

# CITY OF HUNTINGTON BEACH

## 2019 Water Rate Study Update

Final Report / May 10, 2019







May 10, 2019

Mr. Kenneth J. Dills  
Project Manager  
City of Huntington Beach Public Works Department, Utilities Division  
19001 Huntington Street, P.O. Box # 190  
Huntington Beach, CA 92648

**Subject: 2019 Water Rate Study Update Report**

Dear Mr. Dills,

Raftelis Financial Consultants, Inc. (Raftelis) is pleased to provide this 2019 Water Rate Study Update Report (Report) to the City of Huntington Beach (City). The contents of this Report include an updated five-year financial plan for the City's water utility for fiscal year (FY) 2019/20 to FY 2023/24 and proposed water rates for the same five-year period.

The major objectives of the study update include the following:

- Update the five-year financial plan for the City's water utility to ensure revenue sufficiency and financial sustainability
- Conduct a cost-of service analysis to equitably allocate the costs of providing water service incurred by the City to serve the City's customers
- Develop updated water rates for FY 2019/20 through FY 2023/24 that are fair and equitable
- Develop an administrative record that demonstrates the nexus between the City's costs and rates in compliance with Proposition 218

This Report summarizes the key updates made to the 2018 Water Rate Study previously conducted by Raftelis for the City and outlines in detail the development of the updated financial plan and proposed water rates. It has been a pleasure working with you, and we thank you and other City staff for the support provided during this study update.

Sincerely,

***RAFTELIS FINANCIAL CONSULTANTS, INC.***

A handwritten signature in black ink, appearing to read 'Sanjay Gaur'.

**Sanjay Gaur**  
Vice President

A handwritten signature in black ink, appearing to read 'Charles Diamond'.

**Charles Diamond**  
Consultant

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# Glossary

<b>Terms</b>	<b>Descriptions</b>
<b>AWWA</b>	American Water Works Association
<b>BEA</b>	Basin Equity Assessment
<b>BPP</b>	Basin Pumping Percentage
<b>CCF</b>	Hundred cubic feet, 1 CCF = 748 gallons
<b>CIP</b>	Capital Improvement Projects
<b>City</b>	City of Huntington Beach
<b>COS</b>	Cost of Service
<b>CPI</b>	Consumer Price Index/Indices
<b>CY</b>	Calendar Year
<b>EDU</b>	Equivalent Dwelling Unit
<b>EMU</b>	Equivalent Meter Unit
<b>ENR CCI</b>	Engineering News-Record Construction Cost Indices
<b>FY</b>	Fiscal Year ( <i>July 1 – June 30</i> )
<b>GPCD</b>	Gallons per capita per day
<b>MBC</b>	Meter Basic Charges
<b>M1 Manual</b>	“Principles of Water Rates, Fees, and Charges: Manual of Water Supply Practices M1”, 6th edition published by AWWA
<b>MD</b>	Max Day Peaking Factor
<b>MFR</b>	Multi-Family Residential
<b>MH</b>	Max Hour Peaking Factor
<b>MWD</b>	Metropolitan Water District of Southern California
<b>MWDOC</b>	Municipal Water District of Orange County
<b>MWRF</b>	Mesa Water Reliability Facility
<b>OC</b>	Orange County
<b>OCWD</b>	Orange County Water District
<b>O&amp;M</b>	Operations and Maintenance
<b>PAYGO</b>	Pay-As-You-Go
<b>R&amp;R</b>	Repair and Replacement
<b>RA</b>	Replenishment Assessment
<b>Raftelis</b>	Raftelis Financial Consultants, Inc.
<b>RC</b>	Replacement Cost

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# 1. Executive Summary

## 1.1 Introduction

In 2017, the City of Huntington Beach (City) engaged Raftelis Financial Consultants, Inc. (Raftelis) to conduct a cost of service analysis and rate study for the water utility. The 2017 study established a five-year financial plan for the City's water utility and proposed water rates for FY 2018/19. In 2019, Raftelis was engaged to update the 2017 study, develop an updated five-year financial plan through FY 2023/24, and establish updated water rates for FY 2019/20 through FY 2023/24. The major objectives of this study update include the following:

1. Ensure *Revenue Sufficiency* to meet the operations and maintenance (O&M) and capital needs of the City's water utility in light of proposed changes to the fixed meter charge assessment basis for multifamily (MFR) customers.
2. Ensure that rates are *Fair and Equitable*, in accordance with *Cost of Service* guidelines used in the industry.
3. Plan for *Rate and Revenue Stability* to prevent rate spikes, ensure adequate capital replacement funding, preserve the overall financial health of the utility, and maintain adequate reserves under uncertain conditions.

This executive summary provides an overview of the results of the study update and shows the proposed water rates for FY 2019/20.

## 1.2 Proposed Financial Plan

To maintain fiscal solvency, fund O&M and capital expenses, maintain reserve fund balance targets, and avoid the need for debt issuance, we make several recommendations regarding the City's current rate structure and financial plan. These recommendations include proposed annual adjustments to the fixed meter charges in light of a proposal to assess fixed charges to MFR customers based on meter size rather than equivalent dwelling units (EDUs) beginning in FY 2019/20.

### FIXED CHARGE REVENUE ADJUSTMENT

The City currently adjusts the monthly fixed meter charge in non-rate setting years by the annual percentage change available on July 1 in the Consumer Price Index for All Urban Consumers (CPI) in Los Angeles, Orange, and Riverside counties as established by the U.S. Bureau of Labor Statistics.

Raftelis recommends that the City increases its monthly fixed meter charge for customers with a 3/4-inch meter by one dollar at the start of FY 2019/20. The monthly fixed meter charge for customers with all other meter sizes will have a proportional increase of approximately 7.85% in FY 2019. Note that no CPI adjustment will be implemented in FY 2019/20. In both FY 2020/21 and FY 2021/22, Raftelis recommends that City adjust the monthly fixed charge for 3/4-inch meters by CPI plus \$1. The monthly fixed meter charges for all other meter sizes will be adjusted proportionally (CPI + approximately 7%). In FY 2022/23 and FY 2023/24, Raftelis proposes that the City adjust the monthly fixed meter charge for all meter sizes by CPI only. **Table 1-1** displays the revenue adjustments used in this study.

**Table 1-1: Proposed Fixed Charge Adjustments**

Fiscal Year	Effective Date	Monthly Fixed Meter Charge Adjustment (3/4" Meter Size)
FY 2019/20	July 1, 2019	\$1
FY 2020/21	July 1, 2020	CPI + \$1
FY 2021/22	July 1, 2021	CPI + \$1
FY 2022/23	July 1, 2022	CPI Only
FY 2023/24	July 1, 2023	CPI Only

## CAPITAL SURCHARGE

Raftelis recommends that the City maintain its existing rate schedule for the capital surcharge as determined in the prior 2017 water rate study (shown below in **Table 1-2**). The capital surcharge varies by meter size and is currently based on equivalent meter units (EMUs) per month and on EDUs for MFR customers. As with the fixed meter charge, the City proposes to begin assessing the capital surcharge for MFR customers based on meter size as well beginning in FY 2019/20.

**Table 1-2: Proposed Capital Surcharge**

Fiscal Year	Proposed Capital Surcharge (\$ / EMU / day)	Proposed Capital Surcharge (\$ / EMU / month)
FY 2018/19	\$0.0986	\$3.00
FY 2019/20	\$0.0986	\$3.00
FY 2020/21	\$0.1151	\$3.50
FY 2021/22	\$0.1151	\$3.50
FY 2022/23	\$0.1316	\$4.00
FY 2023/24	\$0.1316	\$4.00

## COMMODITY CHARGE PASS-THROUGH

The commodity charge is designed to recover the variable costs of providing water, including water supply costs and unrecovered water system fixed costs<sup>1</sup>. We recommend that the City continue its current policy of increasing the commodity charges in each year based on a “pass-through” of water supply costs, so that the total change in water supply costs from year to year is the basis for changing the commodity rates. Under this policy, the City increases its commodity charge based on the increment of water supply costs in each fiscal year. In keeping with industry standard pass-through methodologies, the City will calculate the actual change in water supply costs in each year as new purveyor rates become available. The proposed commodity rate shown in this report for FY 2019/20 is equal to the existing FY 2018/19 rate of \$2.1063 per hundred cubic feet (CCF), but please note that this rate does not include the yet to be determined pass-through adjustment.

## PROPOSED FINANCIAL PLAN

Based on the recommended revenue adjustments, we project the proposed financial plan for the study period. The proposed fixed charge revenue adjustments help increase projected rate revenues, but reserves are drawn down slowly over the study period. Note however that in the absence of any fixed charge adjustments, reserve balances would be reduced in an unsustainable manner that would jeopardize the fiscal solvency of the City’s water utility.

**Figure 1-1** and

**Figure 1-2** display the proposed financial plan and projected end-year reserve balances.

<sup>1</sup> A portion of water system fixed costs is recovered in the fixed service charge.

Figure 1-1: Proposed Operating Financial Plan

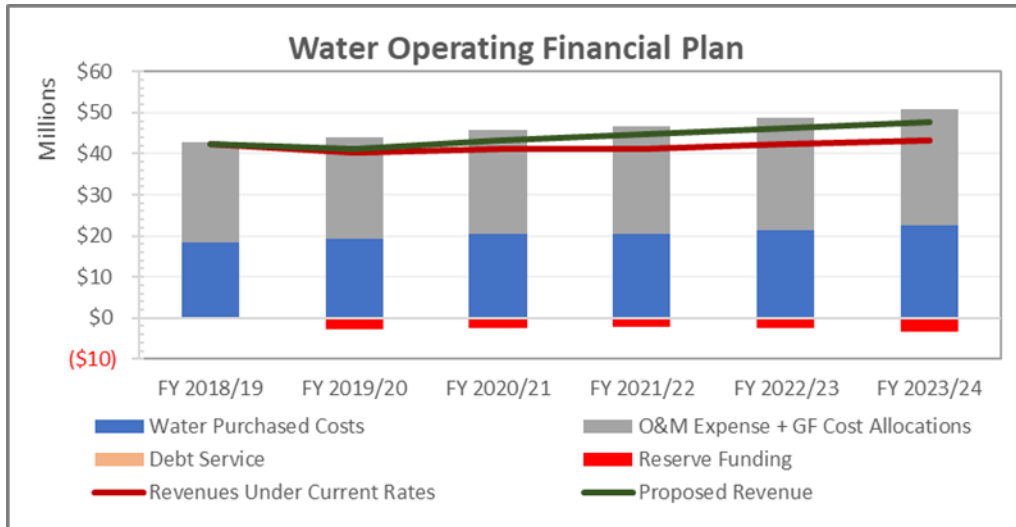
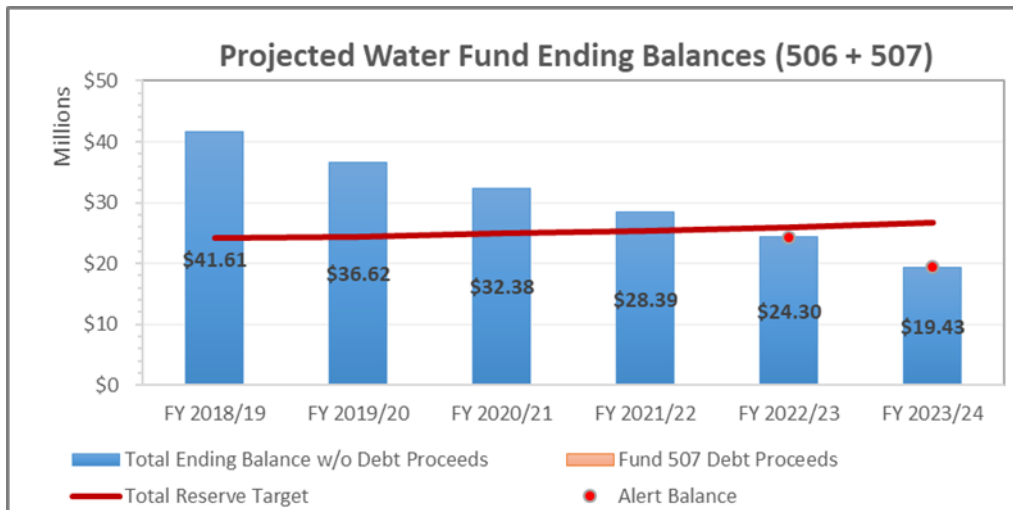


Figure 1-2: Projected Reserve Balances Under Proposed Financial Plan



### 1.3 Proposed Water Rates

Table 1-3 shows the proposed fixed meter charges for FY 2019/20 on both a daily and monthly basis. The rates are based on the COS analysis and rate derivations detailed in Sections 4 and 5 of this report. In the future years of the study period (FY 2020/21 through FY 2023/24), the fixed charges will increase at the rate specified in Table 1-1. The capital surcharge in FY 2019/20 will remain at \$3.00 per EMU per month (as shown previously in Table 1-2). The commodity charge will remain at \$2.1063 per CCF of water delivered prior to inclusion of a pass-through adjustment to be determined by City staff for FY 2019/20. The pass-through adjustment to be calculated by the City is based on the change in effective rates for water supplied by OCWD and MWDOC.

