4	<b>MFR</b>	\$2.36	\$2.40	\$2.45	\$2.50	\$2.55	\$2.61
5	<b>Commercial</b>	\$3.13	\$3.24	\$3.31	\$3.38	\$3.45	\$3.52
<b>Irrigation</b>							
6	Tier 1 - 100% of MAWA	\$2.77	\$3.61	\$3.69	\$3.77	\$3.85	\$3.93
7	Tier 2 - 100% to 200%	\$6.19	\$6.28	\$6.41	\$6.54	\$6.68	\$6.82
8	Tier 3 - Above 200%	\$9.15	\$8.51	\$8.69	\$8.87	\$9.05	\$9.24
9	<b>Recycled</b>	\$1.83	\$1.88	\$1.92	\$1.96	\$2.00	\$2.04

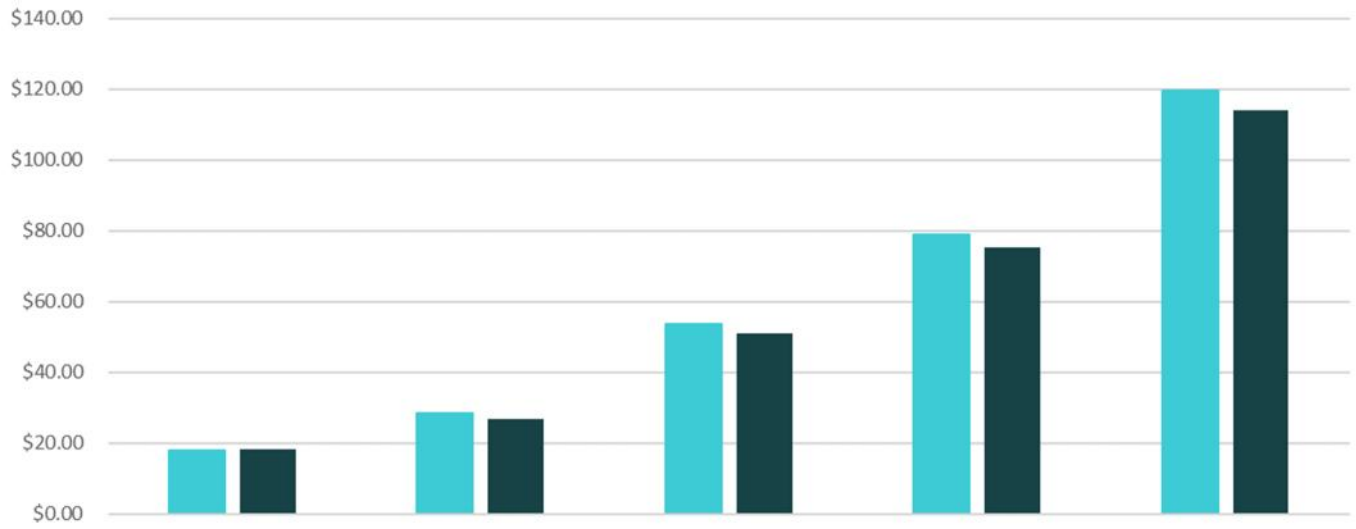
## Water Bill Customer Impacts

Figure 1-7, Figure 1-8, and Figure 1-9 show the monthly bill impacts at various levels of use for typical Single Family Residential customers, commercial customers, and irrigation customers, respectively. The average Single Family Residential customer (with a 1.5" meter and using 13,000 gallons per month) will have a decrease of \$2.55 in their monthly bill.



**Figure 1-7: Single Family Bill Impacts**

Single Family Monthly Bill Impacts, 5/8" Meter



(\$20.00)

	Very Low 3 kgal	Low 8 kgal	Average 13 kgal	High 18 kgal	Very High 26 kgal
■ Current	\$18.02	\$28.29	\$53.59	\$78.89	\$119.37
■ Proposed	\$18.10	\$26.89	\$51.04	\$75.19	\$113.83
Difference (\$)	\$0.08	(\$1.40)	(\$2.55)	(\$3.70)	(\$5.54)
Difference (%)	0.4%	-4.9%	-4.8%	-4.7%	-4.6%

At the proposed rates, the average commercial customer with a 1” meter using an average of 16 kgal per month will see an increase in their monthly bill of \$2.20.

**Figure 1-8: Commercial Bill Impacts**

Commercial Monthly Bill Impacts, 1" Meter



Irrigation customers do not pay a base fixed charge by meter size. At proposed rates, Tier 1 Irrigation water users will experience the largest percentage increase to their bill in percentage terms. This impact reflects the changing demand patterns within the Irrigation class and the extra-capacity costs allocated to the Irrigation class relative to all other classes.

**Figure 1-9: Irrigation Bill Impacts**

Irrigation Monthly Bill Impacts



## Proposed Wastewater Rates

Table 1-8 presents the proposed wastewater rate schedule. Residential customers would continue to pay a single fixed monthly charge per equivalent residential unit (ERU). After much discussion with District staff and the Board Ad Hoc Committee, Raftelis proposes changing non-residential customers to a rate structure that includes a fixed charge based on meter size as well as a volume charge based on average winter consumption (AWC), which represents the peak period sewer system utilization for all wastewater user classes.

**Table 1-8: Proposed Wastewater Rates**

Line	A	B	C	D	E	F	G	H
		2022		2023	2024	2025	2026	2027
	Effective Date	N/A	N/A	April 1, 2022	April 1, 2023	April 1, 2024	April 1, 2025	April 1, 2026
	Proposed Wastewater Rates	Current	COS	Proposed	Proposed	Proposed	Proposed	Proposed
1	Residential	\$21.15	\$20.15	\$20.56	\$20.98	\$21.40	\$21.83	\$22.27
	Non-Residential							
2	5/8	Fixture	\$13.98	\$14.26	\$14.55	\$14.85	\$15.15	\$15.46
3	3/4	Fixture	\$13.98	\$14.26	\$14.55	\$14.85	\$15.15	\$15.46
4	1	Fixture	\$34.38	\$35.07	\$35.78	\$36.50	\$37.23	\$37.98
5	1 1/2	Fixture	\$65.53	\$66.85	\$68.19	\$69.56	\$70.96	\$72.38
6	2	Fixture	\$121.57	\$124.01	\$126.50	\$129.03	\$131.62	\$134.26
7	3	Fixture	\$253.55	\$258.63	\$263.81	\$269.09	\$274.48	\$279.97
8	4	Fixture	\$513.51	\$523.79	\$534.27	\$544.96	\$555.86	\$566.98
9	6	Fixture	\$513.51	\$523.79	\$534.27	\$544.96	\$555.86	\$566.98
10	8	Fixture	\$513.51	\$523.79	\$534.27	\$544.96	\$555.86	\$566.98
11	Volume Rate	N/A	\$4.03	\$4.12	\$4.21	\$4.30	\$4.39	\$4.48

# 2 General Assumptions

## Inflation

The Study Period for financial planning and cash flow projection is from Fiscal Year (FY) 2021 to 2031 (10 years) with proposed revenue adjustments and rates presented for the five years FY 2023-2027. Various types of assumptions and inputs are incorporated into the Study based on discussions with and/or direction from District staff. These include the projected number of accounts and annual changes in water consumption for different customer classes and inflation factors, among others. These cost escalation factors show projected O&M increases across the Study Period for both utilities. Raftelis worked with District staff to escalate individual budget line items according to appropriate escalation factors, which results in the below aggregate escalation factors.

In addition, and to predict non-operating revenues, the study assumes that revenues classified as Other Revenues will increase at 2 percent and that Property Tax Assessments will increase at 1.5 percent per year. The interest rate on the utilities' reserves is assumed to be 1.5 percent.

**Table 2-1: Inflation Assumptions**

	A	B	C	D	E	F
Line	Inflation Category	2022	2023	2024	2025	2026
1	Energy	5.0%	5.0%	5.0%	5.0%	5.0%
2	Non-inflated	0.0%	0.0%	0.0%	0.0%	0.0%
3	General Inflation	3.0%	3.0%	3.0%	3.0%	3.0%
4	Salary	3.0%	3.0%	3.0%	3.0%	3.0%
5	Benefits	8.0%	8.0%	8.0%	8.0%	8.0%
6	Other Operating Revenues	2.0%	2.0%	2.0%	2.0%	2.0%
7	Interest	1.5%	1.5%	1.5%	1.5%	1.5%
8	Property Tax Growth	1.5%	1.5%	1.5%	1.5%	1.5%
9	Capital	3.0%	3.0%	3.0%	3.0%	3.0%

## Projected Demand and Growth

To estimate future water and wastewater usage, two primary factors are used – account growth and water demand relative to FY 2021, our baseline year within the model. Raftelis assumes a 16 percent reduction in water sales in FY 2022, consistent with the District’s budgeting. This reduction is maintained through the rate setting period to be conservative about continued drought and the potential of state-mandated conservation. Raftelis assumes future account (new connection) growth at 0.23% percent per year through the study period, as is forecasted in the District’s recently completed 2020 Urban Water Management Plan (UWMP).

# 3 Reserve Policy

Financial reserves provide a basis for the District to cope with fiscal emergencies such as revenue shortfalls, asset failure, and natural disasters, among others. The District’s Reserve Policy provides guidelines for sound financial management through the establishment of reserve funds with an overall long-range perspective to maintain financial solvency and mitigate financial risks associated with revenue instability, volatile capital costs, and emergencies.

Table 3-1 and Table 3-2 detail the reserve type, existing policy, and target level in FY 2022 for the water and wastewater utility funds. The Water Operating Fund policy is an Operating reserve equal to 50 percent, or six months, of annual O&M expenses. This reserve provides for cash flow in case of revenue shortfall and to provide working capital requirements.

The adopted Capital R&R reserve is equal to 4% of existing water system asset value level. A capital reserve considers long term capital improvement projects (CIP) expenditures, projects to be debt financed versus rate or property tax funded, and system age, among other factors.

The adopted Emergency reserve is \$1 million. The Emergency reserve is intended to provide funds in the event of critical asset failure. An appropriate emergency reserve considers the replacement cost of an essential facility, the time necessary to bring a facility back online, and historical information on the frequency of line breaks or other unanticipated repairs, or impacts of natural disasters, among other factors.

**Table 3-1: Water Utility Reserve Targets**

Line	Reserve	Recommended Policy	2022 Target
1	Operating	50% of Operating Budget	\$2,228,064
2	Emergency	Critical Asset	\$1,000,000
3	Capital R&R	4% of System Value	\$4,768,298
4	Total Water Utility		\$7,996,362

**Table 3-2: Wastewater Utility Reserve Targets**

Line	Reserve	Recommended Policy	2022 Target
1	Operating	50% of Operating Budget	\$1,833,107
2	Emergency	Critical Asset	\$1,000,000
3	Capital R&R	4% of System Value	\$5,401,535
4	Total Wastewater Utility		\$8,234,643

# 4 Administrative Costs and Property Tax Allocation

The District has an Administrative Fund (Fund 10) that incurs general, indirect costs that are unallocated between the water and wastewater utilities. As part of this study, and to adequately account for all expenses incurred by the enterprise funds, Raftelis worked with staff to properly allocate indirect costs to the respective funds. A total of \$3,090,639 in FY 2021 was distributed to the Water Operating Fund (Fund 20), Wastewater Operating Fund (Fund 30), Water Capital Replacement Fund (Fund 22), and Wastewater Capital Replacement Fund (Fund 23).

Costs within Fund 10 are allocated based upon the weighted average of Fund 10 cost allocations over the previous four years. The resulting allocation percentages are shown in Table 4-1.

**Table 4-1: Fund 10 Administration Allocations**

Line	Fund	Fund 10 Allocation
1	Fund 20	34.1%
2	Fund 22	24.3%
3	Fund 30	17.3%
4	Fund 32	24.3%

## Allocation of Property Tax Revenue to Respective Funds

The District receives property tax assessment revenues from parcels within its service area. Historically property tax revenues have been designated for capital R&R projects for District Funds 22 (Water Capital R&R) and 23 (Wastewater Capital R&R). At the direction of District staff, 60 percent of property tax revenues are distributed to the water utility and 40 percent to the wastewater utility. This allocation is similar to the 2015 Study allocation of 59.6 percent to water and 34.2 percent to wastewater.<sup>2</sup> For the water utility, the District will utilize \$1,000,000 of the allocated property tax revenues in order to partially offset operations expenses; the District will use \$900,000 of the allocation for wastewater operations expenses.

**Table 4-2: Property Tax Allocation**

Line	A Property Tax Allocation	B District-Wide Property Tax Received	C % Allocation	D \$ Allocated
1	Water	\$8,160,000	60%	\$4,896,000
2	Wastewater		40%	\$3,264,000

<sup>2</sup> In the prior rate study, 6.1 percent was allocated to the Administration Replacement Fund and 0.1 percent to the New Enterprise Fund.

# 5 Water Utility

This section describes the water utility, the District’s customer account and water use data, and corresponding financial plan.

## Water Revenue Requirements

A review of a utility’s revenue requirements is a key first step in the rate study process. The review involves an analysis of annual operating revenues under the status quo (i.e., no revenue increases), O&M expenses, transfers between funds, capital expenditures, and reserve requirements. This section of the report provides a discussion of the projected revenues, O&M expenses, other reserve funding and revenue adjustments necessary to ensure the fiscal sustainability and solvency of the water utility.

### Revenues from Current Rates

The current rates, last updated on April 1, 2020, were originally developed in the 2015 Rate Study. The District’s water service charges have two components – a fixed component (monthly base service charge) and a volumetric component (water use rates). The monthly base service charge increases with meter size as larger meter sizes generally consume more water on average and tend to have higher rates of peaking; therefore, the costs to provide service to these customers is higher. A typical single-family home with a 5/8” or 3/4” meter has a monthly base charge of \$15.05. Accounts with service designated as multi-family residential (MFR) are charged per dwelling unit, irrespective of the size of meter serving the property. Current base service charges are shown in Table 5-1.

**Table 5-1: Current Base Service Charges**

	A	B
Line	Meter Size	Current Charges
1	5/8"	\$15.05
2	3/4"	\$15.05
3	1"	\$22.79
4	1 1/2"	\$42.16
5	2"	\$65.39
6	3"	\$138.95
7	4"	\$247.39
8	6"	\$545.52
9	8"	\$932.72
10	MFR Dwelling	\$15.05

The volumetric component of a customer’s water charge is the number of units consumed (measured in one thousand gallon increments, or “kgal”) multiplied by rates that vary by customer class and tier. The current rate classes, tiers, and rates are shown in Table 5-2.



**Table 5-2: Current Water Usage Rates (\$ / kgal)**

	A	B
Line	Class	Current Charges
<b>SFR</b>		
1	Tier 1 - First 4,000 Gal.	\$0.99
2	Tier 2 - Next 4,000 Gal.	\$2.32
3	Tier 3 - Above 8,000 Gal.	\$5.06
4	<b>MFR</b>	\$2.36
5	<b>Commercial</b>	\$3.13
<b>Irrigation</b>		
6	Tier 1 - 100% of MAWA	\$2.77
7	Tier 2 - 100% to 200% of MAWA	\$6.19
8	Tier 3 - Above 200% of MAWA	\$9.15
9	<b>Recycled</b>	\$1.83

Table 5-3 shows actual and projected water connections by meter size and projected water sales. Recall, MFR counts represent the total number of dwelling units. Projected accounts are forecasted with .23% annual connection growth. The table also shows forecasted water demand by class and tier. Water demand for the SFR, MFR, and commercial classes is forecasted at the same rate as account growth.

**Table 5-3: Water Accounts and Water Use**

Line	A Demand Forecast	B 2022	C 2023	D 2024	E 2025	F 2026	G 2027
<b>Meter Size</b>							
1	5/8"	16	16	16	16	16	16
2	3/4"	1,897	1,902	1,906	1,910	1,915	1,919
3	1"	425	426	427	428	429	430
4	1 1/2"	63	63	63	63	63	63
5	2"	70	70	70	70	70	70
6	3"	11	11	11	11	11	11
7	4"	8	8	8	8	8	8
8	6"	4	4	4	4	4	4
9	8"	-	-	-	-	-	-
10	MFR	6,909	6,925	6,941	6,957	6,973	6,989
<b>Demand Forecast</b>							
<b>SFR</b>							
11	Tier 1	47,746	47,855	47,965	48,076	48,186	48,297
12	Tier 2	19,539	19,584	19,629	19,674	19,719	19,765
13	Tier 3	57,282	57,414	57,546	57,678	57,811	57,944
14	Multi Family	211,006	211,492	211,978	212,466	212,954	#####
15	Commercial	87,354	87,555	87,756	87,958	88,160	88,363
<b>Irrigation</b>							
16	Within Budget	52,115	52,115	52,115	52,115	52,115	52,115
17	100%-200% of Budget	14,225	14,225	14,225	14,225	14,225	14,225
18	>200% of Budget	1,198	1,198	1,198	1,198	1,198	1,198
19	Recycled Water	67,201	67,201	67,201	67,201	67,201	67,201

Table 5-4 shows the water base charge revenue generated by each meter size (and MFR accounts) at existing (current) rates; as well as revenue generated from the volumetric water use charges by class and tier at current rates. Revenue is calculated by multiplying the projected demand in each year (Table 5-3) by the respective rates from Table 5-1 and Table 5-2. Note, revenues for FY 2022 and beyond use FY 2021 rates (existing rates).

