CITY OF EL MONTE

2019 Water Rate Study

Final Report / October 31, 2019

RAFTELIS

RAFTELIS

October 31, 2019

Mr. Braden Yu
Public Works and Utilities Director
City of El Monte
11333 Valley Boulevard
El Monte, CA 91731

Subject: 2019 Water Rate Study Report

Dear Mr. Yu,

Raftelis is pleased to provide this 2019 Water Rate Study Report to the City of El Monte. The overall goal of the study was to develop updated water rates for the City that are fair and equitable and in compliance with Proposition 218 requirements.

The major objectives of the study include the following:

- Develop a five-year financial plan through fiscal year (FYE) 2024 that sufficiently funds the Water Enterprise's operating costs, debt obligations, and necessary capital expenditures
- Propose equitable water rates for FYE 2020 to FYE 2024
- Develop drought rates designed to mitigate loss in water rate revenues during periods of reduced water demand

This report summarizes the key findings and recommendations related to the development of the financial plan and proposed water rates. It has been a pleasure working with you and we would like to thank you and City staff for the support provided to Raftelis during this study.

Sincerely,

Steve Gagnon, PE
Project Manager

Charles Diamond
Lead Analyst

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1. Executive Summary

1.1. Study Overview

The City of El Monte (City) provides potable water service to about 16% of its population through approximately 3,500 metered service connections. The City's Water Enterprise maintains an extensive system of water infrastructure that includes five active wells and 40 miles of water distribution lines. The City's water supply consists solely of groundwater produced from the Main San Gabriel Basin, although imported replacement water must be purchased if the City produces groundwater in excess of its share of the Basin's operating safe yield (i.e. pumping rights). The operating safe yield is expected to decrease in the future, causing the City to purchase more expensive replacement water.

The City last conducted a water rate study in 2014, which established water rates over a five-year period through the end of calendar year 2019. The City engaged Raftelis in December 2018 to conduct a water rate study to establish proposed water rates over the next five years that are compliant with Proposition 218 and consistent with industry-standard cost of service principles. **The major objectives of the study include the following**:

- Develop a five-year financial plan through fiscal year (FYE) 2024 that sufficiently funds the Water Enterprise's operating costs, debt obligations, and necessary capital expenditures
- Review the City's current water rate structure
- Propose equitable water rates for FYE 2020 to FYE 2024
- Develop drought rates designed to mitigate loss in water rate revenues during periods of reduced water demand

This executive summary provides an overview of key information and results pertaining to the study.

1.2. Existing Water Rates

The City's water customers are currently subject to the following charges for water service:

1. **Commodity Rates:** Volumetric rates are assessed per unit (one unit of water is 100 gallons i.e. one hgal) of water delivered within a bimonthly billing period based on an inclining two-tier rate structure. Up to 125 units of water per bimonthly billing period are charged at the lower Tier 1 rate. Any water use in excess of 125 units per bimonthly billing period is charged at the higher Tier 2 rate.

2. **Bimonthly Water Service Meter Base Charge:** This fixed charge based on meter size is assessed each bimonthly billing period.

3. **Bimonthly Private Fire Protection Water Service Charges:** This bimonthly fixed charge is only charged to dedicated private fire protection connections associated with state regulated buildings and some non-state regulated buildings as defined in the California Fire Code.

1.3. Financial Plan

Raftelis first performed a status quo cash flow analysis to evaluate whether existing water rates can adequately fund the Water Enterprise's various expenses over the five-year study period. Raftelis projected the Water Enterprise's revenue requirement, which includes operations and maintenance (O&M) expenses, capital improvement plan (CIP)

expenditures, existing debt service payments, and adequate levels of reserve funding over the study period. Raftelis projected that with no rate increases over the five-year study period, the Water Enterprise will deplete its cash reserves by FYE 2022 and fail to meet its debt coverage requirement on its 2018 Water Refunding Bonds in all five years. This demonstrates the need for revenue adjustments (i.e. water rate revenue increases relative to the status quo) over the study period.

Raftelis worked with City staff and City Council to propose the following revenue adjustments over the five-year study period. The proposed revenue adjustments were selected to provide financial stability for the Water Enterprise while minimizing impacts to the City's water ratepayers. Note that while the City's fiscal year spans from July to June, each revenue adjustment is planned for January 1 of each year.

Table 1-1: Proposed Five-Year Revenue Adjustments

Fiscal Year	Effective Date	Revenue Adjustment
FYE 2020	January 1, 2020	15.0%
FYE 2021	January 1, 2021	9.0%
FYE 2022	January 1, 2022	9.0%
FYE 2023	January 1, 2023	8.0%
FYE 2023	January 1, 2024	8.0%

Figure 1-1 shows the proposed financial plan that incorporates the proposed revenue adjustments above. Expenses are represented by stacked bars. O&M expenses include El Monte Operable Unit, General & Administrative, Pumping/Transmission/Distribution, and Other O&M expenses. Additional non-O&M related expenses include existing debt service and rate funded CIP. Projected revenues in the absence of any rate increase are represented by the dashed red line, while projected revenues under the proposed revenue adjustments are represented by the dashed blue line. **Figure 1-1** demonstrates the need for revenue adjustments, as current rates will not generate sufficient revenues to recover debt service payments and rate funded CIP expenditures in each year.

Figure 1-1: Proposed Financial Plan

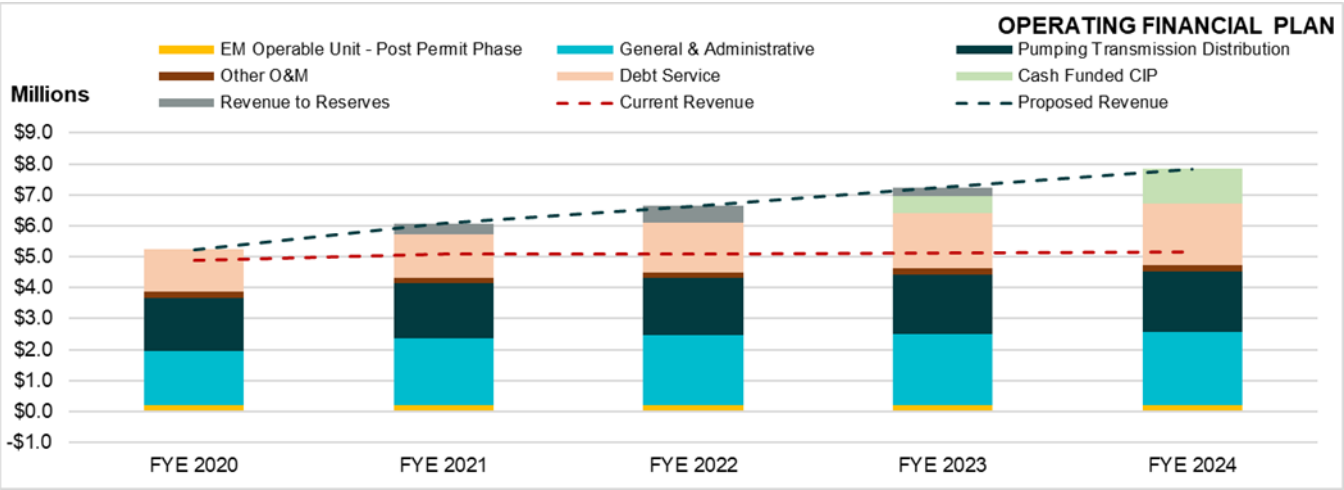
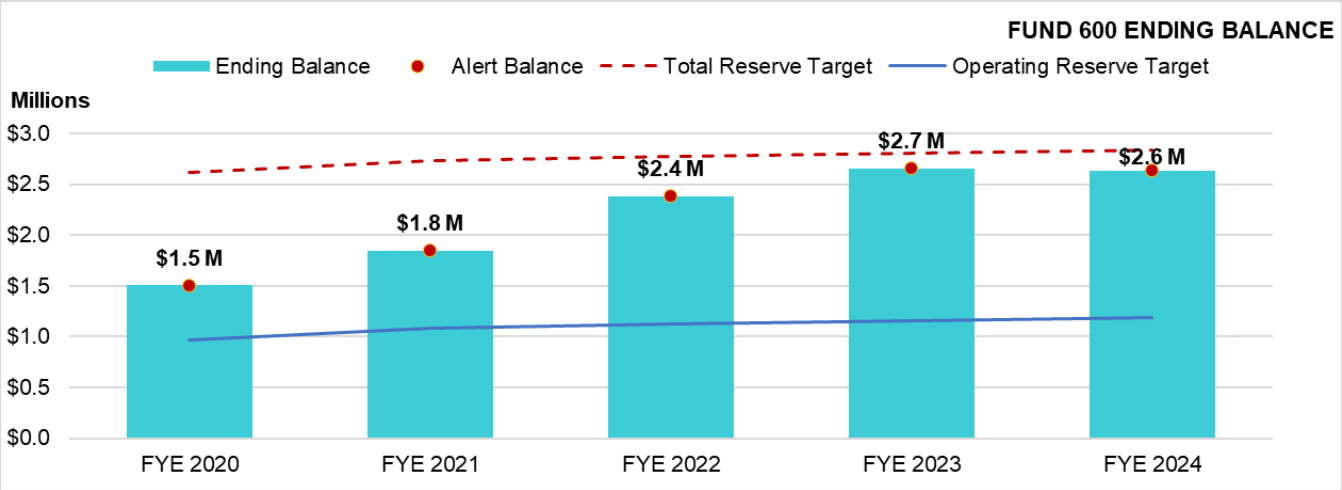


Figure 1-2 shows the Water Enterprise's projected ending cash balance (blue bars) under the proposed financial plan relative to two cash reserve targets. The City has not formally adopted reserve policies for the Water Enterprise. Raftelis therefore developed two reserve targets to use as benchmarks in evaluating the sufficiency of the Water Enterprise's projected ending cash balances over the study period. The first reserve target shown below (see blue line)

includes an operating reserve target of 25% of annual O&M (i.e. 90 days of O&M costs). The operating reserve is a baseline target that Raftelis strongly advises meeting in order to simply ensure sufficient cash on hand to meet short-term operating costs.

The recommended capital reserve target is equal to one year's worth of average annual CIP expenditures and is added to the operating reserve to determine the total reserve target shown below (see red dashed line). The capital reserve target is intended to provide sufficient cash on hand for the City to expeditiously award CIP construction contracts and to reduce the financial impact of unexpected capital asset failure. The total reserve target is informed by Raftelis' experience with similar water utilities in Southern California. To minimize customers bill impacts, Raftelis recommends a slow build-up towards the total reserve target over the five-year study period.

Figure 1-2: Projected Ending Balances - Proposed Financial Plan



1.4. Proposed Water Rates

To calculate fair and equitable rates so that customers pay in proportion to the cost of providing service, Raftelis performed a cost of service analysis for FYE 2020 (i.e. the rate-setting year) in accordance with industry-standard principles outlined by the American Water Works Association (AWWA) in its *Principles of Water Rates, Fees, and Charges: Manual of Water Supply Practices M1 Sixth Edition* (M1 Manual). Raftelis followed industry-standard cost of service principles outlined in the M1 Manual to ensure that proposed rates are in accordance with California Proposition 218, which requires a clear nexus between the cost burden imposed by customers and the rates those customers are charged. The cost of service analysis takes into account water use characteristics by tier in order to allocate costs in proportion to the burden each customer class places on the water system.

The proposed rates shown are the same as the City's existing rate structure. City staff directed Raftelis to develop drought rates, which represent a new type of charge not previously implemented by the City. Drought rates are designed to mitigate reductions in Commodity Rate revenue during periods of reduced water demand, and are discussed further in **Section 1.6** of the executive summary.

Current and proposed water rates over the study period are shown in **Table 1-2**. FYE 2020 proposed rates were established based on the results of the cost of service analysis. Proposed rates from FYE 2021 to FYE 2024 were established by increasing the prior fiscal year's proposed rates by the corresponding revenue adjustment from **Table 1-1**. All rates are proposed to become effective on January 1 of each fiscal year.

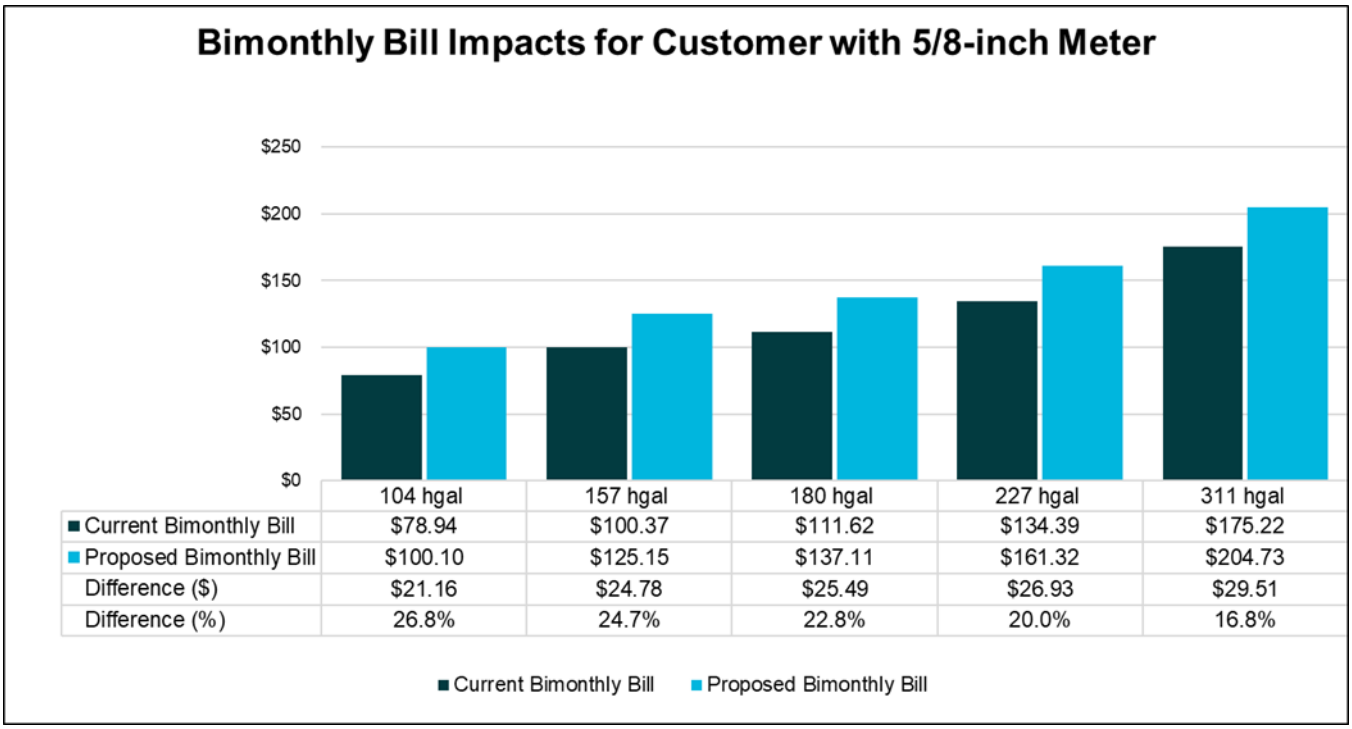
Table 1-2: Proposed Five-Year Rate Schedule

A	B	C	D	E	F	G	H
Line	Fiscal Year	FYE 2019	FYE 2020	FYE 2021	FYE 2022	FYE 2023	FYE 2024
1	Revenue Adjustment		15.0%	9.0%	9.0%	8.0%	8.0%
2	Commodity Rates						
3	Tier	Current 2019	January 1, 2020	January 1, 2021	January 1, 2022	January 1, 2023	January 1, 2024
4	Tier 1 (0-125 hgal)	$0.280	$0.406	$0.442	$0.482	$0.521	$0.562
5	Tier 2 (>125 hgal)	$0.486	$0.517	$0.563	$0.614	$0.663	$0.716
6							
7	Bimonthly Water Service Meter Base Charges						
8	Meter Size	Current 2019	January 1, 2020	January 1, 2021	January 1, 2022	January 1, 2023	January 1, 2024
9	5/8-inch	$49.82	$57.90	$63.11	$68.79	$74.30	$80.24
10	1-inch	$108.06	$121.72	$132.67	$144.61	$156.18	$168.67
11	1.5-inch	$216.08	$228.07	$248.60	$270.98	$292.65	$316.07
12	2-inch	$346.28	$355.70	$387.72	$422.61	$456.42	$492.94
13	3-inch	$648.12	$653.51	$712.32	$776.43	$838.55	$905.63
14	4-inch	$1,080.26	$1,078.94	$1,176.05	$1,281.89	$1,384.44	$1,495.20
15	6-inch	$2,160.44	$2,142.52	$2,335.35	$2,545.53	$2,749.18	$2,969.11
16	8-inch	$3,456.64	$3,418.83	$3,726.52	$4,061.91	$4,386.86	$4,737.81
17	10-inch	$4,968.96	$4,907.84	$5,349.55	$5,831.01	$6,297.49	$6,801.29
18							
19	Bimonthly Private Fire Protection Water Service Charges						
20	Meter Size	Current 2019	January 1, 2020	January 1, 2021	January 1, 2022	January 1, 2023	January 1, 2024
21	2-inch	$108.16	$35.02	$38.17	$41.60	$44.93	$48.53
22	3-inch	$202.60	$89.12	$97.14	$105.88	$114.36	$123.50
23	4-inch	$337.68	$182.44	$198.86	$216.76	$234.10	$252.82
24	6-inch	$643.86	$517.35	$563.92	$614.67	$663.84	$716.95
25	8-inch	$1,080.56	$1,095.02	$1,193.57	$1,300.99	$1,405.07	$1,517.47
26	10-inch	$1,558.50	$1,963.94	$2,140.69	$2,333.36	$2,520.03	$2,721.63

1.5. Customer Impacts

Figure **1-3** shows estimated bimonthly water bills under current FYE 2019 and proposed FYE 2020 rates for a residential customer with a 5/-8-inch water meter at varying levels of bimonthly water use. Note that 157 hgal represents median residential bimonthly water use, and 180 hgal is the average.

Figure 1-3: Bimonthly Bill Impacts at Varying Levels of Use



	104 hgal	157 hgal	180 hgal	227 hgal	311 hgal
Current Bimonthly Bill	$78.94	$100.37	$111.62	$134.39	$175.22
Proposed Bimonthly Bill	$100.10	$125.15	$137.11	$161.32	$204.73
Difference ($)	$21.16	$24.78	$25.49	$26.93	$29.51
Difference (%)	26.8%	24.7%	22.8%	20.0%	16.8%

1.6. Proposed Drought Rates

City staff directed Raftelis to develop drought rates, which have not previously been implemented by the Water Enterprise. Drought rates are intended to recover reductions in net revenue resulting from decreased water sales during times of reduced water demand. Drought rates are commonly used by water utilities in California, especially in the aftermath of the recent California drought which abated in 2017. Many utilities have effectively used drought rates as a tool to combat the financial risk of rate revenue shortfalls during droughts.

Drought rates are not effective under normal water supply and demand conditions, but are only implemented if formally activated by a water provider based on clearly defined demand reduction stages (i.e. drought stages). Raftelis did not develop formal procedures and policies relating to the activation of drought rates during this study. However, Raftelis recommends that City staff develop a formal drought rate activation protocol in which water customers are provided clear notice in advance of drought rate activation. Raftelis developed proposed FYE 2020 drought rates for the following five demand reduction stages:

- **5% Demand Reduction** below projected FYE 2020 water use
- **10% Demand Reduction** below projected FYE 2020 water use
- **15% Demand Reduction** below projected FYE 2020 water use
- **20% Demand Reduction** below projected FYE 2020 water use
- **25% Demand Reduction** below projected FYE 2020 water use

Proposed drought rates are shown in **Table 1-3**, and are determined by adding a drought surcharge to the proposed Commodity Rates (i.e. "base rates") previously shown in **Table 1-2**. The drought surcharge is simply a percentage of the base rate, and is designed to recover the amount of net revenues projected to be lost under each demand reduction stage. Note that proposed drought rates pertain only to the City's Commodity Rates, and do not affect the bimonthly fixed Water Service Meter Base Charges or Private Fire Protection Water Service Charges.

Table 1-3: Proposed FYE 2020 Drought Rates

A	B	C	D	E	F	G	H
Line	Description	Base Demand	5% Demand Reduction	10% Demand Reduction	15% Demand Reduction	20% Demand Reduction	25% Demand Reduction
1	Uniform Percentage Increase	0.0%	1.3%	4.9%	10.7%	17.3%	24.9%
2							
3	**Tier 1 Rate**						
4	Base Rate ($/hgal)	$0.406	$0.406	$0.406	$0.406	$0.406	$0.406
5	Drought Surcharge ($/hgal)	$0.000	$0.005	$0.020	$0.044	$0.070	$0.101
6	**Proposed Tier 1 Rate ($/hgal)**	**$0.406**	**$0.411**	**$0.426**	**$0.449**	**$0.476**	**$0.507**
7							
8	**Tier 2 Rate**						
9	Base Rate ($/hgal)	$0.517	$0.517	$0.517	$0.517	$0.517	$0.517
10	Drought Surcharge ($/hgal)	$0.000	$0.007	$0.025	$0.056	$0.090	$0.128
11	**Proposed Tier 2 Rate ($/hgal)**	**$0.517**	**$0.523**	**$0.542**	**$0.572**	**$0.606**	**$0.645**

2. Introduction

2.1. Water System Overview

The City of El Monte (City) provides potable water service to about 16% of the City's population through approximately 3,500 metered service connections. The City's remaining population receives water service from various private water providers. The City's Water Enterprise maintains an extensive system of water infrastructure that includes five active wells and 40 miles of water distribution lines. Because the City is largely built-out, anticipated growth in water accounts over the next five years is minimal.