**Table 1-3: Proposed FY 2019/20 Fixed Meter Charges**

Meter Size	AWWA Capacity Ratio	Daily Fixed Meter Charges			Monthly Fixed Meter Charges		
		Current FY 2018/19	Proposed FY 2019/20	\$ Difference	Current FY 2018/19	Proposed FY 2019/20	\$ Difference
3/4"	1.00	\$0.4175	\$0.4504	\$0.0329	\$12.70	\$13.70	\$1.00
1"	1.67	\$0.6973	\$0.7507	\$0.0534	\$21.21	\$22.84	\$1.63
1 1/2"	3.33	\$1.3904	\$1.5014	\$0.1110	\$42.29	\$45.67	\$3.38
2"	5.33	\$2.2254	\$2.4022	\$0.1768	\$67.69	\$73.07	\$5.38
3"	11.67	\$4.8723	\$5.2547	\$0.3824	\$148.20	\$159.83	\$11.63
4" Compound	16.67	\$6.9584	\$7.5067	\$0.5483	\$211.65	\$228.33	\$16.68
4" FM	23.33	\$9.7404	\$10.5093	\$0.7689	\$296.27	\$319.66	\$23.39
6" Compound	33.33	\$13.9154	\$15.0133	\$1.0979	\$423.26	\$456.66	\$33.40
6" FM	53.33	\$22.2654	\$24.0212	\$1.7558	\$677.24	\$730.65	\$53.41
8" FM	93.33	\$38.9652	\$42.0370	\$3.0718	\$1,185.19	\$1,278.63	\$93.44
10" FM	146.67	\$61.2348	\$66.0581	\$4.8233	\$1,862.56	\$2,009.27	\$146.71

**CUSTOMER IMPACTS**

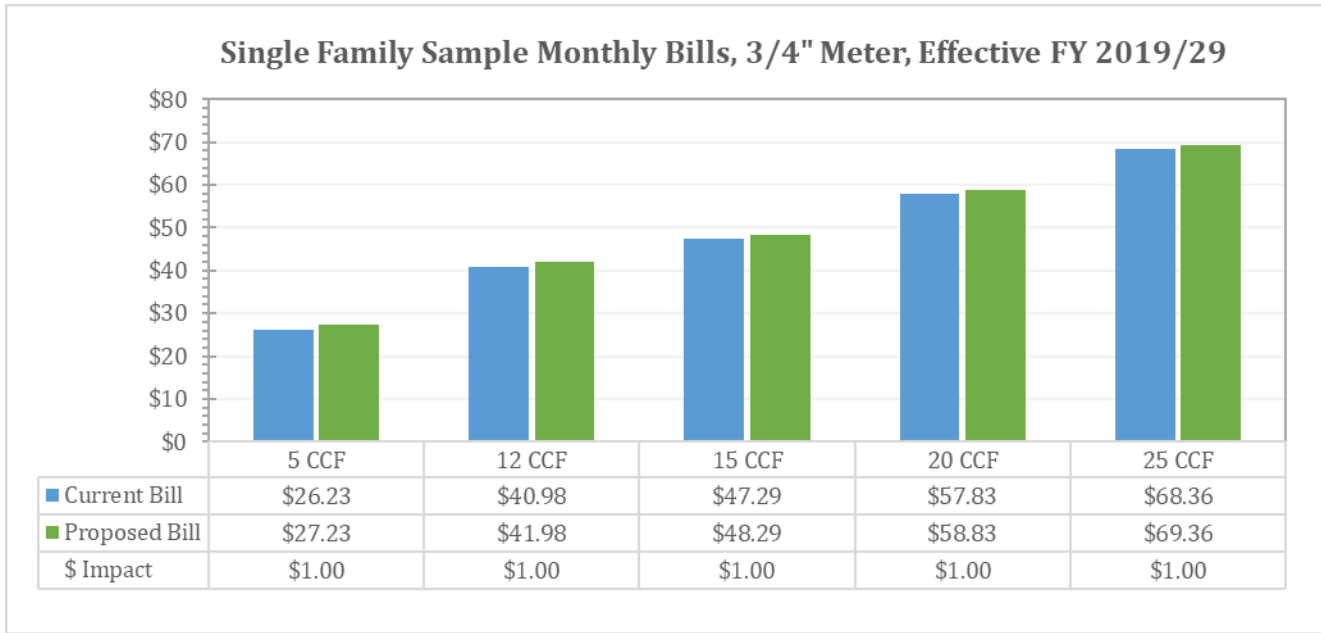
**Table 1-4** compares bills under the current FY 2018/19 rate schedule with those projected under the proposed FY 2019/20 rates. We compared bills for an average residential customer with a 3/4-inch meter using 12 CCF of water per month. Please note that **Table 1-4** does not account for any increase in the commodity rate resulting from the yet-to-be-determined pass-through adjustment.

**Table 1-4: Average Customer Monthly Bill Impacts**

Line	Description	Current FY 2018/19 Rates	Proposed FY 2019/20 Rates	\$ Change	Notes
1	Fixed Meter Service Charge	\$12.70	\$13.70	\$1.00	3/4" meter
2	Capital Surcharge	\$3.00	\$3.00	\$0.00	3/4" meter
3	Commodity Rate Charges	\$25.28	\$25.28	\$0.00	12 CCF monthly usage
4	<b>Total Average Bill</b>	<b>\$40.98</b>	<b>\$41.98</b>	<b>\$1.00</b>	

**Figure 1-3** shows a breakdown of monthly customer impacts for customers with a 3/4-inch meter at various levels of usage, including the 12 CCF example from **Table 1-4**.

**Figure 1-3: Projected Residential Bill Impacts**



# 2. Introduction

## 2.1. Agency Background

The City of Huntington Beach Public Works Department is responsible for the design, construction, maintenance, and operation of public facilities and infrastructure within the City of Huntington Beach. This includes the water utility, which serves a population of over 200,600 residents through approximately 53,000 metered connections. The City's top priorities and goals for the water enterprise include providing safe drinking water, fighting fires and protecting property, and maintaining a reliable and dependable water system for current and future generations.

The City currently provides water from two sources: local groundwater serviced by the Orange County Water District (OCWD) and imported purchased water from the Metropolitan Water District of Orange County (MWDOC). In recent years, the City has provided 75% of its water supply from OCWD and the remaining 25% from MWDOC. The City anticipates significant costs to maintain and replace its substantial water infrastructure, which includes 10 wells, 611 miles of distribution mains, four reservoirs, five booster pump stations, and three import connections. The City also maintains 5,801 public hydrants, 17,749 large valves, 20 miles of shared large mains, and over \$20 million in machinery, vehicles, and equipment. The City estimates the full replacement cost of its water infrastructure at over \$1.4 billion.

The City currently charges customers a uniform commodity rate based on its water supply costs and a monthly fixed meter charge based on meter size as measured in equivalent meter units (EMUs). For multifamily (MFR) customers only, meter charges are currently based on the number of equivalent dwelling units (EDUs). Additionally, the City began assessing a capital surcharge in FY 2018/19 to fund a portion of the water utility's capital improvement plan (CIP) expenditures. The capital surcharge is currently assessed in the same manner as the monthly fixed meter charge. MFR customers are currently assessed the capital surcharge per EDU, while all other customer classes are charged based on meter size.

The City currently adjusts the monthly fixed meter charge by the annual percentage change available on July 1 in the Consumer Price Index for All Urban Consumers (CPI) in Los Angeles, Orange, and Riverside counties as established by the U.S. Bureau of Labor Statistics. The uniform commodity rate is adjusted in each year via a "pass-through" of the water utility's water supply cost increases. This means that the City increases its commodity rate based on the incremental increase in its water supply costs in each year. The capital surcharge is scheduled to ramp up slowly over time to recover a greater proportion of the water utility's CIP expenditures.

## 2.2. Study Background

In 2017, the City of Huntington Beach (City) engaged Raftelis Financial Consultants, Inc. (Raftelis) to conduct a cost of service analysis and rate study for the water utility. The 2017 study established a five-year financial plan for the City's water utility and proposed water rates for FY 2018/19. In 2019, Raftelis was engaged to update the 2017 study, develop an updated five-year financial plan through FY 2023/24, and establish updated water rates for FY 2019/20 through FY 2023/24. The major objectives of this study update include the following:

1. Ensure *Revenue Sufficiency* to meet the operations and maintenance (O&M) and capital needs of the City's water utility in light of proposed changes to the fixed meter charge assessment basis for multifamily customers.
2. Ensure that rates are *Fair and Equitable*, in accordance with *Cost of Service* guidelines used in the industry.

3. Plan for *Rate and Revenue Stability* to prevent rate spikes, ensure adequate capital replacement funding, preserve the overall financial health of the utility, and maintain adequate reserves under uncertain conditions.

This report documents the methods and results of the study update and concludes with recommended water rates for FY 2019/20 through FY 2023/24.

## 2.3. Legal Framework and Rate Setting Methodology

This section of the report describes the legal framework that was considered during rate development to ensure that the calculated cost of service rates provide a fair and equitable cost allocation to the different customer classes.

### **CALIFORNIA CONSTITUTION - ARTICLE XIID, SECTION 6 (PROPOSITION 218)**

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

1. Water rates shall not exceed the funds required to provide the service.
2. Revenues derived by the charge shall not be used for any other purpose other than that for which the charge was imposed.
3. The amount of the charge imposed upon any parcel shall not exceed the proportional cost of service attributable to the parcel.
4. No charge may be imposed for a service unless that service is used or immediately available to the owner of property.
5. No charge may be imposed for general governmental services including, but not limited to, police, fire, ambulance or library services, where the service is available to the public at large in substantially the same manner as it is to property owners.

### **COST-BASED RATE SETTING METHODOLOGY**

Raftelis' rate setting methodology is based on the American Water Works Association (AWWA) M1 Manual. The methods detailed in the M1 Manual align with the Proposition 218 requirement that "a utility's full revenue requirement should be equitably recovered from classes of customers in proportion to the cost of serving those customers." To develop utility rates that comply with Proposition 218 and industry standards while meeting other emerging goals and objectives of the utility, we follow the "Base-Extra Capacity" methodology as outlined in the M1 Manual. Section 4 of this report includes details of the methods and calculations involved in the cost of service analysis, while Section 5 details the derivation of rates.

## 2.4. Disclaimers

In performance of the services, it is understood that the City and/or others may supply Raftelis with certain information and/or data and that Raftelis will rely on such information. Raftelis shall not be liable for the accuracy of such information, nor for its verification, except to the extent that verification is expressly a part of Raftelis' scope of services.

Raftelis' opinions, estimates, projections, and forecasts of current and future costs, revenues, other levels of any sort, and events shall be made on the basis of available information and Raftelis' expertise and qualifications as professionals. Raftelis does not warrant or guarantee that its opinions, estimates, projections or forecasts of current and future levels and events will equal the City's estimates or forecasts or actual outcomes. Raftelis identifies costs, allocates costs to customer classes, and provides rate models. It does not establish rates, which is the legislative

responsibility of City. The numbers shown in the tables listed in this report may be rounded, thus they may not add up to the precise numbers as shown.



# 3. Financial Plan Development

## 3.1. Key Assumptions

The first step in developing the updated financial plan is to identify the growth assumptions used to project costs, usage, and revenues over the study period. Key assumptions of the study include anticipated growth in costs over the study period, inflation factors for account growth and demand growth, and reserve policies. Raftelis developed these assumptions based on the City’s data and projections. These assumptions represent our projections of the most likely scenario over the study period, to the extent that data are available.

### INFLATION FACTORS

**Table 3-1** lists the anticipated change in accounts and usage over the study period. It also lists the annual inflation factors for each of the City’s cost categories, including O&M, capital, and water supply costs. Note that the City does not have any outstanding bonds and does not plan to issue any new debt during the study period.

**Table 3-1: Inflation Factors**

Annual Inflation Factors	FY 2018/19	FY 2019/20 – FY 2023/24
<b>Demand Growth</b>		
Account Growth	0%	0%
Demand Factor	0%	0%
<b>Non-Rate Revenue Increases</b>		
Reserve Interest Rate	1%	1%
Miscellaneous	1%	1%
<b>Cost Inflation Factors</b>		
Salary	2%	2%
Benefits	7%	7%
Chemicals	2%	2%
Energy	5%	5%
General O&M Costs	3%	3%
Water Supply Costs	5%	5%
Capital Costs	3%	3%

The City’s water system is currently built out, so we do not assume any change in the number of accounts over the study period. This assumption is represented by 0% account growth in the table above. Additionally, we assume no change in average demand over the study period, as represented by the 0% demand factor in the table above.

### FINANCIAL POLICIES

A reserve policy is a written document that establishes reserve goals/targets. It provides guidelines for sound financial management with an overall long-range perspective to maintain financial solvency and mitigate financial risks associated with revenue instability, volatile capital costs, and emergencies. Adopting and adhering to a sustainable reserve policy enhances financial management transparency and helps achieve or maintain a certain credit rating for future debt issues. Reserves can offset unanticipated reductions in revenues, fluctuations in costs of providing services, and fiscal emergencies such as revenue shortfalls, asset failure, and natural disasters. Capital

reserves set funds aside for replacement of capital assets as they age and for new capital projects. The appropriate amount of reserves and reserve types are determined by a variety of factors such as the size of the operating budget, the amount of debt, the type of rate structure, frequency of customer billing, and risk of natural disaster.

The City maintains two separate reserve funds: the Water Fund (i.e. Fund 506, Operating Reserve Fund) and the Water Master Plan Fund (i.e. Fund 507, Capital Reserve Fund). In the 2017 study, Raftelis also recommended that the City maintain an emergency reserve for well replacement, included in Fund 507. **Table 3-2** shows these reserve policies for Funds 506 and 507.

