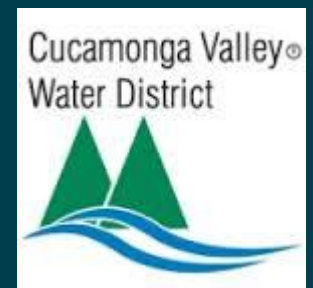


# CUCAMONGA VALLEY WATER DISTRICT

## 2021 Multi-Year Water Rate Study

Final Report / July 19, 2021



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July 19, 2021

Mr. Chad Brantley, CPA, Finance Manager  
Cucamonga Valley Water District  
10440 Ashford Street  
Rancho Cucamonga, CA 91730

**Subject: 2021 Multi-Year Water Rate Study Report**

Dear Mr. Brantley,

Raftelis is pleased to provide this 2021 Multi-Year Water Rate Study Report (Report) for the Cucamonga Valley Water District (District) to develop water rates that are equitable and compliant with Proposition 218. In particular, this Report contains the following:

- » A description of the legal environment surrounding Proposition 218, particularly with respect to water rates
- » Development of a five-year financial plan for the District's Water Fund to ensure financial sufficiency for operating and capital obligations
- » Cost of service analysis and development of potable water rates that meet the Proposition 218 requirements
- » Development of drought rates to be implemented during declared water shortage stages as defined by the District's Water Supply Shortage Contingency Plan

This Report summarizes the key findings and results related to the proposed five-year financial plan, cost of service analysis, and potable water rates. It has been a pleasure working with you, and we thank you and other District staff for the support provided during the course of this study.

Sincerely,

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



**Sanjay Gaur**  
Vice President



**Charles Diamond**  
Senior Consultant

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Appendix 1 – O&M Cost Functionalization and Allocation to Cost Causation Components
Appendix 2 – Capital Asset Functionalization and Allocation to Cost Causation Components
Appendix 3 – Allocation of FY 2020 Rate Revenue Requirement to Cost Causation Components

# LIST OF ABBREVIATIONS

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<b>Terms</b>	<b>Descriptions</b>
<b>AF</b>	Acre-foot
<b>AWWA</b>	American Water Works Association
<b>COS</b>	Cost of Service
<b>CS</b>	Customer Service
<b>District</b>	Cucamonga Valley Water District
<b>EMU</b>	Equivalent Meter Unit
<b>FY</b>	Fiscal Year (July 1 – June 30)
<b>GPD</b>	Gallons per day
<b>GPM</b>	Gallons per minute
<b>HCF</b>	Hundred Cubic Feet = 100 cubic feet = 748 gallons
<b>IEUA</b>	Inland Empire Utilities Agency
<b>M1 Manual</b>	“Principles of Water Rates, Fees, and Charges: Manual of Water Supply Practices M1”, 7 <sup>th</sup> edition published by AWWA
<b>MGD</b>	Million Gallons per Day
<b>MWD</b>	Metropolitan Water District of Southern California
<b>O&amp;M</b>	Operations and Maintenance
<b>RTS</b>	Readiness-to-Serve
<b>TYRA</b>	Ten Year Rolling Average
<b>WSSCP</b>	Water Supply Shortage Contingency Plan

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# 1. EXECUTIVE SUMMARY

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## 1.1 INTRODUCTION

Public water utilities in California typically perform a cost of service analysis every five years to ensure that customers are appropriately charged for water service commensurate with the cost to provide service. The District's last cost of service study established proposed water rates over a four-year period for fiscal year (FY) 2016 through FY 2019. No rate increases have been implemented since the last year of adopted rates went into effect in FY 2019. The District retained Raftelis in late 2019 to conduct a comprehensive cost of service and rate design study for its potable water service. Due to the impacts of the COVID-19 pandemic, the District decided to delay its planned implementation of updated water rates from June 2020 to January 2022.