The City's water supply consists solely of groundwater produced from the Main San Gabriel Basin (Basin). The Main San Gabriel Basin Watermaster (Wastermaster) is the governing body tasked with management of the Basin's water resources, and has administered the Basin's water rights since adjudication in 1973. The Watermaster does not limit the quantity of water that parties within the Basin may pump. However, the City must purchase imported replacement water to offset annual groundwater production in excess of its proportional share of the Basin's operating safe yield (i.e. pumping rights). The City has previously avoided the need to purchase replacement water by maintaining water production below its proportional share of the operating safe yield. However, a reduction in the projected operating safe yield beginning in fiscal year[1] (FYE) 2020 is expected to result in required replacement water purchases over the next five years.

The City began producing water in 2018 from the newly constructed Arden Groundwater Treatment Plant (AGTP). This water supply and treatment facility was constructed as part of the El Monte Operable Unit Project Agreement between the City and private parties responsible for groundwater pollution in the Basin. The project agreement stipulates that the responsible parties must reimburse the City for in-kind service costs to operate the AGTP in excess of approximately $190,000 per fiscal year as of FYE 2019.[2] Nevertheless, the City's operation of the AGTP represents an additional cost pressure on the Water Enterprise.

2.2. Study Objectives

The City last conducted a water rate study in 2014, which established water rates over a five-year period through the end of calendar year 2019. The City engaged Raftelis in December 2018 to conduct a water rate study to establish proposed water rates that are compliant with Proposition 218 and consistent with industry-standard cost of service principles. The major objectives of the study include the following:

- Develop a five-year financial plan through FYE 2024 that sufficiently funds the Water Enterprise's operating costs, debt obligations, and necessary capital expenditures
- Review the City's current water rate structure
- Perform a cost of service analysis to appropriately allocate costs for recovery by the City's water rates
- Propose equitable water rates for FYE 2020 to FYE 2024
- Develop drought rates designed to mitigate loss in water rate revenues during periods of reduced water demand

This report provides a detailed description of the financial plan development, the cost of service analysis, and the development of the proposed five-year water rate schedule. Assumptions, inputs, and calculations are clearly shown

[1] The City's fiscal year is July-June. For example, FYE 2019 covers July 1, 2018 – June 30, 2019.
[2] The not to exceed in-kind contribution by the City is to be adjusted annually by the Los Angeles region Consumer Price Index (CPI) as determined by the U.S. Bureau of Labor Statistics.

in order to provide a thorough and transparent description of how the proposed water rates were established. Numbers shown in tables are rounded. Therefore, recreating the calculations based on table values shown may not produce the exact results.

2.3. Legal Requirements and Rate-Setting Methodology

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

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

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

As stated in the American Water Works Association's (AWWA) *Principles of Water Rates, Fees, and Charges: Manual of Water Supply Practices M1 Sixth Edition* (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 this study meets Proposition 218 requirements and establishes rates that do not exceed the proportionate cost of providing water services on a parcel basis. The methodology in the M1 Manual is a nationally recognized industry ratemaking standard which courts have recognized as consistent with Proposition 218.

California Constitution Article X, Section 2

California Constitution Article X, Section 2 mandates that water resources be put to beneficial use and that the waste or unreasonable use of water be prevented through conservation. Section 106 of the Water Code declares that the highest priority use of water is for domestic purposes, with irrigation secondary. Thus, management of water resources is part of the property-related service provided by public water suppliers to ensure the resource is available over time. The City currently has inclining tiered (also known as inclining block) water rates to incentivize customers to conserve water. The inclining tier rates must be based on the proportionate costs incurred to provide water to customers to achieve compliance with Proposition 218. "Inclining" tier rate structures (which are synonymous with "increasing" tier rate structures and "tiered" rates), when properly designed, allow a water utility to send conservation price signals to customers. Due to heightened interest in water conservation and efficiency of water use, tiered water rates have gained widespread use, especially in relatively water-scarce regions like Southern California. Tiered rates meet the requirements of Proposition 218 as long as they reasonably reflect the proportionate cost of providing service for each tier.

Rate-Setting Methodology

This water rate study was conducted using industry-standard principles outlined by the AWWA M1 Manual. The process and approach Raftelis utilized in the study to determine water rates is informed by the City's policy objectives, the current water system and rates, and the legal requirements in California (namely, Proposition 218). The resulting financial plan, cost of service analysis, and rate design process follows five key steps, outlined below, to determine proposed rates that fulfill the City's objectives, meet industry standards, and comply with relevant regulations.

1. **Financial Plan:** The first study step is to develop a multi-year financial plan that projects the Water Enterprise's revenues, expenses, capital project financing, annual debt service, and reserve funding. The financial plan is used to determine the revenue adjustment, which allows the water utility to recover adequate revenues to fund expenses and reserves.

2. **Revenue Requirement Determination:** After completing the financial plan, the rate-making process begins with the determination of the revenue requirement for the test year, also known as the rate-setting year. The test year for this study is FYE 2020. The revenue requirement should sufficiently fund the Water Enterprise's operations and maintenance (O&M) costs, annual debt service, capital improvement plan (CIP) costs, and reserve funding as projected based on the Water Enterprise's FYE 2020 budget.

3. **Cost of Service Analysis:** The annual cost of providing water service, or the revenue requirement, is then distributed to customer classes and tiers commensurate with their use of and burden on the water system. A cost of service analysis involves the following steps:
    a. Functionalize costs – the different components of the revenue requirement are categorized into functions such as supply, transmission and distribution (T&D), customer service and billing, etc.
    b. Allocate to cost causation components – the functionalized costs are then allocated to cost causation components such as supply, base delivery, peaking, etc.
    c. Develop unit costs – unit costs for each cost causation component are determined using units of service, such as total use, peaking units, equivalent meters, number of customers, etc. for each component.
    d. Distribute cost components – the cost components are allocated to each customer class and tier using the unit costs in proportion to their demand and burden on the system.

    A cost of service analysis considers both the average water demand and peak demand. Peaking costs are incurred during periods of peak consumption, most often coinciding with summer water use. There are additional capacity-related costs associated with designing, constructing, operating, maintaining, and replacing facilities to meet peak demand. Patterns of use impose additional costs on a utility and are used to determine the cost burden on peaking-related facilities.

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

5. **Administrative Record Preparation and Rate Adoption:** The final step in a rate study is to develop the administrative record in conjunction with the rate adoption process. This report serves as the administrative record for this study. The administrative record documents the study results and presents the methodologies,

rationale, justifications, and calculations used to determine the proposed rates. A thorough and methodological administrative record serves two important functions: maintaining defensibility in a stringent legal environment and communicating the rate adoption process to customers and important stakeholders.

3. Financial Plan

This section details the development of the five-year financial plan for City's Water Enterprise for the study period (FYE 2020 to FYE 2024). This includes the determination of annual revenues required from water rates based on annual cash flow and ending balance projections for the Water Enterprise. Assumptions and inputs related to projected revenues, operating expenses, debt service, capital expenditures, and reserve funding are clearly outlined in the following subsections.

3.1. Existing Water Rates

The City's water customers are currently subject to the following charges for water service:

6. **Commodity Rates:** Volumetric rates are assessed per unit (one unit is equal to 100 gallons i.e. one hgal) of water delivered within a bimonthly billing period based on an inclining two-tier rate structure. Up to 125 units of water per bimonthly billing period are charged at the lower Tier 1 rate. Any water use in excess of 125 units per bimonthly billing period is charged at the higher Tier 2 rate.

7. **Bimonthly Water Service Meter Base Charge:** This fixed charge based on meter size is assessed each bimonthly billing period. Larger meter sizes are subject to higher fixed charge rates because they burden the water system with greater capacity-related and maintenance-related costs.

8. **Bimonthly Private Fire Protection Water Service Charges:** This bimonthly fixed charge is only charged to dedicated private fire protection connections associated with state regulated buildings and some non-state regulated buildings as defined in the California Fire Code. Fewer than five percent of the City's water customer accounts are subject to this charge.

Table 3-1 shows the existing rates for the three charges listed above. All rates shown below went into effect on January 1, 2019. The Commodity Rate tier allotments and fixed charge rates shown are all on a bimonthly basis.

Table 3-1: Existing Water Rates and Charges

Commodity Rates (per 100 gallons)	
Tier	**Current 2019 Rate**
Tier 1 (0-125 hgal)	$0.280
Tier 2 (>125 hgal)	$0.486
Bimonthly Water Service Meter Base Charges	
Meter Size	**Current 2019 Rate**
5/8-inch	$49.82
1-inch	$108.06
1.5-inch	$216.08
2-inch	$346.28
3-inch	$648.12
4-inch	$1,080.26
6-inch	$2,160.44
8-inch	$3,456.64
10-inch	$4,968.96
Bimonthly Private Fire Protection Water Service Charges	
Meter Size	**Current 2019 Rate**
2-inch	$108.16
3-inch	$202.60
4-inch	$337.68
6-inch	$643.86
8-inch	$1,080.56
10-inch	$1,558.50

3.2. Water Account and Use Assumptions

City staff provided the number of existing water meters and private fire protection connections as of FYE 2018. Approximately 83% of water meters are associated with residential customers, 15% with commercial/industrial customers, and 2% with irrigation customers. To ensure conservative rate revenue projections, Raftelis projected the number of accounts over the five-year study period assuming a modest 0.5% annual growth in water meters and 0% annual growth in the number of private fire protection connections. **Table 3-2** shows the actual number of water meters and private fire connections for FYE 2018 and projected values for FYE 2019 to FYE 2024 based on these growth assumptions.

Table 3-2: Projected Number of Water Meters and Private Fire Service Connections

Water Meters Meter Size	FYE 2018 Actual	FYE 2019 Projected	FYE 2020 Projected	FYE 2021 Projected	FYE 2022 Projected	FYE 2023 Projected	FYE 2024 Projected
5/8-inch	2,741	2,755	2,768	2,782	2,796	2,810	2,824
1-inch	457	459	462	464	466	469	471
1.5-inch	99	99	100	100	101	101	102
2-inch	137	138	138	139	140	140	141
3-inch	5	5	5	5	5	5	5
4-inch	15	15	15	15	15	15	15
6-inch	5	5	5	5	5	5	5
8-inch	3	3	3	3	3	3	3
10-inch	0	0	0	0	0	0	0
Total	**3,462**	**3,479**	**3,497**	**3,514**	**3,532**	**3,549**	**3,567**
Annual Change		0.5%	0.5%	0.5%	0.5%	0.5%	0.5%
Private Fire Protection Connections **Meter Size**	**FYE 2018** **Actual**	**FYE 2019** **Projected**	**FYE 2020** **Projected**	**FYE 2021** **Projected**	**FYE 2022** **Projected**	**FYE 2023** **Projected**	**FYE 2024** **Projected**
2-inch	0	0	0	0	0	0	0
3-inch	11	11	11	11	11	11	11
4-inch	45	45	45	45	45	45	45
6-inch	42	42	42	42	42	42	42
8-inch	21	21	21	21	21	21	21
10-inch	7	7	7	7	7	7	7
Total	**126**	**126**	**126**	**126**	**126**	**126**	**126**
Annual Change		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Raftelis projected annual water use by tier based on actual water use data provided by City staff for FYE 2018. FYE 2018 represents the most recent fiscal year in which complete water use data was available at the time the study was conducted. For the purposes of the financial plan, no change in per account water consumption is assumed over the study period relative to FYE 2018. Annual increases in projected water use over the study period are solely due to the annual account growth factor applied to water meters over the study period (see **Table 3-2**). The increase in water use over the study period is therefore directly proportional to the increase in total number water meters, which is 0.5% per year. **Table 3-3** shows total water use in both hundreds of gallons and acre-feet. Approximately 35% of total water use falls within Tier 1, with the remaining 65% in Tier 2.

Table 3-3: Projected Water Use by Tier

Water Usage Tier	FYE 2018 Actual	FYE 2019 Projected	FYE 2020 Projected	FYE 2021 Projected	FYE 2022 Projected	FYE 2023 Projected	FYE 2024 Projected
Tier 1	2,197,884	2,208,873	2,219,918	2,231,017	2,242,172	2,253,383	2,264,650
Tier 2	4,165,612	4,186,440	4,207,372	4,228,409	4,249,551	4,270,799	4,292,153
Total Water Usage (hgal)	**6,363,496**	**6,395,313**	**6,427,290**	**6,459,426**	**6,491,724**	**6,524,182**	**6,556,803**
Total Water Usage (Acre-feet)	*1,953 AF*	*1,963 AF*	*1,972 AF*	*1,982 AF*	*1,992 AF*	*2,002 AF*	*2,012 AF*
Annual Change in Water Usage		*0.5%*	*0.5%*	*0.5%*	*0.5%*	*0.5%*	*0.5%*

3.3. Revenue under Existing Rates

The Water Enterprise's revenue consist of rate revenues, interest earnings on cash reserves, and other revenue from rental income, miscellaneous fees, and other sources. City staff provided FYE 2020 budgeted revenue for the Water Enterprise. Raftelis then projected revenues for FYE 2021 to FYE 2024. The revenue projections shown in **Section 3.3** are based on existing 2019 water rates, and therefore represent estimated revenues in the absence of any rate increase. This status quo scenario provided a baseline from which Raftelis then evaluated the need for revenue adjustments (i.e. rate increases).

Calculated Water Rate Revenue

Raftelis projected water rate revenue from Commodity Rates, Water Service Meter Base Charges, and Private Fire Protection Water Service Charges for FYE 2021 to FYE 2024 based on existing rates, projected number of water meters/private fire protection connections, and projected annual water use by tier. Annual Commodity Rate revenue by tier was calculated by multiplying the current Commodity Rate per hgal (from **Table 3-1**) by the corresponding projected annual use in hgal (from **Table 3-3**). Annual Water Service Meter Base Charge and Private Fire Protection Water Service Charge revenue were calculated for each meter size by multiplying the current bimonthly rate (from **Table 3-1)** by the number of water meters/private fire protection connections (from **Table 3-2**) by six bimonthly billing periods per year.

Table 3-4: Projected Water Rate Revenue Under Existing Rates

Rate Revenues	FYE 2021	FYE 2022	FYE 2023	FYE 2024
Calculated Commodity Charge Revenues				
Tier 1	$624,685	$627,808	$630,947	$634,102
Tier 2	$2,055,007	$2,065,282	$2,075,608	$2,085,986
Total	**$2,679,692**	**$2,693,090**	**$2,706,556**	**$2,720,088**
Calculated Bimonthly Water Service Meter Base Charge Revenues				
Meter Size				
5/8-inch	$831,691	$835,850	$840,029	$844,229
1-inch	$300,767	$302,271	$303,782	$305,301
1.5-inch	$130,286	$130,938	$131,593	$132,251
2-inch	$288,933	$290,378	$291,830	$293,289
3-inch	$19,737	$19,835	$19,935	$20,034
4-inch	$98,689	$99,183	$99,678	$100,177
6-inch	$65,790	$66,119	$66,450	$66,782
8-inch	$63,157	$63,473	$63,791	$64,110
10-inch	$0	$0	$0	$0
Total	**$1,799,052**	**$1,808,047**	**$1,817,087**	**$1,826,173**
Calculated Bimonthly Private Fire Protection Water Service Charge Revenues				
Meter Size	$0	$0	$0	$0
2-inch	$13,372	$13,372	$13,372	$13,372
3-inch	$91,174	$91,174	$91,174	$91,174
4-inch	$162,253	$162,253	$162,253	$162,253
6-inch	$136,151	$136,151	$136,151	$136,151
8-inch	$65,457	$65,457	$65,457	$65,457
10-inch	$0	$0	$0	$0
Total	**$468,405**	**$468,405**	**$468,405**	**$468,405**

Revenues Assumptions

Table 3-5 shows assumptions used to project interest earnings and other revenues for FYE 2021 to FYE 2024 based on FYE 2020 budgeted values. Interest earnings were calculated based on projected Water Enterprise ending balances (shown later in **Section 3.9**) and an assumed annual interest rate. Other revenues were projected based on an annual inflation factor with the exception of reimbursements. City staff informed Raftelis that budgeted reimbursements in FYE 2020 represent a one-time revenue that will not recur in subsequent years.

Table 3-5: Revenue Assumptions

Revenue Assumptions	
Interest Earnings	
Annual Interest Rate on Cash Reserves	1.0%
Annual Inflationary Factors	
Other Revenues (excluding Reimbursements)	1.0%

Summary of Revenue under Existing Rates

Table 3-6 shows a summary of budgeted and projected revenue under existing rates. Projected water rate revenue from FYE 2021 to FYE 2024 were calculated previously in **Table 3-4.** Interest earnings and other revenues were projected based on assumptions shown in **Table 3-5**.

Table 3-6: Revenue Summary under Existing Rates

Revenue Summary	FYE 2020 Budget	FYE 2021 Projected	FYE 2022 Projected	FYE 2023 Projected	FYE 2024 Projected
Commodity Charges	$2,555,000	$2,679,692	$2,693,090	$2,706,556	$2,720,088
Water Service Meter Base Charges	$1,740,000	$1,799,052	$1,808,047	$1,817,087	$1,826,173
Private Fire Protection Water Service Charges	$450,000	$468,405	$468,405	$468,405	$468,405
Interest Earnings	$5,000	$16,682	$21,040	$25,076	$26,321
Other Revenues	$130,500	$111,605	$112,721	$113,848	$114,987
TOTAL REVENUES	**$4,880,500**	**$5,075,436**	**$5,103,304**	**$5,130,973**	**$5,155,974**

3.4. Operations and Maintenance Expenses

The Water Enterprise's O&M expenses consist of personnel costs, administrative costs, and other operating costs associated with water production, treatment, and delivery. City staff provided FYE 2020 budgeted expenses for the City's Water Enterprise. For FYE 2020, budgeted salary and benefit costs were adjusted upwards by approximately 15% to incorporate the results of a concurrent Cost Allocation Plan Study conducted by Raftelis for the City's Water Enterprise. The Cost Allocation Plan Study evaluated the effort and associated costs for internal City staff, such as Finance, Information Technology, and the City Manager's office that should be charged to the Water Enterprise. For FYE 2021 to FYE 2024, Raftelis calculated Water Assessment costs based on water supply assumptions and projected all other O&M expenses based on annual inflationary factors. El Monte Operable Unit expenses shown in this section are limited to the maximum amount of in-kind service costs that the City must cover before reimbursement by the responsible parties.

Inflationary Assumptions

Table 3-7 shows the O&M expense inflationary assumptions used to reasonably project future expenses for FYE 2021 to FYE 2024 based on the Water Enterprise's FYE 2020 budget. The majority of expenses were increased by three percent per year relative to the FYE 2020 budget, with salary-related expenses escalated by five percent per year. The Water Assessments inflation factor was used to project Watermaster assessment rates, Water Quality Authority assessment rates, and State Water Resource Control Board (SWRCB) costs, all of which were used to project Water Assessment costs incurred by the Water Enterprise. The Los Angeles region Consumer Price Index (CPI) inflationary factor was used to project the maximum amount of in-kind service costs associated with the El Monte Operable Unit that the City must cover before reimbursement by the responsible parties.

Table 3-7: O&M Expense Inflationary Assumptions

Annual Inflationary Factors for O&M Expenses	
General	3.0%
Salary	5.0%
Benefits	3.0%
Utilities	3.0%
Water Assessments	1.5%
Los Angeles CPI	2.7%

Calculated Water Assessment Costs

Raftelis calculated Water Assessments in FYE 2021 to FYE 2024 based on projected water demand and assessment rate information shown in **Table 3-8**. Water Assessment costs include:

- Assessments paid to the Watermaster per acre-foot of total groundwater production (Administration, In-Lieu, and Water Resource Development Assessments)
- Replacement Water Assessments paid to the Watermaster per acre-foot of annual groundwater production in excess of the City's proportional share of the Basin's operating safe yield plus any carryover from the prior year (i.e. replacement water)
- Water Quality Authority Assessments paid to the San Gabriel Basin Water Quality Authority per acre-foot of prescriptive pumping rights
- Fees paid to the SWRCB

Raftelis estimated total groundwater production in each year by applying a 13.4% water loss factor (estimated by Raftelis and City staff) to total potable water demand (from **Table 3-3**). Raftelis worked with City staff to estimate replacement water based on total groundwater production and the City's expected proportional share of the Basin's operating safe yield. The City also provided its prescriptive pumping rights in acre-feet to Raftelis. The City provided assessment rates throughout the study period for the Replacement Water Assessment and Water Resource Development Assessment. Administration, In-Lieu, and Water Quality Authority assessment rates were projected by escalating FYE 2020 rates by the Water Assessments inflation factor (from **Table 3-7**).