- **Fund 506, Operating Reserve Fund** - Used for unanticipated operating expenses. This fund is designated to maintain working capital for current operations and to meet routine cash flow needs. The target level will equal 25 percent or 3 months of the Water Fund's budgeted total operating expenses. During the 2017 study, the operating reserve target was revised down to 25% down from the previous target of 33%.
- **Fund 507, Capital Reserve Fund** - Used for the replacement of capitalized assets when they reach the end of their useful lives. The target level of Fund 507 includes:
  - Capital replacement reserve: 150% of 5-year average CIP to allow flexibility in the timing of projects and/or schedules change.
  - Emergency reserve: \$5.4M for estimated well replacement costs and the associated cost of importing additional water during construction.

**Table 3-2: Reserve Policies**

Reserve	Definition of Reserve Target	Estimated FY 2019/20 Target
<b>Operations (Fund 506)</b>	25% of Annual Operating Budget	\$10,996,831
<b>Capital (Fund 507)</b>	150% of 5-Year Average Annual CIP	\$8,052,809
<b>Emergency (Fund 507)</b>	Estimated Cost of Well Replacement	\$5,400,000

### 3.2. Revenue from Current Water Rates

In order to develop a new financial plan for the City, we first calculate the anticipated revenues if the City were not to make any changes to its current rate schedule. This provides a baseline with which to compare the proposed financial plan and rate structure. Note that for MFR accounts, the City's fixed charges are currently based on the number of equivalent dwelling units (EDUs) rather than meter size. Under the existing assessment basis for MFR accounts, each EDU is assumed to have the same usage and capacity demands as a 3/4-inch SFR meter; therefore, the rate per EDU is equal to the 3/4-inch fixed charge as assessed to non-MFR accounts.

A primary change incorporated into this study update relative to the 2017 study is a proposal to change the City's fixed charge assessment basis for MFR accounts. MFR customers are currently assessed the fixed monthly meter charge and capital charge rates per EDU. Beginning in FY 2019/20, the City proposes to assess the fixed monthly meter charge and capital charge rates for MFR customers based on water meter size, which is the current assessment basis for all other customer classes. The proposed change will improve the consistency in which the City's customers are assessed the fixed monthly meter charge and capital charge. In the absence of any accompanying rate adjustment, this proposed change in the MFR fixed charge assessment basis would significantly decrease the City's revenues from water rates. Because of this, this subsection shows the number of fixed charge units of service under both the existing and proposed MFR fixed charge assessment bases.

**Table 3-3** shows the City’s current rate schedule, as well as the number of service units billed at each rate under the current and proposed MFR fixed charge assessment bases. Note the significant reduction in fixed charge service units resulting from the proposed change to the MFR fixed charge assessment basis. The City currently updates its rates each year based on the change in CPI. Since the future change in CPI is not known, we use the FY 2018/19 rates to project status quo revenues across the study period. Because there is no assumed growth in accounts or demand, the units of service shown below in **Table 3-3** are the same in each year of the study period through FY 2023/24.

**Table 3-3: Current Fixed Meter Charges & Number of Accounts**

Description	FY 2018/19 Daily Fixed Charges	Number of Meters/EDUs (Current Assessment Basis)	Number of Meters (Proposed Assessment Basis)
<b>Meter Size</b>			
3/4"	\$0.4175	40,212	40,769
1"	\$0.6973	6,283	8,489
1 1/2"	\$1.3904	818	1,494
2"	\$2.2254	1,479	2,058
3"	\$4.8723	100	137
4" Compound	\$6.9584	50	85
4" FM	\$9.7404	1	1
6" Compound	\$13.9154	11	25
6" FM	\$22.2654	3	13
8" FM	\$38.9652	13	16
10" FM	\$61.2348	5	5
MFR Charge (per EDU)	\$0.4175	37,029	N/A
<b>Total Meters/EDUs</b>		<b>86,004</b>	<b>53,092</b>

**Table 3-4** shows the current schedule for the daily capital surcharge through FY 2023/24. No changes to the existing schedule of capital surcharge rates (as shown in **Table 3-4**) are proposed in this study update. However, as outlined above, the City proposes to assess the daily capital surcharge for all customers by meter size beginning in FY 2019/20. MFR customers will no longer be charged per EDU as is currently done in FY 2018/19. This change will reduce the capital surcharge revenues collected by the City, as there are fewer units of service under the proposed MFR assessment basis for fixed charges.

**Table 3-4: Daily Capital Surcharge Schedule through FY 2023/24**

Meter Size	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24
3/4"	\$0.0986	\$0.0986	\$0.1151	\$0.1151	\$0.1316	\$0.1316
1"	\$0.1644	\$0.1644	\$0.1918	\$0.1918	\$0.2193	\$0.2193
1 1/2"	\$0.3288	\$0.3288	\$0.3835	\$0.3835	\$0.4385	\$0.4385
2"	\$0.5260	\$0.5260	\$0.6136	\$0.6136	\$0.7016	\$0.7016
3"	\$1.1507	\$1.1507	\$1.3420	\$1.3420	\$1.5344	\$1.5344
4" Compound	\$1.6438	\$1.6438	\$1.9171	\$1.9171	\$2.1920	\$2.1920
4" FM	\$2.3014	\$2.3014	\$2.6839	\$2.6839	\$3.0687	\$3.0687
6" Compound	\$3.2877	\$3.2877	\$3.8340	\$3.8340	\$4.3837	\$4.3837
6" FM	\$5.2603	\$5.2603	\$6.1344	\$6.1344	\$7.0138	\$7.0138
8" FM	\$9.2055	\$9.2055	\$10.7351	\$10.7351	\$12.2741	\$12.2741
10" FM	\$14.4658	\$14.4658	\$16.8695	\$16.8695	\$19.2879	\$19.2879
MFR Charge (per EDU)	\$0.0986	\$0.0986	\$0.1151	\$0.1151	\$0.1316	\$0.1316

**Table 3-5** shows the projected water sales for the study period. We do not anticipate any growth in demand over the course of the study period through FY 2023/24. The current commodity rate in FY 2018/19 for all customer classes is \$2.1063 per hundred cubic feet (CCF) of water delivered. Because the pass-through adjustment in each year is not yet known, we use the FY 2018/19 commodity rate in each year of the study period. Pass-revenues will be accounted for later in this section.

**Table 3-5: Projected Water Sales**

Fiscal Year	Total Sales (CCF)	Total Sales (AF)
FY 2018/19	11,978,514	27,499
FY 2019/20	11,978,514	27,499
FY 2020/21	11,978,514	27,499
FY 2021/22	11,978,514	27,499
FY 2022/23	11,978,514	27,499
FY 2023/24	11,978,514	27,499

**Table 3-6** shows the projected revenues under the current rate schedule while maintaining the current fixed charge assessment basis for MFR customers (per EDU). We calculate fixed charge revenues by multiplying the fixed meter charges (from **Table 3-3**) and capital surcharges (from **Table 3-4**) by the appropriate number of accounts at each meter size and number of MFR EDUs (from **Table 3-3**). We then multiply the result by 365 days to annualize the fixed charge revenues. We determine the commodity rate revenues by multiplying the FY 2018/19 uniform commodity rate (\$2.1063 per CCF) by total usage (from **Table 3-5**) in each year. This is the total revenue the City expects to collect without any changes to the current FY 2018/19 rates or MFR fixed charge assessment basis. Note that projected daily meter charge revenues beyond FY 2018/19 shown in **Table 3-6** do not incorporate additional revenues resulting from annual CPI adjustments to the meter charge (as formerly planned). Similarly, commodity charge revenues in **Table 3-6** exclude pass-through revenues, which are incorporated into the financial plan based on anticipated increases in water supply costs.

**Table 3-6: Projected Revenues from Current Water Rates Under Existing MFR Assessment Basis**

Operating Revenue	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24
Daily Meter Charge	\$15,671,437	\$15,671,437	\$15,671,437	\$15,671,437	\$15,671,437	\$15,671,437
Daily Capital Surcharge	\$3,700,847	\$3,700,847	\$4,319,394	\$4,319,394	\$4,938,636	\$4,938,636
Commodity Charge	\$25,230,344	\$25,230,344	\$25,230,344	\$25,230,344	\$25,230,344	\$25,230,344
<b>Total</b>	<b>\$44,602,628</b>	<b>\$44,602,628</b>	<b>\$45,221,175</b>	<b>\$45,221,175</b>	<b>\$45,840,417</b>	<b>\$45,840,417</b>

**Table 3-7** shows the projected revenues under the current rate schedule assuming that the proposed fixed charge assessment basis for MFR customers is implemented beginning in FY 2019/20 (all customers charged based on meter size). Revenues are calculated in the same manner as previously described for **Table 3-6**. This is the total revenue the City expects to collect without any changes to the current FY 2018/19 rates with implementation of the newly proposed MFR fixed charge assessment basis (by meter size for all customers). As in **Table 3-6**, **Table 3-7** excludes additional revenues resulting from annual CPI adjustments to the meter charge, as well as pass-through revenues from the commodity charge revenues. **Table 3-7** demonstrates that the projected revenues from the fixed meter charge and capital surcharge will decrease significantly under the proposed MFR fixed charge assessment basis. The remainder of this section assumes implementation of the new MFR fixed charge assessment basis.

**Table 3-7: Projected Revenues from Current Water Rates Under Proposed MFR Assessment Basis**

Operating Revenue	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24
Daily Meter Charge	\$15,671,437	\$11,838,129	\$11,838,129	\$11,838,129	\$11,838,129	\$11,838,129
Daily Capital Surcharge	\$3,700,847	\$2,795,540	\$3,262,238	\$3,262,238	\$3,729,953	\$3,729,953
Commodity Charge	\$25,230,344	\$25,230,344	\$25,230,344	\$25,230,344	\$25,230,344	\$25,230,344
<b>Total</b>	<b>\$44,602,628</b>	<b>\$39,864,013</b>	<b>\$40,330,710</b>	<b>\$40,330,710</b>	<b>\$40,798,425</b>	<b>\$40,798,425</b>

**Table 3-8** displays the projected non-operating revenues for the Water Fund. Note that interest income is based on the proposed financial plan, not the status quo scenario, as it is dependent on reserve balances and cash changes. **Table 3-8** includes a Basin Equity Assessment (BEA) waiver from OCWD that is anticipated to be reimbursed to the City for the construction of Well 9 treatment facilities over the next five years.

**Table 3-8: Fund 506: Projected Non-Operating Revenue**

Non-Operating Revenue	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24
Interest Income	\$179,721	\$163,302	\$137,044	\$114,411	\$91,103	\$62,031
BEA Waiver	\$0	\$900,000	\$900,000	\$900,000	\$900,000	\$900,000
Other Reimbursement	\$685,303	\$685,303	\$685,303	\$685,303	\$685,303	\$685,303
Other Revenue	\$519,875	\$525,074	\$530,324	\$535,628	\$540,984	\$546,394
<b>Total</b>	<b>\$1,384,899</b>	<b>\$2,273,680</b>	<b>\$2,252,672</b>	<b>\$2,235,343</b>	<b>\$2,217,390</b>	<b>\$2,193,728</b>

### 3.3. Projected Expenses

#### WATER SUPPLY COSTS

The City incurs water supply costs, which form the part of the revenue requirement to be recovered by the commodity rate. The City has two sources of water: local groundwater furnished through OCWD and imported

water from MWDOC. Groundwater from OCWD is the cheaper of the two sources and, therefore, the most desirable. In each fiscal year the City is allotted a specific basin pumping percentage (BPP), which determines the proportion of its total water demand that can be sourced through OCWD. The City's BPP is currently 75%. The City anticipates the percentage to stay the same through FY 2020/21 and increase to 80% in FY 2021/22.

**Table 3-9** shows the City's projected water production for the study period. We base these projections on anticipated demand and water loss (i.e. the percent of supplied water that is not sold).

**Table 3-9: Projected Water Production**

Description	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24
<b>Basin Pumping Percentage (BPP)</b>	75%	75%	75%	80%	80%	80%
<b>Water Loss</b>	4.8%	4.8%	4.8%	4.8%	4.8%	4.8%
<b>Water Sales (AF)</b>	27,499	27,499	27,499	27,499	27,499	27,499
<b>Water Production (Sales with loss) (AF)</b>	28,885	28,885	28,885	28,885	28,885	28,885
<b>Water Purchases</b>						
OCWD (AF)	21,664	21,664	21,664	21,664	23,108	23,108
MWDOC (AF)	7,221	7,221	7,221	7,221	5,777	5,777

The costs for each source vary based on season. OCWD's rates are 100% variable, while MWDOC's rates include both fixed and variable components. For each source, we take a weighted average of the seasonal variable costs to develop a "blended rate." The blended rate is weighted based on the proportion of water that the City plans to purchase in each seasonal period. We multiply the blended rate for each source by the total anticipated purchases to arrive at the total variable water supply cost in each fiscal year. Finally, we add the MWDOC fixed charges to arrive at the final total water supply cost. This amount is recovered by the City's commodity rate.

**Table 3-10** shows the projected unit costs and total water supply costs for the study period. Water supply costs are projected based on each agency's rate schedule, escalated by the inflation factors shown in **Table 3-1**. The bottom row displays the year-to-year projected increase in water supply costs, to be recovered as a pass-through cost. Note that the pass-through projections are based on projected incremental increases in water supply costs each year. Actual pass-through adjustments will be determined by City staff as updated water supply cost information becomes available. The proposed commodity rate for FY 2019/20 shown in Section 5 does not include the yet-to-be determined pass-through adjustment for FY 2019/20. However, the financial plans shown in this study update assume that any increase in water supply costs relative to FY 2018/19 will be recovered via pass-through adjustments.