**Table 5-4: Water Revenue at Existing Rates**

	A	B	C	D	E	F	G
Line	Demand Forecast	2022	2023	2024	2025	2026	2027
	<b>Meter Size</b>						
1	5/8"	\$2,890	\$2,896	\$2,903	\$2,910	\$2,916	\$2,923
2	3/4"	\$342,628	\$343,416	\$344,206	\$344,998	\$345,791	\$346,587
3	1"	\$116,252	\$116,519	\$116,787	\$117,056	\$117,325	\$117,595
4	1 1/2"	\$31,620	\$31,693	\$31,766	\$31,839	\$31,912	\$31,985
5	2"	\$54,535	\$54,661	\$54,786	\$54,912	\$55,039	\$55,165
6	3"	\$18,341	\$18,384	\$18,426	\$18,468	\$18,511	\$18,553
7	4"	\$24,492	\$24,548	\$24,604	\$24,661	\$24,718	\$24,775
8	6"	\$26,185	\$26,245	\$26,306	\$26,366	\$26,427	\$26,487
9	8"	\$0	\$0	\$0	\$0	\$0	\$0
10	MFR	\$1,247,765	\$1,250,635	\$1,253,512	\$1,256,395	\$1,259,285	\$1,262,181
	<b>SFR</b>						
11	Tier 1	\$47,268	\$47,377	\$47,486	\$47,595	\$47,704	\$47,814
12	Tier 2	\$45,330	\$45,434	\$45,539	\$45,644	\$45,749	\$45,854
13	Tier 3	\$289,848	\$290,515	\$291,183	\$291,853	\$292,524	\$293,197
14	<b>Multi Family</b>	\$497,975	\$499,120	\$500,268	\$501,419	\$502,572	\$503,728
15	<b>Commercial</b>	\$273,418	\$274,047	\$274,677	\$275,309	\$275,942	\$276,576
	<b>Irrigation</b>						
16	Within Budget	\$144,359	\$144,359	\$144,359	\$144,359	\$144,359	\$144,359
17	100%-200% of Budget	\$88,051	\$88,051	\$88,051	\$88,051	\$88,051	\$88,051
18	>200% of Budget	\$10,965	\$10,965	\$10,965	\$10,965	\$10,965	\$10,965
19	<b>Recycled Water</b>	\$122,977	\$122,977	\$122,977	\$122,977	\$122,977	\$122,977
20	<b>Total Revenue</b>	<b>\$3,384,900</b>	<b>\$3,391,843</b>	<b>\$3,398,801</b>	<b>\$3,405,776</b>	<b>\$3,412,767</b>	<b>\$3,419,773</b>

The above rates, meter counts, and sales figures result in the following projected rate revenues. The estimated rate revenues in FY 2023 are \$3,391,843. This amount becomes our revenue requirement for the cost of service analysis in Section 6. The utility’s projected rate revenues for the Study period are summarized in Table 5-5.

**Table 5-5: Water Revenue Summary**

	A	B	C	D	E	F	G
Line	Demand Forecast	2022	2023	2024	2025	2026	2027
1	Base Charge Revenue	\$1,864,708	\$1,868,997	\$1,873,296	\$1,877,604	\$1,881,923	\$1,886,251
2	Water Use Revenue	\$1,520,192	\$1,522,846	\$1,525,505	\$1,528,171	\$1,530,844	\$1,533,522
3	<b>Total Revenue</b>	<b>\$3,384,900</b>	<b>\$3,391,843</b>	<b>\$3,398,801</b>	<b>\$3,405,776</b>	<b>\$3,412,767</b>	<b>\$3,419,773</b>

The utility also derives some non-operating revenues as well. These revenues include interest income, property taxes, late fees, laboratory fees, permit fees, and other miscellaneous items. Table 5-6 includes non-rate revenues from Funds 20 and 22.

**Table 5-6: Other Water Revenues**

	A	B	C	D	E	F	G
Line	Other Revenues	2022	2023	2024	2025	2026	2027
1	Other Operating	\$82,061	\$82,061	\$82,061	\$82,061	\$82,061	\$82,061
2	Interest Income	\$161,122	\$153,580	\$145,627	\$134,685	\$131,284	\$144,566
3	Property Tax Transfer	\$4,896,000	\$4,969,440	\$5,043,982	\$5,119,641	\$5,196,436	\$5,274,382
4	<b>Total</b>	<b>\$5,139,182</b>	<b>\$5,205,081</b>	<b>\$5,271,669</b>	<b>\$5,336,387</b>	<b>\$5,409,781</b>	<b>\$5,501,009</b>

### Operating Expenses

Total Projected O&M expenses are shown in Table 5-7. These expenses are summarized by department. This table shows expenses for the water operating fund (Fund 20), as well as expenses for the capital repair and replacement fund (Fund 22). Both fund expenses are inclusive of administrative expenses (Fund 10) previously allocated in Section 4.

**Table 5-7: Projected Operating Expenses**

	A	B	C	D	E	F	G
Line	Operating Expenses	2022	2023	2024	2025	2026	2027
<b>Fund 20</b>							
1	Administration	\$290,589	\$299,306	\$308,286	\$317,534	\$327,060	\$336,872
2	Laboratory	\$192,327	\$200,535	\$209,184	\$218,303	\$227,923	\$238,077
3	Operations Admin	\$137,824	\$143,661	\$149,809	\$156,289	\$163,122	\$170,332
4	Maintenance Admin	\$491,425	\$515,331	\$540,687	\$567,595	\$596,165	\$626,516
5	Engineering Water	\$355,519	\$371,155	\$387,657	\$405,083	\$423,497	\$442,963
6	Groundwater	\$878,168	\$913,552	\$950,721	\$989,786	\$1,030,866	\$1,074,090
7	Surface Water	\$130,891	\$134,899	\$139,033	\$143,299	\$147,700	\$152,241
8	Maintenance Water	\$356,085	\$372,412	\$389,680	\$407,954	\$427,303	\$447,801
9	Mechanical Maintenance Water	\$407,196	\$423,839	\$441,336	\$459,741	\$479,110	\$499,507
10	Fund 10	\$1,216,104	\$1,252,587	\$1,290,165	\$1,328,870	\$1,368,736	\$1,409,798
11	<b>Total</b>	<b>\$4,456,128</b>	<b>\$4,627,277</b>	<b>\$4,806,558</b>	<b>\$4,994,454</b>	<b>\$5,191,482</b>	<b>\$5,398,197</b>
<b>Fund 22</b>							
12	Departmental	\$143,840	\$148,155	\$152,599	\$157,177	\$161,893	\$166,749
13	Operations Admin	\$40,330	\$42,233	\$44,248	\$46,383	\$48,648	\$51,049
14	Maintenance Admin	\$50,128	\$52,440	\$54,885	\$57,474	\$60,216	\$63,121
15	Engineering Water	\$239,781	\$250,590	\$262,013	\$274,090	\$286,868	\$300,393
16	Groundwater	\$44,141	\$46,199	\$48,377	\$50,683	\$53,127	\$55,719
17	Mechanical Maintenance Water	\$39,290	\$41,156	\$43,134	\$45,230	\$47,454	\$49,813
18	Fund 10	\$773,307	\$796,506	\$820,402	\$845,014	\$870,364	\$896,475
19	<b>Total</b>	<b>\$1,330,817</b>	<b>\$1,377,279</b>	<b>\$1,425,657</b>	<b>\$1,476,052</b>	<b>\$1,528,569</b>	<b>\$1,583,320</b>

### Projected Capital Improvements

The District has programmed approximately \$16 million in capital expenditures during the Study period (FY 2022-2027) for the water utility, as shown in Table 5-8. The CIP costs for future years is determined by using the budgeted costs and inflating the value by the capital cost inflation factor shown in Table 2-1. The District anticipates funding all capital improvements with non-rate derived property tax revenue. The presented schedule is not comprehensive or final; the District's needs are continuously reevaluated and may require the addition of new projects or that expected projects be temporarily postponed. Therefore, the financial plan includes a small amount of revenue above what is required to meet reserve policies in order to account for the possibility of additional capital spending.

**Table 5-8: Capital Improvement Schedule**

	A	B	C	D	E	F	G
Line	Capital Projects	2022	2023	2024	2025	2026	2027
1	Well 32	\$515,000	\$0	\$0	\$0	\$0	\$0
2	Water Distribution System Improvements	\$722,397	\$737,326	\$1,159,383	\$614,528	\$652,671	\$692,550
3	Center Street Monitoring Well	\$424,360	\$0	\$0	\$0	\$0	\$0
4	Tank Rehab T-1 (Lake Mary Storage Tank)	\$468,271	\$0	\$0	\$0	\$0	\$0
5	LMTP Upgrades	\$0	\$109,273	\$115,829	\$122,680	\$130,998	\$138,510
6	Water Tank Rehab	\$0	\$546,364	\$579,145	\$614,528	\$652,671	\$692,550
7	Replacement wells	\$0	\$2,076,181	\$0	\$2,336,556	\$0	\$0
8	Cost of Service Study	\$0	\$0	\$0	\$0	\$0	\$0
9	Zone 2B Storage	\$0	\$0	\$579,145	\$0	\$0	\$0
10	Dewatering PLC upgrade	\$83,223	\$0	\$0	\$0	\$0	\$0
11	Well 1 Rehab	\$154,500	\$0	\$0	\$0	\$0	\$0
12	Digester Mix Pump	\$41,466	\$0	\$0	\$0	\$0	\$0
13	ERP Upgrade	\$127,308	\$0	\$0	\$0	\$0	\$0
14	Expansion Wells	\$15,450	\$0	\$0	\$0	\$0	\$0
15	PLC upgrade	\$0	\$103,968	\$139,323	\$147,442	\$0	\$0
16	Construction crew trucks	\$48,925	\$61,002	\$97,253	\$19,696	\$28,982	\$29,851
17	Replacement - Engineering	\$18,025	\$0	\$0	\$0	\$0	\$0
18	Loader (CARB compliance)	\$128,750	\$0	\$0	\$0	\$0	\$0
19	Forklift	\$20,909	\$0	\$0	\$0	\$0	\$0
20	Tapping Tool	\$7,725	\$0	\$0	\$0	\$0	\$0
21	<b>Total</b>	<b>\$2,776,309</b>	<b>\$3,634,113</b>	<b>\$2,670,078</b>	<b>\$3,855,430</b>	<b>\$1,465,322</b>	<b>\$1,553,462</b>

**Status Quo Financial Plan (No Revenue Adjustments)**

The assumptions shown above are incorporated into the five-year Financial Plan. To develop the Financial Plan, Raftelis forecasts annual expenses and revenues, models reserve balances and transfers between funds, and incorporates capital expenditures and calculated debt service coverage ratios to estimate the amount of additional rate revenue required per year. Table 5-9 displays the proforma of the District’s water utility under current rates over the Study period. The proforma incorporates revenues and expenses from the Water Operating Fund (Fund 20) and Water Replacement Fund (Fund 22) to show the overall position of the utility. All projections shown in the table are based upon the District’s current rate structure and do not include rate adjustments. The proforma incorporates the water utility data presented in the preceding tables of this section.

Under the “status-quo” scenario, revenues generated from rates and other miscellaneous revenues are inadequate to achieve reserve targets over the Study period. While the utility’s operating revenue does cover operating expenses, it is not enough to maintain reserves at policy.

**Table 5-9: Status Quo Financial Plan**

	A	B	C	D	E	F	G
Line	Fund 20 Financial Plan	2022	2023	2024	2025	2026	2027
<b>Revenue</b>							
1	Water Rate Revenue	\$3,384,900	\$3,391,843	\$3,398,801	\$3,405,776	\$3,412,767	\$3,419,773
2	Revenue Adjustments	\$0	\$0	\$0	\$0	\$0	\$0
3	Other Operating	\$82,061	\$82,061	\$82,061	\$82,061	\$82,061	\$82,061
4	Interest Income	\$161,122	\$153,071	\$143,572	\$130,006	\$125,136	\$144,566
5	Property Tax	\$4,896,000	\$4,969,440	\$5,043,982	\$5,119,641	\$5,196,436	\$5,274,382
6	<b>Total Revenue</b>	<b>\$8,524,082</b>	<b>\$8,596,415</b>	<b>\$8,668,415</b>	<b>\$8,737,484</b>	<b>\$8,816,399</b>	<b>\$8,920,783</b>
<b>Expenses</b>							
7	Fund 20 O&M	\$4,456,128	\$4,627,277	\$4,806,558	\$4,994,454	\$5,191,482	\$5,398,197
8	Fund 22 O&M	\$1,330,817	\$1,377,279	\$1,425,657	\$1,476,052	\$1,528,569	\$1,583,320
9	CIP	\$2,776,309	\$3,634,113	\$2,670,078	\$3,855,430	\$1,465,322	\$1,553,462
10	<b>Total Expenses</b>	<b>\$8,563,255</b>	<b>\$9,638,669</b>	<b>\$8,902,293</b>	<b>\$10,325,936</b>	<b>\$8,185,373</b>	<b>\$8,534,979</b>
11	Net Cash Flow	(\$39,172)	(\$1,042,254)	(\$233,878)	(\$1,588,452)	\$631,026	\$385,803
12	Beginning Fund Balance	\$10,841,596	\$10,802,423	\$9,760,169	\$9,526,291	\$7,937,839	\$8,568,864
13	Ending Fund Balance	\$10,802,423	\$9,760,169	\$9,526,291	\$7,937,839	\$8,568,864	\$8,954,668
14	Target	\$7,996,362	\$8,081,936	\$8,171,577	\$8,265,525	\$8,364,039	\$8,467,397

**Proposed Water Financial Plan**

Raftelis proposes that the District adopt 2 percent rate increases in FY 2023 through FY 2027. All increases are proposed for the beginning of each fiscal year on April 1. Revenue adjustments represent the average increase in rates for the utility as a whole. Actual percent increases (or decreases) in rates are dependent upon the cost of service analysis and are unique to each customer class, tier, and meter size.

Table 5-10 shows the Financial Plan selected by the District Board. The proposed revenue adjustments help to ensure adequate revenue to fund operating expenses and achieve reserve policy targets. The rates presented in Section 7 are based on the proposed Financial Plan.

**Table 5-10: Proposed Water Revenue Adjustments**

	A	B	C	D	E	F
Line	Revenue Adjustment	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027
1	Effective Date	April 1, 2022	April 1, 2023	April 1, 2024	April 1, 2025	April 1, 2026
2	Percent Adjustment	2%	2%	2%	2%	2%

Table 5-11 shows the proforma for the water utility (Funds 20 and 22) with additional revenues from the revenue adjustments in the proposed financial plan. These revenue adjustments allow the utility to fund all operating expenses and achieve reserve targets during the Study Period.

**Table 5-11: Proposed Financial Plan**

Line	A Fund 20 Financial Plan	B 2022	C 2023	D 2024	E 2025	F 2026	G 2027
<b>Revenue</b>							
1	Water Rate Revenue	\$3,384,900	\$3,391,843	\$3,398,801	\$3,405,776	\$3,412,767	\$3,419,773
2	Revenue Adjustments	\$0	\$67,837	\$137,312	\$208,461	\$281,322	\$355,933
3	Other Operating	\$82,061	\$82,061	\$82,061	\$82,061	\$82,061	\$82,061
4	Interest Income	\$161,122	\$153,580	\$145,627	\$134,685	\$131,284	\$144,566
5	Property Tax	\$4,896,000	\$4,969,440	\$5,043,982	\$5,119,641	\$5,196,436	\$5,274,382
6	<b>Total Revenue</b>	<b>\$8,524,082</b>	<b>\$8,664,760</b>	<b>\$8,807,782</b>	<b>\$8,950,624</b>	<b>\$9,103,869</b>	<b>\$9,276,715</b>
<b>Expenses</b>							
7	Fund 20 O&M	\$4,456,128	\$4,627,277	\$4,806,558	\$4,994,454	\$5,191,482	\$5,398,197
8	Fund 22 O&M	\$1,330,817	\$1,377,279	\$1,425,657	\$1,476,052	\$1,528,569	\$1,583,320
9	CIP	\$2,776,309	\$3,634,113	\$2,670,078	\$3,855,430	\$1,465,322	\$1,553,462
10	<b>Total Expenses</b>	<b>\$8,563,255</b>	<b>\$9,638,669</b>	<b>\$8,902,293</b>	<b>\$10,325,936</b>	<b>\$8,185,373</b>	<b>\$8,534,979</b>
11	Net Cash Flow	(\$39,172)	(\$973,909)	(\$94,512)	(\$1,375,312)	\$918,496	\$741,736
12	Beginning Fund Balance	\$10,841,596	\$10,802,423	\$9,828,515	\$9,734,003	\$8,358,691	\$9,277,187
13	Ending Fund Balance	\$10,802,423	\$9,828,515	\$9,734,003	\$8,358,691	\$9,277,187	\$10,018,923
14	Target	\$7,996,362	\$8,081,936	\$8,171,577	\$8,265,525	\$8,364,039	\$8,467,397

Figure 5-1 graphically illustrates the Operating Financial Plan. It compares existing and proposed revenues with projected expenses. The expenses represent O&M expenses (light blue stacked bars) and reserve funding (shown by yellow stacked bars). Total revenues at existing and proposed rates are shown by the horizontal gray and dotted blue lines, respectively. Current revenue from existing rates, in gray, does not meet future total expenses (inclusive of reserve funding) and shows the need for revenue adjustments.