Replacement Water Assessment costs in each year were calculated by multiplying required replacement water by the Replacement Water Assessment rate. Costs associated with the three Watermaster Assessments in each year were calculated by multiplying total groundwater production by the respective assessment rate. Water Quality Authority Assessment costs in each year were calculated by multiplying prescriptive pumping rights by the Water Quality Authority Assessment rate. SWRCB costs were calculated by escalating FYE 2019 actual expenses by the Water Assessments inflation factor (from **Table 3-7**).

Table 3-8: Projected Water Assessments

Calculated Water Assessments		Notes	FYE 2021	FYE 2022	FYE 2023	FYE 2024
Line	Water Supply					
1	Potable Water Demand		1,982.3 AF	1,992.2 AF	2,002.2 AF	2,012.2 AF
2	System Water Loss (%)		13.4%	13.4%	13.4%	13.4%
3	Total Groundwater Production	*Accounts for water loss*	2,289.1 AF	2,300.5 AF	2,312.0 AF	2,323.6 AF
4	Replacement Water Required		457.5 AF	469.0 AF	480.5 AF	492.0 AF
5	Prescriptive Pumping Rights		2,784.4 AF	2,784.4 AF	2,784.4 AF	2,784.4 AF
6						
7	**Watermaster Assessment Rates**					
8	Replacement Water Assessment		$835 /AF	$835 /AF	$835 /AF	$835 /AF
9	Administration Assessment	*($15/AF in FYE 2020)*	$15.23 /AF	$15.45 /AF	$15.69 /AF	$15.92 /AF
10	In-Lieu Assessment	*($10/AF in FYE 2020)*	$10.15 /AF	$10.30 /AF	$10.46 /AF	$10.61 /AF
11	Water Resource Development Assessment		$175 /AF	$190 /AF	$190 /AF	$190 /AF
12	Water Quality Authority Assessment	*($12/AF in FYE 2020)*	$12.18 /AF	$12.36 /AF	$12.55 /AF	$12.74 /AF
13						
14	**Calculated Water Assessments**		FYE 2021	FYE 2022	FYE 2023	FYE 2024
15	Replacement Water Assessment	*(Line 4 x Line 8)*	$382,030	$391,591	$401,199	$410,852
16	Administration Assessment	*(Line 3 x Line 9)*	$34,851	$35,551	$36,264	$36,992
17	In-Lieu Assessment	*(Line 3 x Line 10)*	$23,234	$23,700	$24,176	$24,662
18	Water Resource Development Assessment	*(Line 3 x Line 11)*	$400,586	$437,098	$439,284	$441,481
19	Water Quality Authority Assessment	*(Line 5 x Line 12)*	$33,914	$34,423	$34,939	$35,464
20	SWRCB Costs	*($35,577 in FYE 2019)*	$36,652	$37,202	$37,760	$38,327
21	**Total Calculated Water Assessments**		**$911,268**	**$959,566**	**$973,624**	**$987,776**

Summary of O&M Expenses

Table 3-9 shows budgeted FYE 2020 O&M expenses with an adjustment to salary/benefit costs as a result of the concurrent Cost Allocation Plan study conducted by Raftelis. Projected expenses in FYE 2021 to FYE 2024 are based on inflationary assumptions (from **Table 3-7**) and calculated water assessments (from **Table 3-8**). El Monte Operable Unit expenses shown below only include anticipated costs that will *not* be reimbursed by responsible parties to the El Monte Operable Unit Project Agreement. The significant projected increase in O&M expenses in FYE 2021 is largely due to expected Replacement Water Assessments.

Table 3-9: O&M Expense Summary

O&M Summary	FYE 2020	FYE 2021	FYE 2022	FYE 2023	FYE 2024
Fund 600 O&M Expenses	**Budget**	**Projected**	**Projected**	**Projected**	**Projected**
EM Operable Unit - Post Permit Phase	$198,387	$203,743	$209,244	$214,894	$220,696
General & Administrative: Water Assessments	$555,000	$911,268	$959,566	$973,624	$987,776
Other General & Administrative	$1,189,709	$1,238,820	$1,290,075	$1,328,777	$1,368,640
Pumping Transmission Distribution	$1,714,628	$1,778,948	$1,845,827	$1,902,300	$1,960,506
Other Operating Expenses	$200,000	$200,000	$200,000	$200,000	$200,000
Total Fund 600 O&M Expenses	**$3,857,724**	**$4,332,779**	**$4,504,711**	**$4,619,594**	**$4,737,618**

3.5. Existing Debt Service

Table 3-10 shows the Water Enterprise's existing debt service. This includes annual debt service throughout the study period on the City's 2018 Water Refunding Bonds. Other debt service includes projected payments to be made by the Water Enterprise to the City's General Fund for a loan to establish the Water Authority. These payments were projected based on input from City staff. The Water Enterprise does not anticipate issuing any new debt over the study period.

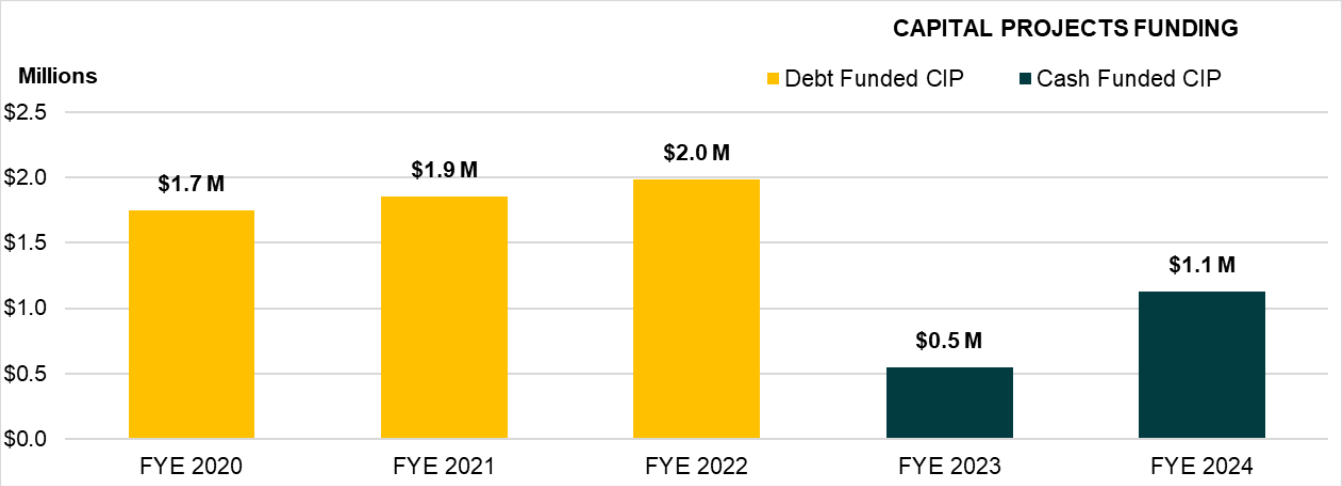
Table 3-10: Existing Debt Service

Existing Debt Service	FYE 2020	FYE 2021	FYE 2022	FYE 2023	FYE 2024
2018 Water Refunding Bonds					
Principal	$495,000	$535,000	$555,000	$570,000	$600,000
Interest	$888,175	$867,575	$845,775	$823,275	$796,875
Total Debt Service - 2018 Water Refunding Bonds	**$1,383,175**	**$1,402,575**	**$1,400,775**	**$1,393,275**	**$1,396,875**
Other Existing Debt Service					
General Fund Repayment	$0	$0	$200,000	$400,000	$600,000
Total Debt Service - Other Existing Debt Service	**$0**	**$0**	**$200,000**	**$400,000**	**$600,000**
Total Existing Debt Service	**$1,383,175**	**$1,402,575**	**$1,600,775**	**$1,793,275**	**$1,996,875**

3.6. Capital Improvement Plan

Figure 3-1 shows projected capital improvement plan (CIP) expenditures over the study period. CIP expenditures fund the repair and replacement of the Water Enterprise's existing capital assets (such as water line replacement and reservoir improvements) as well new capital assets (such as GIS implementation). FYE 2020 CIP includes budgeted capital expenditures for the Water Enterprise in FYE 2020. Raftelis projected CIP expenditures for FYE 2021 to FYE 2024 based on the City's 2010 Water Master Plan Update and input from City staff. The City anticipates that existing bond proceeds will adequately fund all CIP expenditures in FYE 2020 to FYE 2022. CIP expenditures in FYE 2023 and FYE 2024 are expected to be funded entirely by water rate revenue and reserves.

Figure 3-1: Projected CIP Expenditures



3.7. Financial Policies

Debt Coverage

The 2018 Water Refunding Bonds covenant includes a debt coverage ratio requirement of 1.25 for the Water Enterprise. The debt coverage ratio is calculated by dividing the Water Enterprise's net revenues (Water Enterprise revenues less O&M expenses) by annual debt service (principal plus interest payments) associated with the 2018 Water Refunding Bonds.

Reserve Policies

Appropriate levels of reserves enable water utilities to ensure sufficient cash on hand to cover short-term operating costs, facilitate efficient initiation of construction contracts for CIP, reduce the risk of asset failure, and mitigate the impact of reduced Commodity Rate revenues during water supply shortages. The City has not formally adopted a reserve policy for its Water Enterprise. Raftelis therefore developed two reserve targets to use as benchmarks in evaluating the sufficiency of the Water Enterprise's projected ending cash balances in each year over the study period.

The reserve targets shown in **Table 3-11** include an operating reserve target of 25% of annual O&M (i.e. 90 days of O&M costs). The operating reserve represents a baseline target to ensure sufficient cash on hand to meet short-term operating costs. A capital reserve target equal to one year's worth of average annual CIP expenditures is also included. The capital reserve target is intended to provide sufficient cash on hand to expeditiously award CIP construction contracts and to reduce the financial impact of unexpected capital asset failure. The combined reserve target is informed by Raftelis' experience with similar water utilities in Southern California while taking into account factors unique to the City's Water Enterprise.

Table 3-11: Target Reserve Levels

Target Reserve Balance	FYE 2020	FYE 2021	FYE 2022	FYE 2023	FYE 2024
Operating Reserve Target: *(25% of annual O&M)*	$964,431	$1,083,195	$1,126,178	$1,154,898	$1,184,405
Capital Reserve: *(One year of annual average CIP)*	$1,648,691	$1,648,691	$1,648,691	$1,648,691	$1,648,691
Total Fund 600 Target Reserve Balance	**$2,613,122**	**$2,731,886**	**$2,774,869**	**$2,803,590**	**$2,833,096**

3.8. Status Quo Financial Plan

The status quo financial plan illustrates the Water Enterprise's financial health in the absence of revenue adjustments (i.e. water rate increases) over the study period. Current water rates in effect as of FYE 2019 are assumed to remain unchanged over the study period under the status quo. Raftelis and City staff first evaluated the Water Enterprise's cash flow and fund balances over the study period under the status quo before considering revenue adjustments.

Figure 3-2 shows that in the absence of revenue adjustments, the Water Enterprise is not projected to meet its required debt coverage requirement of 1.25 in any year over the study period. **Figure 3-3** shows the Water Enterprise's projected ending cash balance in each year over the study period under the status quo. Without revenue adjustments, The Water Enterprise's cash balance is projected to be fully depleted by FYE 2022. The status quo financial plan demonstrates the need for revenue adjustments over the study period to meet debt coverage requirements and ensure sufficient cash reserves.

Figure 3-2: Revenue Adjustments and Debt Coverage - Status Quo Financial Plan

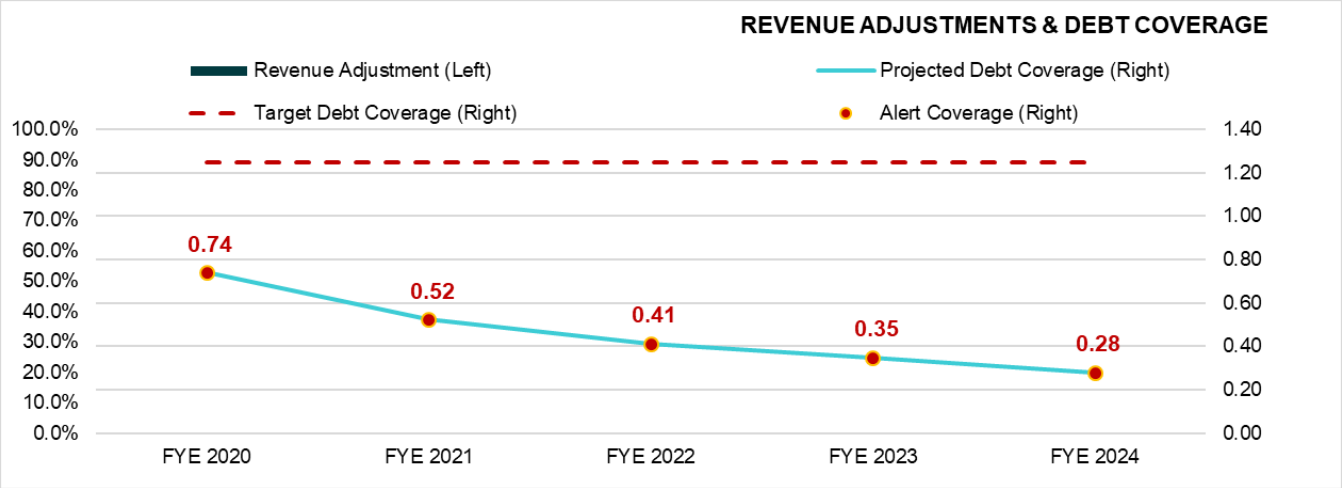
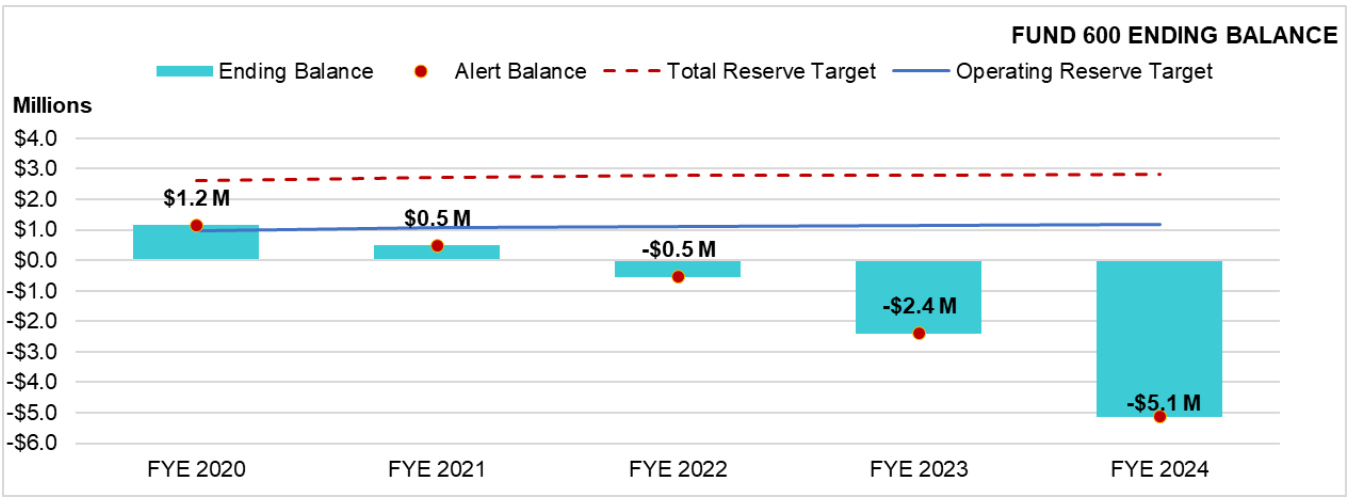


Figure 3-3: Projected Ending Balances - Status Quo Financial Plan



3.9. Proposed Financial Plan

The status quo financial plan demonstrates that the City must increase its revenues from water rates over the study period in order to meet required debt coverage and generate sufficient reserve funding. Raftelis worked with City staff and City Council to select the proposed annual revenue adjustments shown in **Table 3-12**. The proposed revenue adjustments were selected to provide financial stability for the Water Enterprise while minimizing impacts to the City's water ratepayers. Note that while the City's fiscal year spans from July to June, each revenue adjustment is planned for January 1 of each year. Therefore, proposed rates in each fiscal year will only be in effect for the final six months of each fiscal year.

Table 3-12: Proposed Five-Year Revenue Adjustments

Fiscal Year	Effective Date	Revenue Adjustment
FYE 2020	January 1, 2020	15.0%
FYE 2021	January 1, 2021	9.0%
FYE 2022	January 1, 2022	9.0%
FYE 2023	January 1, 2023	8.0%
FYE 2023	January 1, 2024	8.0%

Table 3-13 shows the proposed five-year financial plan in proforma format. Total revenue (Line 19) includes revenue under existing rates (from **Table 3-6**) plus additional rate revenue resulting from the proposed revenue adjustments in **Table 3-12**. Total operating expenses (Line 28) include O&M expenses (from **Table 3-9**) and existing debt service (from **Table 3-10**). The net operating cash flow (Line 30) is equal to total revenue less total operating expenses. City staff provided the Water Enterprise's beginning cash balance for FYE 2020. Raftelis projected ending cash balances (Line 36) over the study period by adding net operating cash flow to the beginning fund balance and subtracting cash funded CIP expenses (from **Figure 3-1**). Calculated debt coverage is equal to net revenues (Line 39) divided by 2018 Water Refunding Bonds debt service (Line 40).

Table 3-13: Proposed Financial Plan Proforma

Water Authority Fund (600) Operating Cash Flow			FYE 2020	FYE 2021	FYE 2022	FYE 2023	FYE 2024
Line	Description						
1	**REVENUES**						
2	Water Sales under Existing Rates		$2,555,000	$2,679,692	$2,693,090	$2,706,556	$2,720,088
3	Domestic Meter Service Reader under Existing Rates		$1,740,000	$1,799,052	$1,808,047	$1,817,087	$1,826,173
4	Private Fire Protection Charge Revenues under Existing Rates		$450,000	$468,405	$468,405	$468,405	$468,405
5							
6	**Additional Revenue Required Under Proposed Adjustments**						
7		Revenue					
8	Fiscal Year	Adjustment					
9	FYE 2020	15.00%	$355,875	$742,072	$745,431	$748,807	$752,200
10	FYE 2021	9.00%		$256,015	$514,348	$516,677	$519,018
11	FYE 2022	9.00%			$280,319	$563,178	$565,730
12	FYE 2023	8.00%				$272,828	$548,129
13	FYE 2024	8.00%					$295,990
14	Total Additional Revenue		$355,875	$998,087	$1,540,099	$2,101,491	$2,681,066
15							
16	Total Rate Revenue (including Proposed Revenue Adjustments)		$5,100,875	$5,945,236	$6,509,641	$7,093,539	$7,695,733
17	Interest		$5,000	$16,682	$21,040	$25,076	$26,321
18	Other Revenues		$130,500	$111,605	$112,721	$113,848	$114,987
19	**TOTAL REVENUE**		**$5,236,375**	**$6,073,523**	**$6,643,403**	**$7,232,463**	**$7,837,041**
20							
21	**OPERATING EXPENSES**						
22	EM Operable Unit - Post Permit Phase		$198,387	$203,743	$209,244	$214,894	$220,696
23	General & Administrative		$1,744,709	$2,150,087	$2,249,640	$2,302,400	$2,356,417
24	Pumping Transmission Distribution		$1,714,628	$1,778,948	$1,845,827	$1,902,300	$1,960,506
25	Other Operating Expenses		$200,000	$200,000	$200,000	$200,000	$200,000
26	Existing Debt Service		$1,383,175	$1,402,575	$1,600,775	$1,793,275	$1,996,875
28	**TOTAL OPERATING EXPENSES**		**$5,240,899**	**$5,735,354**	**$6,105,486**	**$6,412,869**	**$6,734,493**
29							
30	**NET OPERATING CASH FLOW before CAPITAL EXPENSES**		**($4,524)**	**$338,169**	**$537,916**	**$819,594**	**$1,102,548**
31							
Fund Balances			**FYE 2020**	**FYE 2021**	**FYE 2022**	**FYE 2023**	**FYE 2024**
32	**Water Authority Fund (600)**						
33	Beginning Balance		$1,511,950	$1,507,426	$1,845,595	$2,383,511	$2,656,742
34	Net Operating Cash Flow		($4,524)	$338,169	$537,916	$819,594	$1,102,548
35	Cash Funded CIP		$0	$0	$0	($546,364)	($1,125,509)
36	**Ending Balance - Water Authority Fund (600)**		**$1,507,426**	**$1,845,595**	**$2,383,511**	**$2,656,742**	**$2,633,781**
37	*Total Fund 600 Target Reserve Balance*		*$2,613,122*	*$2,731,886*	*$2,774,869*	*$2,803,590*	*$2,833,096*
38							
Debt Coverage Calculation			**FYE 2020**	**FYE 2021**	**FYE 2022**	**FYE 2023**	**FYE 2024**
39	Net Revenues		$1,378,651	$1,740,744	$2,138,691	$2,612,869	$3,099,423
40	Total Debt Service - 2018 Water Refunding Bonds		$1,383,175	$1,402,575	$1,400,775	$1,393,275	$1,396,875
41							
42	**Calculated Debt Coverage**		**1.00**	**1.24**	**1.53**	**1.88**	**2.22**
43	*Required Debt Coverage*		*1.25*	*1.25*	*1.25*	*1.25*	*1.25*

Figure 3-4 shows proposed revenue adjustments (blue bars) on the left axis and projected coverage (light blue line) on the right axis relative to the 1.25 target debt coverage ratio (dashed red line). The highest revenue adjustment of 15% in FYE 2020 is necessary to recover projected debt coverage to near the 1.25 target by FYE 2021. Debt coverage in FYE 2022 to FYE 2024 is projected to be safely above the target.