**Table 3-10: Projected Water Supply Costs**

<b>Water Supply Costs</b>	<b>FY 2018/19</b>	<b>FY 2019/20</b>	<b>FY 2020/21</b>	<b>FY 2021/22</b>	<b>FY 2022/23</b>	<b>FY 2023/24</b>
<b>OCWD - Fixed Costs</b>	\$0	\$0	\$0	\$0	\$0	\$0
<b>OCWD - Unit Cost (\$/AF)</b>						
Oct - Jun	\$476	\$500	\$525	\$551	\$579	\$608
Jul - Sep	\$500	\$525	\$551	\$579	\$608	\$638
<b>MWDOC - Fixed Costs</b>	\$428,037	\$449,439	\$471,910	\$495,506	\$520,281	\$546,295
<b>MWDOC - Unit Cost (\$/AF)</b>						
Oct - Dec	\$1,015	\$1,066	\$1,119	\$1,175	\$1,234	\$1,295
Jan - Sep	\$1,066	\$1,119	\$1,175	\$1,234	\$1,295	\$1,360
<b>Water Purchased from</b>						
OCWD	21,664 AF	21,664 AF	21,664 AF	23,108 AF	23,108 AF	23,108 AF
MWDOC	7,221 AF	7,221 AF	7,221 AF	5,777 AF	5,777 AF	5,777 AF
<b>Effective Unit Cost (\$/AF)</b>						
OCWD	\$483	\$507	\$532	\$559	\$587	\$616
MWDOC	\$1,053	\$1,106	\$1,161	\$1,219	\$1,280	\$1,344
<b>Total Variable Cost (\$)</b>						
OCWD	\$10,456,982	\$10,979,831	\$11,528,823	\$12,912,281	\$13,557,896	\$14,235,790
MWDOC	\$7,603,992	\$7,984,191	\$8,383,401	\$7,042,057	\$7,394,160	\$7,763,867
<b>Total Cost by Source (\$)</b>						
OCWD	\$10,456,982	\$10,979,831	\$11,528,823	\$12,912,281	\$13,557,896	\$14,235,790
MWDOC	\$8,032,028	\$8,433,630	\$8,855,311	\$7,537,563	\$7,914,441	\$8,310,163
<b>TOTAL SUPPLY COST (\$)</b>	<b>\$18,489,010</b>	<b>\$19,413,461</b>	<b>\$20,384,134</b>	<b>\$20,449,844</b>	<b>\$21,472,336</b>	<b>\$22,545,953</b>
<b>Water Supply Pass-Through</b>		\$924,451	\$1,895,124	\$1,960,834	\$2,983,326	\$4,056,943

## **WATER O&M EXPENSES**

**Table 3-11** shows the City’s operating and maintenance (O&M) budget. This includes salaries, benefits, other operating expenses, water purchase costs, operating capital expenses not included in the CIP, and transfers to the General Fund to pay for services rendered by the General Fund to the water utility. Note that the water purchase cost projections match those in **Table 3-10**. Note that water services and other maintenance costs decrease by roughly \$600,000 in FY 2019/20. This is due to a reduction in equipment replacement costs beginning due to anticipated completion of the City’s advanced metering infrastructure project.

**Table 3-11: Projected Water Fund 506 Water Operating Expenses**

Water O&M Expenses	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24
<b>Salaries &amp; Benefits</b>						
Salaries	\$6,722,725	\$6,857,179	\$6,994,323	\$7,134,209	\$7,276,893	\$7,422,431
Benefits	\$4,138,055	\$4,427,718	\$4,737,659	\$5,069,295	\$5,424,145	\$5,803,836
<b>Other Operating Expenses</b>						
Equipment & Supplies	\$1,006,539	\$1,036,736	\$1,067,838	\$1,099,873	\$1,132,869	\$1,166,855
Other Services	\$1,427,971	\$1,470,811	\$1,514,935	\$1,560,383	\$1,607,194	\$1,655,410
Electricity	\$509,736	\$535,223	\$561,984	\$573,224	\$584,689	\$596,382
Natural Gas	\$734,860	\$771,603	\$810,184	\$826,387	\$842,915	\$859,773
Permit Expense	\$837,349	\$879,216	\$923,177	\$969,336	\$1,017,803	\$1,068,693
Purchased Water OCWD	\$10,456,982	\$10,979,831	\$11,528,823	\$12,912,281	\$13,557,896	\$14,235,790
Purchased Water MWDOC	\$8,032,028	\$8,433,630	\$8,855,311	\$7,537,563	\$7,914,441	\$8,310,163
Chemicals	\$182,173	\$185,816	\$189,533	\$193,323	\$197,190	\$201,134
Water Wells Maintenance	\$362,828	\$373,713	\$384,924	\$396,472	\$408,366	\$420,617
Water Svs & Other Maint	\$1,458,195	\$901,941	\$928,999	\$956,869	\$985,576	\$1,015,143
Pump Plant Maintenance	\$241,355	\$248,595	\$256,053	\$263,735	\$271,647	\$279,796
<b>Capital / Equipment</b>	\$865,694	\$891,665	\$918,415	\$945,968	\$974,347	\$1,003,577
<b>Cost Allocations to General Fund</b>	\$5,819,075	\$5,993,647	\$6,173,456	\$6,358,660	\$6,549,420	\$6,745,902
<b>TOTAL WATER O&amp;M EXPENSES</b>	<b>\$42,795,566</b>	<b>\$43,987,325</b>	<b>\$45,845,614</b>	<b>\$46,797,578</b>	<b>\$48,745,389</b>	<b>\$50,785,503</b>

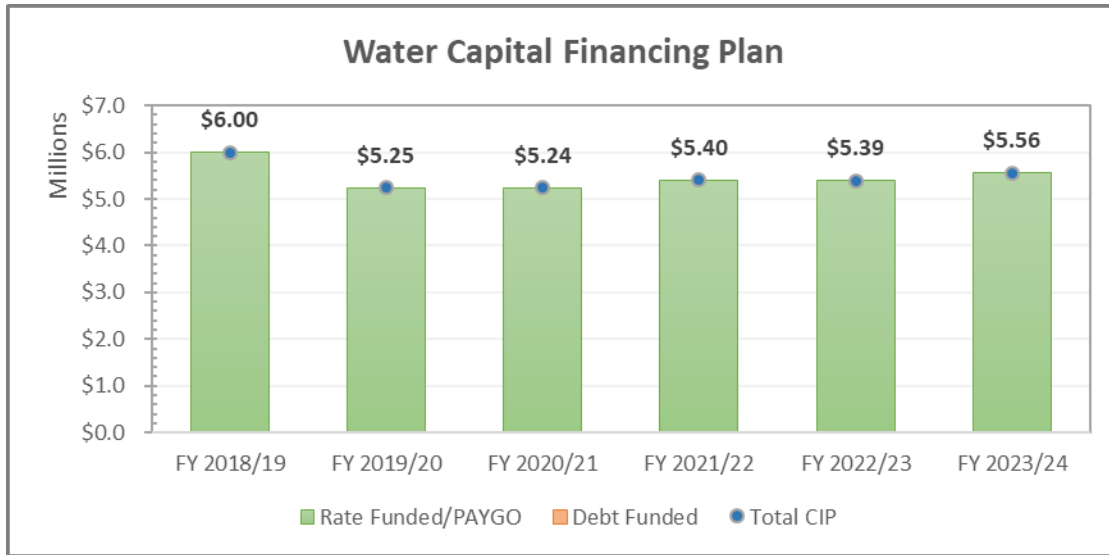
### CAPITAL IMPROVEMENT PLAN (CIP)

The City’s projected CIP expenditures over the course of the study period are shown in **Figure 3-1**. The City’s expected CIP expenditures shown in this report represent estimates.<sup>2</sup> Actual CIP expenditures are subject to future capital planning efforts. The City’s capital expenses and Fund 507 reserve targets are financed entirely by rates (i.e. PAYGO) and the City does not anticipate issuing any new debt to fund capital projects over the study period. **Figure 3-1** shows the capital financing plan.

<sup>2</sup> CIP estimates shown in Figure 3-1 are based on the CIP schedule utilized in the 2017 study, in which \$6 million of CIP expenditures are assumed in each year (before being adjusted for capital inflation). City staff estimated \$6 million as annual average CIP expenditures. This amount was then revised downwards based on expected reductions in capital surcharge revenue resulting from the proposed change in fixed charge assessment basis for MFR customers. The escalated \$6 million average was originally employed as a conservative estimate and used as a proxy for the actual annual budgeted CIP.



Figure 3-1: Projected CIP Expenditures



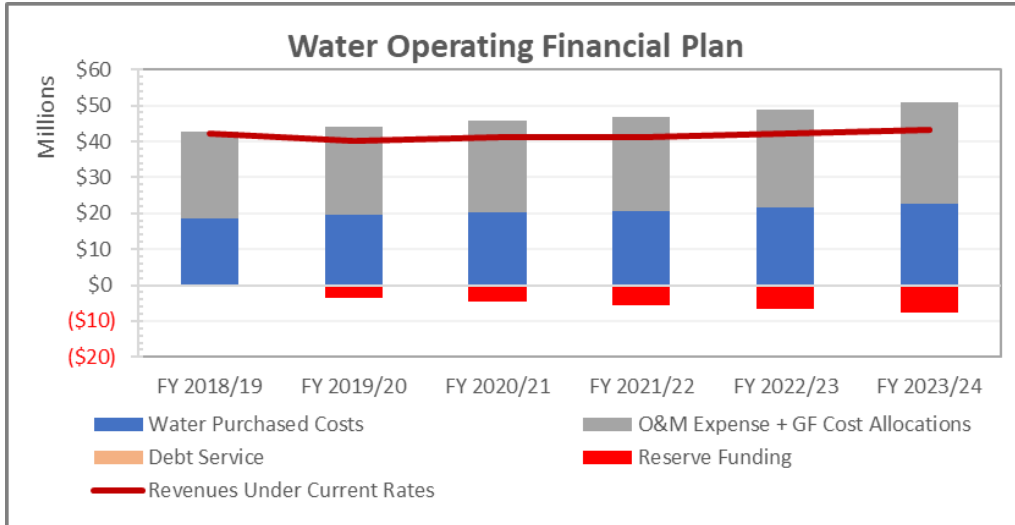
### 3.4. Status Quo Financial Plan

We develop the proposed financial plan for the study period after first estimating the status quo financial plan. The status quo financial plan assumes that the City implements the proposed change in assessing fixed charges for MFR customers by meter size in FY 2019/20, but keeps its fixed meter charges at the current FY 2018/19 rates for the next five years through FY 2023/24. The status quo financial plan does assume that any increases in water supply costs are passed through to customers via the pass-through mechanism. The status quo financial plan also assumes that the existing capital surcharge rate schedule (from **Table 3-4**) is in effect.

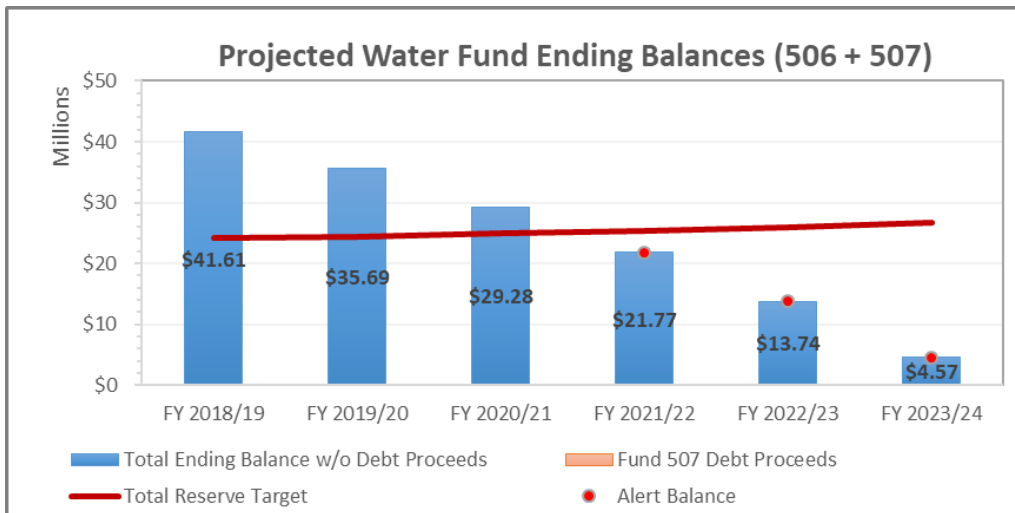
Based on the results of the status quo financial plan, we then make recommendations for proposed fixed meter charge adjustments in each year necessary to preserve the fiscal solvency of the City's water utility. Finally, we project the City's operating finances and reserve balances under the proposed scenario with all recommendations incorporated. This allows for a comparison of the City's current situation with the projected results of implementing the recommendations of this study update.

**Figure 3-2** and **Figure 3-3** illustrate the financial plan under status quo conditions. This is the anticipated result if the City does not implement any changes to its fixed meter charges but proceeds with its proposal to begin assessing fixed charges to MFR customers based on meter size beginning in FY 2019/20. Without any adjustments, the City will draw down both its operating and capital reserves below target levels, resulting in less than \$5 million in reserves by the end of FY 2023/24. This projection highlights the need for adjustments to the City's fixed meter charges if the water utility's financial sustainability is to be preserved into the future.