The major objectives of the Study are to:

- » Develop a proposed five-year financial plan for the District's Water Fund that sufficiently funds operating and capital expenses, maintains adequate reserves, and meets debt coverage requirements
- » Perform a cost of service analysis for potable water service
- » Develop a five-year schedule of potable water rates that meet Proposition 218 requirements
- » Develop drought rates to be implemented during declared water shortage stages as defined by the District's Water Supply Shortage Contingency Plan
- » Draft a report that demonstrates the nexus between the District's costs and proposed rates to meet the requirements of Proposition 218

## 1.2 RATE STUDY PROCESS

This study and analysis were guided by industry standard principles discussed in the American Water Works Association's Manual M1, although the proposed financial plan and rates are based on the District's particular circumstances and unique requirements under California law. The overall rate study process is outlined below:

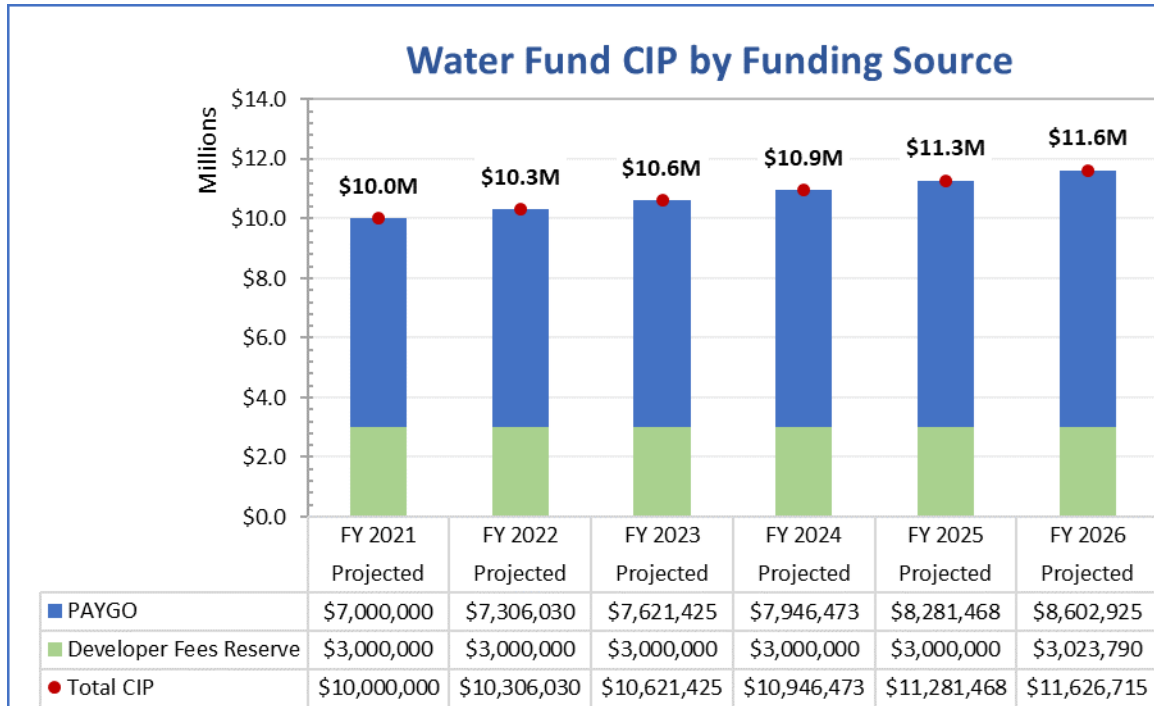
1. **Financial Plan Analysis:** Develop cash flow projections for the District's Water Fund to determine the annual amount of revenue required from water rates over the next five fiscal years (FY 2022-FY 2026).
2. **Cost of Service Analysis:** Allocate costs to system components and then to various customer classes based on user characteristics.
3. **Rate Design:** Develop rates that generate sufficient revenues based on the results of the financial plan and cost of service analyses.
4. **Report Preparation:** Develop a report to document the results of the rate study.
5. **Rate Adoption:** Proposed rates may be adopted by the District's Board of Directors only after holding a public hearing in accordance with Proposition 218 requirements.