Figure 5-1: Proposed Operating Financial Plan

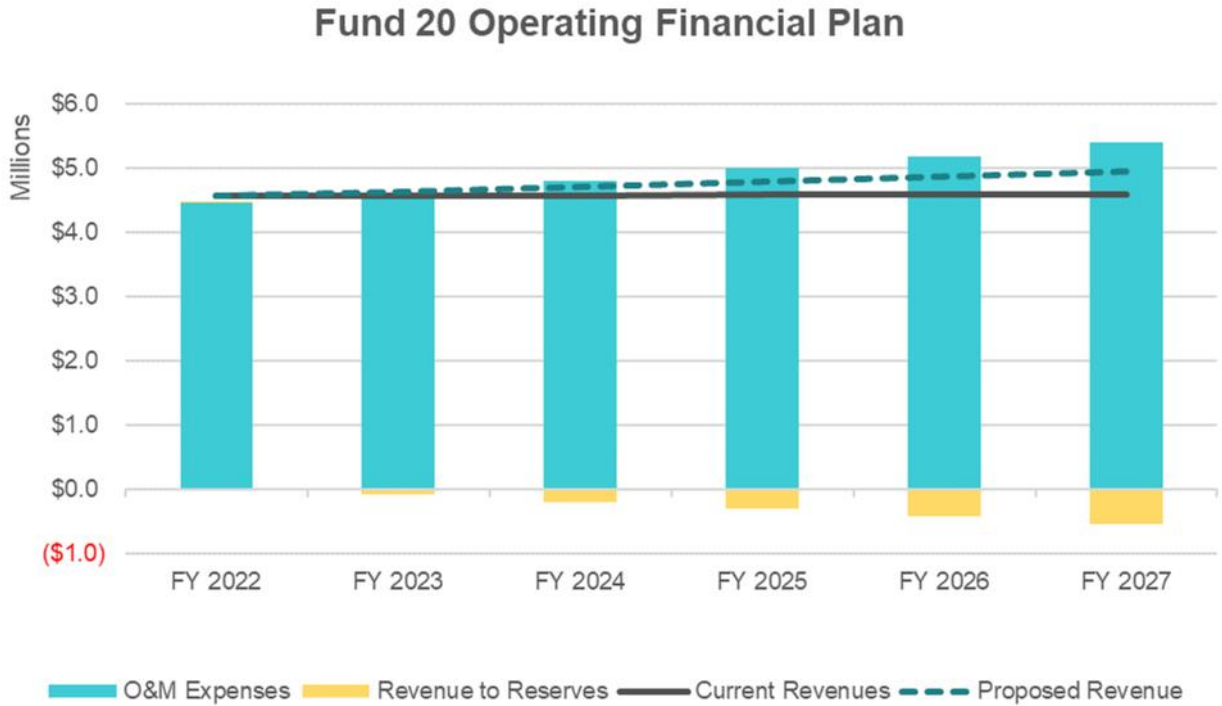
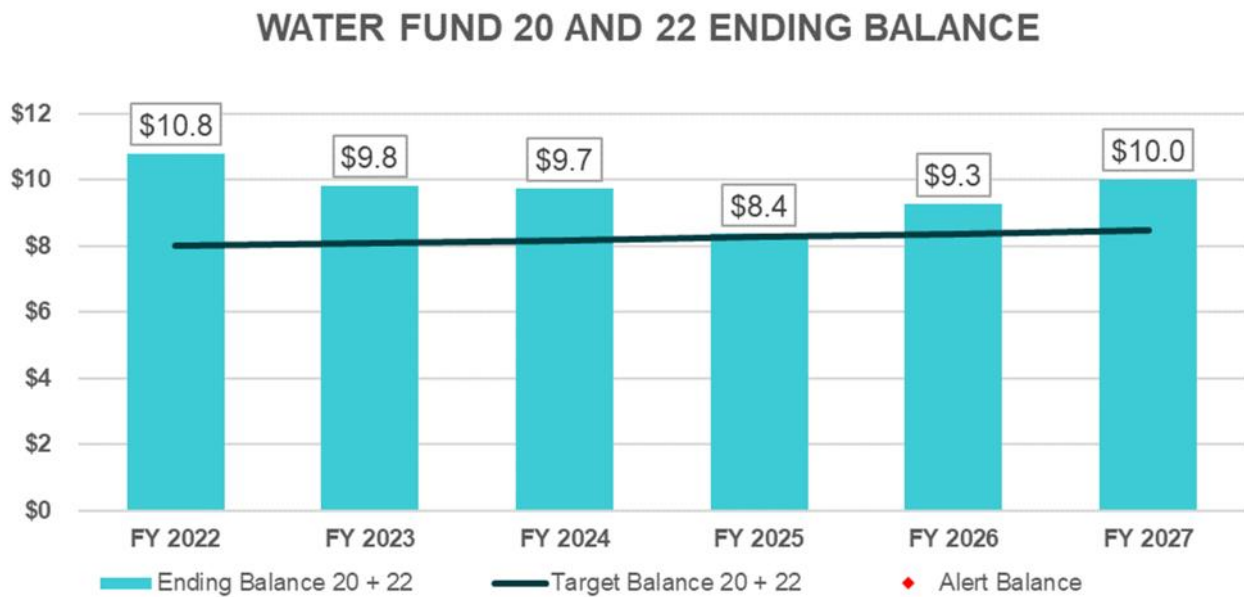


Figure 5-2 shows the water utility’s ending balance by fiscal year. The blue bars indicate the ending balance while the dark line indicates the target balance. A red dot indicates when the utility’s ending balance (blue bar) is below the target balance (dark line).

Figure 5-2: Proposed Water Utility Ending Fund Balances



# 6 Water Cost of Service Analysis

The principles and methodology of a cost of service analysis are described in Section 1. A cost-of-service analysis distributes a utility's revenue requirements (costs) to each customer class. After determining a utility's revenue requirement, the next step in a cost of service analysis is to functionalize its O&M costs. The **functions** include:

1. Pumping
2. Treatment
3. Transmission
4. Distribution
5. Meter service
6. Customer billing and collection
7. General and administrative
8. Conservation

The functionalization of costs allows us to better allocate the costs to the **cost causation components** (plainly, cost components). The cost components include, but are not limited to:

1. Delivery (average demand) costs
2. Peaking costs (maximum day and maximum hour)
3. Meter service
4. Billing and customer service
5. Fire protection
6. Conservation
7. General and administrative costs

Peaking costs are further divided into maximum day and maximum hour demand. The maximum day demand is the maximum amount of water used in a single day in a year. The maximum hour demand is the maximum usage in an hour on the maximum usage day. Different facilities, such as distribution and storage facilities, and the O&M costs associated with those facilities, are designed to meet the peaking demands of customers. Therefore, extra capacity<sup>3</sup> costs include the O&M costs associated with meeting peak customer demand. This method is consistent with the AWWA M1 Manual and is widely used in the water industry to perform cost of service analyses.

## Functionalization of O&M Expenses

Table 6-1 shows the functionalization of the District's O&M expenses for the test year (FY 2023), developed in close consultation with District Staff. Functionalizing O&M expenses allows Raffelis to follow the principles of rate setting theory in which the end goal is to allocate the District's O&M expenses to cost causation components. We note that the functionalized expenses shown in Table 6-1 match with the FY 2023 Fund 20 O&M expenses shown in Table 5-7.

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<sup>3</sup> The terms *extra capacity*, *peaking* and *capacity costs* are used interchangeably.

**Table 6-1: Functionalization of O&M Expenses**

	A	B	C
Line	Function	Expenses \$	Expenses %
1	Pumping	\$ 315,724	6.8%
2	Treatment	\$ 1,448,593	31.3%
3	Distribution	\$ 743,566	16.1%
4	Meters	\$ 423,839	9.2%
5	Customer+General	\$ 462,639	10.0%
6	Conservation	\$ 135,265	2.9%
7	Conservation+General	\$ 503,997	10.9%
8	General	\$ 593,654	12.8%
9	Total	\$ 4,627,277	100.0%

## Allocation of Functionalized Expenses to Cost Components

After functionalizing expenses, the next step is to allocate the functionalized expenses to cost components. To do so we must identify system-wide peaking factors, which are shown in row 4 of Table 6-2. The system-wide peaking factors are used to derive the cost component allocation bases (i.e., percentages) shown in columns C and E of Table 6-2.

Functionalized expenses are then allocated to the cost components using these allocation bases. To understand the interpretation of the percentages shown in these columns, we must first establish the base use as the average daily demand during the year.

As an example, the functionalized expenses that are allocated to the cost components using the maximum day basis (line 1) attributes 43 percent (1.00/2.30) of the demand (and therefore costs) to base<sup>4</sup> (average daily demand) use and the remaining 57 percent (1.30/2.30) to maximum day (peaking) use. Expenses allocated using the maximum hour basis assumes 26 percent (1.00/3.82) of costs are due to base, 34 percent (1.30/3.82) allocated to max day, and the remaining proportion (1.52/3.82) of costs allocated to the maximum hour cost component. These allocation bases are used to distribute the functionalized costs to the cost components.

In Table 6-3, The percentages in columns C through I are applied to the functional cost in column B; the results of those operations are added to provide a cost component total in row 9. Once all direct functions have been allocated to cost components, all costs in the general function are reallocated in proportion to the other expenses (i.e., pro rata).

**Table 6-2: Peaking Factors**

	A	B	C	D	E
Line	Peaking Factors	MD Factor	MD Allocation	MH Factor	MH Allocation
	<b>Factor</b>				
1	Base (Delivery)	1.00	43.4%	1.00	26.2%
2	Max Day	1.30	56.6%	1.30	34.1%
3	Max Hour	N/A	N/A	1.52	39.8%
4	<b>Total:</b>	<b>2.30</b>	<b>100%</b>	<b>3.82</b>	<b>100%</b>

<sup>4</sup> Base is used throughout this section to reflect the Base part of Base-Extra Capacity method. It is interchangeable with the term Delivery, which is also used in this section and the rate design section to convey average daily demand costs. Delivery is used to avoid confusion for the District since monthly service charges based on meter size is known as the base charge of a bill.

**Table 6-3: O&M Cost Allocations**

	A	B	C	D	E	F	G	H	I
Line	O&M Cost Allocations	Total	Delivery	Max Day	Max Hour	Meters	Customer	Conservation	General
	<b>Function</b>								
1	Pumping	315,724	100%						
2	Treatment	1,448,593	43.4%	56.6%					
3	Distribution	743,566	26.2%	34.1%	39.8%				
4	Meters	423,839				100%			
5	Customer+ General	462,639					20%		80%
6	Conservation	135,265						100%	
7	Conservation +General	503,997					47.50%	5%	47.50%
8	General	593,654							100%
9	<b>Total:</b>	<b>\$ 4,627,277</b>	<b>\$ 1,139,704</b>	<b>\$ 1,072,545</b>	<b>\$ 295,635</b>	<b>\$ 423,839</b>	<b>\$ 331,926</b>	<b>\$ 160,465</b>	<b>\$ 1,203,164</b>
10	<b>Reallocation of General:</b>		<b>\$ 1,540,172</b>	<b>\$ 1,449,415</b>	<b>\$ 399,515</b>	<b>\$ 572,768</b>	<b>\$ 448,559</b>	<b>\$ 216,849</b>	
11	<b>Allocation %:</b>		33.3%	31.3%	8.6%	12.4%	9.7%	4.7%	

## Revenue Requirement – To Be Recovered From Rates

Table 6-4 shows the revenue requirement derivation with the total revenue required from rates shown in the last line (\$3,459,680). Raftelis calculated the revenue requirement using Fiscal Year 2023 expenses. O&M expenses include costs directly related to the supply, treatment, and distribution of water as well as routine maintenance of system facilities. To arrive at the rate revenue requirement, we subtract revenue offsets and adjustments for annual cash balances (which fund reserves), and any fund transfers. The result is the total revenue required from rates. This is the amount that the water base charge and commodity rates are designed to collect. Note there is no capital component to the revenue requirement as water rates are designed only to recover the operating costs of the utility.

**Table 6-4: Revenue Required from Rates**

Line	A Revenue Requirement - 2023	B Operating	C Capital	D Total
<b>Expenses</b>				
1	O&M	\$ 4,627,277	\$ -	\$ 4,627,277
2	Debt Service	-	-	-
3	Rate Funded Capital	-	-	-
4	<b>Subtotal: Expenses</b>	<b>\$ 4,627,277</b>	<b>\$ -</b>	<b>\$ 4,627,277</b>
<b>Adjustments</b>				
5	Property Tax Revenue	\$ (1,000,000)	\$ -	\$ (1,000,000)
7	Other Revenue	(177,741)	-	(177,741)
8	Annual Cash Balance	10,143	-	10,143
9	Mid-Year Adjustment	-	-	-
10	<b>Subtotal: Adjustments</b>	<b>\$ (1,167,598)</b>	<b>\$ -</b>	<b>\$ (1,167,598)</b>
11	<b>Net Revenue Requirement:</b>	<b>\$ 3,459,680</b>	<b>\$ -</b>	<b>\$ 3,459,680</b>

## Unit Cost Component Derivation

The end goal of the cost of service analysis is to proportionately distribute the cost components to each user class. To do so we must calculate the cost component unit costs, which starts by assessing the total units demanded by each class, for each cost component. Class peaking factors establish the maximum day and maximum hour requirements for each class and are the basis for the peaking unit rate differentials in the final water commodity rates. Shown in Table 6-5, Maximum month values (Column C) are calculated within the FY 2020 usage analysis. Max day (Column H) and max hour (Column I) factors are determined by multiplying the ratio of the use on the average day of the maximum month (Column D) and the average annual daily usage (Column E) for each class by a system adjustment factor (Column G) calculated by dividing the system maximum day use by the average day in the highest month for the system.

Table 6-6 summarizes the units of service. Daily use is calculated as annual use divided by 365 days. For example, SFR customers are estimated to use 124,853 kgal annually, or 342 kgal daily. The max day demand is then calculated as the daily demand multiplied by the max day factor (833 X 2.43). However, we must subtract the anticipated daily usage (342)

from the max day usage (833) to calculate the max day units of service (490). Max hour units of service are calculated similarly, and the calculation is completed for all customer classes.

**Table 6-5: Customer Class Peaking Factors**

	A	B	C	D	E	F	G	H	I
Line	Customer Peaking Calculation	Annual Use	Maximum Month	Average Day in Max. Month	Average Annual Day	Avg Day in Max Month / Avg Annual Day	System Max Day / Avg Day in System Max Month	Class Max Day Peaking Factor	Class Max Hour Peaking Factor
<b>Class</b>									
1	<b>SFR</b>	<b>124,567</b>	<b>20,568</b>	<b>686</b>	<b>341</b>	<b>2.01</b>	<b>1.21</b>	<b>2.43</b>	<b>4.04</b>
2	Tier 1	47,746	5,148	172	131	1.31	1.21	1.59	2.64
3	Tier 2	19,539	3,116	104	54	1.94	1.21	2.35	3.90
4	Tier 3	57,282	12,566	419	157	2.67	1.21	3.23	5.37
5	<b>MFR</b>	<b>211,006</b>	<b>30,149</b>	<b>1,005</b>	<b>578</b>	<b>1.74</b>	<b>1.21</b>	<b>2.11</b>	<b>3.50</b>
6	<b>Commercial</b>	<b>87,354</b>	<b>12,091</b>	<b>403</b>	<b>239</b>	<b>1.68</b>	<b>1.21</b>	<b>2.04</b>	<b>3.39</b>
7	<b>Irrigation</b>	<b>67,538</b>	<b>15,330</b>	<b>511</b>	<b>185</b>	<b>2.76</b>	<b>1.21</b>	<b>3.35</b>	<b>5.55</b>
8	Tier 1	52,115	12,152	405	143	2.84	1.21	3.44	5.71
9	Tier 2	14,225	3,391	113	39	2.90	1.21	3.51	5.83
10	Tier 3	1,198	352	12	3	3.58	1.21	4.33	7.19

**Table 6-6: Test Year Units of Service**

	A	B	C	D	E	F	G	H	I	J	K
Line	Units of Service	Annual Use	Average Use	MD Factor	MD Total	MD Extra	MH Factor	MH Total	MH Extra	Eq. Meters	Accounts
<b>Customer Class</b>											
1	SFR	124,853	342	2.43	833	490	4.04	1,382	549		
2	MFR	211,492	579	2.11	1,220	641	3.50	2,026	805		
3	Commercial	126,531	347	2.04	707	361	3.39	1,174	467		
4	Irrigation	67,538	185	3.35	619	434	5.55	1,028	409		
5	Customer							-		10,622	9,424
6	Fire Protection				480	480		2,880	2,400		
7	<b>Total:</b>	<b>530,414</b>	<b>1,453</b>		<b>3,859</b>	<b>2,406</b>		<b>8,489</b>	<b>4,630</b>	<b>10,622</b>	<b>9,424</b>

Extra capacity units for public and private fire connections are also included in row 6 of Table 6-6. Detail for these units can be found in Table 6-7. District staff estimates that reasonable concurrent maximum fire flow is approximately 2,000 gallons for 4 hours, shown in lines 1 and 2. This is equivalent to 480 kgal of maximum day demand (2 thousand gallons per minute \* 4 hours \* 60 minutes) and 2,880 kgal maximum hour demand (2 thousand gallons per minute \* 24 hours \* 60 minutes – maximum day demand).