**Figure 3-2: Status Quo Operating Financial Plan**



**Figure 3-3: Status Quo Projected Reserve Balances (Funds 506 & 507)**



### 3.5. Proposed Financial Plan

Raftelis recommends that the City implement a schedule of fixed meter charge revenue adjustments to maintain fiscal solvency, fund O&M and capital expenses, maintain reserve fund balance targets, and avoid the need for debt issuance. These annual adjustments apply only to the fixed meter charge, as the commodity rate is adjusted via a pass-through methodology for water supply costs recovered by the commodity rate and the City proposes to maintain its existing schedule of increases for the capital surcharge.

#### FIXED CHARGE REVENUE ADJUSTMENT

In non-rate setting years, the City currently escalates its fixed meter charge in each year based on the annual percentage change available on July 1 in the Consumer Price Index for All Urban Consumers (CPI) in Los Angeles, Orange, and Riverside counties as established by the U.S. Bureau of Labor Statistics. Consumer Price Index (CPI). For the purposes of our financial plan, we assume that the CPI adjustments are equal to 2.50%<sup>3</sup>.

<sup>3</sup> For the CPI we round to 2.50%, to provide a conservative estimate of fixed charge revenues for financial planning purposes.

We recommend that the City increases its monthly fixed meter charge for customers with a 3/4-inch meter by one dollar at the start of FY 2019/20. The monthly fixed meter charge for customers with all other meter sizes will have a proportional increase of approximately 7.85% in FY 2019/20. Note that no CPI adjustment will be implemented in FY 2019/20. In both FY 2020/21 and FY 2021/22, Raftelis recommends that City adjust the monthly fixed charge for 3/4-inch meters by CPI plus \$1. The monthly fixed meter charges for all other meter sizes will be adjusted proportionally (CPI + approximately 7%). In FY 2022/23 and FY 2023/24, Raftelis proposes that the City adjust the monthly fixed meter charge for all meter sizes by CPI only. **Table 3-12** displays the revenue adjustments used in this study update.

**Table 3-12: Proposed Fixed Charge Adjustments**

Fiscal Year	Effective Date	Monthly Fixed Meter Charge Adjustment (3/4" Meter Size)
FY 2019/20	July 1, 2019	\$1
FY 2020/21	July 1, 2020	CPI + \$1
FY 2021/22	July 1, 2021	CPI + \$1
FY 2022/23	July 1, 2022	CPI Only
FY 2023/24	July 1, 2023	CPI Only

## COMMODITY CHARGE PASS-THROUGH

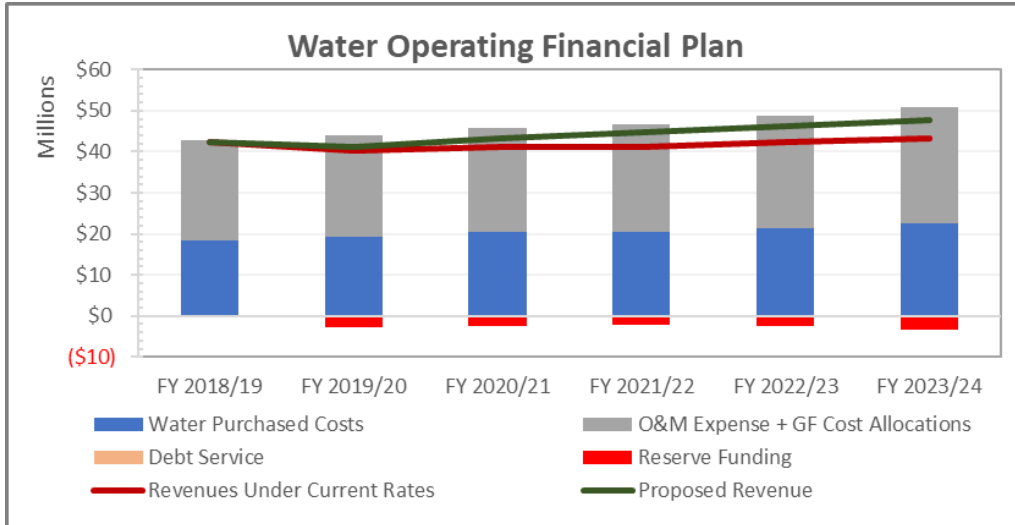
The commodity charge is designed to recover the variable costs of providing water, including water supply costs and unrecovered water system fixed costs<sup>4</sup>. We recommend that the City continue its current policy of increasing the commodity charges in each year based on a “pass-through” of water supply costs, so that the total change in water supply costs from year to year is the basis for changing the commodity rates. Under this policy, the City increases its commodity charge based on the incremental change in water supply costs in each fiscal year. Note that the City will calculate the annual pass-through cost in each year, which may differ from our estimated water supply costs based on inflation assumptions. In keeping with industry standard pass-through methodologies, the City will calculate the actual change in water supply costs in each year as new purveyor rates become available.

## PROPOSED FINANCIAL PLAN

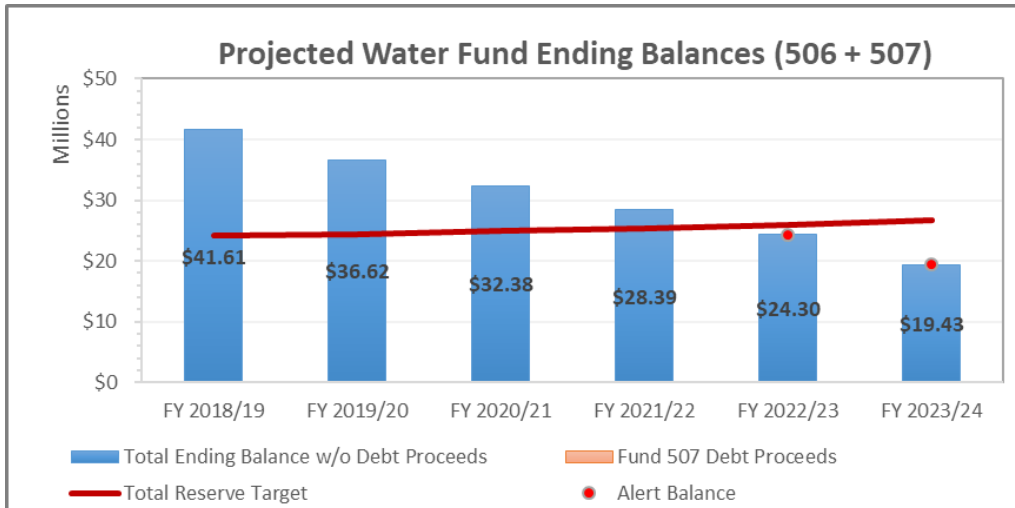
Based on the recommended revenue adjustments, we project the proposed financial plan for the study period. The proposed fixed charge revenue adjustments help increase projected rate revenues, but reserves are drawn down slowly over the study period. Note however that in the absence of any fixed meter charge adjustments, reserve balances would be reduced in an unsustainable manner, thus jeopardizing the fiscal solvency of the City’s water utility. **Figure 3-4** and **Figure 3-5** display the proposed financial plan.

<sup>4</sup> A portion of the water system fixed costs is recovered in the fixed service charge.

**Figure 3-4: Proposed Operating Financial Plan**



**Figure 3-5: Projected Water Fund Ending Balances Under Proposed Financial Plan**



**Table 3-13** and **Table 3-14** show the proposed financial plan, including a breakdown of all revenues and expenses for both funds. The proposed financial plan incorporates the rate adjustments to the fixed meter charge as shown previously in **Table 3-12**.

**Table 3-13: Proposed Water Fund 506 Financial Plan**

<b>Fund 506 Financial Plan</b>	<b>FY 2018/19</b>	<b>FY 2019/20</b>	<b>FY 2020/21</b>	<b>FY 2021/22</b>	<b>FY 2022/23</b>	<b>FY 2023/24</b>
<b>Revenues</b>						
Total Fixed Meter Fixed Charge	\$15,671,437	\$11,838,129	\$11,838,129	\$11,838,129	\$11,838,129	\$11,838,129
Revenue from Adjustments	\$0	\$929,576	\$2,142,508	\$3,470,669	\$3,853,388	\$4,245,676
Total Commodity Charge	\$25,230,344	\$25,230,344	\$25,230,344	\$25,230,344	\$25,230,344	\$25,230,344
Pass-through	\$0	\$924,451	\$1,895,124	\$1,960,834	\$2,983,326	\$4,056,943
<b>Total Revenue from Rates</b>	<b>\$40,901,781</b>	<b>\$38,922,499</b>	<b>\$41,106,104</b>	<b>\$42,499,975</b>	<b>\$43,905,187</b>	<b>\$45,371,092</b>
Interest Income	\$179,721	\$163,302	\$137,044	\$114,411	\$91,103	\$62,031
Other Reimbursement	\$685,303	\$685,303	\$685,303	\$685,303	\$685,303	\$685,303
BEA Waiver	\$0	\$900,000	\$900,000	\$900,000	\$900,000	\$900,000
Other Revenue	\$519,875	\$525,074	\$530,324	\$535,628	\$540,984	\$546,394
<b>Total Revenue</b>	<b>\$42,286,680</b>	<b>\$41,196,179</b>	<b>\$43,358,776</b>	<b>\$44,735,317</b>	<b>\$46,122,577</b>	<b>\$47,564,819</b>
<b>O&amp;M Expenses</b>						
Salaries & Benefits	\$10,860,779	\$11,284,897	\$11,731,981	\$12,203,504	\$12,701,039	\$13,226,267
Equipment & Supplies	\$1,006,539	\$1,036,736	\$1,067,838	\$1,099,873	\$1,132,869	\$1,166,855
Other Services	\$1,427,971	\$1,470,811	\$1,514,935	\$1,560,383	\$1,607,194	\$1,655,410
Electricity	\$509,736	\$535,223	\$561,984	\$573,224	\$584,689	\$596,382
Natural Gas	\$734,860	\$771,603	\$810,184	\$826,387	\$842,915	\$859,773
Permit Expense	\$837,349	\$879,216	\$923,177	\$969,336	\$1,017,803	\$1,068,693
Purchased Water - MWDOC	\$8,032,028	\$8,433,630	\$8,855,311	\$7,537,563	\$7,914,441	\$8,310,163
Purchased Water - OCWD	\$10,456,982	\$10,979,831	\$11,528,823	\$12,912,281	\$13,557,896	\$14,235,790
Chemicals	\$182,173	\$185,816	\$189,533	\$193,323	\$197,190	\$201,134
Water Wells Maintenance	\$362,828	\$373,713	\$384,924	\$396,472	\$408,366	\$420,617
Water Svs & Other Maintenance	\$1,458,195	\$901,941	\$928,999	\$956,869	\$985,576	\$1,015,143
Pump Plant Maintenance	\$241,355	\$248,595	\$256,053	\$263,735	\$271,647	\$279,796
Capital / Equipment	\$865,694	\$891,665	\$918,415	\$945,968	\$974,347	\$1,003,577
Cost Allocations to General Fund	\$5,819,075	\$5,993,647	\$6,173,456	\$6,358,660	\$6,549,420	\$6,745,902
<b>Total O&amp;M Expenses</b>	<b>\$42,795,566</b>	<b>\$43,987,325</b>	<b>\$45,845,614</b>	<b>\$46,797,578</b>	<b>\$48,745,389</b>	<b>\$50,785,503</b>
<b>Net Operating Income</b>	<b>(\$508,886)</b>	<b>(\$2,791,147)</b>	<b>(\$2,486,838)</b>	<b>(\$2,062,261)</b>	<b>(\$2,622,813)</b>	<b>(\$3,220,683)</b>
Beginning Balance	\$18,659,007	\$18,150,121	\$15,358,974	\$12,872,136	\$10,809,875	\$8,187,063
Net Cash Balance	(\$508,886)	(\$2,791,147)	(\$2,486,838)	(\$2,062,261)	(\$2,622,813)	(\$3,220,683)
<b>Ending Balance</b>	<b>\$18,150,121</b>	<b>\$15,358,974</b>	<b>\$12,872,136</b>	<b>\$10,809,875</b>	<b>\$8,187,063</b>	<b>\$4,966,379</b>
<i>Fund 506 Reserve Target</i>	<i>\$10,698,891</i>	<i>\$10,996,831</i>	<i>\$11,461,403</i>	<i>\$11,699,395</i>	<i>\$12,186,347</i>	<i>\$12,696,376</i>

**Table 3-14: Proposed Water Master Plan Fund 507 Financial Plan**

<b>Fund 507 Financial Plan</b>	<b>FY 2018/19</b>	<b>FY 2019/20</b>	<b>FY 2020/21</b>	<b>FY 2021/22</b>	<b>FY 2022/23</b>	<b>FY 2023/24</b>
<b>Revenue</b>						
Revenue from Capital Surcharge	\$3,700,847	\$2,795,540	\$3,262,238	\$3,262,238	\$3,729,953	\$3,729,953
Interest Income	\$273,396	\$248,612	\$228,916	\$211,384	\$194,441	\$179,747
<b>Total Revenue</b>	<b>\$3,974,243</b>	<b>\$3,044,152</b>	<b>\$3,491,153</b>	<b>\$3,473,621</b>	<b>\$3,924,394</b>	<b>\$3,909,699</b>
<b>Capital Expenses</b>						
Cash Funded	\$6,000,000	\$5,247,104	\$5,244,370	\$5,401,701	\$5,393,852	\$5,555,668
Debt Funded	\$0	\$0	\$0	\$0	\$0	\$0
<b>Total Capital Expenses</b>	<b>\$6,000,000</b>	<b>\$5,247,104</b>	<b>\$5,244,370</b>	<b>\$5,401,701</b>	<b>\$5,393,852</b>	<b>\$5,555,668</b>
<b>Net Cash Balances</b>	<b>(\$2,025,757)</b>	<b>(\$2,202,952)</b>	<b>(\$1,753,217)</b>	<b>(\$1,928,080)</b>	<b>(\$1,469,458)</b>	<b>(\$1,645,969)</b>
<b>Fund Balance</b>						
Beginning Balance	\$25,489,164	\$23,463,407	\$21,260,455	\$19,507,238	\$17,579,158	\$16,109,699
Net Cash Balance	(\$2,025,757)	(\$2,202,952)	(\$1,753,217)	(\$1,928,080)	(\$1,469,458)	(\$1,645,969)
<b>Ending Balance</b>	<b>\$23,463,407</b>	<b>\$21,260,455</b>	<b>\$19,507,238</b>	<b>\$17,579,158</b>	<b>\$16,109,699</b>	<b>\$14,463,731</b>
<i>Fund 507 Reserve Target</i>	<i>\$13,586,109</i>	<i>\$13,452,809</i>	<i>\$13,541,305</i>	<i>\$13,680,500</i>	<i>\$13,823,871</i>	<i>\$14,022,513</i>

# 4. Cost of Service Analysis

## 4.1. Methodology

As stated in the American Water Works Association (AWWA) M1 Manual, “the costs of water rates and charges should be recovered from classes of customers in proportion to the cost of serving those customers.” To develop utility rates that comply with Proposition 218 and industry standards while meeting other emerging goals and objectives of the utility, we follow the Cost of Service (COS) methodology discussed below.