Figure 3-4: Revenue Adjustments and Debt Coverage - Proposed Financial Plan

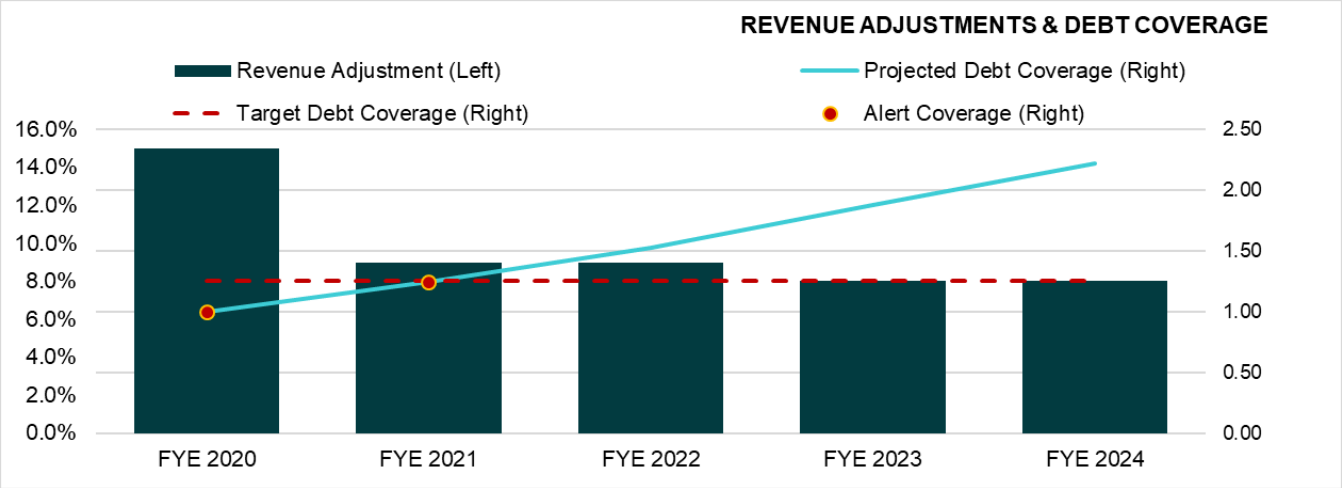


Figure 3-5 summarizes the tabular results from **Table 3-13** in graphical format. O&M expenses, debt service, cash funded CIP, and revenues to (or from) reserves are represented by stacked bars. Revenue under current rates are represented by the dashed red line, while revenue inclusive of the proposed revenue adjustments are represented by the dashed blue line. **Figure 3-5** demonstrates that although current rates are sufficient to cover O&M costs over the study period, the proposed revenue adjustments are necessary to sufficiently fund debt service, CIP, and reserves.

Figure 3-5: Proposed Financial Plan

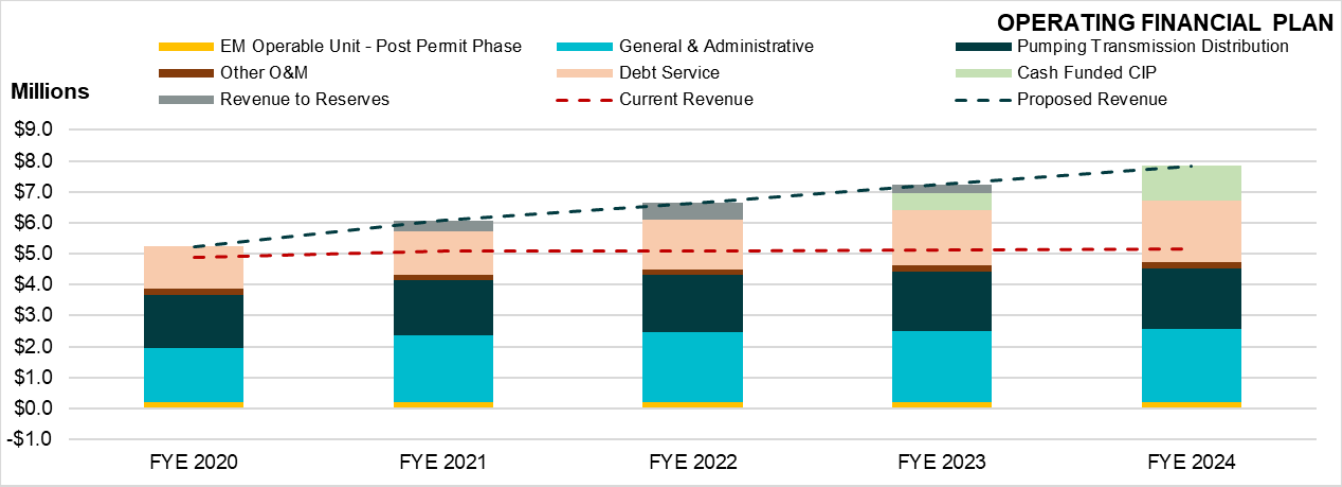
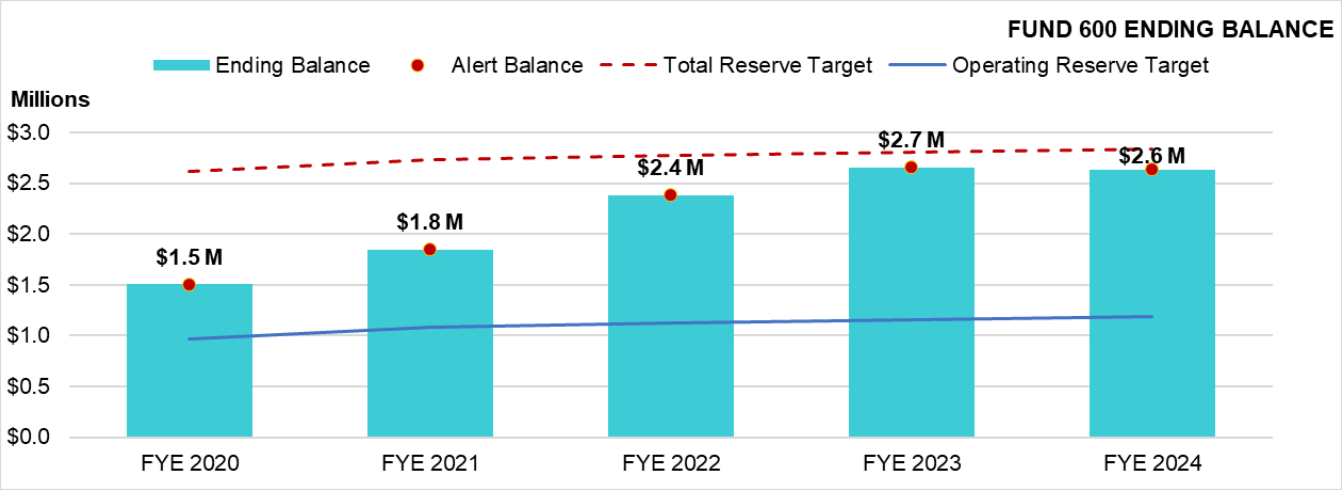


Figure 3-6 shows the Water Enterprise's projected ending cash balance (blue bars) relative to its operating reserve target (blue line) and combined operating and capital total reserve target (red dashed line) from **Table 3-11**. The proposed financial plan results in projected ending balances that exceed the operating reserve target in all years. However, the selected financial plan slowly builds up reserves to near the total reserve target to avoid substantial upfront bill impacts to ratepayers.

Figure 3-6: Projected Ending Balances - Proposed Financial Plan



4. Cost of Service

Section 4 details the cost of service (COS) analysis performed for the City's Water Enterprise. The COS analysis allocates the overall rate revenue requirement to all customer classes and tiers based on their proportion of use of and burden on the system.

4.1. Process and Approach

The first step in the COS analysis is to determine the revenue required from rates. The total revenue requirement is determined as a result of the financial plan and the proposed revenue adjustments in **Section 3**. The framework and methodology utilized to develop the COS analysis and to apportion the revenue requirement to each customer class and tier is informed by the processes outlined in the M1 Manual.

COS analyses are tailored specifically to meet the unique needs of each water system. However, there are four distinct steps in every COS analysis to recover costs from customers in an accurate, equitable, and defensible manner:

1. **Cost functionalization:** O&M expenses and capital assets are categorized by their function in the system. Functions include supply, treatment, transmission and distribution, billing and customer service, etc.
2. **Cost causation component allocation:** the functionalized costs are then allocated to cost causation components based on their burden on the system. The cost causation components include supply, base delivery, peaking, meters, customer, etc. The revenue requirement is allocated accordingly to the cost causation components and results in the total revenue requirement for each cost causation component.
3. **Unit cost development:** the revenue requirement for each cost causation component is divided by the appropriate units of service to determine the unit cost for each cost causation component.
4. **Revenue requirement distribution:** the unit cost is utilized to distribute the revenue requirement for each cost causation component to customer classes and/or tiers based on their individual service units. The City does not differentiate its Commodity Rates by customer class, but does have a two-tiered rate structure.

4.2. Revenue Requirement

Table 4-1 shows the rate revenue requirement for FYE 2020 (also referred to as the test year or rate-setting year). The revenue requirement is split into the Operating and Capital categories (Columns C and D), which are later allocated based on O&M expenses and capital assets respectively.

The revenue requirement (Line 5) is calculated using FYE 2020 expenses. The cash balance adjustment (Line 8) is equal to negative FYE 2020 net operating cash flow (**Table 3-13**, Line 30). The adjustment to annualize the rate increase (Line 9) is due to the proposed FYE 2020 revenue adjustment occurring in the middle of the fiscal year (January 2020). The revenue offsets (Lines 15-16) include interest earnings and other non-rate revenues that are applied as offsets to the final rate revenue requirement. The final rate revenue requirement (Line 19) is calculated as follows:

Total revenue required from rates (Line 19) = Revenue requirements (Line 5) - Adjustments (Line 10) - Revenue offsets (Line 17)

Table 4-1: Proposed Revenue Requirement

A	B	C	D	E
Line	FYE Revenue Requirement Determination	Operating	Capital	Total
1	**Revenue Requirements**			
2	O&M Expenses	$3,857,724	$0	$3,857,724
3	Existing Debt Service	$0	$1,383,175	$1,383,175
4	Cash Funded CIP	$0	$0	$0
5	**Total Revenue Requirements**	**$3,857,724**	**$1,383,175**	**$5,240,899**
6				
7	**Less Adjustments**			
8	Cash Balance	$0	$4,524	$4,524
9	Mid-Year Increase	$0	($355,875)	($355,875)
10	**Total Less Adjustments**	**$0**	**($351,351)**	**($351,351)**
11				
12	**Revenue Required before Revenue Offsets**	**$3,857,724**	**$1,734,526**	**$5,592,250**
13				
14	**Less Revenue Offsets**			
15	Interest	$5,000	$0	$5,000
16	Other Revenues	$130,500	$0	$130,500
17	**Total Less Revenue Offsets**	**$135,500**	**$0**	**$135,500**
18				
19	**Total Revenue to be Recovered from Rates**	**$3,722,224**	**$1,734,526**	**$5,456,750**

4.3. Functionalization and Allocation of Expenses

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

- **Water Purchase Costs** – cost of Water Assessments
- **Supply** – other water-supply related costs
- **Treatment** – costs of water treatment
- **Transmission & Distribution** –costs related to the City's water distribution system
- **Billing & Customer Service** –costs of meter reading, billing, and other customer services
- **Meter Replacement/ Repair** – costs associated with purchasing, maintaining, and servicing water meters as well as some costs related to system capacity
- **Conservation** – costs relating to efforts to reduce customers' water use
- **Direct Fire** – costs of fire protection
- **General -** costs for general operational expenses which cannot be categorized under any of the above

The functionalization of costs allows for the allocation of costs to the cost causation components. Some cost causation components correspond directly to a functional category listed above. The cost causation components include:

- **Water Purchase Costs -** cost of Water Assessments
- **Supply** – other costs associated with water supply
- **Base**– costs associated with providing water under average water demand conditions

- **Peaking** (Max Day and Max Hour) – costs associated with providing water under peak demand conditions
- **Conservation** – costs associated with the City's recycled water system
- **Customer** – costs associated with customer service and billing
- **Meters** – costs associated with purchasing, maintaining, and servicing water meters as well as some costs related to system capacity
- **Direct Fire Costs** – costs of fire protection
- **General** – costs that do not have any direct cost causation
- **Revenue Offsets** – non-rate revenues (such as interest income) with no direct association with specific expenses or services

4.4. Peaking Factors

Peaking costs are divided into maximum day (Max Day) and maximum hour (Max Hour) demand. The Max Day demand is the maximum amount of water used in a single day in a year. The Max Hour demand is the maximum use in an hour on the Max Day. **Table 4-2** shows the system-wide peaking factors used to derive the cost component allocation bases for Base, Max Day, and Max Hour costs. Base use is considered average daily demand over one year, which has been normalized to a factor of 1.00 (Column C, Line 1). The Max Day peaking factor (Column C, Line 2) indicates that the Max Day demand is 1.55 times greater than the average daily demand. Similarly, the Max Hour peaking factor (Column C, Line 3) shows that the Max Hour demand is 2.65 times greater than average demand. The allocation bases (Columns D to F) are calculated using the equations outlined below. Columns are represented in these equations as letters, and rows are represented as numbers. For example, Column D, Line 2 is shown as D2.

The Max Day allocations are calculated as follows:

- Base Delivery: *C1 / C2 x 100% = D2*
- Max Day: *(C2 - C1) / C2 x 100% = E2*

The Max Hour allocations are calculated as follows:

- Base Delivery: *C1 / C3 x 100% = D3*
- Max Day: *(C2 - C1) / C3 x 100% = E3*
- Max Hour: *(C3 - C2) / C3 x 100% = F3*

Table 4-2: System Peaking Factor Allocations

A Line	B System Peaking Factors	C Factors	D Base	E Max Day	F Max Hour	G Total
1	Base	1.00	100.0%			**100.0%**
2	Max Day	1.55	64.5%	35.5%	0.0%	**100.0%**
3	Max Hour	2.65	37.7%	20.8%	41.5%	**100.0%**

4.5. O&M Allocation

Table 4-3 shows the allocation of O&M expenses to each cost causation component. O&M expenses are used in subsequent steps of the COS analysis to allocate the operating revenue requirement. Prior to allocating costs to cost causation components, Raftelis functionalized the FYE 2020 Water Enterprise O&M budget (shown in detail in **Appendix A**). The results are shown in Column C, Lines 1-9 in which total FYE 2020 O&M expenses are summarized by function. Note that total FYE 2020 expenses (Column C, Line 10) incorporate projected El Monte Operable Unit costs before reimbursement by responsible parties and therefore exceed total O&M expenses previously shown in **Table 4-1**, Column C, Line 1.

Costs by function were then allocated to each cost causation component based on the percentages shown in Columns D-M, Lines 1-9. Water Purchase Costs, Billing & Customer Service, Meter Replacement/ Repair, Conservation, Direct Fire, and General functionalized costs were fully allocated to the corresponding cost causation component. For example, costs functionalized as Water Purchase Costs were allocated 100% to the Water Purchase Costs cost causation component. Supply costs were allocated 80% to Supply and 20% to Max Day based on input from City staff which indicated that the wells are operating in such a manner to meet Max Day demand. Treatment costs were allocated to the cost causation components based on Max Day peaking factor allocations (**Table 4-2**, Line 2). Transmission & Distribution costs were allocated to the cost causation components based on Max Hour peaking factor allocations (**Table 4-2**, Line 3), as transmission and distribution infrastructure is typically designed to withstand Max Hour demands. Total O&M Expenses by cost causation component (Line 10) is calculated by multiplying functionalized expenses (Column C) by the corresponding allocation percentage and then summing across all functions for each cost causation component. The final O&M allocation (Line 12) used to allocate the operating revenue requirement is calculated by dividing O&M expenses allocated to each cost causation component (Columns D-M, Line 10) by total FYE 2020 O&M expenses (Column C, Line 10).

Table 4-3: O&M Cost Allocation

A	B	C	D	E	F	G	H	I	J	K	L	M	N
O&M Allocation			COST CAUSATION COMPONENTS										
Line	Functional Category	FY 2020 Expenses	Water Purchase Costs	Supply	Base	Max Day	Max Hour	Conser-vation	Cust-omer	Meters	Direct Fire Costs	General	Total
1	Water Purchase Costs	$555,000	100.0%										**100.0%**
2	Supply	$424,698		80.0%		20.0%							**100.0%**
3	Treatment	$596,161			64.5%	35.5%							**100.0%**
4	Transmission & Distribution	$754,436			37.7%	20.8%	41.5%						**100.0%**
5	Billing & Customer Service	$272,483							100.0%				**100.0%**
6	Meter Replacement/ Repair	$284,330								100.0%			**100.0%**
7	Conservation	$154,012						100.0%					**100.0%**
8	Direct Fire	$22,146									100.0%		**100.0%**
9	General	$984,070										100.0%	**100.0%**
10	**Total O&M Expenses**	**$4,047,337**	**$555,000**	**$339,759**	**$669,313**	**$453,062**	**$313,162**	**$154,012**	**$272,483**	**$284,330**	**$22,146**	**$984,070**	**$4,047,337**
11													
12	**O&M Allocation**		**13.7%**	**8.4%**	**16.5%**	**11.2%**	**7.7%**	**3.8%**	**6.7%**	**7.0%**	**0.5%**	**24.3%**	**100.0%**

4.6. Capital Allocation

Table 4-4 shows the allocation of capital assets to each cost component. Capital assets are utilized in COS analyses to allocate capital costs to the cost causation components. We use the distribution of total capital assets because the distribution of a short-term CIP projects can be heavily weighted to specific cost causation components. For example, the City may have several projects that are supply related in the near term. Capital assets remain relatively stable and are more representative of the City's investments in its water system. City staff provided Raftelis with a detailed asset listing that included the Original Cost of each individual fixed asset. Raftelis calculated the Replacement Cost Less Depreciation (RCLD) of each asset based on Original Cost, year purchased, and useful life using the Engineering News-Record's 20-City Average Cost Construction Index (CCI) to account for capital cost inflation. RCLD is often utilized in capital asset analyses because it takes into consideration inflation and depreciation when valuing assets. As part of the capital asset analysis, Raftelis also assigned each individual asset to a functional category. Total asset value (RCLD) by functional category is shown in Column C, Lines 1-7 of **Table 4-4**.

The capital assets are allocated to the various cost causation components using the same methodology described in **Section 4.5** to allocate O&M costs. Asset value by functional category (Column C) is allocated to each cost causation component (Columns D-M) based on percentages identical to those shown in **Table 4-3.** Allocation percentages for each cost causation component are multiplied by the capital asset value for each functional category and summed to determine the capital asset value allocated to each cost causation component. The capital allocation in Line 10 represents the proportion of total asset value within each cost causation component and is used subsequently in the COS analysis to allocate capital revenue requirements.