**Table 6-7: Fire Protection Demand**

	A	B
Line	Fire Protection Demand	Value
1	Hours for Fire	4
2	Gallons per Minute	2,000
3	Required Max Day Demand	<b>480</b>
4	Required Max Hour Demand	<b>2,880</b>

Table 6-8 shows the cost component unit cost derivation. The operating revenue requirement shown in the Total column line 1 of Table 6-8(\$4,627,277) is allocated to the cost components using the resulting O&M allocation percentages shown in Table 6-3, row 11. Operating Reserve funding (\$10,143) is allocated in the same manner. Twenty percent of property tax revenues are allocated to the revenue offset component, while the remainder are allocated in proportion to O&M expenses. Lastly, we reallocate a portion (50 percent) of base costs to the meter capacity component (\$638,336) to maintain existing revenue stability from fixed sources to yield the adjusted cost of service. Revenue offsets are maintained as a cost component, which is utilized as a rate component in Section 7.

The total adjusted cost of service is divided by the respective units of service in Table 6-8 to calculate the unit cost of the various cost components. For example, the unit cost for the base (delivery) component is determined by dividing the total base cost (\$643,690) by total water use (529,442 kgal) to derive a base unit cost of \$1.215/kgal. Max day and max hour costs are divided by the total max day and max hour use to determine a unit rate in kgal/day. Annual customer costs are divided by the estimated number of annual monthly bills and meter costs are divided by total meter equivalencies to determine a cost per equivalent meter. The unit costs are used to distribute the cost components to the customer classes in Section 7.



**Table 6-8: Unit Cost of Service**

	A	B	C	D	E	F	G	H	I
Line	Cost of Service	Delivery	Max Day	Max Hour	Meters	Customer	Conservation	Revenue Offset	Total
	<b>Revenue Requirement</b>								
1	Operating Expenses	1,540,172	1,449,415	399,515	572,768	448,559	216,849	-	\$ 4,627,277
2	Capital Expenses	-	-	-	-	-	-	-	-
3	Property Tax Revenue	(266,277)	(250,586)	(69,071)	(99,025)	(77,550)	(37,490)	(200,000)	(1,000,000)
4	Other Revenue	-	-	-	-	-	-	(177,741)	(177,741)
5	Surplus/Deficit	3,376	3,177	876	1,256	983	475	-	10,143
6	Mid-Year Adjustment	-	-	-	-	-	-	-	-
7	<b>Total:</b>	<b>\$1,277,271</b>	<b>\$ 1,202,006</b>	<b>\$ 331,319</b>	<b>\$ 474,999</b>	<b>\$ 371,992</b>	<b>\$ 179,833</b>	<b>\$ (377,741)</b>	<b>\$ 3,459,680</b>
8	<b>COS Adjustment</b>	(638,636)	-	-	638,636	-	-	-	
9	<b>Total: Cost of Service</b>	<b>\$638,636</b>	<b>\$ 1,202,006</b>	<b>\$ 331,319</b>	<b>\$ 1,113,634</b>	<b>\$ 371,992</b>	<b>\$ 179,833</b>	<b>\$ (377,741)</b>	<b>\$ 3,459,680</b>
10	<b>Units of Service</b>	530,414	2,406	4,630	10,622	9,424	530,414	403,883	
11	<b>Unit Cost</b>	1.20	499.58	71.55	104.84	39.47	0.34	(0.94)	

## Distribution of Cost Components to Customer Classes

The final step in a cost of service analysis is to distribute the cost components to the user classes using the unit costs derived in Table 6-8. This is the ultimate goal of a cost of service analysis and yields the cost to serve each customer class. Table 6-9 shows the derivation of the cost to serve (i.e., cost of service for) each class. The cost components shown in columns B, C, D, G, and H are collected through the commodity (volumetric) rates (\$/kgal). The cost components shown in columns E and F are collected through the District's base service charge providing fixed revenue.

To derive the cost to serve each class, the unit costs from Table 6-8 are multiplied by the units shown in Table 6-6 for each class. For example, the SFR class base costs are calculated by multiplying the base unit cost (\$1.21) by the annual SFR use (124,567 kgal) to arrive at a total of \$151,306. Similarly, the commercial *customer* costs are derived by multiplying the *customer* unit cost (\$39.84) by the number of accounts (9,403) to arrive at a total cost of \$374,586. Similar calculations for each of the remaining user classes and cost components yield the total cost to serve each user class shown in column I. Finally, water system fire protection costs are reallocated to the meter component. Note that the total cost of service is equal to the revenue requirement in Table 6-4 as intended. We have now calculated the cost to serve each user class and can proceed to derive rates to collect the cost to serve from each class.

**Table 6-9: Class Cost of Service**

Line	A Class COS	B Delivery	C Max Day	D Max Hour	E Meters	F Customer	G Conservation	H Revenue Offset	I Total	J Reallocation of Fire	K COS
<b>Class</b>											
1	SFR	\$ 150,327	\$ 245,033	\$ 39,318			\$ 42,331	\$ (116,772)	\$ 360,236		\$ 360,236
2	MFR	254,643	320,175	57,631			71,705	(197,802)	506,351		506,351
3	Commercial	152,348	180,148	33,401			42,900	-	408,797		408,797
4	Irrigation	81,318	216,850	29,238			22,898	(63,167)	287,138		287,138
5	Recycled							-	-		-
6	Customer	-	-	-	1,113,634	371,992	-	-	1,485,626	411,532	1,897,157
7	Fire Protection	-	239,800	171,732			-	-	411,532	(411,532)	-
8	<b>Total:</b>	<b>\$ 638,636</b>	<b>\$1,202,006</b>	<b>\$ 331,319</b>	<b>\$1,113,634</b>	<b>\$ 371,992</b>	<b>\$ 179,833</b>	<b>\$ (377,741)</b>	<b>\$3,459,680</b>	<b>\$ -</b>	<b>\$3,459,680</b>

# 7 Water Rate Derivation and Design

## Proposed Water Service Charge

Utilities invest in and continue to maintain facilities to provide capacity to meet all levels of desired consumption, including peak demand plus fire protection, and these costs must be recovered regardless of the amount of water used during a given period. Thus, peaking costs along with base costs and fixed water system costs to meet average demand are generally considered as fixed water system costs. To balance between affordability and revenue stability, it is a common practice that a portion of the base costs and/or peaking costs are recovered in the monthly service charge, along with customer-related costs and meter-related costs. For the District, 100 percent of peaking costs are recovered on the variable rate while 50 percent of the base delivery costs are to be recovered on the fixed water service charge.

Two components comprise the Water Service Charge: meter capacity costs and customer service costs. The Water Service Charge recognizes the fact that even when a customer uses no water, the District incurs fixed costs in connection with maintaining the ability and readiness to serve each connection.

### Meter Capacity Component

The meter capacity component collects capacity related costs. Larger meters have the potential to demand more capacity instantaneously, or said differently, exert greater peaking characteristics compared to smaller meters. The potential capacity needed (peaking) is proportional to the potential flow through each meter size as established by the American Water Works Association (AWWA) hydraulic capacity ratios. For example, the flow through a 4" meter is 21 times that of a 3/4" meter; therefore, the meter capacity component of the base service charge is 21 times that of the 3/4" meter.

Allocating a portion of base costs by meter size (with the remainder allocated to the delivery cost component of the commodity rates) is a way to provide greater revenue stability, especially in light of decreasing water sales revenues during a drought, from permanent conservation, or other reductions in waster use.

In order to create parity across the various meter sizes, each meter size is assigned a factor relative to a 5/8" or 3/4" meter, which has a value of 1.00. This establishes the "base" meter size. A given meter size's ratio of meter and capacity servicing costs relative to the base (that of a 5/8" or 3/4" meter) determines the *meter equivalency*. Summation of all meter equivalencies for a given size yields "Meter Equivalency Units" (MEU), also referred to as equivalent meters. For this study, Raftelis used standard AWWA capacity ratios and estimated meter counts for FY 2023. MFR dwelling units count as one 5/8" or 3/4" meter and has a value of 1.00 for each dwelling unit.

The total equivalent meters calculation is completed by multiplying the count of meters (or count of dwelling units) of a specific size by their respective capacity ratio. Using AWWA meter capacity ratios mentioned above, the total number of equivalent meters within the District is determined to be 10,598.

**Table 7-1: Meter Equivalency Calculation**

Line	A Meter Size	B Accounts	C Capacity Ratio	D EQ. Meters
1	5/8"	16	1.00	16
2	3/4"	1,897	1.00	1,897
3	1"	425	1.67	708
4	1 1/2"	63	3.33	208
5	2"	70	5.33	371
6	3"	11	11.67	128
7	4"	8	21.00	173
8	6"	4	46.67	187
9	8"	-	80.00	-
10	MFR	6,909	1.00	6,909
11	<b>Total:</b>	<b>9,403</b>		<b>10,598</b>

The meter capacity component of the water base service charge is calculated by dividing the total meter capacity costs (inclusive of meter costs, fire protection costs, and a portion of base costs) from Table 6-9 by the total number of equivalent meters in Table 7-1. The cost is rounded up to the nearest penny and is calculated as \$12.08 per equivalent meter.

### Customer Component

The customer component recovers costs associated with meter reading, customer billing and collection, as well as answering customer service calls. These costs are uniform for all meter sizes as it costs the same to bill and provide customer service to a small meter as it does a larger meter.

To calculate the customer component, Raftelis divides the total customer service costs from Table 6-9 by the total accounts served by the District from Table 7-1 to determine the monthly customer service charge component of \$3.32.

Table 7-2 shows both the meter capacity and customer component calculations. The costs in column B are divided by the units in column C to derive an annual cost in column E, which is divided by 12 to provide the final monthly rate component.

**Table 7-2: Customer and Meter Component Calculations**

Line	A	B	C	E	F
	Cost Component	Cost	Units	Annual Rate	Monthly Rate
1	Meters	\$ 1,525,166	10,622 3/4" Meters	\$ 143.58	\$ 11.97
2	Customer	\$ 371,992	9,424 Accounts	\$ 39.47	\$ 3.29

Table 7-3 shows the derivation of the total proposed monthly fixed charges. The summation of the uniform customer component, and the meter (capacity) component that varies by meter size, yields the total proposed monthly service charge.

**Table 7-3: Proposed Monthly Service Charge**

	A	B	C	D	E	F	G
Line	Service Charge Design	Customer	Meter	Total	Current	% Increase	\$ Increase
<b>Meter Size</b>							
1	5/8"	\$3.29	\$11.97	\$15.25	\$15.05	1.33%	\$0.20
2	3/4"	\$3.29	\$11.97	\$15.25	\$15.05	1.33%	\$0.20
3	1"	\$3.29	\$19.94	\$23.23	\$22.79	1.93%	\$0.44
4	1 1/2"	\$3.29	\$39.88	\$43.17	\$42.16	2.40%	\$1.01
5	2"	\$3.29	\$63.81	\$67.10	\$65.39	2.62%	\$1.71
6	3"	\$3.29	\$139.59	\$142.88	\$138.95	2.83%	\$3.93
7	4"	\$3.29	\$251.27	\$254.56	\$247.39	2.90%	\$7.17
8	6"	\$3.29	\$558.37	\$561.66	\$545.52	2.96%	\$16.14
9	8"	\$3.29	\$957.21	\$960.50	\$932.72	2.98%	\$27.78

Table 7-4 shows the proposed five-year forecast of monthly fixed charges. The rates in column D were derived in Table 7-3; the rates in columns E through H are calculated by applying the required revenue increases from Table 5-10 (3 percent per year).

**Table 7-4: Forecast of Monthly Fixed Charges**

	A	C	D	E	F	G	H
Line	Fiscal Year	2022	2023	2024	2025	2026	2027
	Effective Date		April 1, 2022	April 1, 2023	April 1, 2024	April 1, 2025	April 1, 2026
	Meter Size	Current	Proposed	Proposed	Proposed	Proposed	Proposed
1	5/8"	\$15.05	\$15.25	\$15.56	\$15.88	\$16.20	\$16.53
2	3/4"	\$15.05	\$15.25	\$15.56	\$15.88	\$16.20	\$16.53
3	1"	\$22.79	\$23.23	\$23.70	\$24.18	\$24.67	\$25.17
4	1 1/2"	\$42.16	\$43.17	\$44.04	\$44.93	\$45.83	\$46.75
5	2"	\$65.39	\$67.10	\$68.45	\$69.82	\$71.22	\$72.65
6	3"	\$138.95	\$142.88	\$145.74	\$148.66	\$151.64	\$154.68
7	4"	\$247.39	\$254.56	\$259.66	\$264.86	\$270.16	\$275.57
8	6"	\$545.52	\$561.66	\$572.90	\$584.36	\$596.05	\$607.98
9	8"	\$932.72	\$960.50	\$979.71	\$999.31	\$1,019.30	\$1,039.69
10	MFR Dwelling	\$15.05	\$15.25	\$15.56	\$15.88	\$16.20	\$16.53

## Proposed Commodity Rates

### Unit Cost Component Definitions

The commodity rates for each class and tier are derived by summation of the unit rates (\$/kgal) for:

1. Delivery
2. Peaking
3. Conservation
4. Revenue Offsets

**Delivery costs** are the costs associated with obtaining and treating water to make it ready for transmission and distribution as well as the operating costs associated with delivering water to all customers at a constant average rate of use – also known as serving customers under average daily demand conditions. Therefore delivery costs are spread over all units of water irrespective of customer class or tiers. Delivery is referred to as “base” in the cost of service analysis reflecting the base-extra capacity method utilized in this study.

**Peaking costs**, or extra-capacity costs, represent costs incurred to meet customer peak demands in excess of base use (or average daily demand). Total extra capacity costs are comprised of maximum day and maximum hour demands. The peaking costs are distributed to each class and tier using peaking factors derived from customer use data. The distribution of peaking requirements (demand) and costs were previously described in Table 6-5.

**Conservation costs** are costs that cover water conservation and efficiency programs and efforts. These programs are targeted to high-volume water users. Therefore conservation costs are allocated to Tier 2 and 3, where water consumption is considered discretionary or inefficient and for which conservation programs are designed to promote water use curtailment. Allocation of conservation costs to upper tiers helps provide a price signal for conservation, consistent with Article X Section 2 of the State of California Constitution, and proportionately allocates such costs to those customers whose greater demand creates the need for conservation and water use efficiency programs and efforts.

**Revenue offsets** are the non-rate, general revenues available to the District to reduce the commodity rates in the lower tiers to promote affordability and efficient use. Revenue offsets consist of property tax allocated to the water operating fund, miscellaneous fees and charges, and interest income from reserves. These funds allow flexibility in the rate design process to achieve policy objectives while maintaining cost of service principles.

## **Delivery Unit Cost**

The delivery unit cost is the cost to supply and deliver water under average daily demand conditions. By dividing estimated annual usage by total base costs (from Table 6-8), we identify the cost to provide water delivery under the same conditions. Since we are interested in average daily demands, the delivery cost is the same for all classes and tiers. A summary of delivery costs by customer class is provided in Table 7-5.

**Table 7-5: Delivery Unit Cost Calculation**

Line	A Delivery	B Billing Units (kgal)	C Intra-Class Allocation	D Cost	E Rate
<b>SFR</b>					
1	Tier 1 - First 4,000 Gal.	47,855	38.3%	\$ 57,619	\$ 1.20
2	Tier 2 - Next 4,000 Gal.	19,584	15.7%	23,580	1.20
3	Tier 3 - Above 8,000 Gal.	57,414	46.0%	69,128	1.20
4	<b>Subtotal: SFR</b>	<b>124,853</b>		<b>\$ 150,327</b>	<b>\$ 1.20</b>
<b>MFR</b>					
5	<b>MFR</b>	<b>211,492</b>	100.0%	<b>\$ 254,643</b>	<b>\$ 1.20</b>
<b>Commercial</b>					
6	<b>Commercial</b>	<b>126,531</b>	100.0%	<b>\$ 152,348</b>	<b>\$ 1.20</b>
<b>Irrigation</b>					
7	Tier 1 - 100% of MAWA	52,115	77.2%	\$ 62,748	\$ 1.20
8	Tier 2 - 100% to 200%	14,225	21.1%	17,127	1.20
9	Tier 3 - Above 200%	1,198	1.8%	1,443	1.20
10	<b>Subtotal: Irrigation</b>	<b>67,538</b>		<b>\$ 81,318</b>	<b>\$ 1.20</b>

### Peaking Unit Cost

Table 6-2 provided customer class peaking factors. For the derivation of intra-class peaking cost components, we must derive peaking factors *within* the tiers. Table 7-6 shows the derivation of the unit peaking costs for SFR tiers and Irrigation tiers. (MFR and Commercial classes are uniform). The peaking factor in column C is multiplied by the billing units in column B to derive the weighted peaking units in column D. The allocation in column E is calculated from these peaking units and the resulting percentages are applied to the total SFR peaking cost in row 4, column F, also shown in Table 6-9, columns C and D. The rate in column G is calculated by dividing the cost in column F by the billing units in column B.