### 1) DETERMINE REVENUE REQUIREMENT

The rate-making process starts by determining the revenue requirement. In this study, the COS analysis is based on FY 2019/20 revenue requirements, since this is the year the new rates will go into effect. The revenue requirement includes the utility’s O&M, debt service, capital expenses, and reserve requirements. It does not include costs covered by non-operating revenues or other sources.

### 2) COST OF SERVICE ANALYSIS (COS)

The annual cost of providing water service is distributed among customer classes commensurate with their service requirements. For this study, our COS analysis involves the following:

1. Functionalizing costs. Examples of functions are supply, treatment, transmission, distribution, storage, meter servicing, and customer billing.
2. Allocating functionalized costs to cost causation components. Cost causation components include supply, base delivery, maximum day, maximum hour<sup>5</sup>, fire, and meter costs.
3. Calculating costs to be recovered by each rate category. We allocate cost causation components to the City’s fixed charges, variable commodity rates, and surcharges to ensure that the full cost of service is collected equitably through these rate categories.

A COS analysis considers both the average quantity of water consumed (base delivery costs) and the peak rate at which it is consumed (peaking or capacity costs as identified by maximum day and maximum hour demands).<sup>6</sup> Peaking costs are costs that are incurred during peak times of consumption. The water system is designed to handle peak demands and additional costs are associated with designing, constructing, and operating and maintaining larger facilities needed to meet peak demands.

A COS analysis distributes a utility’s revenue requirements (costs) equitably. After determining a utility’s revenue requirements, the next step in a cost of service analysis is to functionalize its O&M costs, based on the City’s current O&M budget (see **Section 3.3**). The functionalization of costs allows us to better allocate the functionalized costs to the **cost causation components**, i.e. the specific “buckets” of revenue requirements that are recovered by the rates. The cost causation components utilized in this study include:

1. **Supply** – variable costs associated with providing water supply to all customers
2. **Base Delivery** – fixed costs associated with providing service under average conditions
3. **Peaking (Max Day and Max Hour)** – costs associated with meeting above-average demand
4. **Fire** – costs associated with providing fire protection capacity
5. **Meters** – costs associated with maintenance of meters and associated capital costs
6. **General** – costs that cannot be allocated directly to any one cost causation

<sup>5</sup> Collectively, maximum day and maximum hour costs are known as peaking costs or capacity costs.

<sup>6</sup> System capacity is the system’s ability to supply water to all delivery points at the time when demanded. It is measured by each customer’s water demand at the time of greatest system demand. The time of greatest demand is known as peak demand. Operating and capital costs incurred to accommodate the peak demands are allocated to each customer class based upon the class’s peaking characteristics.

Peaking costs are 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 (as well as the O&M costs associated with those facilities), are designed to meet the peaking demands of customers. Therefore, extra capacity<sup>7</sup> costs include the O&M and capital 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.

### 3) RATE DESIGN AND CALCULATIONS

Rates do more than simply recover costs. Properly designed rates should support and optimize a blend of various utility objectives including revenue stability, customer affordability, regulatory compliance, political feasibility, and fiscal solvency. Rates may also act as a public information tool in communicating these objectives to customers. The M1 Manual describes a wide variety of potential rate structures, all of which meet these various requirements to various degrees.

We design rates to fully recover the cost of service for each customer class, as determined in the COS analysis. Rates include both a fixed and variable component, each of which recovers specific cost causation components. We derive the rates using the annual units of service and the total revenue requirement for each cost causation component and for each customer class. Fixed charges are developed based on meter size (i.e. meter capacity) while variable charges are based on water use.

### 4) RATE ADOPTION

Rate adoption is the last step of the rate-making process to comply with Proposition 218. Raftelis documented the rate study results in this Study Report to help educate the public about the proposed changes, the rationale and justifications behind the changes, and their anticipated financial impacts in lay terms.

## 4.2. Analysis

Proposition 218 requires a nexus between the rates charged and the costs of providing service. Based on the proposed financial plan, the COS analysis translates this financial requirement into the unit costs used to develop rates. This subsection describes each section of the COS analysis in detail.

### REVENUE REQUIREMENT DETERMINATION

**Table 4-1** shows the revenue requirement derivation, which results in the total revenue required from rates in FY 2019/20. The totals shown in the “Operating” and “Capital” columns are the total O&M and capital revenue requirements, respectively, that are to be recovered through rates.

Raftelis calculated the revenue requirement using projected FY 2019/20 expenses, which include O&M expenses, water supply costs, rate funded capital expenses, and existing and proposed debt service. To arrive at the rate revenue requirement, we subtract revenue offsets (e.g. non-rate revenues). We also adjust for annual cash balances, to ensure the City’s net cash flow does not deviate from the proposed financial plan under the new rates. These adjustments are then added to arrive at the total revenue requirement from rates. This is the amount that the City’s rates are designed to collect.

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<sup>7</sup> The terms extra capacity, peaking, and capacity costs are used interchangeably.



**Table 4-1: FY 2019 Revenue Requirements**

Line	Revenue Requirements	FY 2019/20	Notes
1	Operating Costs		
2	Water Supply Costs	\$19,413,461	Table 3-10
3	Other Operating Costs	\$24,573,864	Table 3-11
4	Subtotal Operating Costs	\$43,987,325	
5			
6	Capital Costs		
7	Debt Service	\$0	No Debt Service
8	Subtotal Capital Costs	\$0	
9			
10	Less (-) Revenue Offsets		
11	Pass-through Revenue	\$924,451	Table 3-13
12	Interest Income	\$163,302	Table 3-8
13	Other Reimbursement	\$900,000	Table 3-8
14	BEA Waiver	\$685,303	Table 3-8
15	Other Revenue	\$525,074	Table 3-8
16	Subtotal Revenue Offsets	\$3,198,130	
17			
18	Less (-) Adjustments		
19	Adjustment for Cash Balance	\$2,791,147	Table 3-13
20	Subtotal Adjustments	\$2,791,147	
21			
22	Annualized Revenue from Rates	\$37,998,048	[Line 4] + [Line 8] - [Line 16] - [Line 20]
23	Revenue from Capital Surcharge	\$2,795,540	Table 3-14
24	<b>Total Annualized Rate Revenue Requirement</b>	<b>\$40,793,589</b>	<b>[Line 22] + [Line 23]</b>

## ALLOCATION OF FUNCTIONALIZED EXPENSES TO COST CAUSATION COMPONENTS

After determining the City’s overall revenue requirement from rates, we begin to allocate costs so that each cost function is recovered equitably. We first determine the function of all O&M and capital expenses and then allocate these functions to “cost causation components”, which then form the basis of the new rates. We use systemwide peaking factors, provided by City staff, to develop allocation percentages for the City’s costs. These allocation percentages in turn are used to allocate system costs to the peaking components of the rates (Max Day and Max Hour).

The City’s Max Day factor is 1.8, which means that Max Day demand is expected to be 180% of the average day demand. Calculating the Max Day allocation of functionalized costs to the cost causation components results in the following allocation percentages:

$$Base\ Allocation = \frac{Base}{Max\ Day} = \frac{1}{1.8} \approx 56\%$$

$$Max\ Day\ Allocation = 1 - Base/Max\ Day \approx 44\%$$

Facilities designed for Max Hour peaks, such as distribution system facilities, are allocated similarly. The Max Hour factor is 2.8, so Max Hour facilities are designed to provide 280% of the average day demand. Below are the allocation percentages for facilities designed to meet Max Hour demand:

$$\text{Base Allocation} = \frac{\text{Base}}{\text{Max Hour}} = \frac{1}{2.8} = 36\%$$

$$\text{Max Day Allocation} = \frac{\text{Max Day} - \text{Base}}{\text{Max Hour}} = \frac{1.8 - 1.00}{2.8} = 29\%$$

$$\text{Max Hour Allocation} = 1 - 36\% - 29\% = 35\%$$

**Table 4-2** summarizes the systemwide peaking factors and resulting allocation percentages.

**Table 4-2: Systemwide Peaking Factors and Allocation Percentages**

Description	Peaking Factor	Base Allocation	Max Day Allocation	Max Hour Allocation	Total
Base	1.00	100%			100%
Max Day	1.80	56%	44%		100%
Max Hour	2.80	36%	29%	36%	100%

The City’s water system provides Max Hour capacity for public fire service. This capacity provides a benefit to all users of the water system by allowing the instantaneous use of water to fight fires anywhere in the City. Therefore, we allocate some capacity-related costs to fire service using City-provided data on water storage capacity dedicated to fire protection. **Table 4-3** shows the derivation of the fire Max Hour allocation percentage.

**Table 4-3: Allocation Percentage for Fire Service**

Line	Water System Demand for Fire Protection	Storage Capacity (MGD)	Notes
1	Average Day Demand	5.16	
2	Max Day Demand	55.00	
3	Max Hour Demand	9.4%	[Line 1] / [Line 2]

**Table 4-4** shows the system peaking factors including fire allocation percentages. These percentages are then applied to the operating and capital expenses to allocate costs.

**Table 4-4: Allocation Percentages Including Fire**

Description	Peaking Factor	Base Allocation	Max Day Allocation	Max Hour Allocation	Fire Allocation
Base	1.00	100%			
Max Day	1.80	50.3%	40.3%	0%	9.4%
Max Hour	2.80	32.4%	25.9%	32.4%	9.4%

We categorize the City’s costs by function in order to allocate them to cost causation components. The cost causation components include Supply, Base, Peaking (Max Day & Max Hour), Meters, and Capital (recovered by the proposed Capital Surcharge). Each cost function has a specific basis of allocation to these cost causation components, following from the Base, Max Day, and Max Hour percentages shown in **Table 4-4**. We use the following cost functions in this study:

1. **Water Supply Costs:** These costs are related to water supply and are recovered by the commodity rate. They are allocated 100% to the Supply cost causation component.
2. **Source of Supply:** These are capital costs related to facilities which provide water supply. They are allocated 100% to the Base cost causation component.
3. **Storage:** Capital costs for system facilities which store water for current or future use. They are allocated according to Max Day.
4. **Pumping:** Includes capital costs for pump stations, booster pumps, etc.; and O&M expenses for utilities needed to power pumping facilities. They are allocated according to Max Hour.
5. **Treatment:** Includes capital costs for water treatment facilities, and O&M costs for chemicals. They are allocated according to Max Day.
6. **Transmission & Distribution (T&D):** Capital costs for pipes and other treatment and distribution facilities. They are allocated according to Max Hour.
7. **Fire Protection:** Costs directly related to fire protection and water system capacity for firefighting. They are allocated 100% to the Fire cost causation component.
8. **Meter Service:** Includes both capital costs of meters and O&M costs for service and maintenance. They are allocated 100% to the Meters cost causation component and recovered by the fixed service charges.
9. **General & Administrative Costs:** Includes costs related to O&M payroll expenses, the value of land owned by the utility, office supplies, and other general costs. These costs are allocated to a “General” cost causation component, and then reallocated proportionally to the share of total costs by the other components.

**Table 4-5: O&M Functions and Allocation Bases**

O&M Expense	Function	Allocation Basis
Salaries	G&A	General
Benefits	G&A	General
Equipment & Supplies	G&A	General
Other Services	G&A	General
Electricity	Pumping	Max Hour
Natural Gas	Pumping	Max Hour
Permit Expense	G&A	General
Purchased Water MWDOC	Water Supply Costs	Supply
Purchased Water OCWD	Water Supply Costs	Supply
Chemicals	Treatment	Max Day
Water Wells Maintenance	G&A	General
Water Services & Other Maintenance	Meter Service	Meters
Pump Plant Maintenance	Pumping	Max Hour
Capital / Equipment	G&A	General
Cost Allocations to General Fund	G&A	General

**Table 4-6** shows the functions for the City’s capital assets. This information is based on the replacement cost (RC) of the City’s current assets, as provided by City staff.