Table 4-4: Capital Cost Allocation

A	B	C	D	E	F	G	H	I	J	K	L	M	N
Capital Allocation			COST CAUSATION COMPONENTS										
Line	Functional Category	Asset Value (RCLD)	Water Purchase Costs	Supply	Base	Max Day	Max Hour	Conservation	Customer	Meters	Direct Fire Costs	General	Total
1	Supply	$51,452,566		80.0%		20.0%							**100.0%**
2	Treatment	$1,442,905			64.5%	35.5%							**100.0%**
3	Transmission & Distribution	$7,457,352			37.7%	20.8%	41.5%						**100.0%**
4	Billing & Customer Service	$2,212							100.0%				**100.0%**
5	Meter Replacement/ Repair	$623,796								100.0%			**100.0%**
6	Conservation	$0						100.0%					**100.0%**
7	General	$1,648,898										100.0%	**100.0%**
8	**Total Asset Value (RCLD)**	**$62,627,729**	**$0**	**$41,162,053**	**$3,745,001**	**$12,350,264**	**$3,095,505**	**$0**	**$2,212**	**$623,796**	**$0**	**$1,648,898**	**$62,627,729**
9													
10	**Capital Allocation**		**0.0%**	**65.7%**	**6.0%**	**19.7%**	**4.9%**	**0.0%**	**0.0%**	**1.0%**	**0.0%**	**2.6%**	**100.0%**

4.7. Revenue Offset Allocation

Table 4-5 shows the revenue offset allocation to each cost causation component. Revenue offsets are miscellaneous, non-rate revenues that are used to offset the rate revenue requirement. Some non-rate revenues are allocated directly to the most closely associated cost causation component. Other revenues, such as rental income, are not directly linked to a service that the Water Enterprise provides to its water customers. These revenues are therefore allocated to the Revenue Offsets cost causation component (Column M), which can be utilized to provide offsets to specific customer classes and/or tiers. The Revenue Offsets cost causation component was not included in the O&M or capital allocations, as it only applies to revenues. The methodology as described previously for the O&M and capital allocations was utilized to determine the amount of revenue offsets allocated to each cost causation component (**Table 4-5**, Line 9) and the final revenue offset allocation percentages are utilized in the next step of the COS analysis (**Table 4-5**, Line 11).

Table 4-5: Revenue Offset Allocation

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
	Revenue Offset Allocation		COST CAUSATION COMPONENTS											
Line	Non-Rate Revenues	FY 2020 Amount	Water Purchase Costs	Supply	Base	Max Day	Max Hour	Conser-vation	Cust-omer Service	Meters	Direct Fire Costs	General	Revenue Offsets	Total
1	600-11-4601 Interest Income	$5,000										100.0%		**100.0%**
2	600-11-4621 Rental Income	$30,000											100.0%	**100.0%**
3	600-67-4725 Reimbursements - Others	$20,000											100.0%	**100.0%**
4	600-67-4791 Miscellaneous Revenue	$25,000											100.0%	**100.0%**
5	600-67-4802 Penalties	$36,000											100.0%	**100.0%**
6	600-67-4803 Shut off Notices	$12,000											100.0%	**100.0%**
7	600-67-4804 Meter Lock Off	$5,000								100.0%				**100.0%**
8	600-67-4807 Fire Flow Testing	$2,500									100.0%			**100.0%**
9	**Total Non-Rate Revenues**	**$135,500**		**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$5,000**	**$2,500**	**$5,000**	**$123,000**	**$135,500**
10														
11	**Revenue Offset Allocation**			**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**3.7%**	**1.8%**	**3.7%**	**90.8%**	**100.0%**

4.8. Units of Service

Section 4.8 shows the unit of service determination. Units of service are used to convert total costs allocated to each cost causation component into unit costs, which are directly incorporated into the proposed rate calculations.

Peaking Units of Service

Peaking units of service are used to develop Max Day and Max Hour unit costs. **Table 4-6** shows the calculation of peaking units of service. Estimated FYE 2020 water use by tier (Column C) was previously determined in **Table 3-3**. Projected use by tier (Column C) is divided by 365 days to determine average daily use (Column D). Average daily use in Column D is then multiplied by the Max Day factor[3] in Column E to determine Max Day Capacity (Column F). Max Day Extra Capacity (Column G) is determined by subtracting average daily use (Column D) from Max Day Capacity (Column F). Max Hour Extra Capacity (Column J) is similarly calculated. Max Hour Capacity (Column I) equals average daily use (Column D) multiplied by the Max Hour Capacity Factor (Column H). Max Hour Extra Capacity (Column J) equals Max Hour Capacity (Column I) less Max Day Capacity (Column F). Raftelis estimated peaking units for fire protection (Line 3) based on design criteria from the City's 2010 Water Master Plan Update.[4]

Table 4-6: Use and Peaking Units of Service

A	B	C	D	E	F	G	H	I	J
Line	Customer Class	FY 2020 Annual Use (hgal)	Average Daily Use (hgal)	Maximum Day Capacity Factor	Total Max Day Capacity (hgal/day)	Max Day Extra Capacity (hgal/day)	Maximum Hour Capacity Factor	Total Max Hour Capacity (hgal/day)	Max Hour Extra Capacity (hgal/day)
1	Tier 1	2,219,918	6,082	1.38	8,378	2,296	2.36	14,324	5,946
2	Tier 2	4,207,372	11,527	1.65	18,988	7,461	2.82	32,463	13,475
3	Total Fire Protection					18,000			68,400
4	**Total**	**6,427,290**	**17,609**	**1.554**	**27,366**	**27,757**		**46,787**	**87,821**

Equivalent Meters

Equivalent meter units are used to allocate meter-related costs appropriately and equitably. Larger meters impose larger demands; are more expensive to install, maintain, and replace than smaller meters; and require greater capacity in the water system. Equivalent meter units are based on meter hydraulic capacity and are calculated to represent the potential demand on the water system compared to a base meter size. A ratio of hydraulic capacity is calculated by dividing larger meter capacities by the base meter capacity. The base meter in this study is the 5/8" meter, which is the smallest meter size.

Table 4-7 shows the equivalent meters for the test year (FYE 2020). The capacity in gallons per minute (gpm) is based on data from the M1 Manual (Column B). The capacity ratios (Column C) are calculated by dividing the capacity for each meter size by the capacity for the 5/8-inch meter. The projected number of meters (Column D) was determined in **Table 3-2**. Equivalent meters (Column E) equal the capacity meter ratio Column (C) multiplied by the number of meters (Column D).

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[3]Raftelis estimated Max Day and Max Hour factors for Tier 1 and Tier 2 usage based on FYE 2018 account level water usage data.

[4]Raftelis calculated Max Hour and Max Day Extra Capacity associated with fire projection based on system design criteria intended to provide capacity for a fire lasting five hours and requiring 6,000 gallons per minute of water usage.
Max Day Extra Capacity = 6,000 gpm x (60 min./hr.) x 5 hrs. x (0.01 hgal/gal) = 18,000 hgal/day
Max Hour Extra Capacity = 6,000 gpm x (60 min./hr.) x (24 hrs./day) x (0.01 hgal/gal) – 18,000 hgal/day = 68,400 hgal/day

Table 4-7: Equivalent Meters Subject to Water Service Meter Base Charges

Line	Meter Size (A)	Hydraulic Capacity (gpm) (B)	Capacity Meter Ratio (C)	Number of Meters (D)	Equivalent Meters (E)
1	5/8-inch	20	1.0	2,768	2,768
2	1-inch	50	2.5	462	1,154
3	1.5-inch	100	5.0	100	500
4	2-inch	160	8.0	138	1,107
5	3-inch	300	15.0	5	76
6	4-inch	500	25.0	15	379
7	6-inch	1,000	50.0	5	253
8	8-inch	1,600	80.0	3	242
9	10-inch	2,300	115.0	0	0
10	**Total**			**3,497**	**6,479**

Equivalent Fire Lines

Similar to equivalent water meters, private fire connections (i.e. fire lines) and public fire hydrant counts are also converted to equivalent lines based on fire line capacities. **Table 4-8** shows the equivalent lines for private fire lines and public fire hydrants. The fire line demand potential (Column B) is determined based on the Hazen-Williams equation for flow through pressure conduits, as explained in the M1 Manual. The flow potential is dependent on the diameter of the fire line raised to the power of 2.63. Note that each fire hydrant has either two or three connections. City staff provided number of hydrants by connection size/type (Column C, Lines 1-2). The projected number of fire lines (Column C, Lines 5-10) are from **Table 3-2.** Equivalent demand (Column D) equals fire demand potential (Column B) multiplied by number of fire hydrants/fire lines (Column C).

Table 4-8: Equivalent Fire Lines

Line	Fire Line Size - Public Hydrants (A)	Fire Demand Potential (B)	Number of Fire Hydrants (C)	Equivalent Demand (D)
1	Fire Hydant, 2-4" Ports and 1-2.5" Port	87.77	59	5,135
2	Fire Hydant, 1-4" Ports and 1-2.5" Port	49.45	332	16,393
3	**Total**		**390**	**21,528**
4	**Fire Line Size - Private Fire**	**Fire Demand**	**Number of Lines**	**Equivalent Demand**
5	2-inch	6.19	0	0
6	3-inch	17.98	11	198
7	4-inch	38.32	45	1,724
8	6-inch	111.31	42	4,675
9	8-inch	237.21	21	4,981
10	10-inch	426.58	7	2,986
11	**Total**		**126**	**14,565**

4.9. Unit Cost of Service Calculation

Table 4-9 shows the revenue requirement allocation from **Table 4-1.** The total operating revenue requirement in **Table 4-9**, Column N, Line 1 of **Table 4-9** is equal to the operating revenue requirement less adjustments (Column C, Line 12) from **Table 4-1**. The total operating revenue requirement is allocated to the various cost causation components in Columns C-M, Line 1 of **Table 4-9** based on the O&M allocation percentages from Columns D-M, Line 12 of **Table 4-3**.

The total Capital revenue requirement in Column M, Line 2 of **Table 4-9** is equal to the capital revenue requirement less adjustments (Column D, Line 12) from **Table 4-1**. The total capital revenue requirement is allocated to the various cost causation components in Columns C-M, Line 2 of **Table 4-9** based on the capital allocation percentages from Columns D-M, Line 10 of **Table 4-4**.

Total revenue offsets in Column N, Line 3 of **Table 4-9** is equal to the revenue offsets in Column E, Line 17 of **Table 4-1**. Total revenue offsets are allocated to the various cost causation components in Columns C-M, Line 3 of **Table 4-9** based on the revenue offset allocation percentages in Columns D-N, Line 11 of **Table 4-5**.

Lines 1-3 in **Table 4-9** are summed to determine the preliminary COS allocation to each cost causation component in Line 4. General costs are then reallocated to all other cost causation components (excluding Water Purchase Costs and Revenue Offsets) proportionally in Line 6 based on the percentages shown in Line 5. Lines 4 and 6 are summed to determine the adjusted cost of service (Line 7), which represents the preliminary allocation of the total rate revenue requirement to each cost causation component. This preliminary allocation is shown as a percentage of the total rate revenue requirement in Line 8.

Table 4-9: Adjusted Cost Service by Cost Causation Component

A	B	C	D	E	F	G	H	I	J	K	L	M	N
Line	Cost of Service Allocation	Water Purchase Costs	Supply	Base	Max Day	Max Hour	Con-Servation	Customer Service	Meter Service	Direct Fire Costs	General & Admin-istrative	Revenue Offset	Total
1	Operating Expenses	$528,999	$323,841	$637,956	$431,836	$298,491	$146,797	$259,718	$271,010	$21,109	$937,967	$0	$3,857,724
2	Capital Expenses		$1,140,017	$103,721	$342,051	$85,733	$0	$61	$17,277	$0	$45,668	$0	$1,734,526
3	Revenue Offset		$0	$0	$0	$0	$0	$0	-$5,000	-$2,500	-$5,000	-$123,000	-$135,500
4	**Total Cost of Service**	**$528,999**	**$1,463,858**	**$741,677**	**$773,887**	**$384,223**	**$146,797**	**$259,779**	**$283,286**	**$18,609**	**$978,635**	**-$123,000**	**$5,456,750**
5	**Percent Excluding Gen & Admin**		35.9%	18.2%	19.0%	9.4%	3.6%	6.4%	7.0%	0.5%			
6	Allocation of General Admin		$351,803	$178,244	$185,985	$92,339	$35,279	$62,432	$68,081	$4,472	-$978,635		
7	**Total Adjusted Cost of Service**	**$528,999**	**$1,815,661**	**$919,922**	**$959,872**	**$476,562**	**$182,076**	**$322,210**	**$351,367**	**$23,081**	**$0**	**-$123,000**	**$5,456,750**
8	*Total Adjusted Cost of Service (%)*	*9.7%*	*33.3%*	*16.9%*	*17.6%*	*8.7%*	*3.3%*	*5.9%*	*6.4%*	*0.4%*	*0.0%*	*-2.3%*	***100.0%***

Table 4-10 shows the reallocation of peaking costs (capacity) related to fire protection. This is necessary as public fire protection peaking costs are reallocated to the Meter Service cost causation component and private fire protection peaking costs are reallocated to Private Fire costs (a new cost causation component introduced in **Table 4-11**). The adjusted cost of service for Max Day and Max Hour in Line 1 (from **Table 4-9**, Columns F-G, Line7)

is divided by total peaking units of service in Line 2 (from **Table 4-6**, Columns G and J, Line 4) to determine a preliminary peaking unit cost in **Table 4-10**, Line 3. The preliminary peaking unit costs (Line 3) are multiplied by the units of service associated with fire protection (from **Table 4-6**, Columns G and J, Line 3) to determine peaking costs allocated to fire protection (Line 5). Equivalent fire demand associated with public hydrants and private fire protection in Lines 7-8 (from **Table 4-8**, Column D, Lines 3 and 11) is shown proportionally as percentages in Lines 9-10. The allocation of peaking costs to public and private fire protection in Lines 12-13 is calculated by multiplying the allocated cost of service for fire protection (Line 5) by the corresponding allocation percentages to public (Line 9) and private fire protection (Line 10).

Table 4-10: Allocation of Fire-Related Peaking Costs

A	B	C	D	E
Line	Fire Protection Cost Allocation	Max Day	Max Hour	Total
1	Adjusted Cost of Service	$959,872	$476,562	**$1,436,434**
2	Units of Service (hgal/day)	27,757	87,821	
3	Unit Cost of Service ($/hgal/day)	$34.58	$5.43	
4	Units of Service for a Fire (hgal/day)	18,000	68,400	
5	**Allocated Cost of Service for Fire Protection**	**$622,468**	**$371,174**	**$993,643**
6				
7	Equivalent Fire Demand - Public Hydrant	21,528	21,528	
8	Equivalent Fire Demand - Private Fire Protection	14,565	14,565	
9	**% Allocation to Public Hydrants**	**60%**	**60%**	
10	**% Allocation to Private Fire Protection**	**40%**	**40%**	
11				
12	**Public Fire Protection**	**$371,279**	**$221,392**	**$592,671**
13	**Private Fire Service**	**$251,189**	**$149,783**	**$400,972**

Table 4-11 shows the calculation of unit costs by cost causation component. The cost of service allocated to each cost causation component (Line 1) was previously determined in **Table 4-9**, Line 7. Columns F-G, Line 2 show the reallocation of private fire protection peaking costs (from **Table 4-10**, Columns C-D, Line 13) to Private Fire (Column N, Line 2). Private Fire represents a new cost causation component used in calculating proposed Private Fire Protection Water Service Charges. An additional $5,000 of Direct Fire Costs (Column K, Line 2) associated with administration of private fire backflow prevention[5] is reallocated to the Private Fire Costs Causation Component (Column N, Line 2). Columns F-G, Line 3 show the reallocation of public hydrant peaking costs (from **Table 4-10**, Columns C-D, Line 12) to Meter Service (Column J, Line 3). Remaining Direct Fire Costs (Column K, Line 3) were also reallocated to Meter Service (Column J, Line 3). Additional reallocations are shown in Lines 4-5. Line 4 shows the reallocation of 45% of non-fire peaking costs (Columns F-G, Line 4) to Meter Service (Column J, Line 4). Line 5 shows the reallocation of 18% of Supply and Base costs (Columns D-E, Line 5) to Meter Service (Column J, Line 5). These reallocations achieve the City's policy objective of maintaining fixed charge revenues at

[5] City staff provided Raftelis with an estimate of $5,000 in annual costs associated with administration of private fire backflow prevention.

approximately 45% of total rate revenue in order to maintain revenue stability. Lines 1-5 are summed to determine the final adjusted cost of service in Line 6.

Unit costs of service (Line 11) used in the proposed rate calculations in **Section 5** are calculated by dividing the final adjusted cost of service (Line 6) by the units of service (Line 8). Total projected FYE 2020 water use in hgal (from **Table 4-6**, Column C, Line 4) is the unit of service for the following cost causation components: Water Purchase Costs, Supply, Base, and Conservation. The units of service for Max Day and Max Hour are Tier 1 and Tier 2 extra capacity requirements in hgal per day (from **Table 4-6**, Columns G and J, Lines 1-2). Customer Service units of service equal projected number of water meters in FYE 2020 (from **Table 4-7**, Column D, Line 10). Meter Service units of service equal projected equivalent meters in FYE 2020 (from **Table 4-7**, Column E, Line 10). Revenue Offset units of service equal projected FYE 2020 Tier 1 use (from **Table 4-6**, Column C, Line 1), as revenue offsets are only applied to Tier 1 use in **Section 5**. Private Fire units of service and unit cost (Column N, Lines 8 and 11) are not shown, as the derivation of Private Fire costs (Column N, Line 6) into proposed Private Fire Protection Water Service Charges is shown in greater detail in **Section 5**.

Table 4-11: Unit Cost of Service by Cost Causation Component

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
Line	Cost of Service Allocation	Water Purchase Cost	Supply	Base	Max Day	Max Hour	Con-servation	Customer Service	Meter Service	Direct Fire Costs	General & Admin-istrative	Revenue Offset	Private Fire	Total
1	Cost of Service	$528,999	$1,815,661	$919,922	$959,872	$476,562	$182,076	$322,210	$351,367	$23,081	$0	-$123,000		$5,456,750
2	Private Fire Protection				-$251,189	-$149,783				-$5,000			$405,972	$0
3	Allocation of Public Fire to Meter Service (Fixed Charge)				-$371,279	-$221,392			$610,752	-$18,081	$0			$0
4	Costs in Proportion to Meter Capacity				-$151,832	-$47,425			$199,256					$0
5	Reallocation of Supply and Base Costs by Meter Size		-$326,819	-$165,586					$492,405					$0
6	**Total Adjusted Cost of Service**	**$528,999**	**$1,488,842**	**$754,336**	**$185,572**	**$57,963**	**$182,076**	**$322,210**	**$1,653,780**	**$0**	**$0**	**-$123,000**	**$405,972**	**$5,456,750**
7														
8	**Unit of Service**	6,427,290	6,427,290	6,427,290	9,757	19,421	6,427,290	3,497	6,479			2,219,918	N/A	
9	**Units**	hgal	hgal	hgal	hgal/day	hgal/day	hgal	meters	equiv meters					
10														
11	**Unit Cost of Service Rates**	**$0.082**	**$0.232**	**$0.117**	**$19.020**	**$2.985**	**$0.028**	**$92.147**	**$255.260**			**-$0.055**	**N/A**	

4.10. Cost to Serve All Customer Classes

Table 4-12 shows the final cost of service by cost causation component recovered by Commodity Rates, Water Service Meter Base Charges, and Private Fire Protection Charges. Total cost of service (Line 5) was previously determined in **Table 4-11**, Line 6. The following cost causation components are recovered by Commodity Rates: Water Purchase Costs, Supply, Base, Max Day, Max Hour, Conservation, and Revenue Offsets (Tier 1 only). Water Service Meter Base Charges recover Customer Service and Meter Service costs. Private Fire Protection Water Service Charges recover Private Fire costs. Commodity Rate cost recovery by tier was calculated based on the share of projected FYE 2020 water use and extra capacity requirements falling within

each tier. Note however that Revenue Offsets are allocated solely to Tier 1 water use to help improve affordability for essential indoor water use (which generally falls within Tier 1).

Table 4-12: Cost to Serve by Customer Charge

A	B	C	D	E	F	G	H	I	J	K	L	M
Line	Charge	Water Purchase Cost	Supply	Base	Max Day	Max Hour	Con-Servation	Customer Service	Meter Service	Revenue Offset	Private Fire	Total
1	Tier 1 Commodity Charge	$182,711	$514,230	$260,540	$43,673	$17,746	$82,887			-$123,000		$958,786
2	Tier 2 Commodity Charge	$346,288	$974,612	$493,796	$141,899	$40,218	$119,189					$2,116,002
3	Water Sevice Meter Base Charge							$322,210	$1,653,780			$1,975,991
4	Private Fire Protection Water Service Charge										$405,972	$405,972
5	**Total Cost of Service**	**$528,999**	**$1,488,842**	**$754,336**	**$185,572**	**$57,963**	**$182,076**	**$322,210**	**$1,653,780**	**-$123,000**	**$405,972**	**$5,456,750**

5. Proposed Water Rates

Section 5 details the proposed water rate calculations. FYE 2020 proposed rates are calculated based on the results of the COS analysis (from **Section 4**). All rates beyond FYE 2020 are calculated by simply increasing the prior year proposed rate by the annual revenue adjustment (from **Table 3-12**).

Raftelis and City Staff discussed the existing rate structure and decided to make no changes. Therefore, all proposed rates shown are consistent with the City's existing rate structure. City staff directed Raftelis to develop drought rates, which have not been implemented by the City. Drought rates are designed to mitigate reductions in Commodity Rate revenue during periods of reduced water demand and are described in detail in **Section 7**.