**Table 7-6: Peaking Unit Cost Calculation**

	A	B	C	D	E	F	G
Line	Peaking	Billing Units (kgal)	Peaking Factor	Peaking Units	Intra-Class Allocation	Cost	Rate
<b>SFR</b>							
1	Tier 1	47,855	1.59	76,049	24.7%	\$ 70,269	\$ 1.47
2	Tier 2	19,584	2.35	46,040	15.0%	42,541	2.17
3	Tier 3	57,414	3.23	185,648	60.3%	171,540	2.99
4	<b>Subtotal: SFR</b>	<b>124,853</b>		<b>307,737</b>		<b>284,350</b>	<b>\$ 2.28</b>
<b>MFR</b>							
5	<b>MFR</b>	<b>211,492</b>			<b>100.0%</b>	<b>377,806</b>	<b>\$ 1.79</b>
<b>Commercial</b>							
6	<b>Commercial</b>	<b>126,531</b>			<b>100.0%</b>	<b>213,550</b>	<b>\$ 1.69</b>
<b>Irrigation</b>							
7	Tier 1	52,115	3.44	179,126	76.4%	\$ 188,133	\$ 3.61
8	Tier 2	14,225	3.51	49,989	21.3%	52,502	3.69
9	Tier 3	1,198	4.33	5,192	2.2%	5,453	4.55
10	<b>Subtotal: Irrigation</b>	<b>67,538</b>		<b>234,307</b>		<b>246,088</b>	<b>\$ 3.64</b>

### Conservation Unit Cost

Conservation components are determined in the same manner as peaking components but use different factors (conservation factors) to determine the weighted units, allocation percentages and therefore unit rates. Conservation factors are applied to all customer classes and tiers except for Tier 1 SFR and Tier 1 Irrigation, which are considered efficient use. MFR and Commercial classes are designated a factor of 100 percent of the unit cost; the upper tiers for SFR and Irrigation are designated a higher weight of conservation costs in recognition that this use is considered inefficient and/or wasteful and is the primary driver for the District’s conservation costs. A higher share of conservation costs is applied to SFR and Irrigation Tier 3 compared to SFR and Irrigation Tier 2 recognizing that direct conservation outreach is required for egregious water use rather than the broad conservation outreach in Tier 2.

**Table 7-7: Conservation Unit Cost Calculation**

	A	B	C	D	E	F	G
Line	Conservation	Billing Units (kgal)	Policy Factor	Allocation Units	Intra-Class Allocation	Cost	Rate
<b>SFR</b>							
1	Tier 1	47,855	0%	-	0.0%	\$ -	\$ -
2	Tier 2	19,584	100%	19,584	14.6%	6,168	0.31
3	Tier 3	57,414	200%	114,828	85.4%	36,163	0.63
4	<b>Subtotal: SFR</b>	<b>124,853</b>		<b>134,412</b>		<b>\$ 42,331</b>	<b>\$ 0.34</b>
<b>MFR</b>							
5	<b>MFR</b>	<b>211,492</b>	<b>100%</b>		<b>100.0%</b>	<b>\$ 71,705</b>	<b>\$ 0.34</b>
<b>Commercial</b>							
6	<b>Commercial</b>	<b>126,531</b>			<b>100.0%</b>	<b>\$ 42,900</b>	<b>\$ 0.34</b>
<b>Irrigation</b>							
7	Tier 1	52,115	0%	-	0.0%	\$ -	\$ -
8	Tier 2	14,225	100%	14,225	85.6%	19,597	1.38
9	Tier 3	1,198	200%	2,397	14.4%	3,302	2.76
10	<b>Subtotal: Irrigation</b>	<b>67,538</b>		<b>16,622</b>		<b>\$ 22,898</b>	<b>\$ 0.34</b>

**Revenue Offset Unit Cost**

Revenue offset components are determined similarly to the peaking and conservation components: revenue offsets are applied to Tier 1 and Tier 2 of SFR rates and Tier 1 of Irrigation rates (all use regarded as efficient), as well as to MFR use. Per standing District policy, Commercial accounts are not allocated revenue offsets. Table 7-8 shows the revenue offset unit rate calculation.

**Table 7-8: Revenue Offset Unit Cost Calculation**

Line	A Revenue Offset	B Billing Units (kgal)	C Policy Factor	D Allocation Units	E Intra-Class Allocation	F Cost	G Rate
<b>SFR</b>							
1	Tier 1	47,855	100%	47,855	71.0%	\$ (82,862)	\$ (1.73)
2	Tier 2	19,584	100%	19,584	29.0%	(33,910)	(1.73)
3	Tier 3	57,414		-	0.0%	-	-
4	<b>Subtotal: SFR</b>	<b>124,853</b>		<b>67,439</b>		<b>\$ (116,772)</b>	<b>\$ (0.94)</b>
5	<b>MFR</b>	<b>211,492</b>	<b>100%</b>		<b>100.0%</b>	<b>\$ (197,802)</b>	<b>\$ (0.94)</b>
6	<b>Commercial</b>	<b>126,531</b>			<b>100.0%</b>	<b>-</b>	<b>\$ -</b>
<b>Irrigation</b>							
7	Tier 1	52,115	100%	52,115	100.0%	\$ (63,167)	\$ (1.21)
8	Tier 2	14,225		-	0.0%	-	-
9	Tier 3	1,198		-	0.0%	-	-
10	<b>Subtotal: Irrigation</b>	<b>67,538</b>		<b>52,115</b>		<b>\$ (63,167)</b>	<b>\$ (0.94)</b>

### Final Commodity Rates Derivation

To determine commodity rates, the four components are added together. The resulting summation constitutes the final water commodity rates. The cost of service-based rates are shown in column F in Table 7-9. Per District policy, the Recycled water rate is set at 58 percent of the proposed Commercial rate.

**Table 7-9: Proposed Commodity Rates**

Line	A Volume Charge Design	B Delivery	C Peaking	D Conserv- ation	E Revenue Offset	F Proposed	G Current	H % Increase	I \$ Increase
<b>SFR</b>									
1	Tier 1 – First 4,000 Gal.	1.20	1.47	-	(1.73)	0.95	0.99	-4.04%	\$ (0.04)
2	Tier 2 – Next 4,000 Gal.	1.20	2.17	0.31	(1.73)	1.96	2.32	-15.52%	(0.36)
3	Tier 3 – Above 8,000 Gal.	1.20	2.99	0.63	-	4.83	5.06	-4.55%	(0.23)
4	<b>MFR</b>	1.20	1.79	0.34	(0.94)	2.40	2.36	1.69%	0.04
5	<b>Commercial</b>	1.20	1.69	0.34	-	3.24	3.13	3.51%	0.11
<b>Irrigation</b>									
6	Tier 1 – 100% of MAWA	1.20	3.61	-	(1.21)	3.61	2.77	30.32%	0.84
7	Tier 2 – 100% to 200%	1.20	3.69	1.38	-	6.28	6.19	1.45%	0.09
8	Tier 3 – Above 200%	1.20	4.55	2.76	-	8.51	9.15	-6.99%	(0.64)
9	<b>Recycled</b>	-	-	-	-	1.88	1.83	2.73%	0.05

Table 7-10 shows proposed five-year water commodity rates. Commodity rates are increased “across the board” in subsequent years – that is, relative to existing (current year) rates – by the selected Financial Plan. Beginning April 1, 2023 commodity rates will increase to collect an additional 2 percent per year in additional revenue. All rates are rounded up to the nearest penny.

**Table 7-10: Forecast of Commodity Rates**

	A	C	D	E	F	G	H
	Fiscal Year	2022	2023	2024	2025	2026	2027
	Effective Date		April 1, 2022	April 1, 2023	April 1, 2024	April 1, 2025	April 1, 2026
Line	Class	Current	Proposed	Proposed	Proposed	Proposed	Proposed
<b>SFR</b>							
1	Tier 1 - First 4,000 Gal.	\$0.99	\$0.95	\$0.97	\$0.99	\$1.01	\$1.04
2	Tier 2 - Next 4,000 Gal.	\$2.32	\$1.96	\$2.00	\$2.04	\$2.09	\$2.14
3	Tier 3 - Above 8,000 Gal.	\$5.06	\$4.83	\$4.93	\$5.03	\$5.14	\$5.25
4	<b>MFR</b>	\$2.36	\$2.40	\$2.45	\$2.50	\$2.55	\$2.61
5	<b>Commercial</b>	\$3.13	\$3.24	\$3.31	\$3.38	\$3.45	\$3.52
<b>Irrigation</b>							
6	Tier 1 - 100% of MAWA	\$2.77	\$3.61	\$3.69	\$3.77	\$3.85	\$3.93
7	Tier 2 - 100% to 200%	\$6.19	\$6.28	\$6.41	\$6.54	\$6.68	\$6.82
8	Tier 3 - Above 200%	\$9.15	\$8.51	\$8.69	\$8.87	\$9.05	\$9.24
9	<b>Recycled</b>	\$1.83	\$1.88	\$1.92	\$1.96	\$2.00	\$2.04

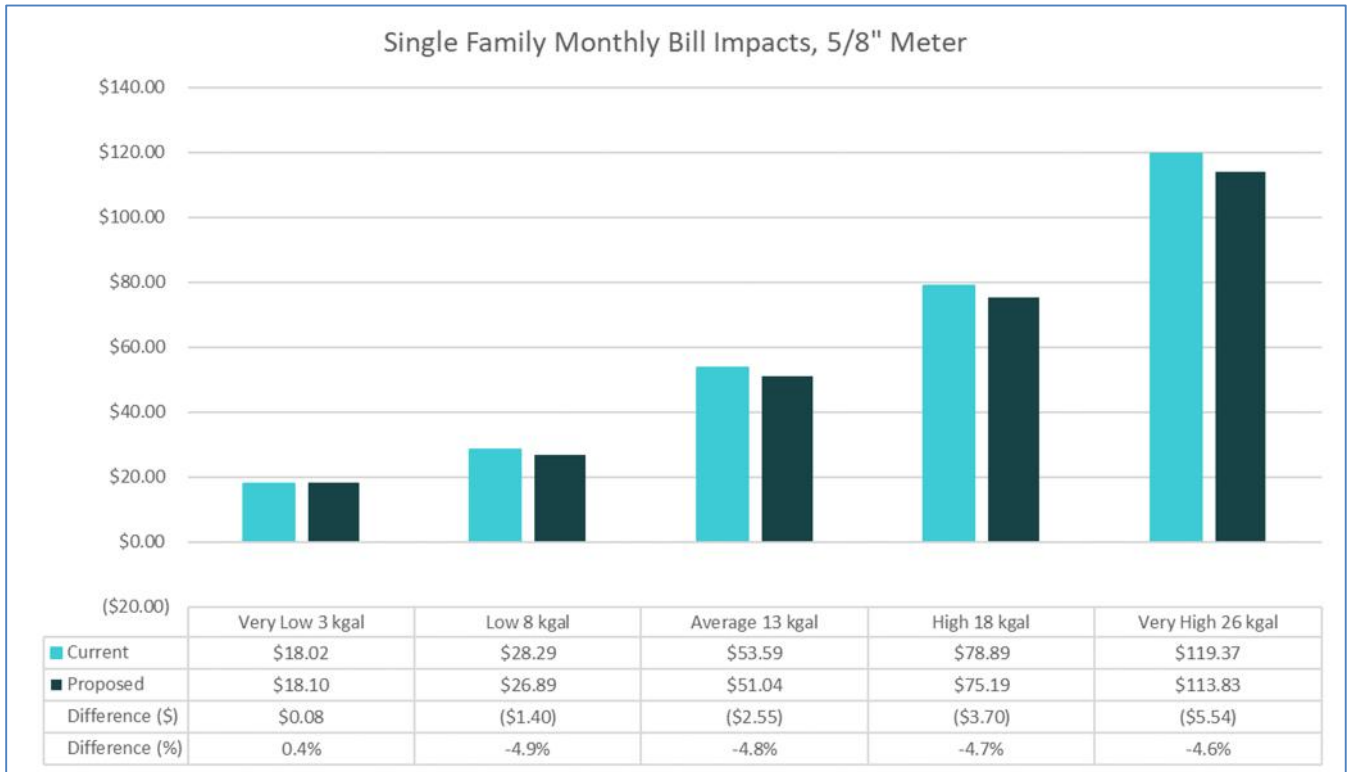
## Water Customer Impacts

Raftelis calculated water customer impacts for all classes and meter sizes. Customer impacts from the proposed new rates can be seen below in Figure 7-1, Figure 7-2, and Figure 7-3. The District’s average SFR customer uses approximately 13 kgal of water during a given month. At this level of water use, a SFR customer with a 5/8” or 3/4" will experience a \$2.55 decrease in their bill. This is due to a lower commodity rate in Tiers 1 and 2, which more than offsets the \$0.20 increase in the fixed monthly service charge.

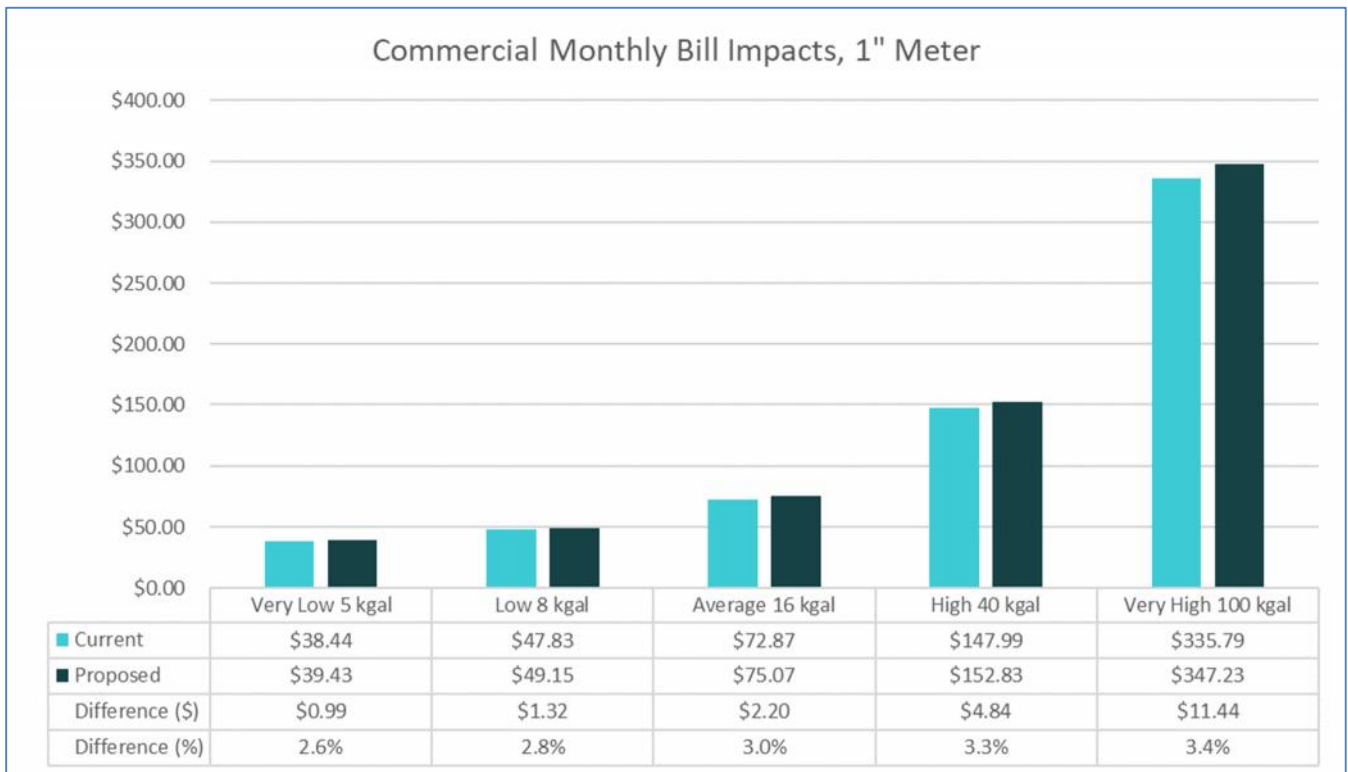
At the proposed rates, the average commercial customer with a 1” meter using an average of 16 kgal per month will see an increase in their monthly bill of \$2.30.

Irrigation customers do not pay a base fixed charge by meter size. At proposed rates, Tier 1 Irrigation water users will experience the largest percentage increase to their bill.