**Table 4-6: Capital Functions and Allocation Bases**

Asset Type	Function	Allocation Basis
Supply	Source of Supply	Base
Pumping	Pumping	Max Hour
Storage	Storage	Max Day
Treatment	Treatment	Max Day
Transmission	T&D	Max Hour
Distribution	T&D	Max Hour
Meters	Meter Service	Meters
Land	G&A	General
General	G&A	General
Fire	Fire Protection	Fire

**Table 4-7** and **Table 4-8** show the functions for each O&M and capital cost item and the allocation percentages to each of the cost causation components. Functional costs are allocated according to industry standards based on the nature of each function. For example: water supply costs are allocated 100% to the Supply component, treatment costs are allocated based on Max Day, distribution costs are allocated based on Max Hour, utility billing costs and conservation program costs are allocated 100% to the Customer component, and meter service costs are allocated to the Meter component. Costs which cannot be readily functionalized are allocated to General and then spread amongst all the other cost causation components proportionate to the overall cost allocation.

**Table 4-7: O&M Allocations to Cost Causation Components**

O&M Expense	Function	FY 2019/20 Cost	Supply	Base	Max Day	Max Hour	Fire	Meters	General
Salaries	G&A	\$6,857,179	0%	0%	0%	0%	0%	0%	100%
Benefits	G&A	\$4,427,718	0%	0%	0%	0%	0%	0%	100%
Equipment & Supplies	G&A	\$1,036,736	0%	0%	0%	0%	0%	0%	100%
Other Services	G&A	\$1,470,811	0%	0%	0%	0%	0%	0%	100%
Electricity	Pumping	\$535,223	0%	32.4%	25.9%	32.4%	9.4%	0%	0%
Natural Gas	Pumping	\$771,603	0%	32.4%	25.9%	32.4%	9.4%	0%	0%
Permit Expense	G&A	\$879,216	0%	0%	0%	0%	0%	0%	100%
Purchased Water MWDOC	Water Supply	\$8,433,630	100%	0%	0%	0%	0%	0%	0%
Purchased Water OCWD	Water Supply	\$10,979,831	100%	0%	0%	0%	0%	0%	0%
Chemicals	Treatment	\$185,816	0%	50.3%	40.3%	0%	9.4%	0%	0%
Water Wells Maintenance	G&A	\$373,713	0%	0%	0%	0%	0%	0%	100%
Water Services & Other Maintenance	Meter Service	\$901,941	0%	0%	0%	0%	0%	100%	0%
Pump Plant Maintenance	Pumping	\$248,595	0%	32.4%	25.9%	32.4%	9.4%	0%	0%
Capital / Equipment	G&A	\$891,665	0%	0%	0%	0%	0%	0%	100%
Allocation to General Fund	G&A	\$5,993,647	0%	0%	0%	0%	0%	0%	100%
<b>TOTAL</b>		<b>\$43,987,325</b>							

**Table 4-8: Capital Allocations to Cost Causation Components**

Asset Type	Function	Replacement Cost	Supply	Base	Max Day	Max Hour	Fire	Meters	General
Supply	Source of Supply	\$12,102,707	0%	100%	0%	0%	0%	0%	0%
Pumping	Pumping	\$1,452,114	0%	32.4%	25.9%	32.4%	9.4%	0%	0%
Storage	Storage	\$28,524,232	0%	50.3%	40.3%	0%	9.4%	0%	0%
Treatment	Treatment	\$332,485	0%	50.3%	40.3%	0%	9.4%	0%	0%
Transmission	T&D	\$0	0%	32.4%	25.9%	32.4%	9.4%	0%	0%
Distribution	T&D	\$19,207,265	0%	32.4%	25.9%	32.4%	9.4%	0%	0%
Meters	Meter Service	\$3,551,652	0%	0%	0%	0%	0%	100%	0%
Land	G&A	\$5,734,475	0%	0%	0%	0%	0%	0%	100%
General	G&A	\$33,883,228	0%	0%	0%	0%	0%	0%	100%
Fire	Fire Protection	\$0	0%	0%	0%	0%	100%	0%	0%
<b>TOTAL</b>		<b>\$104,788,158</b>							

**Table 4-9** summarizes the total costs allocated to each cost causation component for both O&M and capital assets. The “initial” cost allocations shown are based on the functionalized allocations from **Table 4-7** and **Table 4-8**. General costs/assets are then reallocated proportionally in **Table 4-9** to all other cost causation components excluding Supply. This is because General costs typically do not pertain to water supply-related activities. After general costs/assets are reallocated, the allocation percentages to be used to allocate the revenue requirement from **Table 4-1** can then be determined. **Table 4-9** shows the O&M allocation percentages for both all cost causation components and for all cost causation components excluding Supply and Fire. Capital allocation percentages are shown for both all cost causation components and for all cost causation components excluding Fire.

**Table 4-9: Cost Causation Component Allocation Percentages**

Description	Supply	Base	Max Day	Max Hour	Fire	Meters	General	Total FY 2019/20
<b>O&amp;M Allocation</b>								
Initial O&M Allocation	\$19,413,461	\$596,938	\$477,550	\$503,391	\$163,360	\$901,941	\$21,930,685	\$43,987,325
Proportional Reallocation of General Costs (Excluding Supply)	N/A	\$4,952,841	\$3,962,273	\$4,176,679	\$1,355,410	\$7,483,482	(\$21,930,685)	\$0
<b>Reallocated Total O&amp;M</b>	<b>\$19,413,461</b>	<b>\$5,549,778</b>	<b>\$4,439,823</b>	<b>\$4,680,070</b>	<b>\$1,518,770</b>	<b>\$8,385,424</b>	<b>\$0</b>	<b>\$43,987,325</b>
<i>Allocation %: O&amp;M</i>	<i>44.1%</i>	<i>12.6%</i>	<i>10.1%</i>	<i>10.6%</i>	<i>3.5%</i>	<i>19.1%</i>	<i>N/A</i>	<i>100%</i>
<i>Allocation %: O&amp;M w/o Supply or Fire</i>	<i>N/A</i>	<i>24.1%</i>	<i>19.3%</i>	<i>20.3%</i>	<i>N/A</i>	<i>36.4%</i>	<i>N/A</i>	<i>100%</i>
<b>Capital Allocation</b>								
Initial Asset Allocation	\$0	\$33,316,295	\$16,970,871	\$6,686,126	\$4,645,510	\$3,551,652	\$39,617,703	\$104,788,158
Proportional Reallocation of General Assets	N/A	\$20,253,274	\$10,316,745	\$4,064,556	\$2,824,047	\$2,159,081	(\$39,617,703)	\$0
<b>Reallocated Assets</b>	<b>\$0</b>	<b>\$53,569,570</b>	<b>\$27,287,615</b>	<b>\$10,750,683</b>	<b>\$7,469,557</b>	<b>\$5,710,733</b>	<b>\$0</b>	<b>\$104,788,158</b>
<i>Allocation %: Capital</i>	<i>0%</i>	<i>51.1%</i>	<i>26.0%</i>	<i>10.3%</i>	<i>7.1%</i>	<i>5.4%</i>	<i>N/A</i>	<i>100%</i>
<i>Allocation %: Capital w/o Fire</i>	<i>0%</i>	<i>55.0%</i>	<i>28.0%</i>	<i>11.0%</i>	<i>N/A</i>	<i>5.9%</i>	<i>N/A</i>	<i>100%</i>

Note that the replacement cost of capital assets is not recovered by the rates—it is used to develop percentages for allocating capital costs (which include reserve funding). To allocate the true revenue requirement to the cost causation components, we first allocate total costs without any of the proposed increases to the current rate schedule. This provides a baseline allocation of FY 2019/20 costs, to which we will then add the proposed fixed charge revenue adjustments and capital surcharge revenues.

### **DISTRIBUTION OF COST CAUSATION COMPONENTS TO RATE CATEGORIES**

**Table 4-10** displays the revenue requirement allocation under current rates. O&M expenses are allocated based on the O&M allocation percentages developed in **Table 4-9**. Capital expenses are allocated based on the capital allocation percentages. We subtract pass-through water supply revenues from the Supply cost causation component, since these are to be incorporated into the commodity rate by City staff once the necessary water supply cost information becomes available. We also subtract other operating revenues and interest income using the O&M allocation percentages excluding Supply and Fire, and other reimbursements using the capital allocation percentages excluding Fire.

After determining the net revenue requirement from *current* rates, we reallocate the Fire cost causation component to Meters, to ensure that costs related to fire protection capacity are recovered by the fixed meter charges. Also note the revenue adjustment made to cost components recovered by the fixed charge, as discussed in **Section 3.5** and shown in **Table 3-13**. The fixed charge adjustment is allocated proportionally among the Base, Max Day, Max Hour, and Meters cost components after the reallocation of public fire protection costs. The result, shown on the bottom row of **Table 4-10**, is the City's FY 2019/20 revenue requirement by cost causation component before the incorporation of revenues from capital surcharges.

**Table 4-10: Allocation of Revenue Requirement to Cost Causation Components**

Line	Description	Supply	Base	Max Day	Max Hour	Fire	Meters	Total FY 2019/20
1	<b>Revenue Requirement</b>							
2	O&M Expense	\$19,413,461	\$5,549,778	\$4,439,823	\$4,680,070	\$1,518,770	\$8,385,424	\$43,987,325
3	Reserve Funding <sup>8</sup>	\$0	(\$1,902,100)	(\$968,904)	(\$381,725)	(\$265,222)	(\$202,772)	(\$3,720,723)
4	<b>Subtotal</b>	<b>\$19,413,461</b>	<b>\$3,647,679</b>	<b>\$3,470,919</b>	<b>\$4,298,344</b>	<b>\$1,253,548</b>	<b>\$8,182,652</b>	<b>\$40,266,603</b>
5								
6	<b>Less Other Revenues</b>							
7	Pass-through Revenue	\$924,451	\$0	\$0	\$0	\$0	\$0	\$924,451
8	Other Operating Revenue	\$0	\$343,041	\$274,433	\$289,283	\$0	\$518,317	\$1,425,074
9	Other Reimbursement	\$0	\$377,229	\$192,155	\$75,705	\$0	\$40,214	\$685,303
10	Interest Revenue	\$0	\$39,310	\$31,448	\$33,150	\$0	\$59,395	\$163,302
11	<b>Subtotal</b>	<b>\$924,451</b>	<b>\$759,580</b>	<b>\$498,036</b>	<b>\$398,137</b>	<b>\$0</b>	<b>\$617,926</b>	<b>\$3,198,130</b>
12								
13	<b>Net Revenue Requirement from Current Rates</b>	<b>\$18,489,010</b>	<b>\$2,888,099</b>	<b>\$2,972,883</b>	<b>\$3,900,207</b>	<b>\$1,253,548</b>	<b>\$7,564,726</b>	<b>\$37,068,472</b>
14								
15	<b>Adjustments</b>							
16	Reallocation of Public Fire Protection	\$0	\$0	\$0	\$0	(\$1,253,548)	\$1,253,548	\$0
17	Fixed Charge Adjustment		\$144,499	\$148,741	\$195,137	\$0	\$441,200	\$929,576
18								
19	<b>Adjusted Revenue Requirement<sup>9</sup></b>	<b>\$18,489,010</b>	<b>\$3,032,597</b>	<b>\$3,121,623</b>	<b>\$4,095,344</b>	<b>\$0</b>	<b>\$9,259,473</b>	<b>\$37,998,048</b>

<sup>8</sup> Note that Reserve Funding in Line 3 of Table 4-10 represents reserve funding before accounting for the impact of the fixed charge revenue adjustment. The (\$3,720,723) total shown in Line 3 of Table 4-10 is determined by subtracting \$929,576 in fixed charge revenue adjustments in FY 2019/20 from (\$2,791,147) of net operating income in FY 2019/20 (as shown in Table 3-13).

<sup>9</sup> The adjusted revenue requirement includes the reallocation of public fire costs, as well as the fixed charge revenue adjustment. It does not include the proposed capital surcharge or estimated water supply pass-through cost.



**Table 4-11** shows the cost causation components as they will be recovered by the City’s proposed FY 2019/20 rates, including adjustments. The fixed service charge recovers the Meters component, the commodity charge recovers the Supply component, and the other components are divided between the fixed and variable rates. Based on City policy to ensure both revenue stability and affordability, we allocate approximately 34% of the base and peaking costs to the fixed charge, with the remaining 66% recovered by the commodity rate.

We take the revenue requirement under current rates, as developed in **Table 4-10**, and add the proposed adjustment for the capital surcharge. Note that the water supply pass-through revenue requirement is excluded from the rate components, as City staff will determine the FY 2019/20 increase in the commodity rate based on analysis of incremental water supply costs. The actual pass-through adjustment to be determined by City staff is based on the BPP as established by OCWD for the upcoming water year (July to June), the Replenishment Assessment (RA) per acre-foot of water as established by OCWD for the upcoming year, and the rate established by MWDOC per acre-foot of water for the upcoming year. The capital surcharge revenue was determined previously in **Table 3-7**. This results in the final revenue requirement by cost causation component. The final revenue requirement allocated to cost components through COS analysis is equal to the revenue requirement determined in **Table 4-1**.