5.1. Commodity Rate Calculation

The proposed Commodity Rates calculated for the test year (FYE 2020) include five distinct "unit rates" that are summed to determine the proposed rate per hgal. The five unit rates, which incorporate one or more cost causation components, are:

- **Water Purchase Cost Rate**: Includes the Water Purchase cost causation component
- **Average Delivery Rate**: Includes the Supply and Base cost causation components
- **Peaking Rate:** Includes the Max Hour and Max Day cost causation components
- **Conservation Rate:** Includes the Conservation cost causation component
- **Revenue Offset Rate:** Includes the Revenue Offset cost causation component

Water Purchase Cost Unit Rate

The Water Purchase unit cost causation component was previously calculated in **Table 4-11**, Column C, Line 11. To promote affordability for Tier 1 essential indoor water use needs, Raftelis developed different Water Purchase Cost unit rates for each tier. Because the City is expecting to purchase replacement water to replenish the Basin's aquifer, replacement water costs were allocated to Tier 2.

Table 5-1 shows the unit cost calculation per hgal for Watermaster assessments on water production within the City's share of the Basin's operating safe yield and for replacement water assessments on groundwater production in excess of the City's share of the operating safe yield. FYE 2021 water supply projections in Line 1 (from **Table 3-8**, Lines 3-4) and water cost information in Line 4 (from **Table 3-8**, Lines 15-18) were used as FYE 2020 was less representative of replacement water requirements over the five-year study period. The percentage of water supply within and above the City's share of the operating safe yield is shown in Line 2, which are then applied to total FYE 2020 water use in Column E, Line 3 to determine water use within and above the operating safe yield in Columns C-D, Line 3.

FYE 2021 water supply costs in Line 4 associated with Watermaster assessments (from **Table 3-8**, Lines 16-18) and replacement water assessments (from **Table 3-8**, Line 15) are shown proportionally as percentages in Line 5. These percentages are applied to the total Water Purchase Cost revenue requirement in Column E, Line 6 (from **Table 4-12**, Column C, Line 5) to determine the share of the revenue requirement within and above the operating safe yield in Columns C-D, Line 6. The water supply revenue requirement (Line 6) is divided by FYE 2020 use by source (Line 3) to determine unit costs per hgal (Line 7). Note that the total unit cost (Column E, Line 7) match the Water Purchase unit cost causation component from **Table 4-11**, Column C, Line 11.

Table 5-1: Water Purchase Unit Cost by Source

A	B	C	D	E
Line	Description	City's Share of Operating Safe Yield	Replacement Water	Total
1	Acre Feet (AF)	1,832	458	2,289
2	Percent of Supply	80%	20%	100%
3	Water Use by Source (hgal)	5,142,653	1,284,637	6,427,290
4	Water Cost (FYE 2021)	$458,671	$382,030	$840,701
5	Proportion of Water Cost	55%	45%	100%
6	Water Supply Revenue Requirement	$288,612	$240,387	$528,999
7	**Unit Cost ($/ hgal)**	**$0.056**	**$0.187**	**$0.082**

Table 5-2, Column F shows the calculation of Water Purchase Cost unit rates for each tier. Unit rates within and above the City's share of the operating safe yield are shown in Line 1 in Columns D and E respectively (from **Table 5-1**, Line 7). Water within the City's share of the operating safe yield is allocated to Tier 1, as shown in Column D, Line 2. The remaining water supply within the operating safe yield is allocated to Tier 2 (Column D, Line 3), with replacement water allocated to the remaining Tier 2 demand (Column E, Line 3). The unit rates in Columns F, Lines 2-3, are calculated based on a weighted average of the unit costs (Columns D-F, Line 1). For example, the Tier 2 unit rate in Column F, Line 3 is calculated:

$$[\$0.056/hgal\ x\ 2{,}922{,}735\ hgal\ + \$0.187/hgal\ x\ 1{,}284637\ hgal] / 4{,}207{,}372\ hgal = \$0.096/hgal$$

Table 5-2: Water Purchase Cost Unit Rate

A	B	C	D	E	F
Line No.	Water Purchase Cost Allocation	Use (hgal)	City's Share of Operating Safe Yield	Replacement Water	Unit Rate
1	Unit Cost ($/ hgal)		**$0.056**	**$0.187**	
2	Tier 1	2,219,918	2,219,918	0	**$0.056**
3	Tier 2	4,207,372	2,922,735	1,284,637	**$0.096**
4	**Total**	**6,427,290**	**5,142,653**	**1,284,637**	**$0.082**

Average Delivery Unit Rate

The Average Delivery unit rate is not differentiated by tier and simply equals the sum of the Supply and Base unit cost causation components (from **Table 4-11**, Column D-E, Line 11). As stated previously, Supply costs include all other supply-related costs not pertaining to Water Assessments (which are classified as Water Purchase Costs). **Table 5-3** shows the Average Delivery unit rate in Column C, Line 3.

Table 5-3: Average Delivery Unit Rate

A	B	C
Line	Description	Unit Rate ($/hgal)
1	Supply Unit Cost	$0.232
2	Base Unit Cost	$0.117
3	**Average Delivery Rate**	**$0.349**

Peaking Unit Rate

Table 5-4 shows the calculation of peaking unit rates for each tier based on Max Day and Max Hour unit costs and extra capacity requirements. Max Day (Line 1) and Max Hour (Line 5) unit costs were previously determined in **Table 4-11**, Columns F-G, Line 11. Max Day (Line 2) and Max Hour (Line 6) extra capacity requirements in hgal per day were previously determined in **Table 4-6**, Columns G and J, Lines 1-2. Max Day peaking costs (Line 3) are calculated for each tier by multiplying the unit cost (Lines 1) by extra capacity (Lines 2). Max Hour peaking costs (Line 7) are calculated for each tier by multiplying the unit cost (Lines 5) by extra capacity (Lines 6). Total peaking costs (Line 9) includes the sum of Max Day (Line 3) and Max Hour (Line 7) peaking costs. The peaking unit rate for each tier (Line 12) is calculated by dividing total peaking costs (Line 9) by projected FYE 2020 water use in Line 10 (from **Table 4-6**, Column C, Lines 1-2).

Table 5-4: Peaking Unit Rates

A	B	C	D
Line	Description	Tier 1	Tier 2
1	Max Day Unit Cost	$19.020	$19.020
2	Max Day Extra Capacity (hgal/day)	2,296	7,461
3	**Max Day Extra Capacity Costs**	**$43,673**	**$141,899**
4			
5	Max Hour Unit Cost	$2.985	$2.985
6	Max Hour Extra Capacity (hgal/day)	5,946	13,475
7	**Max Hour Extra Capacity Costs**	**$17,746**	**$40,218**
8			
9	**Total Peaking Costs**	**$61,418**	**$182,117**
10	**Total Water Usage (hgal)**	**2,219,918**	**4,207,372**
11			
12	**Peaking Unit Rate ($/hgal)**	**$0.028**	**$0.043**

Conservation and Revenue Offset Unit Rates

Table 5-5 shows the Conservation and Revenue Offset unit rates, which are simply equal to the Conservation and Revenue Offset unit cost causation components respectively (from **Table 4-11**, Columns H and M, Line 11). Conservation unit rates do not vary by tier. Revenue Offset unit rates however are applied to Tier 1 use as previously discussed. Revenue Offset unit rates are used to reduce the proposed Tier 1 Commodity Rate and are therefore shown as negative.

Table 5-5: Conservation and Revenue Offset Unit Rates

A	B	C	D
Line	Description	Tier 1	Tier 2
1	Conservation Unit Rate	$0.028	$0.028
2	Revenue Offset Unit Rate	-$0.055	$0.000

Proposed FYE 2020 Commodity Rates Calculation

Table 5-6 shows the final calculation of proposed FYE 2020 Commodity Rates by tier. The five unit rates in Columns C-G (from **Table 5-2** through **Table 5-5**) are summed to determine the total proposed FYE 2020 rate by tier (Column H). The difference between proposed (Column H) and current rates (Column I) is shown in Column J.

Table 5-6: FYE 2020 Proposed Commodity Rates

A	B	C	D	E	F	G	H	I	J
Line	Tier	Water Purchase Cost Rate	Average Delivery Rate	Peaking Rate	Conser-vation Rate	Revenue Offset Rate	Total Proposed Rate	Current Rate	Difference
1	Tier 1 (0-125 hgal)	$0.056	$0.349	$0.028	$0.028	-$0.055	**$0.406**	$0.280	$0.126
2	Tier 2 (>125 hgal)	$0.096	$0.349	$0.043	$0.028	$0.000	**$0.517**	$0.486	$0.031

5.2. Water Service Meter Base Charge Calculation

Water Service Meter Base Charges are designed to recover costs allocated to the Meter Service and Customer Service cost causation components. **Table 5-7** shows the Meter Service and Customer Service unit charge calculation based on unit cost causation components for Meter Service and Customer Service in Line 1 (from **Table 4-11**, Columns I-J, Line 11). The unit cost causation components for Meter Service and Customer Service are annualized costs recovered by each unit of service. Unit cost causation components (Line 1) are divided by six bimonthly billing periods per year (Line 2) to determine the unit charge per bimonthly billing period (Line 3).

Table 5-7: Meter Service and Customer Service Unit Charge Calculations

A	B	C	D
Line	Description	Meter Service	Customer Service
1	Unit Cost Causation Component	$255.26	$92.15
2	Bimonthly Billing Periods per Year	6	6
3	**Unit Charge**	**$42.54**	**$15.36**

Table 5-8 shows the calculation of proposed FYE 2020 bimonthly Water Service Meter Charge rates by meter size. Meter Service costs vary by meter size based on meter capacity. Therefore, hydraulic capacity meter ratios in Column C (from **Table 4-7**, Column C) are used to apply Meter Service unit charges in proportion to meter size capacity. Customer Service costs do not vary based on meter size and are therefore applied equally to all meter sizes. The Meter Service charge (Column D) is calculated by multiplying the Meter Service unit charge (from **Table 5-7**, Column C, Line 3) by the corresponding hydraulic capacity meter ratio (Column C). Customer Service charges (Column E), which do not vary by meter size, equal the Customer Service unit charge from **Table 5-7**, Column D, Line 3. The proposed FYE 2020 bimonthly charge (Column F) is the sum of the Meter Service charge (Column D) and Customer Service charge (Column E). The difference between proposed (Column F) and current bimonthly charges (Column G) is shown in Column H.

Table 5-8: FYE 2020 Proposed Water Service Meter Base Charge Calculation

A	B	C	D	E	F	G	H
Line	Meter Size	Hydraulic Capacity Meter Ratio	Meter Service	Customer Service	Proposed Bimonthly Charge	Current Bimonthly Charge	Difference
1	5/8-inch	1.0	$42.54	$15.36	**$57.90**	**$49.82**	$8.08
2	1-inch	2.5	$106.36	$15.36	**$121.72**	**$108.06**	$13.66
3	1.5-inch	5.0	$212.72	$15.36	**$228.07**	**$216.08**	$11.99
4	2-inch	8.0	$340.35	$15.36	**$355.70**	**$346.28**	$9.42
5	3-inch	15.0	$638.15	$15.36	**$653.51**	**$648.12**	$5.39
6	4-inch	25.0	$1,063.58	$15.36	**$1,078.94**	**$1,080.26**	-$1.32
7	6-inch	50.0	$2,127.17	$15.36	**$2,142.52**	**$2,160.44**	-$17.92
8	8-inch	80.0	$3,403.47	$15.36	**$3,418.83**	**$3,456.64**	-$37.81
9	10-inch	115.0	$4,892.48	$15.36	**$4,907.84**	**$4,968.96**	-$61.12

5.3. Private Fire Protection Water Service Charge Calculation

Private Fire Protection Water Service Charges are designed to recover costs allocated to the Private Fire cost causation component. Private Fire costs are further distinguished in this subsection between Fire Backflow Administration costs and all other Private Fire costs. **Table 5-9** shows the calculation of Private Fire (i.e. non-backflow related) and Fire Backflow Administration unit charges. Reducing the total FYE 2020 Private Fire Revenue Requirement in Line 1 (from **Table 4-11**, Columns N, Line 6) by $5,000 in backflow-related costs (Line 2)[6] provides remaining Private Fire costs (Line 3) recovered by the Private Fire unit charge. Theses remaining costs (Line 5) are divided by equivalent private fire demand in Line 5 (from **Table 4-8**, Column D, Line 11) and then divided again by six bimonthly billing periods per year (Line 7) to determine the Private Fire charge per unit of potential fire line demand (Line 8). The Fire Backflow Administration unit charge (Line 13) is similarly calculated by dividing total Fire Backflow Administration costs by total projected private fire connections in Line 11 (from **Table 4-8**, Column C, Line 11) and then dividing again by six bimonthly billing periods (Line 12).

[6] City staff estimated that $5,000 in annual operating expenses are associated with private fire backflow administration.

Table 5-9: Private Fire Protection Unit Charge Calculations

A	B	C
Line	Description	FY 2020
1	Total FYE 2020 Private Fire Revenue Requirement	$405,972
2	Less Fire Backflow Administration Costs	($5,000)
3	**Remaining Private Fire Costs**	**$400,972**
4		
5	Remaining Private Fire Costs	$400,972
6	Equivalent Private Fire Demand	14,565
7	Bimonthly Billing Periods per Year	6
8	**Private Fire Unit Charge**	**$4.59**
9		
10	Fire Backflow Administration Costs	$5,000
11	Number of Private Fire Connections	126
12	Bimonthly Billing Periods per Year	6
13	**Fire Backflow Administration Unit Charge**	**$6.61**

Table 5-10 shows the calculation of proposed FYE 2020 bimonthly Private Fire Protection Water Service Charge rates by connection size. Private Fire costs vary by connection size based on potential fire line demand. Therefore, the Private Fire charge (Column E) is calculated by multiplying the Private Fire charge per unit of potential demand in Column D (from **Table 5-9**, Column C, Line 8) by potential demand in Column C (from **Table 4-8**, Column C). Fire Backflow Administration charges (Column F), which do not vary by connection size, equal the Customer Fire Backflow Administration unit charge from **Table 5-9**, Column C, Line 13. The proposed FYE 2020 bimonthly charge (Column G) is the sum of the Private Fire charge (Column E) and Fire Backflow Administration charge (Column F). The difference between proposed (Column G) and current bimonthly charges (Column H) is shown in Column I.

Table 5-10: FYE 2020 Proposed Private Fire Protection Water Service Charge Calculation

A	B	C	D	E	F	G	H	I
Line	Meter Size	Potential Demand	Private Fire per Unit of Potential Demand	Private Fire	Fire Backflow Administration	Proposed Bimonthly Charge	Current Bimonthly Charge	Difference
1	2-inch	6.19	$4.59	$28.40	$6.61	**$35.02**	$108.16	-$73.14
2	3-inch	17.98	$4.59	$82.51	$6.61	**$89.12**	$202.60	-$113.48
3	4-inch	38.32	$4.59	$175.83	$6.61	**$182.44**	$337.68	-$155.24
4	6-inch	111.31	$4.59	$510.74	$6.61	**$517.35**	$643.86	-$126.51
5	8-inch	237.21	$4.59	$1,088.40	$6.61	**$1,095.02**	$1,080.56	$14.46
6	10-inch	426.58	$4.59	$1,957.33	$6.61	**$1,963.94**	$1,558.50	$405.44

5.4. Proposed Five-Year Rate Schedule

Table 5-11 shows current FYE 2019 water rates and proposed water rates for FYE 2020 to FYE 2024. Current FYE 2019 rates (Column C) were shown previously in **Table 3-1**. Proposed FYE 2020 Commodity Rates (Column D, Lines 4-5) were calculated in **Table 5-6**. Proposed FYE 2020 Water Service Meter Charges (Column D, Lines 9-17) were calculated in **Table 5-8**. Proposed FYE 2020 Private Fire Protection Water Service Charges (Column D, Lines 21-26) were calculated in **Table 5-10**. All rates beyond FYE 2020 (Columns E-H) were calculated by increasing the

prior year proposed rate or charge by the corresponding revenue adjustment in Line 1 (from **Table 3-12**). Commodity Rates are rounded to the nearest tenth of a cent. All fixed charges are rounded to the nearest cent.

Table 5-11: Proposed Five-Year Rate Schedule

A	B	C	D	E	F	G	H
Line	Fiscal Year	FYE 2019	FYE 2020	FYE 2021	FYE 2022	FYE 2023	FYE 2024
1	Revenue Adjustment		15.0%	9.0%	9.0%	8.0%	8.0%
2	**Commodity Rates**						
3	Tier	Current 2019	January 1, 2020	January 1, 2021	January 1, 2022	January 1, 2023	January 1, 2024
4	Tier 1 (0-125 hgal)	$0.280	$0.406	$0.442	$0.482	$0.521	$0.562
5	Tier 2 (>125 hgal)	$0.486	$0.517	$0.563	$0.614	$0.663	$0.716
6							
7	**Bimonthly Water Service Meter Base Charges**						
8	Meter Size	Current 2019	January 1, 2020	January 1, 2021	January 1, 2022	January 1, 2023	January 1, 2024
9	5/8-inch	$49.82	$57.90	$63.11	$68.79	$74.30	$80.24
10	1-inch	$108.06	$121.72	$132.67	$144.61	$156.18	$168.67
11	1.5-inch	$216.08	$228.07	$248.60	$270.98	$292.65	$316.07
12	2-inch	$346.28	$355.70	$387.72	$422.61	$456.42	$492.94
13	3-inch	$648.12	$653.51	$712.32	$776.43	$838.55	$905.63
14	4-inch	$1,080.26	$1,078.94	$1,176.05	$1,281.89	$1,384.44	$1,495.20
15	6-inch	$2,160.44	$2,142.52	$2,335.35	$2,545.53	$2,749.18	$2,969.11
16	8-inch	$3,456.64	$3,418.83	$3,726.52	$4,061.91	$4,386.86	$4,737.81
17	10-inch	$4,968.96	$4,907.84	$5,349.55	$5,831.01	$6,297.49	$6,801.29
18							
19	**Bimonthly Private Fire Protection Water Service Charges**						
20	Meter Size	Current 2019	January 1, 2020	January 1, 2021	January 1, 2022	January 1, 2023	January 1, 2024
21	2-inch	$108.16	$35.02	$38.17	$41.60	$44.93	$48.53
22	3-inch	$202.60	$89.12	$97.14	$105.88	$114.36	$123.50
23	4-inch	$337.68	$182.44	$198.86	$216.76	$234.10	$252.82
24	6-inch	$643.86	$517.35	$563.92	$614.67	$663.84	$716.95
25	8-inch	$1,080.56	$1,095.02	$1,193.57	$1,300.99	$1,405.07	$1,517.47
26	10-inch	$1,558.50	$1,963.94	$2,140.69	$2,333.36	$2,520.03	$2,721.63

6. Customer Impacts

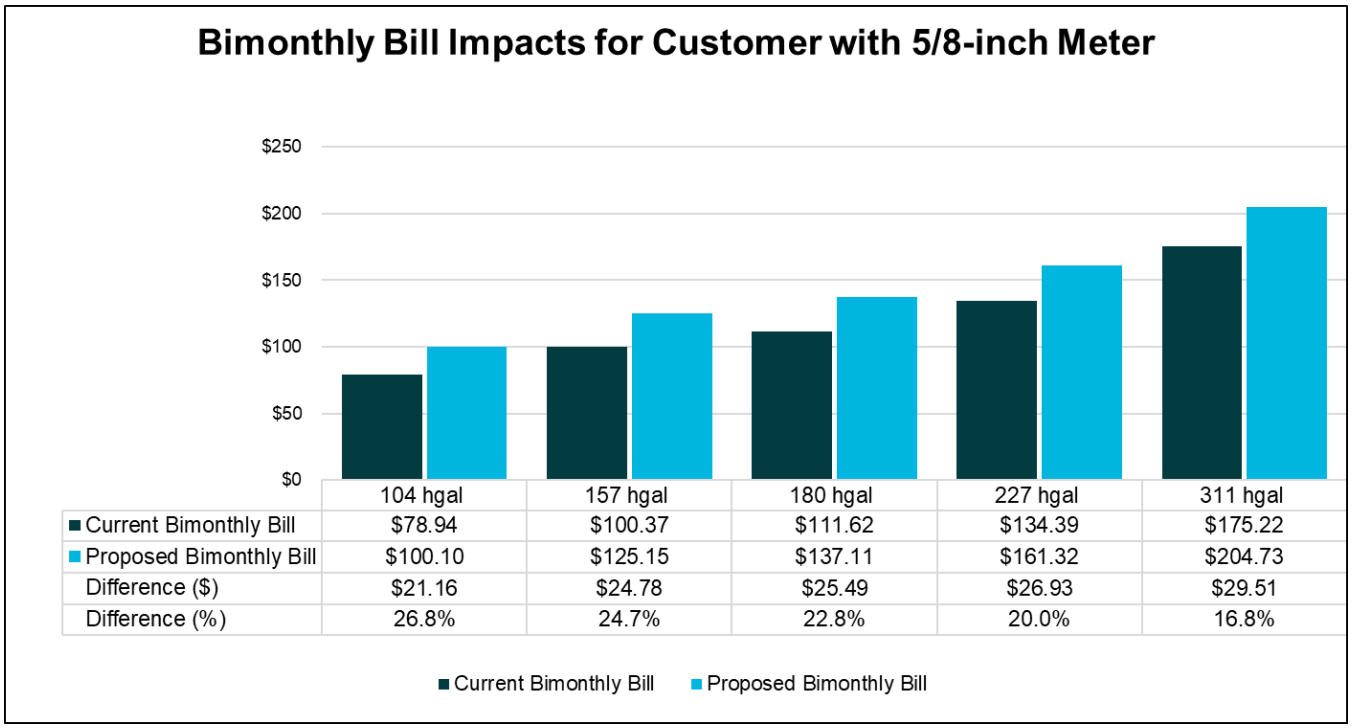
6.1. Bimonthly Bill Impacts

Figure **6-1** shows estimated bimonthly bills under current rates and proposed FYE 2020 rates for customers with a 5/8-inch water meter at varying levels of bimonthly water use. Note that nearly all residential customers in the City have a 5/8-inch meter. The varying levels of bimonthly use are based on actual FYE 2018 residential water use in the City:

- 25th percentile: 104 hgal
- Median: 157 hgal
- Average: 180 hgal
- 75th percentile: 227 hgal
- 90th percentile: 311 hgal

Median and average use residential customers will realize a $24.78 and $25.49 bimonthly bill increase respectively. High use customers see a smaller percentage increase in bimonthly bills under the proposed FYE 2020 rates due to the decreased differentiation between Tier 1 and Tier 2 Commodity Rates relative to existing 2019 rates. Tiered rates must have a robust cost nexus, as demonstrated in this report and the decreased differentiation causes slightly lower percentage bill impacts for higher water users. Note that the total dollar bill impact is still higher for higher water users.