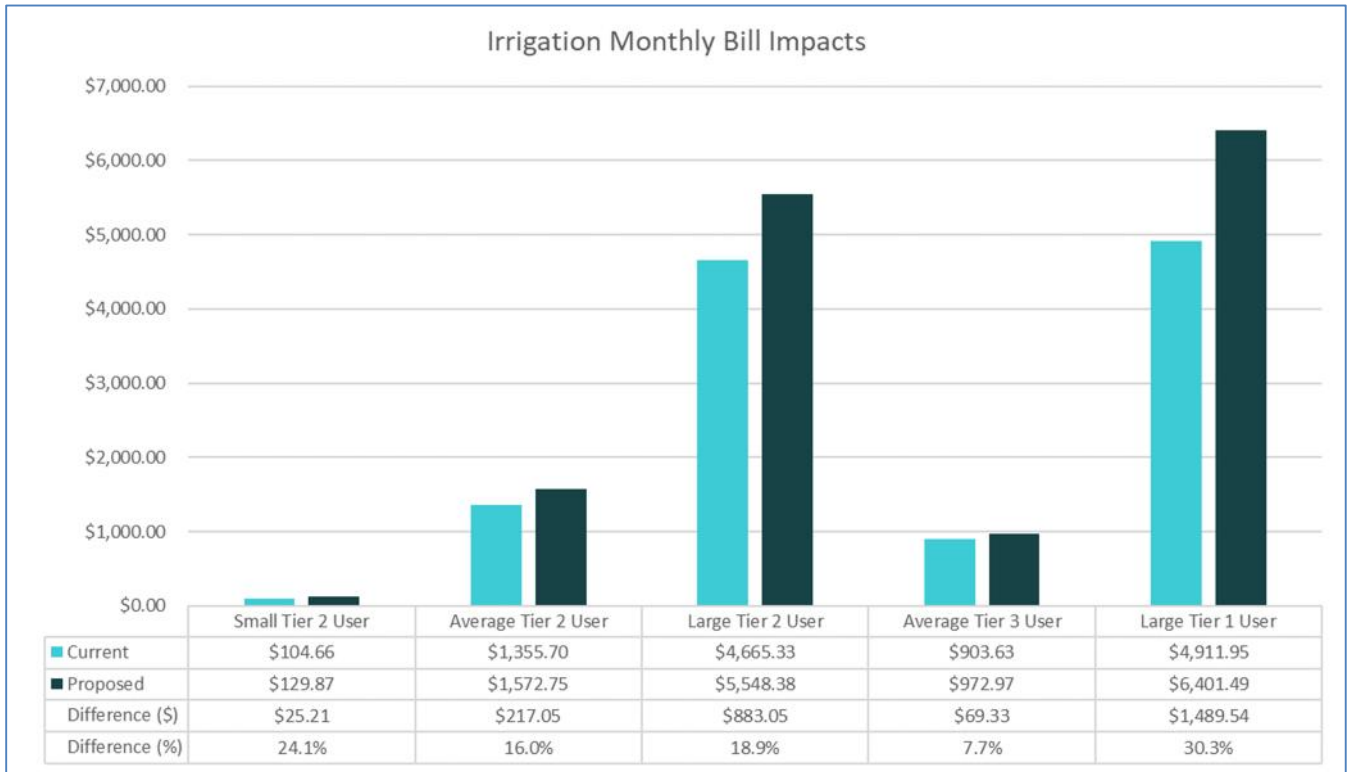
**Figure 7-1: Single Family Residential Bill Impacts**



**Figure 7-2: Commercial Bill Impacts**



**Figure 7-3: Irrigation Bill Impacts**



# 8 Wastewater Utility

This section describes the wastewater utility, the District’s customer account and wastewater use data, and corresponding financial plan.

## Wastewater Revenue Requirements

A review of a utility’s revenue requirements is a key first step in the rate study process. The review involves an analysis of annual operating revenues under the status quo, operation and maintenance (O&M) expenses, transfers between funds, and reserve requirements. This section of the report provides a discussion of the projected revenues, O&M expenses, other reserve funding and revenue adjustments estimated as required to ensure the fiscal sustainability and solvency of the wastewater utility.

### Revenues from Current Rates

The current rate structure consists of a fixed monthly charge for residential classes (per dwelling unit). All SFR customers pay \$21.15 per month and all multi-family units pay \$18.21 per month, per dwelling unit. Non-residential classes pay “fixture” based charges. Charges per fixture (sometimes called a *special multiplier*) may vary within customer classes. For example, restaurants and other similar businesses pay a charge per seat while hospitals and dorms pay a charge per bed. Raftelis recommends a change in structure, as discussed in more detail below.



Table 8-1 shows the current wastewater charges by customer class.

**Table 8-1: Current Wastewater Rates**

	A	B
Line	Wastewater Charges	Current Charges
<b>Inside District Service Charges</b>		
1	Single Family	\$21.15
2	Multi Family	\$18.21
3	RV Space	\$3.09
4	Motel Units	\$9.63
5	Ski Dorm/Bed	\$3.09
6	Commercial Unit	\$13.64
7	Laundry - Commercial	\$814.31
8	Laundromat - Public	\$499.45
9	Service Station	\$24.97
10	Car Wash	\$62.48
11	Restaurant Seat	\$2.55
12	Bar Seat	\$1.34
13	Theatre Seat	\$0.65
14	Public Building	\$41.72
15	Elem School	\$0.94
16	High School	\$1.15
17	Storage/Warehouse	\$18.82
18	Swimming Pool	\$12.47
19	Spa/Hot Tub	\$6.38
20	Hospital Bed	\$28.72
21	Juniper	\$13.71
22	Mill Cabins	\$21.14
<b>Outside District Service Charges</b>		
23	Out of District Cabin	\$21.15
24	Out of District Manager Unit	\$21.15
25	Out of District Motel	\$21.15
26	Out of District Commercial or Public	\$13.64
27	Out of District Restaurant/Seat	\$2.00
28	Out of District Campground Unit	\$2.40
29	Out of District Picnic Area or Trailhead	\$1.22
<b>Outside District O&amp;M Charges</b>		
30	Out of District Cabin	\$25.04
31	Out of District Manager Unit	\$25.04
32	Out of District Motel	\$25.04
33	Out of District Commercial or Public	\$16.12
34	Out of District Restaurant/Seat	\$2.40
35	Out of District Campground Unit	\$2.81
36	Out of District Picnic Area or Trailhead	\$1.43

Table 8-2 shows projected billable wastewater units. The District expects account growth of .23% per year, consistent with the forecasted growth in water accounts.

**Table 8-2: Billable Wastewater Units**

	A	B	C	D	E	F	G
Line	Billable Units	2022	2023	2024	2025	2026	2027
<b>Inside District</b>							
1	Single Family	2,201	2,206	2,211	2,216	2,221	2,226
2	Multi Family	7,564	7,581	7,599	7,616	7,634	7,651
3	RV Space	-	-	-	-	-	-
4	Motel Units	1,020	1,022	1,025	1,027	1,029	1,032
5	Ski Dorm/Bed	96	96	96	97	97	97
6	Commercial Unit	496	497	498	499	501	502
7	Laundry - Commercial	1	1	1	1	1	1
8	Laundromat - Public	3	3	3	3	3	3
9	Service Station	5	5	5	5	5	5
10	Car Wash	4	4	4	4	4	4
11	Restaurant Seat	6,213	6,227	6,242	6,256	6,270	6,285
12	Bar Seat	1,307	1,310	1,313	1,316	1,319	1,322
13	Theatre Seat	556	557	559	560	561	562
14	Public Building	42	42	42	42	42	42
15	Elem School	908	910	912	914	916	918
16	High School	426	427	428	429	430	431
17	Storage/Warehouse	4	4	4	4	4	4
18	Swimming Pool	13	13	13	13	13	13
19	Spa/Hot Tub	30	30	30	30	30	30
20	Hospital Bed	15	15	15	15	15	15
21	Juniper	43	43	43	43	43	43
22	Mill Cabins	427	428	429	430	431	432
<b>Outside District</b>							
23	Out of District Cabin	86	86	87	87	87	87
24	Out of District Manager Unit	2	2	2	2	2	2
25	Out of District Motel	26	26	27	27	27	27
26	Out of District Commercial or Public	2	2	2	2	2	2
27	Out of District Restaurant/Seat	88	89	89	89	89	89

Table 8-3 shows the wastewater revenue generated by each customer class calculated using existing wastewater rates for FY 2022 and beyond. Revenue is calculated by multiplying the projected units in each year (Table 8-2) by the respective rates from Table 8-1.

**Table 8-3: Projected Wastewater Revenue**

Line	A Billable Units	B 2022	C 2023	D 2024	E 2025	F 2026	G 2027
<b>Inside District Service Charge</b>							
1	Single Family	\$558,614	\$559,899	\$561,186	\$562,477	\$563,771	\$565,067
2	Multi Family	\$1,652,885	\$1,656,687	\$1,660,497	\$1,664,316	\$1,668,144	\$1,671,981
3	RV Space	\$0	\$0	\$0	\$0	\$0	\$0
4	Motel Units	\$117,871	\$118,142	\$118,414	\$118,686	\$118,959	\$119,233
5	Ski Dorm/Bed	\$3,560	\$3,568	\$3,576	\$3,584	\$3,593	\$3,601
6	Commercial Unit	\$81,185	\$81,372	\$81,559	\$81,747	\$81,935	\$82,123
7	Laundry - Commercial	\$9,772	\$9,794	\$9,817	\$9,839	\$9,862	\$9,885
8	Laundromat - Public	\$17,980	\$18,022	\$18,063	\$18,105	\$18,146	\$18,188
9	Service Station	\$1,498	\$1,502	\$1,505	\$1,509	\$1,512	\$1,516
10	Car Wash	\$2,999	\$3,006	\$3,013	\$3,020	\$3,027	\$3,034
11	Restaurant Seat	\$190,118	\$190,555	\$190,993	\$191,433	\$191,873	\$192,314
12	Bar Seat	\$21,017	\$21,065	\$21,113	\$21,162	\$21,211	\$21,259
13	Theatre Seat	\$4,337	\$4,347	\$4,357	\$4,367	\$4,377	\$4,387
14	Public Building	\$21,027	\$21,075	\$21,124	\$21,172	\$21,221	\$21,270
15	Elem School	\$10,242	\$10,266	\$10,289	\$10,313	\$10,337	\$10,361
16	High School	\$5,879	\$5,892	\$5,906	\$5,919	\$5,933	\$5,947
17	Storage/Warehouse	\$903	\$905	\$908	\$910	\$912	\$914
18	Swimming Pool	\$1,945	\$1,950	\$1,954	\$1,959	\$1,963	\$1,968
19	Spa/Hot Tub	\$2,297	\$2,302	\$2,307	\$2,313	\$2,318	\$2,323
20	Hospital Bed	\$5,170	\$5,181	\$5,193	\$5,205	\$5,217	\$5,229
21	Juniper	\$7,074	\$7,091	\$7,107	\$7,123	\$7,140	\$7,156
22	Mill Cabins	\$108,321	\$108,570	\$108,820	\$109,070	\$109,321	\$109,573
<b>Outside District Service Charge</b>							
23	Out of District Cabin	\$10,949	\$10,974	\$10,999	\$11,025	\$11,050	\$11,075
24	Out of District Manager Unit	\$258	\$258	\$259	\$259	\$260	\$261
25	Out of District Motel	\$3,349	\$3,357	\$3,365	\$3,372	\$3,380	\$3,388
26	Out of District Commercial or Public	\$166	\$167	\$167	\$167	\$168	\$168
27	Out of District Restaurant/Seat	\$1,060	\$1,062	\$1,065	\$1,067	\$1,070	\$1,072
28	Out of District Campground Unit	\$0	\$0	\$0	\$0	\$0	\$0
29	Out of District Picnic Area or Trailhead	\$0	\$0	\$0	\$0	\$0	\$0
<b>Outside District O&amp;M Charge</b>							
30	Out of District Cabin	\$12,963	\$12,992	\$13,022	\$13,052	\$13,082	\$13,112
31	Out of District Manager Unit	\$305	\$306	\$306	\$307	\$308	\$309
32	Out of District Motel	\$3,965	\$3,974	\$3,983	\$3,992	\$4,002	\$4,011
33	Out of District Commercial or Public	\$196	\$197	\$197	\$198	\$198	\$199
34	Out of District Restaurant/Seat	\$1,272	\$1,275	\$1,278	\$1,280	\$1,283	\$1,286
35	Out of District Campground Unit	\$0	\$0	\$0	\$0	\$0	\$0
36	Out of District Picnic Area or Trailhead	\$0	\$0	\$0	\$0	\$0	\$0
37	<b>Outside Replacement Charge</b>	\$4,644	\$4,655	\$4,666	\$4,676	\$4,687	\$4,698
38	<b>Total Revenue</b>	<b>\$2,863,821</b>	<b>\$2,870,408</b>	<b>\$2,877,009</b>	<b>\$2,883,627</b>	<b>\$2,890,259</b>	<b>\$2,896,907</b>

The utility also derives some non-operating revenues. These revenues include interest income, property taxes, late fees, laboratory fees, permit fees, and other miscellaneous items. Table 8-4 includes non-rate revenues from Funds 30 and 23.

**Table 8-4: Other Wastewater Revenues**

	A	B	C	D	E	F	G
Line	Other Revenues	2022	2023	2024	2025	2026	2027
1	Other Operating	\$41,933	\$41,933	\$41,933	\$41,933	\$41,933	\$41,933
2	Interest Income	\$128,868	\$128,593	\$132,607	\$143,147	\$150,648	\$157,323
3	Property Tax	\$3,264,000	\$3,312,960	\$3,362,654	\$3,413,094	\$3,464,291	\$3,516,255
4	<b>Total</b>	<b>\$3,434,801</b>	<b>\$3,483,487</b>	<b>\$3,537,195</b>	<b>\$3,598,175</b>	<b>\$3,656,872</b>	<b>\$3,715,511</b>

### Operating Expenses

Total Projected O&M expenses are shown in Table 8-5. These expenses are summarized by department. This table shows expenses for the wastewater operating fund (Fund 30), as well as expenses for the capital repair and replacement fund (Fund 23). Both fund expenses are inclusive of administrative expenses allocated in Section 4.

**Table 8-5: Wastewater Operating Expenses**

	A	B	C	D	E	F	G
Line	Operating Expenses	2022	2023	2024	2025	2026	2027
<b>Fund 30</b>							
1	Laboratory	\$218,747	\$227,747	\$237,212	\$247,172	\$257,658	\$268,705
2	Operations Admin	\$140,118	\$145,916	\$152,017	\$158,438	\$165,200	\$172,326
3	Maintenance Admin	\$425,802	\$445,739	\$466,848	\$489,209	\$512,910	\$538,043
4	Engineering Wastewater	\$439,822	\$457,959	\$477,037	\$497,113	\$518,253	\$540,526
5	Wastewater Treatment	\$1,034,202	\$1,073,693	\$1,115,046	\$1,158,370	\$1,203,784	\$1,251,413
6	Line Maintenance Wastewater	\$374,726	\$391,243	\$408,678	\$427,091	\$446,549	\$467,122
7	Mechanical Maintenance Wastewater	\$258,715	\$270,623	\$283,221	\$296,555	\$310,676	\$325,638
8	Fund 10	\$774,083	\$797,306	\$821,225	\$845,862	\$871,238	\$897,375
9	<b>Total</b>	<b>\$3,666,215</b>	<b>\$3,810,228</b>	<b>\$3,961,283</b>	<b>\$4,119,810</b>	<b>\$4,286,267</b>	<b>\$4,461,148</b>
<b>Fund 23</b>							
10	Department	\$17,573	\$16,491	\$15,248	\$13,829	\$12,217	\$10,395
11	Maintenance Admin	\$90,860	\$95,174	\$99,745	\$104,590	\$109,728	\$115,181
12	Engineering Water	\$699	\$736	\$775	\$817	\$861	\$907
13	Mechanical Maintenance	\$907	\$954	\$1,005	\$1,059	\$1,117	\$1,178
14	Engineering Wastewater	\$182,798	\$190,922	\$199,500	\$208,565	\$218,147	\$228,283
15	Line Maintenance Wastewater	\$6,825	\$7,194	\$7,588	\$8,008	\$8,455	\$8,933
16	Mechanical Maintenance Wastewater	\$3,820	\$4,028	\$4,249	\$4,485	\$4,737	\$5,006
17	Fund 10	\$551,188	\$567,724	\$584,755	\$602,298	\$620,367	\$638,978
18	<b>Total</b>	<b>\$854,670</b>	<b>\$883,223</b>	<b>\$912,866</b>	<b>\$943,650</b>	<b>\$975,629</b>	<b>\$1,008,861</b>

## Projected Capital Improvements

The District has programmed approximately \$7.4 million in wastewater capital expenditures during the Study period (FY 2022-2027) as shown in Table 8-6. The CIP costs for future years is determined by using the budgeted costs and inflating the value by the capital cost inflation factor shown in Table 2-1. The District anticipates funding all capital improvements with non-rate derived property tax revenue.