**Table 4-11: Cost Causation Components by Rate Category**

Description	FY 2019/20 Revenue Requirement	Fixed Service Charges	Variable Commodity Rate	Capital Surcharge	TOTAL RATE REVENUE
<b>Cost Components</b>					
Supply	\$18,489,010	\$0	\$18,489,010	\$0	\$18,489,010
Base	\$3,032,597	\$1,038,001	\$1,994,597	\$0	\$3,032,597
Max Day	\$3,121,623	\$1,068,473	\$2,053,151	\$0	\$3,121,623
Max Hour	\$4,095,344	\$1,401,759	\$2,693,585	\$0	\$4,095,344
Meters	\$9,259,473	\$9,259,473	\$0	\$0	\$9,259,473
<b>Subtotal</b>	<b>\$37,998,048</b>	<b>\$12,767,705</b>	<b>\$25,230,343</b>	<b>\$0</b>	<b>\$37,998,048</b>
<b>Capital Surcharges</b>	<b>\$2,795,540</b>	<b>\$0</b>	<b>\$0</b>	<b>\$2,795,540</b>	<b>\$2,795,540</b>
<b>Total Revenue Required from Rates</b>	<b>\$40,793,589</b>	<b>\$12,767,705</b>	<b>\$25,230,343</b>	<b>\$2,795,540</b>	<b>\$40,793,589</b>

# 5. Rate Derivation

We develop rates to recover the revenue requirement from each cost causation component, as determined by the COS analysis in Section 4 and summarized in **Table 4-11**. To determine the rates, we calculate the units of service for each component. The unit of service for the fixed charge and capital surcharge is equivalent meter units (EMUs) for all customers. The unit of service for the commodity rate is annual water use, measured in CCF. Recall that no changes to the existing capital surcharge rate schedule are proposed in this study update.

## 5.1. Proposed Daily Service Charge

**Table 5-1** shows the number of EMUs estimated for FY 2019/20. EMUs are calculated by multiplying the number of accounts at each meter size by the corresponding AWWA ratio. The monthly units of service total are a simple sum of the total EMUs. The annual units of service total are the monthly total multiplied by 12, since the City bills monthly (e.g. 12 bills per year per account).

**Table 5-1: Equivalent Meter Units**

Meter Size	Number of Accounts	AWWA Ratios	Number of EMUS	Annual EMU Billing Units
3/4"	40,769	1.00	40,769	489,228
1"	8,489	1.67	14,148	169,780
1 1/2"	1,494	3.33	4,980	59,760
2"	2,058	5.33	10,976	131,712
3"	137	11.67	1,598	19,180
4" Compound	85	16.67	1,417	17,000
4" FM	1	23.33	23	280
6" Compound	25	33.33	833	10,000
6" FM	13	53.33	693	8,320
8" FM	16	93.33	1,493	17,920
10" FM	5	146.67	733	8,800
<b>Total</b>	<b>53,092</b>		<b>77,665</b>	<b>931,980</b>

Taking the total revenue requirement from fixed charges, as calculated in **Table 4-11**, and the total annual units of service from **Table 5-1**, we arrive at the monthly fixed charge per EMU for FY 2019/20. We then divide this by the average number of days per month (30.42) to arrive at the daily charge, matching the City's current rate schedule. The rate is rounded to four decimal places.

**Table 5-2: Development of Daily Fixed Meter Service Charge**

Line	Description	Amount	Units	Notes
1	Revenue Requirement	\$12,767,705		Table 4-11
2	Units of Service	931,980	EMUs	Table 5-1
3	Monthly Fixed Service Charge	\$13.70	per EMU per month	[Line 1] / [Line 2]
4	Daily Fixed Service Charge	\$0.4504	per EMU per day	[Line 3] / 30.42 days

Table 5-3 shows the proposed FY 2019/20 fixed meter charge on both a monthly and daily basis. The fixed meter charge for each meter size is determined by multiplying the fixed charge per EMU from Table 5-2 by the corresponding AWWA meter capacity ratio. Daily charges are rounded up to four decimals and monthly charges are rounded up to two decimals.

**Table 5-3: Proposed FY 2019/20 Fixed Meter Charges (Daily & Monthly)**

Meter Size	AWWA Capacity Ratio	Daily Fixed Meter Charges			Monthly Fixed Meter Charges		
		Current FY 2018/19	Proposed FY 2019/20	\$ Difference	Current FY 2018/19	Proposed FY 2019/20	\$ Difference
3/4"	1.00	\$0.4175	\$0.4504	\$0.0329	\$12.70	\$13.70	\$1.00
1"	1.67	\$0.6973	\$0.7507	\$0.0534	\$21.21	\$22.84	\$1.63
1 1/2"	3.33	\$1.3904	\$1.5014	\$0.1110	\$42.29	\$45.67	\$3.38
2"	5.33	\$2.2254	\$2.4022	\$0.1768	\$67.69	\$73.07	\$5.38
3"	11.67	\$4.8723	\$5.2547	\$0.3824	\$148.20	\$159.83	\$11.63
4" Compound	16.67	\$6.9584	\$7.5067	\$0.5483	\$211.65	\$228.33	\$16.68
4" FM	23.33	\$9.7404	\$10.5093	\$0.7689	\$296.27	\$319.66	\$23.39
6" Compound	33.33	\$13.9154	\$15.0133	\$1.0979	\$423.26	\$456.66	\$33.40
6" FM	53.33	\$22.2654	\$24.0212	\$1.7558	\$677.24	\$730.65	\$53.41
8" FM	93.33	\$38.9652	\$42.0370	\$3.0718	\$1,185.19	\$1,278.63	\$93.44
10" FM	146.67	\$61.2348	\$66.0581	\$4.8233	\$1,862.56	\$2,009.27	\$146.71

Table 5-4 displays the rate schedule of daily fixed meter service charges by meter size through FY 2023/24. Please note that beyond FY 2019/20, all rates shown represent estimates assuming 2.5% annual CPI. Actual rates will be calculated according to Table 3-12 as CPI data becomes available in each year. Therefore, all rates shown below for FY 2020/21 through FY 2023/23 are for illustrative purposes only and are subject to change.

**Table 5-4: FY 2019 Proposed and Estimated Monthly Fixed Meter Charges through FY 2023/24**

Meter Size	Current FY 2018/19	Proposed FY 2019/20	Estimated FY 2020/21	Estimated FY 2021/22	Estimated FY 2022/23	Estimated FY 2023/24
3/4"	\$12.70	\$13.70	\$15.05	\$16.43	\$16.85	\$17.28
1"	\$21.21	\$22.84	\$25.08	\$27.38	\$28.07	\$28.78
1 1/2"	\$42.29	\$45.67	\$50.15	\$54.74	\$56.11	\$57.52
2"	\$67.69	\$73.07	\$80.24	\$87.58	\$89.77	\$92.02
3"	\$148.20	\$159.83	\$175.50	\$191.56	\$196.35	\$201.26
4" Compound	\$211.65	\$228.33	\$250.71	\$273.65	\$280.50	\$287.52
4" FM	\$296.27	\$319.66	\$350.99	\$383.10	\$392.68	\$402.50
6" Compound	\$423.26	\$456.66	\$501.41	\$547.28	\$560.97	\$575.00
6" FM	\$677.24	\$730.65	\$802.25	\$875.64	\$897.54	\$919.98
8" FM	\$1,185.19	\$1,278.63	\$1,403.93	\$1,532.37	\$1,570.68	\$1,609.95
10" FM	\$1,862.56	\$2,009.27	\$2,206.17	\$2,408.00	\$2,468.20	\$2,529.91

## 5.2. Proposed Capital Surcharge

As stated previously, this study update does not propose any changes to the existing rate schedule for the capital surcharge. However, all customers (including MFR) are to be charged the capital surcharge based on meter size beginning in FY 2019/20. The rate schedule for the daily capital surcharge through FY 2023/24 is shown in daily terms in **Table 5-5** and monthly terms in **Table 5-6** below.

**Table 5-5: Daily Capital Surcharge Schedule through FY 2023/24**

Meter Size	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24
3/4"	\$0.0986	\$0.0986	\$0.1151	\$0.1151	\$0.1316	\$0.1316
1"	\$0.1644	\$0.1644	\$0.1918	\$0.1918	\$0.2193	\$0.2193
1 1/2"	\$0.3288	\$0.3288	\$0.3835	\$0.3835	\$0.4385	\$0.4385
2"	\$0.5260	\$0.5260	\$0.6136	\$0.6136	\$0.7016	\$0.7016
3"	\$1.1507	\$1.1507	\$1.3420	\$1.3420	\$1.5344	\$1.5344
4" Compound	\$1.6438	\$1.6438	\$1.9171	\$1.9171	\$2.1920	\$2.1920
4" FM	\$2.3014	\$2.3014	\$2.6839	\$2.6839	\$3.0687	\$3.0687
6" Compound	\$3.2877	\$3.2877	\$3.8340	\$3.8340	\$4.3837	\$4.3837
6" FM	\$5.2603	\$5.2603	\$6.1344	\$6.1344	\$7.0138	\$7.0138
8" FM	\$9.2055	\$9.2055	\$10.7351	\$10.7351	\$12.2741	\$12.2741
10" FM	\$14.4658	\$14.4658	\$16.8695	\$16.8695	\$19.2879	\$19.2879

**Table 5-6: Monthly Capital Surcharge Schedule through FY 2023/24**

Meter Size	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24
3/4"	\$3.00	\$3.00	\$3.50	\$3.50	\$4.00	\$4.00
1"	\$5.00	\$5.00	\$5.84	\$5.84	\$6.67	\$6.67
1 1/2"	\$10.00	\$10.00	\$11.67	\$11.67	\$13.34	\$13.34
2"	\$16.00	\$16.00	\$18.67	\$18.67	\$21.34	\$21.34
3"	\$35.00	\$35.00	\$40.84	\$40.84	\$46.67	\$46.67
4" Compound	\$50.00	\$50.00	\$58.34	\$58.34	\$66.67	\$66.67
4" FM	\$70.00	\$70.00	\$81.67	\$81.67	\$93.34	\$93.34
6" Compound	\$100.00	\$100.00	\$116.67	\$116.67	\$133.34	\$133.34
6" FM	\$160.00	\$160.00	\$186.67	\$186.67	\$213.34	\$213.34
8" FM	\$280.00	\$280.00	\$326.67	\$326.67	\$373.34	\$373.34
10" FM	\$440.00	\$440.00	\$513.34	\$513.34	\$586.67	\$586.67

### 5.3. Proposed Commodity Rate

We calculate the proposed uniform commodity rates by taking the revenue requirement from **Table 4-11** and dividing it by the total projected water sales in FY 2019/20, as shown in **Table 3-5**. **Table 5-7** shows the derivation of the commodity rate.

The commodity rate is designed to recover three cost causation components: Supply (including supply O&M costs and source of supply capital costs), Base Delivery, and Peaking (including Max Day and Max Hour supply costs). These components are shown in **Table 5-7** for clarity. The final rate is rounded to four decimal places.

Please note that the commodity rate shown is before incorporation of any water supply pass-through adjustment as determined by City staff. The proposed commodity rate shown below for FY 2019/20 is equal to the existing commodity rate for FY 2018/19. City staff will determine a pass-through adjustment to be added to the commodity rate shown below. The pass-through adjustment is to be determined by City staff based on the BPP as established by OCWD for the upcoming water year (July to June), the RA per acre-foot of water as established by OCWD for the upcoming year, and the rate established by MWDOC per acre-foot of water for the upcoming year.

**Table 5-7: Development of FY 2019/20 Commodity Rate (Excludes Pass-Through Adjustment)**

Line	Description	Amount	Notes
1	<b>Cost Component</b>		
2	Supply	\$18,489,010	Table 4-11
3	Base	\$1,994,597	Table 4-11
4	Max Day	\$2,053,151	Table 4-11
5	Max Hour	\$2,693,585	Table 4-11
6	<b>Total FY 2019 Revenue Requirement</b>	<b>\$25,230,343</b>	Sum of Lines 2-5
7			
8	Units of Service (CCF)	11,978,514	Table 3-5
9	<b>Commodity Rate (per CCF)</b>	<b>\$2.1063</b>	[Line 6] / [Line 8]

### 5.4. Customer Impact Analysis

**Table 5-8** compares bills under the current FY 2018/19 rate schedule with those projected under the proposed FY 2019/20 rates. We compare bills for an average residential customer with a 3/4" meter using 12 CCF of water per month. For these calculations, we multiply the daily fixed charges by the average number of days per month (30.42)<sup>10</sup>. Please note that **Table 5-8** does not account for any increase in the commodity rate resulting from the yet-to-be-determined pass-through adjustment.

<sup>10</sup> 365 days / 12 months = 30.42 days per month

**Table 5-8: Average Customer Monthly Bill Impacts**

Line	Description	Current FY 2018/19 Rates	Proposed FY 2019/20 Rates	\$ Change	Notes
1	Fixed Meter Service Charge	\$12.70	\$13.70	\$1.00	3/4" meter
2	Capital Surcharge	\$3.00	\$3.00	\$0.00	3/4" inch meter
3	Commodity Rate Charges	\$25.28	\$25.28	\$0.00	12 CCF monthly usage
4	<b>Total Average Bill</b>	<b>\$40.98</b>	<b>\$41.98</b>	<b>\$1.00</b>	

**Figure 5-1** shows a breakdown of monthly customer impacts for customers with a 3/4-inch meters at various levels of usage, including the 12 CCF example from **Table 5-8**.

**Figure 5-1: Projected Residential Bill Impacts**