Figure 6-1: Bimonthly Bill Impacts at Varying Levels of Use



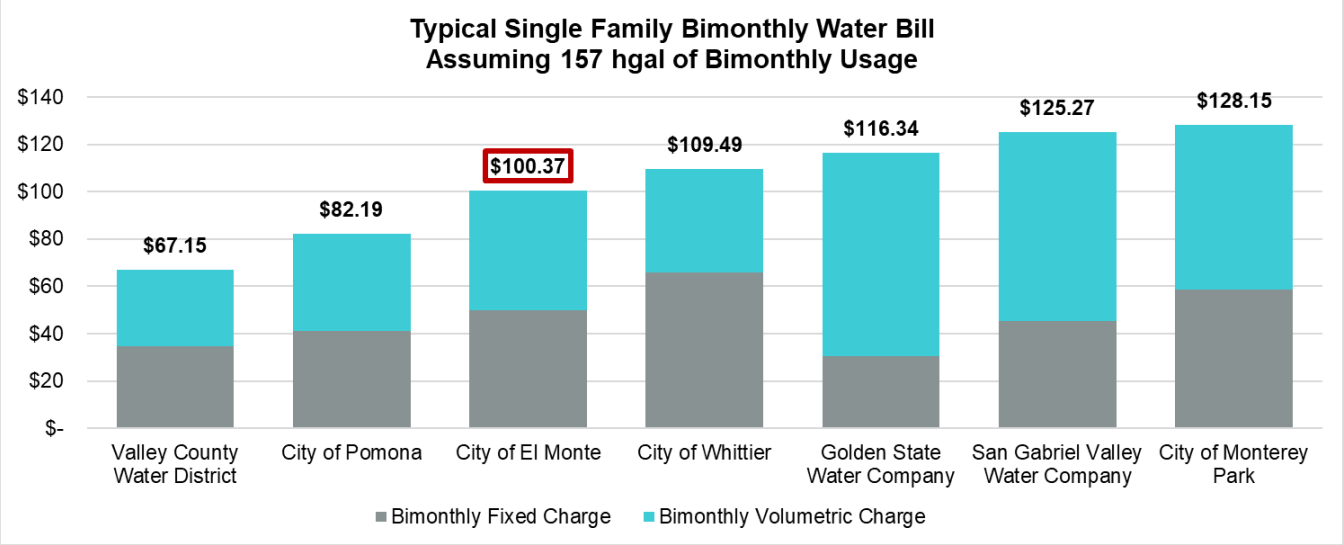
	104 hgal	157 hgal	180 hgal	227 hgal	311 hgal
Current Bimonthly Bill	$78.94	$100.37	$111.62	$134.39	$175.22
Proposed Bimonthly Bill	$100.10	$125.15	$137.11	$161.32	$204.73
Difference ($)	$21.16	$24.78	$25.49	$26.93	$29.51
Difference (%)	26.8%	24.7%	22.8%	20.0%	16.8%

6.2. Bimonthly Bill Survey

Current Bill Comparison

Figure **6-2** shows a typical bimonthly water bill for the City's residential water customers compared to residential customers of six neighboring water utilities for calendar year (CY) 2019. The City's 2019 bimonthly bill is calculated based on current 2019 water rates for a residential customer with median water use (157 hgal per bimonthly billing period) and a 5/8-inch water meter. Bimonthly bills for other agencies are calculated assuming 157 hgal per bimonthly billing and the smallest available meter size (typically 3/4-inch or 5/8-inch). The fixed charge portion of each bimonthly bill is represented by grey stacked bars, with the volumetric charge portion represented by blue stacked bars. Under current 2019 rates, the City's residential customers are subject to lower than average water bills relative to residential customers within the six other surveyed agencies.

Figure 6-2: 2019 Residential Bimonthly Bill Comparison

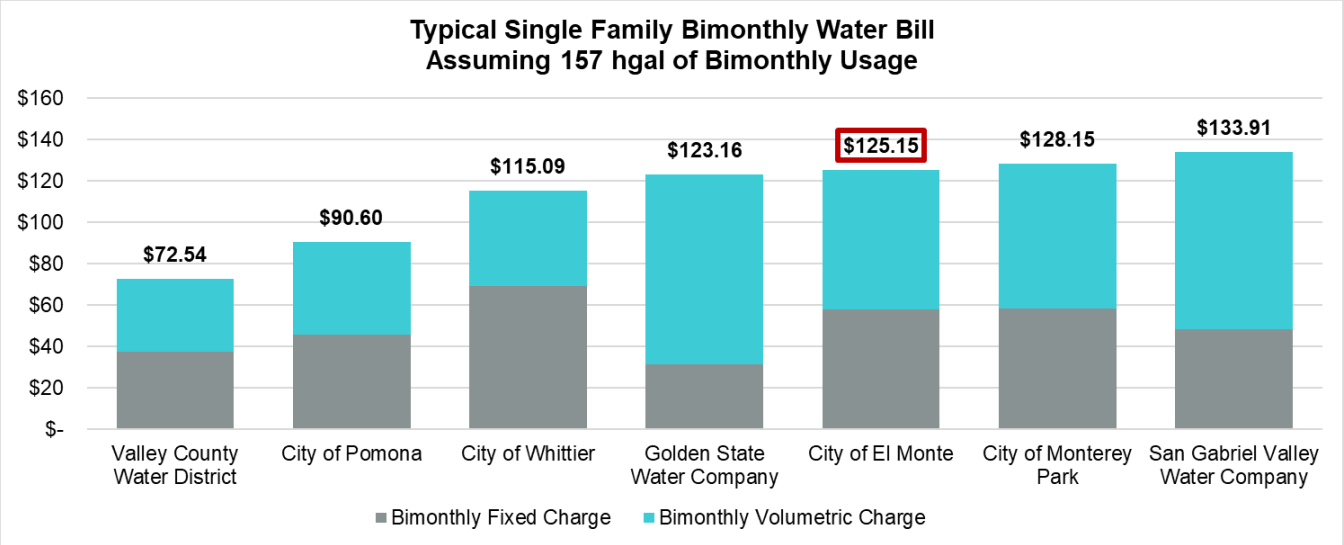


FYE 2020 Bill Comparison

Figure **6-3** shows a typical bimonthly residential water bill for the City's residential water customers compared to residential customers of six neighboring water utilities estimated for CY 2020 – to compare the proposed bills with the future bills of the other agencies The same water use and meter size assumptions from Figure **6-2** are maintained in Figure **6-3**. The City's bimonthly bill for a typical residential customer was calculated based on proposed FYE 2020 water rate from **Section 5**. Bimonthly bills for the other six surveyed agencies are based on rates expected to be implemented during CY 2020.[7]

[7] Note however that the San Gabriel Valley Water Company bimonthly bill for 2020 is estimated based on a projected 6.9% bill increase in 2020 for average residential users (per its 2019 General Rate Case public participation hearing notice)

Figure 6-3: 2020 Residential Bimonthly Bill Comparison



7. Proposed Drought Rates

7.1. Drought Rates Background Information

City staff directed Raftelis to develop drought rates, which have not previously been implemented by the Water Enterprise. Drought rates are intended to recover reductions in net revenues resulting from decreased water sales during times of reduced water demand due to drought, water supply emergencies, or other reasons. Drought rates are commonly used by water utilities in California, especially after the recent California drought which abated in 2017. Many utilities have effectively used drought rates as a tool to combat the financial risk of rate revenue shortfalls during droughts.

Drought rates are not effective under normal water supply and demand conditions, but are only implemented if formally activated by a water provider based on clearly defined demand reduction stages (i.e. drought stages). Raftelis did not develop formal procedures and policies relating to the activation of drought rates during this study. However, Raftelis recommends that City staff develop a formal drought rate activation protocol in which water customers are provided clear notice in advance of drought rate activation.

Raftelis developed proposed FYE 2020 drought rates for five demand reduction stages, which are distinct from and entirely unrelated to the five drought stages defined in the City's Drought Response Conservation Plan. Raftelis developed drought rates for the following five demand reduction stages:

- **5% Demand Reduction** below projected FYE 2020 water use
- **10% Demand Reduction** below projected FYE 2020 water use
- **15% Demand Reduction** below projected FYE 2020 water use
- **20% Demand Reduction** below projected FYE 2020 water use
- **25% Demand Reduction** below projected FYE 2020 water use

7.2. Drought Rate Calculations

Raftelis developed drought rates to be added to the proposed FYE 2020 Commodity Rates. The goal of the drought rates is to account for changes in net revenues resulting from both reduced Commodity Rate revenues and reduced water purchase costs.

Commodity Rate Revenue by Demand Reduction Stage

Table 7-1 shows the first step in the drought rate calculations, which is to project annualized FYE 2020 Commodity Rate revenue under proposed FYE 2020 rates for each of the five demand reduction stages listed above. This involved projecting water use by tier for each demand reduction stage. Total FYE 2020 projected water use under base demand (Column C, Line 1) represents projected FYE 2020 use from the proposed financial plan (from **Table 3-3**). Columns D-H, Line 1 are determined by reducing base demand by the percent demand reduction for each stage. The total reduction from base demand (Columns D-H, Line 2) represents the difference between base demand and demand at each stage.

Because higher tiers are generally disproportionately reduced during periods of drought, Raftelis analyzed FYE 2018 account level water use data to estimate the percentage reduction occurring in Tier 1 and Tier 2 for each demand reduction stage. This analysis assumed that each individual account's bimonthly use was reduced uniformly by the overall percentage demand reduction. Lines 4-5 show the percent of total reduction from base demand (Line 2) occurring in Tier 1 and Tier 2 at each stage based on the analysis of FYE 2018 use data. Lines 7-8 show the reduction

from base demand occurring in each tier. The Tier 1 reduction (Line 7) equals the total reduction (Line 2) multiplied the percent reduction occurring in Tier 1 (Line 4). Similarly, the Tier 2 reduction (Line 8) equals the total reduction (Line 2) multiplied the percent reduction occurring in Tier 2 (Line 5). Projected FYE 2020 Tier 1 water use by stage (Columns D-H, Line 10) is determined by subtracting the Tier 1 reduction from base demand (Columns D-H, Line 7) from FYE 2020 Tier 1 base demand in Column C, Line 10 (from **Table 3-3**). Projected FYE 2020 Tier 2 water use by stage (Columns D-H, Line 11) is similarly determined by subtracting the Tier 2 reduction from base demand (Columns D-H, Line 8) from FYE 2020 Tier 2 base demand in Column C, Line 11 (from **Table 3-3**).

Annualized Commodity Rate revenue by tier are calculated by multiplying projected water use by tier by the proposed FYE 2020 Commodity Rate by tier (from **Table 5-6**, Column H). Tier 1 revenues (Line 17) equal Tier 1 use (Line 10) multiplied by the Tier 1 rate (Line 14). Tier 2 revenues (Line 18) equal Tier 2 use (Line 11) multiplied by the Tier 2 rate (Line 15). The sum of Line 17-18 provides total annualized Commodity Rate revenue (Line 19) for each demand reduction stage under proposed FYE 2020 Commodity Rates.

Table 7-1: Annualized FYE 2020 Commodity Rate Revenues by Demand Reduction Stage

A	B	C	D	E	F	G	H
Line	Description	Base Demand	5% Demand Reduction	10% Demand Reduction	15% Demand Reduction	20% Demand Reduction	25% Demand Reduction
1	Total Projected Water Usage (hgal)	6,427,290	6,105,926	5,784,561	5,463,197	5,141,832	4,820,468
2	Reduction from Base Demand (hgal)		321,365	642,729	964,094	1,285,458	1,606,823
3							
4	*% of Reduction in Tier 1*	-	*8.3%*	*8.9%*	*9.5%*	*10.3%*	*11.1%*
5	*% of Reduction in Tier 2*	-	*91.7%*	*91.1%*	*90.5%*	*89.7%*	*88.9%*
6							
7	Tier 1 Reduction from Base Demand (hgal)	-	26,810	57,147	91,945	131,971	177,623
8	Tier 2 Reduction from Based Demand (hgal)	-	294,555	585,582	872,148	1,153,487	1,429,200
9							
10	Projected Tier 1 Water Usage (hgal)	2,219,918	2,193,108	2,162,770	2,127,973	2,087,947	2,042,295
11	Projected Tier 2 Water Usage (hgal)	4,207,372	3,912,818	3,621,791	3,335,224	3,053,885	2,778,173
12	**Total Projected Water Usage (hgal)**	**6,427,290**	**6,105,926**	**5,784,561**	**5,463,197**	**5,141,832**	**4,820,468**
13							
14	Proposed Tier 1 Commodity Rate ($/hgal)	$0.406	$0.406	$0.406	$0.406	$0.406	$0.406
15	Proposed Tier 2 Commodity Rate ($/hgal)	$0.517	$0.517	$0.517	$0.517	$0.517	$0.517
16							
17	Annualized Tier 1 Commodity Rate Revenue	$900,660	$889,783	$877,474	$863,356	$847,117	$828,595
18	Annualized Tier 2 Commodity Rate Revenue	$2,174,128	$2,021,919	$1,871,533	$1,723,452	$1,578,072	$1,435,600
19	**Total Annualized Commodity Rate Revenue**	**$3,074,788**	**$2,911,702**	**$2,749,007**	**$2,586,808**	**$2,425,189**	**$2,264,195**

Avoided Water Purchase Costs by Demand Reduction Stage

During a drought, the City will decrease O&M expenditures such as water purchase and pumping costs. **Table 7-2** shows the second step of the drought rate calculations, in which Raftelis estimated avoided water purchase costs associated with Watermaster Assessments and Replacement Water Assessments during each demand reduction stage. All values shown are on an annualized basis for FYE 2020. Raftelis projected reductions in groundwater production and replacement water during each stage. Required water production under base demand (Column C, Line 1) was determined by adjusting base water use (from **Table 7-1**, Column C, Line 1) by a 13.4% water loss factor (estimated by Raftelis and City staff) and then converting from hundreds of gallons to acre-feet. Columns D-H, Line 1 are determined by reducing water production under base demand (Column C, Line 1) by the percent demand reduction for each stage. Required replacement water (Line 4) equals total water production (Line 1) less the City's share of the Basin's operating safe yield (Line 2), as no carryover water (Line 3) is projected to be available in any year.

The reduction in water production from base demand (Line 6) represents the difference in water production under base demand (Column C, Line 1) and water production under each demand reduction stage (Columns D-H, Line 1). Similarly, the reduction in required replacement water under base demand (Line 7) represents the difference in replacement water under base demand (Column C, Line 4) and replacement water under each demand reduction stage (Columns D-H, Line 4). Watermaster assessments per acre-foot of water production in FYE 2020 (Line 13) equals the sum of the Administration, In-Lieu, and Water Resource Development assessments per acre-foot in Lines 10-12 (provided for FYE 2020 by City staff). The Replacement Water Assessment per acre-foot in FYE 2020 is shown in Line 15. Watermaster assessment savings (Line 17) equal reduced water production (Line 6) multiplied by the total Watermaster assessment (Line 13). Replacement Water Assessment savings (Line 18) equal reduced replacement water (Line 7) multiplied by the Replacement Water Assessment (Line 15). The sum of Lines 17-18 represent total annualized FYE 2020 water purchase cost savings (Line 19) for each demand reduction stage.

Table 7-2: Annualized FYE 2020 Water Purchase Cost Savings by Demand Reduction Stage

A	B	C	D	E	F	G	H
Line	Description	Base Demand	5% Demand Reduction	10% Demand Reduction	15% Demand Reduction	20% Demand Reduction	25% Demand Reduction
1	Required Water Production (AF)	2,278	2,164	2,050	1,936	1,822	1,708
2	Less City's share of Basin's Operating Safe Yield (AF)	2,113	2,113	2,113	2,113	2,113	2,113
3	Less Carryover from Prior Year (AF)	0	0	0	0	0	0
4	**Required Replacement Water (AF)**	**164**	**50**	**0**	**0**	**0**	**0**
5							
6	Reduction in Water Production from Base Demand (AF)	-	114	228	342	456	569
7	Reduction in Replacement Water from Base Demand (AF)	-	114	164	164	164	164
8							
9	**Water Master Assessments on Total Production ($/AF)**						
10	Administration Assessment	$15	$15	$15	$15	$15	$15
11	In-Lieu Assessment	$10	$10	$10	$10	$10	$10
12	Water Resource Development Assessment	$140	$140	$140	$140	$140	$140
13	**Total Watermaster Assessment ($/AF)**	**$165**	**$165**	**$165**	**$165**	**$165**	**$165**
14							
15	Replacement Water Assessment	$935	$935	$935	$935	$935	$935
16							
17	Savings from Water Master Assessments	$0	$18,791	$37,582	$56,373	$75,163	$93,954
18	Savings from Replacement Water Assessments	$0	$106,482	$153,677	$153,677	$153,677	$153,677
19	**Total Water Purchase Cost Savings**	**$0**	**$125,272**	**$191,258**	**$210,049**	**$228,840**	**$247,631**

Proposed FY 2020 Drought Rate Calculation

Table 7-3 shows the calculation of drought surcharges by demand reduction stage. The annualized Commodity Rate revenue requirement (Line 3) is determined by reducing annualized Commodity Rate revenues under base demand in Line 1 (from **Table 7-1**, Column C, Line 19) by water purchase cost savings in Line 2 (from **Table 7-2**, Line 19). Annualized Commodity Rate revenues under proposed FYE 2020 rates in Line 5 were determined in **Table 7-1**, Line 19. Revenues required from drought surcharges (Line 6) equal the annualized Commodity Rate revenue requirement (Line 3) less annualized Commodity Rate revenues under proposed FYE 2020 rates (Line 5). This is the net revenue shortfall to be recovered by drought surcharges (Line 6). The proposed drought surcharge (Line 7) is equal to the revenue required from drought surcharges (Line 6) divided by annualized Commodity Rate revenues (Line 5). The proposed drought surcharge is to be applied as a percentage of Tier 1 and Tier 2 Commodity Rates.

Table 7-3: Drought Surcharge Calculation

A	B	C	D	E	F	G	H
Line	Description	Base Demand	5% Demand Reduction	10% Demand Reduction	15% Demand Reduction	20% Demand Reduction	25% Demand Reduction
1	Annualized Commodity Rate Revenue under Base Demand	$3,074,788	$3,074,788	$3,074,788	$3,074,788	$3,074,788	$3,074,788
2	Less Supply Savings	-	($125,272)	($191,258)	($210,049)	($228,840)	($247,631)
3	**Annualized Commodity Rate Revenue Requirement**	**$3,074,788**	**$2,949,515**	**$2,883,529**	**$2,864,738**	**$2,845,948**	**$2,827,157**
4							
5	Annualized Commodity Rate Revenue under Proposed Rates	$3,074,788	$2,911,702	$2,749,007	$2,586,808	$2,425,189	$2,264,195
6	Revenue Required from Surcharges	$0	$37,814	$134,522	$277,931	$420,759	$562,962
7	**Proposed Drought Surcharge**	**0.0%**	**1.3%**	**4.9%**	**10.7%**	**17.3%**	**24.9%**

Table 7-4 shows FYE 2020 Commodity Rates by demand reduction stage after incorporating drought surcharges. The uniform percentage increase to the Commodity Rates in Line 1 was determined in **Table 7-3**, Line 7. Base rates in Lines 4 and 9 represent proposed FYE 2020 Commodity Rates (from **Table 5-6**, Column H). The drought surcharges in Lines 5 and 9 are calculated by multiplying each corresponding base rate (Lines 4 and 9) by the uniform percentage increase (Line 1). The proposed drought rates for Tier 1 (Line 6) and Tier 2 (Line 11) equal the sum of the base rate and drought surcharge. Note that proposed drought rates pertain only to the City's Commodity Rates, and do not affect the bimonthly fixed Water Service Meter Base Charges or Private Fire Protection Water Service Charges.