## 1.3 FINANCIAL PLAN

Raftelis worked closely with District staff to develop assumptions necessary to project cash flow, reserve balance, and debt coverage for the Water Fund through FY 2026. This included the projection

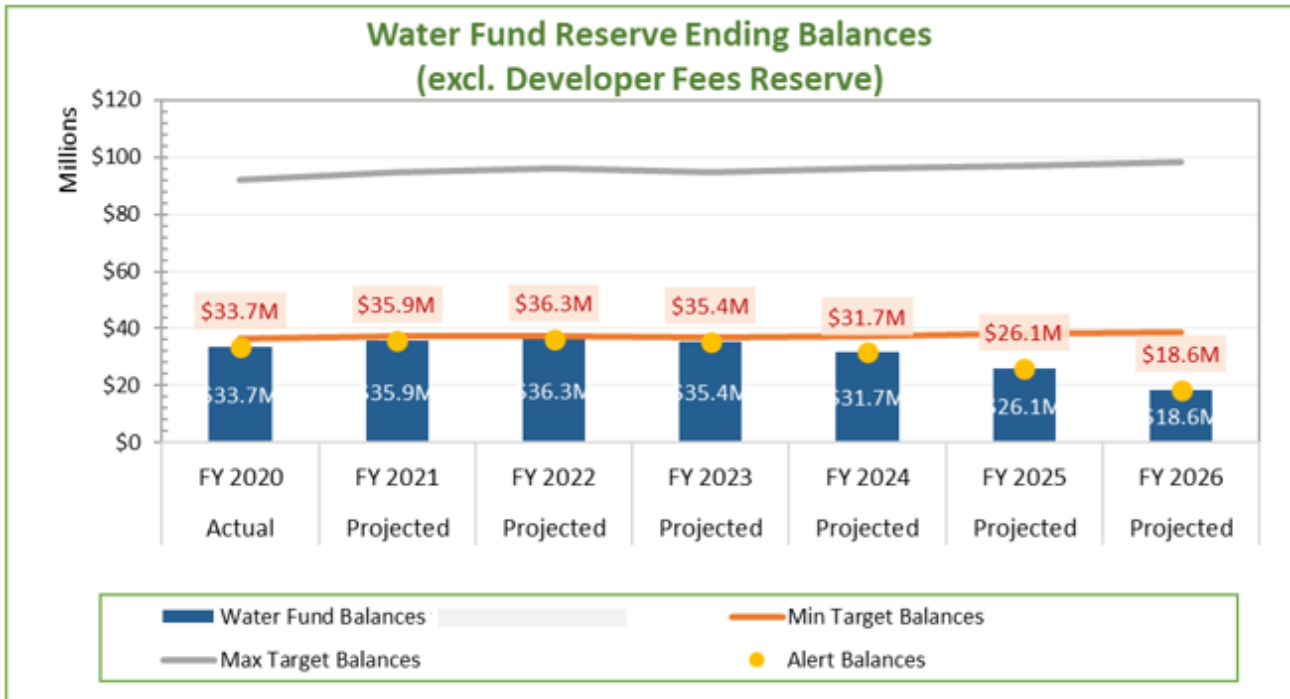
of revenues, O&M expenses, debt service, and Capital Improvement Project (CIP) expenditures over the study period. A fundamental driver of financial plan results is the assumed level of CIP expenditures in each year. Figure 1-1 below shows assumed CIP expenditures by funding source through FY 2026. District staff directed Raftelis to assume \$10 million in annual CIP expenditures before accounting for cost inflation. Annual increases in CIP expenditures shown below are solely due to assumed cost inflation. Approximately \$3 million in annual Water Fund CIP is assumed to be funded by the Developer Fees Reserve. All remaining CIP is assumed to be cash funded by water rates. It is assumed that no new debt will be issued to finance CIP projects through FY 2026.