**Table 8-6: Wastewater Capital Projects**

Line	A Capital Projects	B 2022	C 2023	D 2024	E 2025	F 2026	G 2027
1	Laurel Pond Monitoring Wells	\$445,990	\$0	\$0	\$0	\$0	\$0
2	Sewer Line Rehab	\$444,413	\$404,203	\$440,369	\$467,086	\$496,169	\$526,577
3	Coldwater Cr LS Rehab	\$40,809	\$0	\$0	\$0	\$0	\$0
4	Battery Backup and Storage	\$20,600	\$0	\$0	\$0	\$0	\$0
5	WWTP Upgrades	\$0	\$218,545	\$231,658	\$246,486	\$260,837	\$277,020
6	Rehab Primary Clarifier	\$0	\$0	\$45,895	\$0	\$52,167	\$0
7	WWTP Filter Replacement	\$0	\$1,092,727	\$0	\$0	\$0	\$0
8	Rehab North EQ Basin	\$0	\$0	\$0	\$0	\$391,835	\$0
9	Dewatering PLC upgrade	\$83,223	\$0	\$0	\$0	\$0	\$0
10	Well 1 Rehab	\$154,500	\$0	\$0	\$0	\$0	\$0
11	Digester Mix Pump	\$41,466	\$0	\$0	\$0	\$0	\$0
12	ERP Upgrade	\$127,308	\$0	\$0	\$0	\$0	\$0
13	Expansion Wells	\$15,450	\$0	\$0	\$0	\$0	\$0
14	PLC upgrade	\$0	\$103,968	\$139,323	\$147,442	\$0	\$0
15	Construction crew trucks	\$48,925	\$61,002	\$97,253	\$19,696	\$28,982	\$29,851
16	Replacement - Engineering	\$18,025	\$0	\$0	\$0	\$0	\$0
17	Loader (CARB compliance)	\$128,750	\$0	\$0	\$0	\$0	\$0
18	Forklift	\$20,909	\$0	\$0	\$0	\$0	\$0
19	Tapping tool	\$7,725	\$0	\$0	\$0	\$0	\$0
20	<b>Total</b>	<b>\$1,598,092</b>	<b>\$1,880,445</b>	<b>\$954,497</b>	<b>\$880,711</b>	<b>\$1,229,990</b>	<b>\$833,449</b>

## Status Quo Financial Plan (No Revenue Adjustments)

The assumptions shown above are incorporated into the five-year Financial Plan. To develop the Financial Plan, Raftelis forecasts annual expenses and revenues, models reserve balances and transfers between funds, and incorporates capital expenditures and calculated debt service coverage ratios to estimate the amount of additional rate revenue required per year. Table 8-7 displays the proforma of the District's wastewater utility under current rates over the Study period. The proforma incorporates revenues and expenses from the Wastewater Operating Fund (Fund 30) and Wastewater Replacement Fund (Fund 23) to show the overall position of the utility. All projections shown in the table are based upon the District's current rate structure and do not include rate adjustments. The proforma incorporates the wastewater utility data shown in the preceding tables.

**Table 8-7: Status Quo Wastewater Proforma**

Line	A Wastewater Financial Plan	B 2022	C 2023	D 2024	E 2025	F 2026	G 2027
1	Rate Revenue	\$2,809,900	\$2,870,408	\$2,877,009	\$2,883,627	\$2,890,259	\$2,890,259
2	Revenue Adjustments	\$0	\$0	\$0	\$0	\$0	\$0
3	Other Operating	\$41,933	\$41,933	\$41,933	\$41,933	\$41,933	\$41,933
4	Interest Income	\$128,868	\$128,163	\$130,868	\$139,187	\$143,517	\$146,042
5	Property Tax	\$3,264,000	\$3,312,960	\$3,362,654	\$3,413,094	\$3,464,291	\$3,516,255
6	<b>Total Revenue</b>	<b>\$6,244,701</b>	<b>\$6,353,464</b>	<b>\$6,412,465</b>	<b>\$6,477,841</b>	<b>\$6,540,000</b>	<b>\$6,594,489</b>
	<b>Expenses</b>						
7	Fund 30 O&M	\$3,666,215	\$3,810,228	\$3,961,283	\$4,119,810	\$4,286,267	\$4,461,148
8	Fund 32 O&M	\$854,670	\$883,223	\$912,866	\$943,650	\$975,629	\$1,008,861
9	CIP	\$1,598,092	\$1,880,445	\$954,497	\$880,711	\$1,229,990	\$833,449
10	<b>Total Expenses</b>	<b>\$6,118,977</b>	<b>\$6,573,896</b>	<b>\$5,828,646</b>	<b>\$5,944,170</b>	<b>\$6,491,886</b>	<b>\$6,303,457</b>
11	Net Cash Flow	\$125,724	(\$220,432)	\$583,819	\$533,670	\$48,114	\$291,032
12	Beginning Fund Balance	\$8,592,750	\$8,718,474	\$8,498,042	\$9,081,861	\$9,615,531	\$9,663,645
13	Ending Fund Balance	\$8,718,474	\$8,498,042	\$9,081,861	\$9,615,531	\$9,663,645	\$9,954,677
14	Target	\$8,234,643	\$8,306,649	\$8,382,177	\$8,461,440	\$8,544,669	\$8,632,109

**Proposed Wastewater Financial Plan**

Raftelis proposes that the District adopt 2 percent rate increases in FY 2023 through FY 2027. All increases are proposed for the beginning of each fiscal year (April 1). Revenue adjustments represent the average increase in rates for the utility as a whole. Actual percent increases (or decreases) in rates are dependent upon the cost of service analysis and are unique to each customer class.

Table 8-8 shows the Financial Plan selected by the District Board. The proposed revenue adjustments help to ensure adequate revenue to fund operating expenses and achieve reserve policy targets. The rates presented in Section 10 are based on the proposed Financial Plan below.

**Table 8-8: Proposed Wastewater Revenue Increases**

Line	A Revenue Adjustment	B FY 2023	C FY 2024	D FY 2025	E FY 2026	F FY 2027
1	Effective Date	April 1, 2022	April 1, 2023	April 1, 2024	April 1, 2025	April 1, 2026
2	Percent Adjustment	2%	2%	2%	2%	2%

Table 8-9 shows the proforma for the wastewater utility (Funds 30 and 23) with additional revenues from the revenue adjustments in the proposed financial plan. These revenue adjustments allow the utility to fund all operating expenses and achieve reserve targets during the Study Period.

**Table 8-9: Proposed Wastewater Proforma**

	A	B	C	D	E	F	G
Line	Wastewater Financial Plan	2022	2023	2024	2025	2026	2027
1	Rate Revenue	\$2,809,900	\$2,870,408	\$2,877,009	\$2,883,627	\$2,890,259	\$2,890,259
2	Revenue Adjustments	\$0	\$57,408	\$116,231	\$176,501	\$238,250	\$300,820
3	Other Operating	\$41,933	\$41,933	\$41,933	\$41,933	\$41,933	\$41,933
4	Interest Income	\$128,868	\$128,593	\$132,607	\$143,147	\$150,648	\$157,323
5	Property Tax	\$3,264,000	\$3,312,960	\$3,362,654	\$3,413,094	\$3,464,291	\$3,516,255
6	<b>Total Revenue</b>	<b>\$6,244,701</b>	<b>\$6,411,302</b>	<b>\$6,530,435</b>	<b>\$6,658,303</b>	<b>\$6,785,382</b>	<b>\$6,906,591</b>
	<b>Expenses</b>						
7	Fund 30 O&M	\$3,666,215	\$3,810,228	\$3,961,283	\$4,119,810	\$4,286,267	\$4,461,148
8	Fund 32 O&M	\$854,670	\$883,223	\$912,866	\$943,650	\$975,629	\$1,008,861
9	CIP	\$1,598,092	\$1,880,445	\$954,497	\$880,711	\$1,229,990	\$833,449
10	<b>Total Expenses</b>	<b>\$6,118,977</b>	<b>\$6,573,896</b>	<b>\$5,828,646</b>	<b>\$5,944,170</b>	<b>\$6,491,886</b>	<b>\$6,303,457</b>
11	Net Cash Flow	\$125,724	(\$162,594)	\$701,790	\$714,132	\$293,495	\$603,133
12	Beginning Fund Balance	\$8,592,750	\$8,718,474	\$8,555,881	\$9,257,670	\$9,971,802	\$10,265,298
13	Ending Fund Balance	\$8,718,474	\$8,555,881	\$9,257,670	\$9,971,802	\$10,265,298	\$10,868,431
14	Target	\$8,234,643	\$8,306,649	\$8,382,177	\$8,461,440	\$8,544,669	\$8,632,109

Figure 8-1 graphically illustrates the Operating Financial Plan. It compares existing and proposed revenues with projected expenses. The expenses represent O&M expenses (light blue stacked bars) and reserve funding (shown by yellow stacked bars). Total revenues at existing and proposed rates are shown by the horizontal gray and dotted blue lines, respectively. Current revenue from existing rates, in gray, does not meet future total expenses (inclusive of reserve funding) and shows the need for revenue adjustments.



Figure 8-1: Wastewater Financial Plan

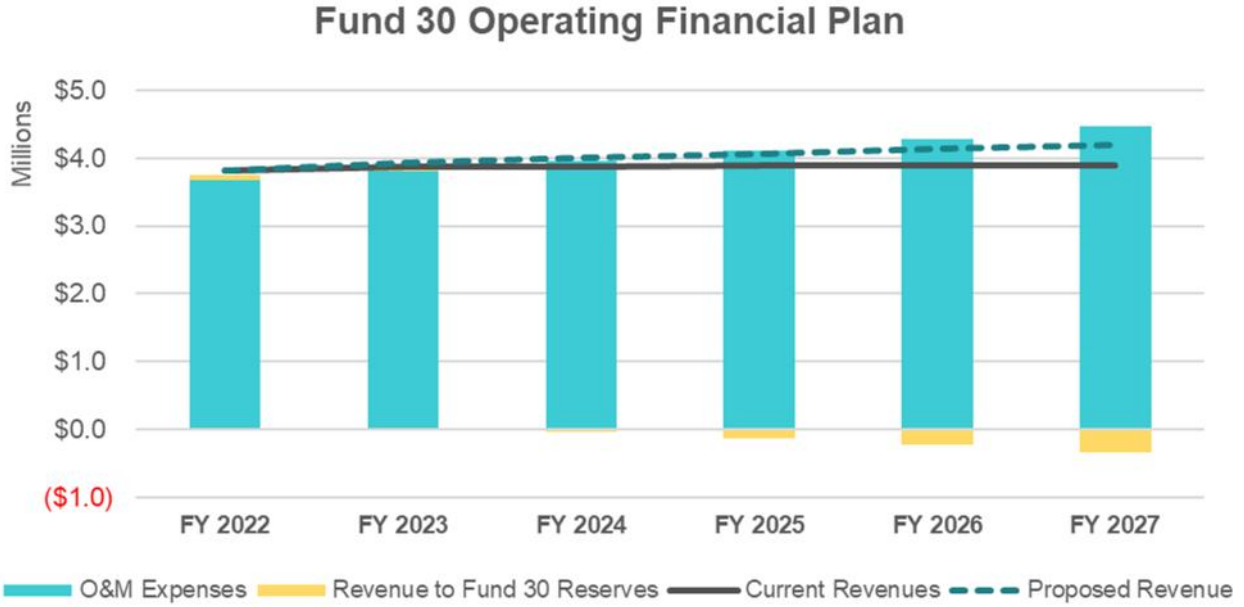
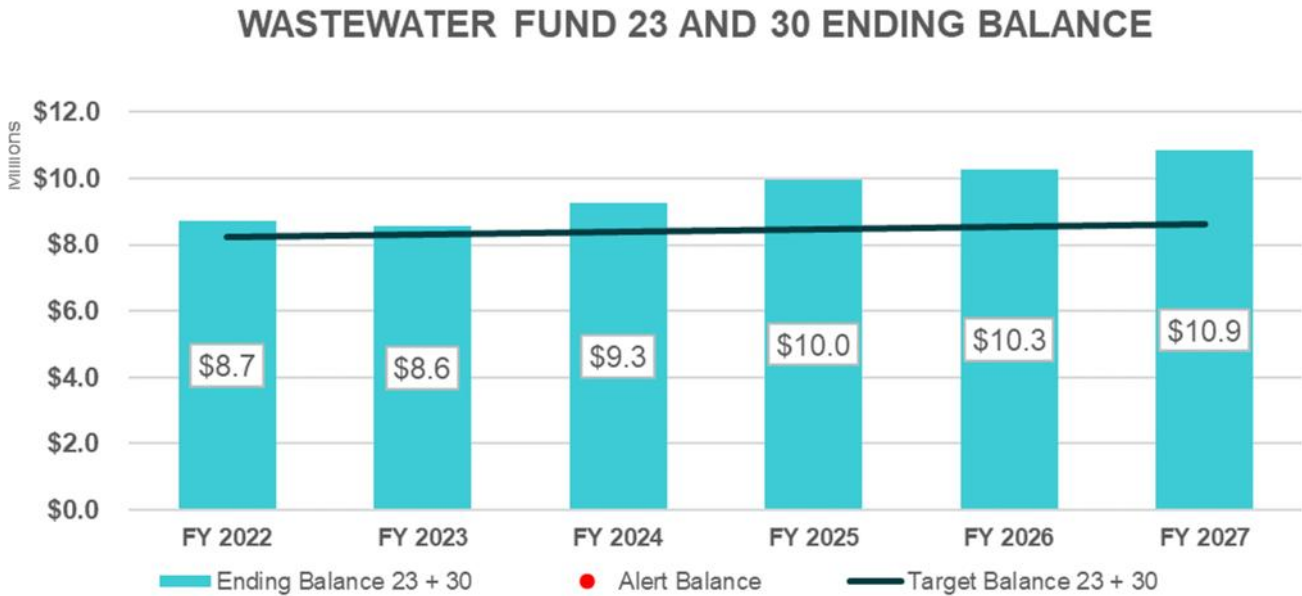


Figure 8-2 shows the wastewater utility’s ending balance by fiscal year. The blue bars indicate the ending balance while the dark line indicates the target balance.

Figure 8-2: Wastewater Fund Balances



# 9 Wastewater Cost of Service Analysis

This section of the report details the cost-of-service analysis and rate calculation process to determine the proposed wastewater rates. The goal of this process is to determine the cost of providing wastewater service to each of the District's wastewater customer classes and to ensure equity and fairness among the various classes.

## Process and Approach

The cost-of-service analysis utilized to develop the wastewater rates follows the guidelines for allocating costs outlined in the Water Environment Federation (WEF) Manual No. 27. The cost-of-service analysis and rate design process consists of six major steps, as outlined below:

1. Determine the revenue requirement, equal to the revenue to be recovered from rates.
2. Allocate functionalized O&M expenses to cost components such as flow, strength, customer, and general.
3. Develop customer class characteristics and units of service by cost component.
4. Calculate the cost component unit rates by dividing the total cost in each cost component by the total units of service for that component.
5. Calculate the cost for each customer class by multiplying the unit cost by the units of service for each customer class.
6. Design rates to recover the various customer classes' cost of service and achieve the District's objectives.

## Revenue Requirement

The revenue required from rates is the amount of revenue required to fund all wastewater expenses in the test year, and is shown in Table 9-1. The utility must generate annual revenues adequate to meet its estimated annual O&M expenses and reserve targets. Due to the District's choice to begin the development of potential wastewater rate structures before the completion of the financial plan described in Section 8, Raftelis developed rates using FY 2022 as the test year. After the completion of the financial plan, the calculated rates are adjusted by the required increases presented in Table 8-8 for each year, including FY 2023.

**Table 9-1: Wastewater Revenue Requirement**

	A	B	C	D
Line	Wastewater Revenue Requirement	Operating	Capital	Total
	<b>Expenses</b>			
1	O&M	\$3,666,215	\$ -	\$ 3,666,215
2	Debt Service	-	-	-
3	Rate Funded Capital	-	-	-
4	<b>Subtotal: Expenses</b>	<b>\$ 3,666,215</b>	<b>\$ -</b>	<b>\$ 3,666,215</b>
	<b>Adjustments</b>			
5	Property Tax Revenue	(\$900,000)	\$ -	\$ (900,000)
6	Recycled Water Revenue			-
7	Other Revenue	(\$105,765)	-	(105,765)
8	Annual Cash Balance	\$149,450	-	149,450
9	Mid-Year Adjustment		-	-
10	<b>Subtotal: Adjustments</b>	<b>\$ (856,315)</b>	<b>\$ -</b>	<b>\$ (856,315)</b>
11	<b>Net Revenue Requirement:</b>	<b>\$ 2,809,900</b>	<b>\$ -</b>	<b>\$ 2,809,900</b>

## O&M Cost Allocation to Cost Components

This section discusses the allocation of O&M expenses and capital costs to the wastewater cost components and customer classes. Table 9-2 shows the allocation of the District’s FY 2022 O&M budget, as of January 2021, to the cost components – Flow, BOD and TSS (used to measure wastewater pollutant strength), Customer, and General costs. Column A shows the budget category to be allocated. The percentages in Columns C to G show the allocation factors, developed in consultation with District staff. These factors are applied to the amounts in Column B, resulting in the allocation totals in row 12. The General cost component is then proportionally reallocated to all others in row 13.