Table 7-4: Proposed FYE 2020 Drought Rates

A	B	C	D	E	F	G	H
Line	Description	Base Demand	5% Demand Reduction	10% Demand Reduction	15% Demand Reduction	20% Demand Reduction	25% Demand Reduction
1	Uniform Percentage Increase	0.0%	1.3%	4.9%	10.7%	17.3%	24.9%
2							
3	**Tier 1 Rate**						
4	Base Rate ($/hgal)	$0.406	$0.406	$0.406	$0.406	$0.406	$0.406
5	Drought Surcharge ($/hgal)	$0.000	$0.005	$0.020	$0.044	$0.070	$0.101
6	**Proposed Tier 1 Rate ($/hgal)**	**$0.406**	**$0.411**	**$0.426**	**$0.449**	**$0.476**	**$0.507**
7							
8	**Tier 2 Rate**						
9	Base Rate ($/hgal)	$0.517	$0.517	$0.517	$0.517	$0.517	$0.517
10	Drought Surcharge ($/hgal)	$0.000	$0.007	$0.025	$0.056	$0.090	$0.128
11	**Proposed Tier 2 Rate ($/hgal)**	**$0.517**	**$0.523**	**$0.542**	**$0.572**	**$0.606**	**$0.645**

7.3. Proposed Five-Year Drought Rates

Table 7-5 shows a five-year rate schedule of proposed drought rates. FYE 2020 Rates in Column C were previously determined in **Table 7-4**. All rates beyond FYE 2020 (Columns D-G) were calculated by increasing the prior year proposed rate by the corresponding revenue adjustment in Line 1 (from **Table 3-12**). All rates shown are rounded to the nearest tenth of a cent.

Table 7-5: Proposed Five-Year Drought Rate Schedule

A	B	C	D	E	F	G
Line	Proposed Drought Rates	FYE 2020	FYE 2021	FYE 2022	FYE 2023	FYE 2024
1	**Proposed Revenue Adjustment**	15.0%	9.0%	9.0%	8.0%	8.0%
2						
3	**Base Demand**					
4	Tier 1 Rate ($/hgal)	$0.406	$0.442	$0.482	$0.521	$0.562
5	Tier 2 Rate ($/hgal)	$0.517	$0.563	$0.614	$0.663	$0.716
6						
7	**5% Demand Reduction**					
8	Tier 1 Rate ($/hgal)	$0.411	$0.448	$0.488	$0.527	$0.570
9	Tier 2 Rate ($/hgal)	$0.523	$0.571	$0.622	$0.672	$0.725
10						
11	**10% Demand Reduction**					
12	Tier 1 Rate ($/hgal)	$0.426	$0.464	$0.506	$0.546	$0.590
13	Tier 2 Rate ($/hgal)	$0.542	$0.591	$0.644	$0.696	$0.751
14						
15	**15% Demand Reduction**					
16	Tier 1 Rate ($/hgal)	$0.449	$0.490	$0.534	$0.577	$0.623
17	Tier 2 Rate ($/hgal)	$0.572	$0.624	$0.680	$0.734	$0.793
18						
19	**20% Demand Reduction**					
20	Tier 1 Rate ($/hgal)	$0.476	$0.519	$0.566	$0.611	$0.660
21	Tier 2 Rate ($/hgal)	$0.606	$0.661	$0.720	$0.778	$0.840
22						
23	**25% Demand Reduction**					
24	Tier 1 Rate ($/hgal)	$0.507	$0.552	$0.602	$0.650	$0.702
25	Tier 2 Rate ($/hgal)	$0.645	$0.703	$0.767	$0.828	$0.894

APPENDICES

APPENDIX A: FYE 2020 FUNCTIONALIZED O&M EXPENSES

O&M Allocation to Cost Causation Components (pg. 1/3)			FUNCTIONS									
Fund 600 O&M Expenses		FY 2020 Amount	Water Purchase Costs	Supply	Treatment	Transmission & Distribution	Billing & Customer Service	Meter Replacement / Repair	Con-servation	Direct Fire	General	Total
600-67-679	**EM Operable Unit - Post Permit Phase**											
600-67-679-5111	Salaries - Full Time	$70,000	0.0%	50.0%	50.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**100.0%**
600-67-679-5132	Salaries - Overtime	$0	0.0%	50.0%	50.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**100.0%**
600-67-679-5222	Medicare	$0	0.0%	50.0%	50.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**100.0%**
600-67-679-5252	Workers Compensation Insurance	$0	0.0%	50.0%	50.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**100.0%**
600-67-679-6111	General Contract Services	$132,000	0.0%	50.0%	50.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**100.0%**
600-67-679-6125	Legal Services	$0	0.0%	50.0%	50.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**100.0%**
600-67-679-6160	Water Assessment	$75,000	0.0%	50.0%	50.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**100.0%**
600-67-679-6161	Water Quality Testing	$30,000	0.0%	50.0%	50.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**100.0%**
600-67-679-6415	Utillities - Electricity	$81,000	0.0%	50.0%	50.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**100.0%**
600-67-679-6125	Legal Services	$0	0.0%	50.0%	50.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**100.0%**
Total - EM Operable Unit- Post Permit Phase		**$388,000**	**$0**	**$194,000**	**$194,000**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$388,000**
600-67-690	**UTILITIES**											
600-67-690-5111	Salaries - Full Time	$0	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**100.0%**
600-67-690-5132	Salaries - Overtime	$0	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**100.0%**
600-67-690-5222	Medicare	$0	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**100.0%**
600-67-690-5252	Workers Compensation Insurance	$0	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**100.0%**
Total - Utilities		**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
600-67-695	**GENERAL & ADMINISTRATIVE (cont.)**											
600-67-695-5111	Salaries - Full Time	$476,170	0.0%	4.9%	4.9%	0.0%	22.8%	23.7%	12.9%	1.1%	29.7%	**100.0%**
600-67-695-5125	Salaries - Part Time	$0	0.0%	5.0%	5.0%	0.0%	23.0%	24.0%	13.0%	0.0%	30.0%	**100.0%**
600-67-695-5132	Overtime	$3,455	0.0%	5.0%	5.0%	0.0%	23.0%	24.0%	13.0%	0.0%	30.0%	**100.0%**
600-67-695-5134	Cafeteria Plan Overtime	$0	0.0%	5.0%	5.0%	0.0%	23.0%	24.0%	13.0%	0.0%	30.0%	**100.0%**
600-67-695-5141	Workers' Compensation Salary Cont.	$0	0.0%	5.0%	5.0%	0.0%	23.0%	24.0%	13.0%	0.0%	30.0%	**100.0%**
600-67-695-5144	Incentive Pay	$3,224	0.0%	5.0%	5.0%	0.0%	23.0%	24.0%	13.0%	0.0%	30.0%	**100.0%**
600-67-695-5181	Car Allowance	$2,649	0.0%	5.0%	5.0%	0.0%	23.0%	24.0%	13.0%	0.0%	30.0%	**100.0%**
600-67-695-5201	Group Insurance	$82,567	0.0%	5.0%	5.0%	0.0%	23.0%	24.0%	13.0%	0.0%	30.0%	**100.0%**
600-67-695-5202	Dental Insurance	$5,185	0.0%	5.0%	5.0%	0.0%	23.0%	24.0%	13.0%	0.0%	30.0%	**100.0%**
600-67-695-5203	Vision Insurance	$921	0.0%	5.0%	5.0%	0.0%	23.0%	24.0%	13.0%	0.0%	30.0%	**100.0%**
600-67-695-5206	Life Insurance	$1,267	0.0%	5.0%	5.0%	0.0%	23.0%	24.0%	13.0%	0.0%	30.0%	**100.0%**
600-67-695-5208	Retiree Medical Insurance	$0	0.0%	5.0%	5.0%	0.0%	23.0%	24.0%	13.0%	0.0%	30.0%	**100.0%**
600-67-695-5222	Medicare	$7,255	0.0%	5.0%	5.0%	0.0%	23.0%	24.0%	13.0%	0.0%	30.0%	**100.0%**
600-67-695-5225	Ret. Contribution - Unit Retiree Medical	$0	0.0%	5.0%	5.0%	0.0%	23.0%	24.0%	13.0%	0.0%	30.0%	**100.0%**
600-67-695-5226	Supplemental Retirement - PARS	$62,530	0.0%	5.0%	5.0%	0.0%	23.0%	24.0%	13.0%	0.0%	30.0%	**100.0%**
600-67-695-5227	Deferred Compensation	$4,837	0.0%	5.0%	5.0%	0.0%	23.0%	24.0%	13.0%	0.0%	30.0%	**100.0%**
600-67-695-5252	Workers Compensation Insurance	$15,201	0.0%	5.0%	5.0%	0.0%	23.0%	24.0%	13.0%	0.0%	30.0%	**100.0%**
600-67-695-5255	Holiday Payoff	$0	0.0%	5.0%	5.0%	0.0%	23.0%	24.0%	13.0%	0.0%	30.0%	**100.0%**
600-67-695-5256	Sick Leave Payoff	$0	0.0%	5.0%	5.0%	0.0%	23.0%	24.0%	13.0%	0.0%	30.0%	**100.0%**
600-67-695-5257	Vacation Payoff	$0	0.0%	5.0%	5.0%	0.0%	23.0%	24.0%	13.0%	0.0%	30.0%	**100.0%**
600-67-695-5291	Other Employee Benefits	$0	0.0%	5.0%	5.0%	0.0%	23.0%	24.0%	13.0%	0.0%	30.0%	**100.0%**
600-67-695-6110	Contract Staffing	$186,500	0.0%	5.0%	5.0%	0.0%	23.0%	24.0%	13.0%	0.0%	30.0%	**100.0%**
600-67-695-6111	Contract Services	$60,200	0.0%	5.0%	5.0%	0.0%	23.0%	24.0%	13.0%	0.0%	30.0%	**100.0%**
600-67-695-6115	Professional Services	$167,000	0.0%	5.0%	5.0%	0.0%	23.0%	24.0%	13.0%	0.0%	30.0%	**100.0%**
600-67-695-6123	Copier Lease	$2,400	0.0%	5.0%	5.0%	0.0%	23.0%	24.0%	13.0%	0.0%	30.0%	**100.0%**

O&M Allocation to Cost Causation Components (pg. 2/3)												
			FUNCTIONS									
Fund 600 O&M Expenses		FY 2020 Amount	Water Purchase Costs	Supply	Treatment	Transmission & Distribution	Billing & Customer Service	Meter Replacement / Repair	Con-servation	Direct Fire	General	Total
600-67-695	**GENERAL & ADMINISTRATIVE (cont.)**											
600-67-695-6160	Water Assessment	$555,000	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**100.0%**
600-67-695-6211	Office Supplies	$1,800	0.0%	5.0%	5.0%	0.0%	23.0%	24.0%	13.0%	0.0%	30.0%	**100.0%**
600-67-695-6213	Postage	$12,500	0.0%	5.0%	5.0%	0.0%	23.0%	24.0%	13.0%	0.0%	30.0%	**100.0%**
600-67-695-6215	General Supplies	$0	0.0%	5.0%	5.0%	0.0%	23.0%	24.0%	13.0%	0.0%	30.0%	**100.0%**
600-67-695-6221	Dues & Subscription	$3,650	0.0%	5.0%	5.0%	0.0%	23.0%	24.0%	13.0%	0.0%	30.0%	**100.0%**
600-67-695-6226	Advertising & Publishing	$6,400	0.0%	5.0%	5.0%	0.0%	23.0%	24.0%	13.0%	0.0%	30.0%	**100.0%**
600-67-695-6231	Local Conferences & Meetings	$2,400	0.0%	5.0%	5.0%	0.0%	23.0%	24.0%	13.0%	0.0%	30.0%	**100.0%**
600-67-695-6245	Training	$2,200	0.0%	5.0%	5.0%	0.0%	23.0%	24.0%	13.0%	0.0%	30.0%	**100.0%**
600-67-695-6256	Bank Service Charges	$4,200	0.0%	5.0%	5.0%	0.0%	23.0%	24.0%	13.0%	0.0%	30.0%	**100.0%**
600-67-695-6261	Computer Supplies & Software	$74,000	0.0%	5.0%	5.0%	0.0%	23.0%	24.0%	13.0%	0.0%	30.0%	**100.0%**
600-67-695-6311	Office Equipment Maintenance	$1,200	0.0%	5.0%	5.0%	0.0%	23.0%	24.0%	13.0%	0.0%	30.0%	**100.0%**
600-67-695-6412	Cell Phone/Smart Phone	$0	0.0%	5.0%	5.0%	0.0%	23.0%	24.0%	13.0%	0.0%	30.0%	**100.0%**
Total - General & Administrative		**$1,744,709**	**$555,000**	**$59,235**	**$59,235**	**$0**	**$272,483**	**$284,330**	**$154,012**	**$5,000**	**$355,413**	**$1,744,709**
600-67-696	**PUMPING TRANSMISSION DISTRIBUTION**											
600-67-696-5111	Salaries - Full Time	$508,183	0.0%	10.0%	20.0%	44.0%	0.0%	0.0%	0.0%	1.0%	25.0%	**100.0%**
600-67-696-5132	Overtime	$80,609	0.0%	10.0%	20.0%	44.0%	0.0%	0.0%	0.0%	1.0%	25.0%	**100.0%**
600-67-696-5134	Cafeteria Plan Overtime	$0	0.0%	10.0%	20.0%	44.0%	0.0%	0.0%	0.0%	1.0%	25.0%	**100.0%**
600-67-696-5141	Workers' Compensation Salary Cont.	$0	0.0%	10.0%	20.0%	44.0%	0.0%	0.0%	0.0%	1.0%	25.0%	**100.0%**
600-67-696-5144	Incentive Pay	$5,182	0.0%	10.0%	20.0%	44.0%	0.0%	0.0%	0.0%	1.0%	25.0%	**100.0%**
600-67-696-5201	Group Insurance	$129,205	0.0%	10.0%	20.0%	44.0%	0.0%	0.0%	0.0%	1.0%	25.0%	**100.0%**
600-67-696-5202	Dental Insurance	$8,421	0.0%	10.0%	20.0%	44.0%	0.0%	0.0%	0.0%	1.0%	25.0%	**100.0%**
600-67-696-5203	Vision Insurance	$921	0.0%	10.0%	20.0%	44.0%	0.0%	0.0%	0.0%	1.0%	25.0%	**100.0%**
600-67-696-5206	Life Insurance	$1,497	0.0%	10.0%	20.0%	44.0%	0.0%	0.0%	0.0%	1.0%	25.0%	**100.0%**
600-67-696-5208	Retiree Medical Insurance	$0	0.0%	10.0%	20.0%	44.0%	0.0%	0.0%	0.0%	1.0%	25.0%	**100.0%**
600-67-696-5222	Medicare	$7,946	0.0%	10.0%	20.0%	44.0%	0.0%	0.0%	0.0%	1.0%	25.0%	**100.0%**
600-67-696-5225	Ret. Contribution - Unit Retiree Medical	$0	0.0%	10.0%	20.0%	44.0%	0.0%	0.0%	0.0%	1.0%	25.0%	**100.0%**
600-67-696-5226	Supplemental Retirement	$92,355	0.0%	10.0%	20.0%	44.0%	0.0%	0.0%	0.0%	1.0%	25.0%	**100.0%**
600-67-696-5227	Deferred Compensation	$4,030	0.0%	10.0%	20.0%	44.0%	0.0%	0.0%	0.0%	1.0%	25.0%	**100.0%**
600-67-696-5252	Workers Compensation Insurance	$16,698	0.0%	10.0%	20.0%	44.0%	0.0%	0.0%	0.0%	1.0%	25.0%	**100.0%**
600-67-696-5255	Holiday Payoff	$0	0.0%	10.0%	20.0%	44.0%	0.0%	0.0%	0.0%	1.0%	25.0%	**100.0%**
600-67-696-5291	Other Employee Benefits	$0	0.0%	10.0%	20.0%	44.0%	0.0%	0.0%	0.0%	1.0%	25.0%	**100.0%**
600-67-696-6111	Contract Services	$55,000	0.0%	10.0%	20.0%	44.0%	0.0%	0.0%	0.0%	1.0%	25.0%	**100.0%**
600-67-696-6161	Water Quality Testing	$50,000	0.0%	10.0%	20.0%	44.0%	0.0%	0.0%	0.0%	1.0%	25.0%	**100.0%**
600-67-696-6197	Unanticipated Costs	$25,000	0.0%	10.0%	20.0%	44.0%	0.0%	0.0%	0.0%	1.0%	25.0%	**100.0%**
600-67-696-6215	General Supplies	$174,135	0.0%	10.0%	20.0%	44.0%	0.0%	0.0%	0.0%	1.0%	25.0%	**100.0%**
600-67-696-6217	Carbon Supply	$60,000	0.0%	10.0%	20.0%	44.0%	0.0%	0.0%	0.0%	1.0%	25.0%	**100.0%**
600-67-696-6248	Uniforms/Safety Equipment	$10,325	0.0%	10.0%	20.0%	44.0%	0.0%	0.0%	0.0%	1.0%	25.0%	**100.0%**
600-67-696-6258	Tools & Minor Equipment	$6,500	0.0%	10.0%	20.0%	44.0%	0.0%	0.0%	0.0%	1.0%	25.0%	**100.0%**
600-67-696-6265	Fuel & Oil	$28,000	0.0%	10.0%	20.0%	44.0%	0.0%	0.0%	0.0%	1.0%	25.0%	**100.0%**
600-67-696-6266	Special Departmental Expense	$30,000	0.0%	10.0%	20.0%	44.0%	0.0%	0.0%	0.0%	1.0%	25.0%	**100.0%**
600-67-696-6315	Equipment Maintenance	$75,770	0.0%	10.0%	20.0%	44.0%	0.0%	0.0%	0.0%	1.0%	25.0%	**100.0%**
600-67-696-6335	Vehicle Maintenance & Repair	$10,000	0.0%	10.0%	20.0%	44.0%	0.0%	0.0%	0.0%	1.0%	25.0%	**100.0%**
600-67-696-6344	Permits, Assessments & Taxes	$750	0.0%	10.0%	20.0%	44.0%	0.0%	0.0%	0.0%	1.0%	25.0%	**100.0%**
600-67-696-6399	Depreciation Expense	$0	0.0%	10.0%	20.0%	44.0%	0.0%	0.0%	0.0%	1.0%	25.0%	**100.0%**
600-67-696-6411	Utilities - Telephone	$2,600	0.0%	10.0%	20.0%	44.0%	0.0%	0.0%	0.0%	1.0%	25.0%	**100.0%**

O&M Allocation to Cost Causation Components (pg. 3/3)											
		FUNCTIONS									
Fund 600 O&M Expenses	FY 2020 Amount	Water Purchase Costs	Supply	Treatment	Transmission & Distribution	Billing & Customer Service	Meter Replacement/ Repair	Con-servation	Direct Fire	General	Total
600-67-696 PUMPING TRANSMISSION DISTRIBUTION (cont.)											
600-67-696-6413 IPad/Tablet Monthly Fee	$2,000	0.0%	10.0%	20.0%	44.0%	0.0%	0.0%	0.0%	1.0%	25.0%	**100.0%**
600-67-696-6415 Utillities - Electricity	$199,000	0.0%	10.0%	20.0%	44.0%	0.0%	0.0%	0.0%	1.0%	25.0%	**100.0%**
600-67-696-6416 Utilities - Water	$1,500	0.0%	10.0%	20.0%	44.0%	0.0%	0.0%	0.0%	1.0%	25.0%	**100.0%**
600-67-696-8131 Machinery & Equipment Water Meters	$34,000	0.0%	10.0%	20.0%	44.0%	0.0%	0.0%	0.0%	1.0%	25.0%	**100.0%**
600-67-696-8132 Vehicle	$95,000	0.0%	10.0%	20.0%	44.0%	0.0%	0.0%	0.0%	1.0%	25.0%	**100.0%**
Total - Pumping Transmission Distribution	**$1,714,628**	**$0**	**$171,463**	**$342,926**	**$754,436**	**$0**	**$0**	**$0**	**$17,146**	**$428,657**	**$1,714,628**
Other Operating Expenses											
600-67-855-6125 Legal Services	$0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	**100.0%**
600-67-196-7355 Lease of Water Facility (Warehouse)	$200,000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	**100.0%**
Total - Other Operating Expenses	**$200,000**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$200,000**	**$200,000**
TOTAL FUND 600 O&M EXPENSES	**$4,047,337**	**$555,000**	**$424,698**	**$596,161**	**$754,436**	**$272,483**	**$284,330**	**$154,012**	**$22,146**	**$984,070**	**$4,047,337**