**Figure 1-1: Estimated Annual CIP Funding**



Raftelis first conducted a “status quo” cash flow analysis to evaluate whether existing water rates currently in effect are adequate to fund the Water Fund’s expenses, maintain sufficient reserves, and meet debt coverage requirements through FY 2026. Figure 5-2 shows the results of the status quo financial plan analysis. Projected ending balances are shown relative to minimum and maximum reserve targets (based on the District’s Policy No. 1.3 [Reserve & Financial Benchmark Policy]). Figure 5-2 demonstrates that in the absence of any rate increases over the next five fiscal years, reserves are projected to fall below the minimum target amount in each year. By the end of FY 2026, reserves are projected to drop significantly from over \$33 million at the beginning of the study period to less than \$19 million. Additionally, parity obligation debt coverage is projected to fall below the required ratio in FY 2026.

Figure 1-2: Status Quo Financial Plan



The status quo financial plan analysis clearly demonstrates that revenue adjustments (i.e., increases in water rate revenues relative to the status quo) are necessary over the next five years to adequately fund Water Fund expenses, maintain sufficient reserve levels, and meet debt coverage requirements. Raftelis worked closely with District staff to identify financial plan options for the District’s Board of Directors to consider. After close consideration of multiple options, the District’s Board of Directors and Finance Committee directed District staff to proceed with the proposed revenue adjustments presented below in Table 1-1. Revenue adjustments are shown as annual percent increases in rate revenue, and represent incremental increases in rate revenue collected as a result of proposed rate increases. The proposed financial plan provides for 2.8 percent annual revenue adjustments each year beginning in FY 2022. All revenue adjustments are proposed to be implemented in January of each fiscal year.

Table 1-1: Proposed Water Revenue Adjustments

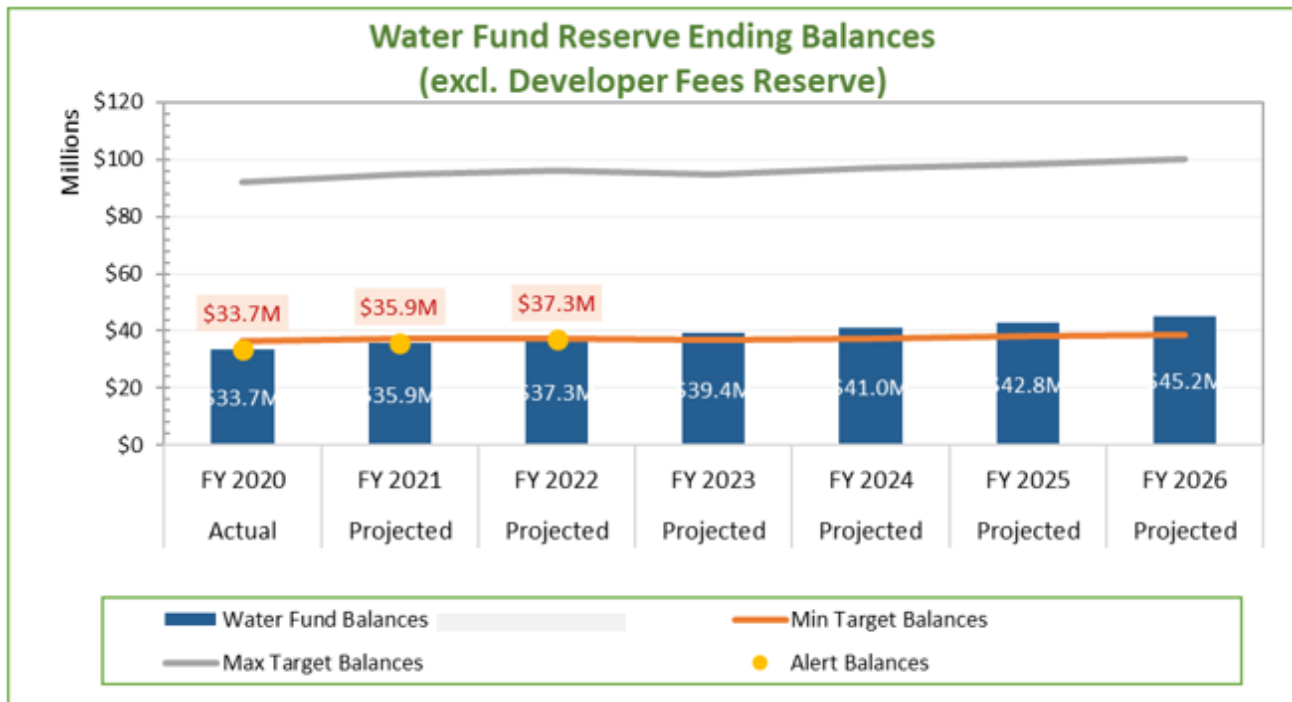
Fiscal Year	Effective Date	Water Fund Revenue Adjustments
<b>FY 2022</b>	January 1, 2022	2.8%
<b>FY 2023</b>	January 1, 2023	2.8%
<b>FY 2024</b>	January 1, 2024	2.8%
<b>FY 2025</b>	January 1, 2025	2.8%
<b>FY 2026</b>	January 1, 2026	2.8%