**Table 9-2: Wastewater O&M Allocation**

Line	A O&M Allocation	B Budget	C Flow	D BOD	E TSS	F Customer	G General
	<b>Function</b>						
1	Administration	\$ 380,205					100.00%
2	Finance	203,199				50.00%	50.00%
3	Information	117,079				50.00%	50.00%
4	Lab	210,184		50.00%	50.00%		
5	Operation Administration	134,603	50.00%	25.00%	25.00%		
6	Human Resources and Safety	104,829					100.00%
7	Maintenance Management	406,960	100.00%				
8	Engineering Wastewater	422,172	50.00%	25.00%	25.00%		
9	Wastewater Treatment	996,471	50.00%	25.00%	25.00%		
10	Line Maintenance Wastewater	359,070	100.00%				
11	Mechanical Maintenance Wastewater	247,451	100.00%				
12	<b>Total:</b>	<b>\$ 3,582,222</b>	<b>\$ 1,790,104</b>	<b>\$ 493,403</b>	<b>\$ 493,403</b>	<b>\$ 160,139</b>	<b>\$ 645,173</b>
13	<b>Reallocated Total:</b>		2,183,330	601,788	601,788	195,316	-
14	<i>Percent Allocation</i>		61%	17%	17%	5%	

## Units of Service

The second step of the cost-of-service analysis is to determine the units of service, including conducting a plant mass balance analysis. The mass balance analysis is used to estimate and validate the wastewater loadings (flow and strength) generated by each customer class. In Table 9-3, the values in column B, rows 1 and 2 represent an annualized total of the average winter consumption (AWC) of each customer class. In other words, if all residential customers used the same amount of water each month as they do in the average of December, January, and February, they would use approximately 305 million gallons per year. AWC is a commonly used estimate of indoor water use since there would be near zero outdoor water use in those months. Biochemical oxygen demand (BOD) and total suspended solids (TSS) strength parameters (a measure of organic and inorganic materials in wastewater influent) are estimated in milligrams per liter in Columns C and E; the strength and flow for each class are combined to estimate total pounds of pollutants in Columns D and F. Because of the wide variety and mix of the District's classifications of Residential and Non-Residential wastewater customers, the strength of wastewater generated is assumed to be the same between the classes (415 mg/l BOD and 400 mg/l TSS). Inflow and infiltration (I&I) represents plant influent, not from customer generation, but through runoff and seepage. I&I estimates were vetted with District staff and is reapportioned proportionally.

**Table 9-3: Mass Balance**

Line	A	B	C	D	E	F
	Mass Balance	AWC Flow	BOD	BOD	TSS	TSS
		Annual gal	mg/l	lbs	mg/l	lbs
	<b>Class</b>					
1	Residential	305,365,928	415.0	1,056,902	400.0	1,018,701
2	Non-Residential	119,974,856	415.0	415,245	400.0	400,236
3	<b>Net Plant:</b>	<b>425,340,784</b>	<b>415.0</b>	<b>1,472,147</b>	<b>400.0</b>	<b>1,418,937</b>
4	I&I	115,896,086	17.8	17,245	148.4	143,405
5	<b>Plant Total:</b>	<b>541,236,870</b>	<b>330.0</b>	<b>1,489,391</b>	<b>346.1</b>	<b>1,562,341</b>

## Unit and Class Cost of Service

Table 9-4 shows the calculation of unit costs by cost component. The FY 2022 revenue requirement is allocated to cost components using the percentages derived on row 14 of Table 9-2. The units of service developed in Table 9-3 are summarized on rows 2 to 4. The unit cost on line 5 is calculated by dividing the revenue requirement for each cost component by the corresponding units of service.

The final step in the cost-of-service analysis is to allocate the revenue requirement to each customer class based on their share of burden in the wastewater system. Rows 6 and 7 show the revenue requirement allocated to each customer class based on the cost components, which is calculated by multiplying the unit costs of each cost component by the units of service for each customer class. Note that the total cost of service is equal to the total revenue required shown on line 1.

**Table 9-4: Cost of Service**

Line	A Cost of Service	B Flow	C BOD	D TSS	E Customer	F Total
1	<b>Revenue Requirement</b>	\$ 1,712,607	\$ 472,043	\$ 472,043	\$ 153,206	\$ 2,809,900
	<b>Units of Service</b>					
2	Residential	305,366	1,056,902	1,018,701	8,513	
3	Non-Residential	119,975	415,245	400,236	231	
4	<b>Total:</b>	<b>425,341</b>	<b>1,472,147</b>	<b>1,418,937</b>	<b>8,744</b>	
5	<b>Unit Cost</b>	\$ 4.03	\$ 0.32	\$ 0.33	\$ 17.52	
	<i>Unit of Measure</i>	<i>Kgal</i>	<i>Lb</i>	<i>Lb</i>	<i>Account</i>	
	<b>Class COS</b>					
6	Residential	\$ 1,229,536	\$ 338,895	\$ 338,895	\$ 149,159	\$ 2,056,485
7	Non-Residential	483,071	133,148	133,148	4,047	753,415
8	<b>Total:</b>	<b>\$ 1,712,607</b>	<b>\$ 472,043</b>	<b>\$ 472,043</b>	<b>\$ 153,206</b>	<b>\$ 2,809,900</b>

# 10 Wastewater Rate Derivation and Design

After several rate design iterations, the District chose to maintain the fixed monthly equivalent residential unit (ERU) charge for residential customers and adopt a new rate structure for non-residential customers. Rather than a charge based on seats, fixtures, or a previously determined ERU value, non-residential customers will have a fixed plus variable rate structure: a fixed monthly charge based on water meter size as well as a volumetric charge (\$/kgal of water) based on their AWC. The AWC charge will ensure that customers who place a higher demand on the system will pay their fair share, but no customers will be penalized for high outdoor summer water use for irrigation that is not returned to the wastewater system. The proposed non-residential rate structure improves equity for connections whose water use and wastewater generation no longer reflect their assigned fixture counts/special multipliers. The proposed structure will also reduce the administrative burden on the District and improve customer understanding.

## Residential Charges

The ERU charge has two components: billing and treatment/collection. The billing component recovers the cost to generate the monthly bill and provide customer service. Just like the customer component to water service charges, the wastewater billing component is recovered uniformly from the total number of accounts over the course of the year; an analysis of the billing data provided by the District indicated that there are 8,513 SFR and MFR dwelling units. The billing cost was determined in Table 9-4, column E, row 6. The unit cost for this component is \$1.47 per month per unit.

All other costs for treatment and collection of wastewater are recovered on an ERU basis. District billing data included 8,513 residential ERUs to recover the costs shown in Table 9-4, columns B, C, and D, row 6. The treatment and collection unit cost for this component is \$18.68 per ERU per month.

The total residential rate, shown in column D of Table 10-1 is \$20.15 per ERU per month. All residential units are assumed to be one ERU. For example, a single family home would be one ERU and a 10-unit apartment complex would equal 10 ERUs.

**Table 10-1: Residential ERU Charge Development**

	A	B	C	D
Line	ERU Charge Development	Bills	Treatment	Total
1	Cost	\$ 149,159	\$ 1,907,327	\$ 2,056,485
2	Units	8,513	8,513	
3	Monthly Charge	\$ 1.47	\$ 18.68	\$ 20.15

## Non-Residential Charges

### Fixed Charge

The non-residential fixed charge includes the cost to provide customer service, recovered equally from all accounts, as well as the costs of treating BOD and TSS pollutants, recovered on an equivalent meter basis. Table 10-2 shows the development of the wastewater equivalent meters. The equivalency ratio in column C is applied to the number of meters in column B to calculate the number of equivalent meters in column D. For consistency, the equivalency ratios are the same as those used

in the District’s most recent Capacity Fee Study which utilizes data from East Bay Municipal Utilities District (EBMUD)<sup>5</sup>. The EBMUD ratios are calculated in average annual flow in for each meter size.

**Table 10-2: Wastewater Equivalent Meters**

	A	B	C	D
Line	Equivalent Meter Calculation	Meter Count	Ratio	Eq. Meters
	<b>Meter Size</b>			
1	5/8	10	1.0	10
2	3/4	54	1.0	54
3	1	56	2.6	147
4	1 1/2	36	5.1	184
5	2	48	9.6	461
6	3	9	20.2	181
7	4	6	40.9	246
8	6	10	40.9	409
9	8	2	40.9	82
10	Total	231		1,774

Table 10-3 shows the calculation of the fixed charge. The billing cost in column B was developed in Table 9-4, column E, row 7 and the strength (BOD and TSS) charges are the sum of columns C and D, row 7.

**Table 10-3: Non-Residential Fixed Charge Development**

	A	B	C	D
Line	Fixed Charge Development	Bills	Treatment	Total
1	Cost	\$ 4,047	\$ 266,296	\$ 270,344
2	Units	231	1,774	
3	Rate	\$ 1.47	\$ 12.51	\$ 13.98

Table 10-4 presents the full monthly fixed charge. The ratios in Table 10-2 are applied to the strength charge in Table 10-3 and added to the billing charge for each meter size.

<sup>5</sup> The sewer ratios calculated using District winter water use present challenges due to a small population of larger meters with disparate and seasonal use. For example, when calculating wastewater ratios, the 4” meter ratio is less than the 2” and the 8” ratio is less than the base 3/4”. To avoid manipulation of the data while maintaining a similar approach to derive sewer ratios, Raftelis relies on the sewer flow ratios of EBMUD. EBMUD serves 685,000 customers across a large service area, with a mix of residential and commercial customers.



**Table 10-4: Total Proposed Fixed Charge**

	A	B	C	D
Line	Proposed Fixed Charge	Billing	Treatment	Total
<b>Meter Size</b>				
1	5/8	\$ 1.47	\$ 12.51	\$ 13.98
2	3/4	\$ 1.47	\$ 12.51	\$ 13.98
3	1	\$ 1.47	\$ 32.90	\$ 34.38
4	1 1/2	\$ 1.47	\$ 64.05	\$ 65.53
5	2	\$ 1.47	\$ 120.10	\$ 121.57
6	3	\$ 1.47	\$ 252.08	\$ 253.55
7	4	\$ 1.47	\$ 512.03	\$ 513.51
8	6	\$ 1.47	\$ 512.03	\$ 513.51
9	8	\$ 1.47	\$ 512.03	\$ 513.51

### Volume Charge

The volume charge is designed to recover the remainder of non-residential costs (the flow component shown in Table 9-4, column B, row 7) on the basis of the annualized AWC for the class shown in Table 9-3. Flow costs are divided by the annualized AWC to derive a rate of \$4.03/kgal of water use.

**Table 10-5: Proposed Volume Charge**

	A	B
Line	Volume Charge Development	Flow
1	Cost (\$)	\$483,071
2	Units (kgal)	119,975
3	Rate (\$/kgal)	\$ 4.03

### Wastewater Rate Forecast

Table 10-6 shows the forecast of proposed wastewater rates, developed by applying the revenue increases in Table 8-8 to the rates in Table 10-4 and Table 10-5.

**Table 10-6: Wastewater Rate Forecast**

Line	A	B	C	D	E	F	G	H
		2022		2023	2024	2025	2026	2027
	Effective Date	N/A	N/A	April 1, 2022	April 1, 2023	April 1, 2024	April 1, 2025	April 1, 2026
	Proposed Wastewater Rates	Current	COS	Proposed	Proposed	Proposed	Proposed	Proposed
1	Residential	\$21.15	\$20.15	\$20.56	\$20.98	\$21.40	\$21.83	\$22.27
	Non-Residential							
2	5/8	Fixture	\$13.98	\$14.26	\$14.55	\$14.85	\$15.15	\$15.46
3	3/4	Fixture	\$13.98	\$14.26	\$14.55	\$14.85	\$15.15	\$15.46
4	1	Fixture	\$34.38	\$35.07	\$35.78	\$36.50	\$37.23	\$37.98
5	1 1/2	Fixture	\$65.53	\$66.85	\$68.19	\$69.56	\$70.96	\$72.38
6	2	Fixture	\$121.57	\$124.01	\$126.50	\$129.03	\$131.62	\$134.26
7	3	Fixture	\$253.55	\$258.63	\$263.81	\$269.09	\$274.48	\$279.97
8	4	Fixture	\$513.51	\$523.79	\$534.27	\$544.96	\$555.86	\$566.98
9	6	Fixture	\$513.51	\$523.79	\$534.27	\$544.96	\$555.86	\$566.98
10	8	Fixture	\$513.51	\$523.79	\$534.27	\$544.96	\$555.86	\$566.98
11	Volume Rate	N/A	\$4.03	\$4.12	\$4.21	\$4.30	\$4.39	\$4.48

## Wastewater Bill Impacts

Raftelis calculated wastewater customer impacts for all classes and meter sizes. SFR customers will see a decrease in their monthly bill of \$0.59, while MFR customers will have an increase of \$2.32 per dwelling unit. Non-residential customers will experience a wide range of impacts on their monthly bills since the existing rate structure is based on fixture units, for which each customer has a different rate and/or count of fixtures. This structure is being replaced by a simpler structure consisting of a uniform volume rate (\$/kgal) and a standardized fixed charge schedule based on water meter size. Rather than examining the change in a common or average bill, Figure 10-1 displays a distribution of monthly impacts for each of the District’s non-residential customers. Each line in the chart represents a single non-residential customer.

Figure 10-1: Non-Residential Bill Impact Distribution



## Outside of District (OOD) Charges

### Outside of District - Base Charges

The District charges OOD customers monthly base charges just like in-District customers, however, OOD accounts pay for only six months of service. The historic basis is that most OOD sewer customers only have access to their properties (and therefore the sewer system) for six months out of the year. Therefore, the OOD Base charges have been levied against OOD customers for only six billing periods. Wastewater collection and treatment infrastructure must be constructed, operated, and maintained at all times to provide capacity for wastewater collection, treatment, and disposal. This infrastructure must be maintained 365 days per year and the costs of doing so are almost entirely fixed. Raftelis recommends the District bill monthly base charges to OOD customers for all 12 months of the year, on par with in-District customers.

The District provides wastewater collection and treatment services to some campgrounds out of District for which it does not provide water service. To determine appropriate charges Raftelis relied upon *2016 Residential End Uses of Water* by the Water Research Foundation in conjunction with the American Water Works Association. 64 percent of indoor water consumption is used in toilet flushing, showers, and faucets, the same facilities offered at campgrounds. Campsite occupancy is assumed to be the same as Residential customers, at roughly three people per site, therefore the wastewater base charge for OOD campgrounds will be calculated at 64 percent of the residential base rate for each campground site.

### Outside of District – Replacement Charges

The District charges OOD customers a monthly operations and maintenance charge and an annual replacement charge to fund capital replacement projects located outside the District boundaries and/or on United States Forest Service land. The monthly O&M charge is currently \$25.04 per cabin and the current annual replacement charge for each customer outside the District boundaries and/or on United States Forest Service land, including Mill City, is \$95.32 per Cabin, Commercial, Public, Restaurant, or Motel complex.

The District receives a share of property tax revenues from inside District customers. Historically property tax revenues have been utilized to pay for the District’s repair and replacement capital program, while rates – via base charges – fund

operations. Since the District does not receive property tax revenues from OOD properties it serves, and to ensure equity with inside District customers, Raftelis recommends a right-sizing of the OOD replacement charge, which is shown in Table 10-7.

The total property tax received by the District is first allocated between the Water and Wastewater utilities. This apportionment was discussed in Section 4 and presented in Table 4-2. The fee is then calculated by dividing the amount of taxes apportioned to Fund 23 - Wastewater Replacement Capital Fund by the total number of residential and non-residential ERUs from the District’s billing data (11,992). This results in an annual replacement charge of \$272.18 per ERU or a monthly charge of \$22.69 per ERU to outside District customers. Just like the OOD Base charge, campgrounds will pay 64 percent of the replacement charge, per campground site.

**Table 10-7: OOD Replacement Charge Derivation**

	A	B
Line	Description	Value
1	Estimated Property Tax Revenues – District-wide	\$8,160,000
2	Percent (%) Allocation to Wastewater	40%
3	Property Tax – Wastewater Utility	\$3,264,000
4	Total Wastewater ERUs	11,992
5	OOD Replacement Charge (Annual)	<b>\$272.18</b>
6	OOD Replacement Charge (Monthly)	<b>\$ 22.69</b>

Table 10-8 shows the forecast of proposed OOD replacement charges, developed by applying the revenue increases in Table 8-8 to the charge calculated in Table 10-7.

**Table 10-8: OOD Replacement Charge Forecast**

	A	B	C	D	E	F
Line	Fiscal Year	2023	2024	2025	2026	2027
	Effective Date	April 1, 2022	April 1, 2023	April 1, 2024	April 1, 2025	April 1, 2026
	Proposed Outside District Replacement Charge	Proposed	Proposed	Proposed	Proposed	Proposed
1	All OOD Customers (\$/Year)	\$277.62	\$283.18	\$288.85	\$294.63	\$300.53
2	All OOD Customers (\$/Month)	\$23.14	\$23.61	\$24.09	\$24.58	\$25.08