The proposed revenue adjustments shown below are exclusive of pass-through adjustments. The District may implement pass-through adjustments each year to recover incremental cost increases for

water supplied from the Metropolitan Water District of Southern California (MWD). These pass-through adjustments may be recovered from customers via MWD Surcharges and a newly proposed IEUA Fixed Surcharge (see Section 1.5 for details).

Figure 1-3 shows projected Water Fund ending balances with the inclusion of proposed revenue adjustments. Under the proposed financial plan, reserves are projected to meet the minimum target amount in each year beginning in FY 2023. Additionally, all debt coverage requirements are projected to be met in each year. Customer affordability was a significant reason why higher revenue adjustments were not proposed, especially in light of economic hardships resulting from the COVID-19 pandemic.

**Figure 1-3: Proposed Financial Plan**



## 1.4 CURRENT WATER RATE STRUCTURE

The District’s current water rate structure consists of the following rates and charges:

- » **Fixed Charges:**
  - **Meter Service Charge:** Monthly fixed charge paid by all customers; varies based on water meter size.
  - **Fire Line Service Charge:** Monthly fixed charge paid only by customers with a dedicated private fire line; varies based on fire line connection size.
- » **Variable Rates:**
  - **Commodity Rates:** Volumetric rates are charged per hundred cubic feet (hcf) of water delivered per billing period. All customers excluding Temporary (i.e., construction) are subject to a four-tier commodity rate structure. Tier allotments vary by meter size in proportion to hydraulic capacity. Temporary customers are subject to a uniform commodity rate of \$4.70.

- **MWD Surcharge:** All water use is subject to a uniform MWD Surcharge per hcf of water delivered. The MWD Surcharge is designed to recover additional increases in variable MWD water supply costs relative to projected costs from the prior rate study.

## 1.5 PROPOSED CHANGES TO WATER RATE STRUCTURE

Raftelis worked closely with District staff to evaluate the need for revisions to the District’s current water rate structure. After careful consideration, the following three changes to the District’s current rate structure are proposed:

1. Revised tier definitions based on updated water supply and demand assumptions
2. Elimination of MWD Surcharges for Tier 1 and Tier 2 water use
3. Implementation of a new “Fixed IEUA Surcharge” to recover IEUA and MWD fixed water supply costs

### 1.5.1 Revised Tier Definitions

Table 1-2 shows the existing monthly tier allotments by meter size. The current Tier 1 allotment was designed to provide for basic indoor water needs; Tier 2 was designed to provide sufficient water for landscaping; Tier 3 was designed to represent moderate to high water use, and Tier 4 was designed to apply to the top 15 percent of residential water use.

**Table 1-2: Current Monthly Tier Definitions by Meter Size**

Meter Size	Current Tier 1 (hcf)	Current Tier 2 (hcf)	Current Tier 3 (hcf)	Current Tier 4 (hcf)
3/4"	0-5	6-20	21-50	>50
1"	0-9	10-34	35-84	>84
1 1/2"	0-17	18-67	68-167	>167
2"	0-27	28-107	108-267	>267
3"	0-50	51-200	201-500	>500
4"	0-84	85-334	335-834	>834
6"	0-167	168-667	668-1667	>1667
8"	0-267	268-1067	1068-2667	>2667
10"	0-400	401-1600	1601-4000	>4000
12"	0-600	601-2400	2401-6000	>6000

Raftelis worked with District staff to develop revised monthly tier definitions based on updated water supply and demand assumptions. Table 1-3 shows revised monthly tier allotments based on the proposed changes. The proposed basis for each monthly tier definition is as follows:

- » **Tier 1 Monthly Allotment:** Designed such that projected Tier 1 water use would approximately equal the water supply availability of the District’s least expensive water supply sources (surface water and Cucamonga Groundwater Basin).
- » **Tier 2 Monthly Allotment:** Designed such that projected Tier 2 water use would approximately equal the water supply availability from the District’s next most affordable water supply source (Chino Groundwater Basin).

- » **Tier 3 Monthly Allotment:** Designed such that the available MWD Tier 1 water supply is apportioned to all customers evenly on an equivalent meter unit basis.
- » **Tier 4 Monthly Allotment:** All water use in excess of Tier 3.

**Table 1-3: Revised Monthly Tier Definitions by Meter Size**

Meter Size	Revised Tier 1 (hcf)	Revised Tier 2 (hcf)	Revised Tier 3 (hcf)	Revised Tier 4 (hcf)
3/4"	0-6	7-18	19-36	> 36
1"	0-10	11-30	31-60	> 60
1 1/2"	0-20	21-60	61-120	> 120
2"	0-32	33-96	97-192	> 192
3"	0-64	65-192	193-384	> 384
4"	0-100	101-300	301-600	> 600
6"	0-200	201-600	601-1,200	> 1,200
8"	0-320	321-960	961-1,920	> 1,920
10"	0-480	481-1,440	1,441-2,880	> 2,880
12"	0-675	676-2,025	2,026-4,050	> 4,050

### 1.5.2 Proposed Changes to MWD Surcharge

The District has utilized MWD Surcharges since 2010 to pass through increases in MWD water supply costs to District customers. As a result of this rate study, the MWD Surcharge will be reset in January 2022 based on the incremental increase in the MWD Tier 1 rate in 2022 relative to the current rate of \$777 per acre-foot (AF). MWD Surcharges will continue to be utilized by the District over the study period to pass through increases in variable MWD water supply costs. All water use is currently subject to the District’s existing MWD Surcharge. However, the revised tier definitions attribute imported water supplies from MWD to customer water use within Tier 3 and Tier 4. Therefore, Raftelis recommends that water use falling within Tier 1 and Tier 2 be exempted from MWD Surcharge rates beginning in January 2022. Under the proposed change, only Tier 3, Tier 4, and Temporary water use would be subject to MWD Surcharge rates implemented through FY 2026.

### 1.5.3 Proposed Introduction of New IEUA Fixed Surcharge

As described above, the District will continue to utilize MWD Surcharges to ensure sufficient cost recovery of variable MWD water supply costs. Because future MWD cost increases over the next five years are uncertain and beyond the control of the District, pass-through mechanisms such as the MWD Surcharge are an effective tool to mitigate the risk posed by uncertain wholesale water supply costs in the future. The District faces similar risk due to the future cost uncertainty of fixed IEUA and MWD water supply costs. Therefore, Raftelis proposes that a new pass-through mechanism be introduced to recover actual increases in fixed IEUA and MWD water supply costs.

Fixed IEUA and MWD water supply costs consist of three specific charges paid by the District to the Inland Empire Utilities Agency: IEUA Meter Equivalent Unit (MEU), MWD Capacity, and MWD TYRA Charges. Raftelis proposes the introduction of a new monthly fixed charge to recover these MWD and IEUA fixed supply costs each year. This newly proposed charge, which all water meters will be subject to in addition to the existing monthly Meter Service Charge, is referred to as the “IEUA Fixed

Surcharge.” The new IEUA Fixed Surcharge will increase with meter size in proportion to meter capacity in the exact same manner as with Meter Service Charges. Beyond FY 2022, the IEUA Fixed Surcharge will be increased by the amount necessary to recover actual increases in fixed MWD and IEUA water supply costs.

## 1.6 PROPOSED WATER RATES

Raftelis developed a proposed five-year schedule of water rates based the proposed revenue adjustments from the financial plan analysis as well as the updated cost of service analysis. Proposed rates and charges are shown below in Table 1-4 through Table 1-8. All proposed FY 2022 rates are calculated based on the results of the cost of service analysis. Proposed Meter Service Charges, Fire Line Service Charges, and Commodity Rates beyond FY 2022 are calculated by increasing the prior year rate by 2.8 percent (i.e., the proposed annual revenue adjustment). IEUA Fixed Surcharges and MWD Surcharges beyond FY 2022 will depend on MWD water supply pass-through costs, and therefore cannot yet be determined.

**Table 1-4: Proposed Five-Year Schedule of Monthly Meter Service Charges**

Meter Size	Current	Proposed FY 2022 (Jan. 2022)	Proposed FY 2023 (Jan. 2023)	Proposed FY 2024 (Jan. 2024)	Proposed FY 2025 (Jan. 2025)	Proposed FY 2026 (Jan. 2026)
3/4"	\$25.00	\$25.30	\$26.01	\$26.74	\$27.49	\$28.26
1"	\$41.67	\$40.08	\$41.21	\$42.37	\$43.56	\$44.78
1.5"	\$83.34	\$77.02	\$79.18	\$81.40	\$83.68	\$86.03
2"	\$133.34	\$121.36	\$124.76	\$128.26	\$131.86	\$135.56
3"	\$250.00	\$239.59	\$246.30	\$253.20	\$260.29	\$267.58
4"	\$416.67	\$372.60	\$383.04	\$393.77	\$404.80	\$416.14
6"	\$833.34	\$742.08	\$762.86	\$784.23	\$806.19	\$828.77
8"	\$1,333.34	\$1,185.44	\$1,218.64	\$1,252.77	\$1,287.85	\$1,323.91
10"	\$2,000.00	\$1,776.59	\$1,826.34	\$1,877.48	\$1,930.05	\$1,984.10
12"	\$3,000.00	\$2,497.07	\$2,566.99	\$2,638.87	\$2,712.76	\$2,788.72

**Table 1-5: Proposed IEUA Fixed Surcharges**

Meter Size	Current	Proposed FY 2022 (Jan. 2022)	Proposed FY 2023 (Jan. 2023)	Proposed FY 2024 (Jan. 2024)	Proposed FY 2025 (Jan. 2025)	Proposed FY 2026 (Jan. 2026)
3/4"	N/A	\$3.52	TBD	TBD	TBD	TBD
1"	N/A	\$5.87	TBD	TBD	TBD	TBD
1.5"	N/A	\$11.70	TBD	TBD	TBD	TBD
2"	N/A	\$18.72	TBD	TBD	TBD	TBD
3"	N/A	\$37.43	TBD	TBD	TBD	TBD
4"	N/A	\$58.47	TBD	TBD	TBD	TBD
6"	N/A	\$116.91	TBD	TBD	TBD	TBD
8"	N/A	\$187.04	TBD	TBD	TBD	TBD
10"	N/A	\$280.55	TBD	TBD	TBD	TBD
12"	N/A	\$394.52	TBD	TBD	TBD	TBD

**Table 1-6: Proposed Five-Year Schedule of Monthly Fire Line Service Charges**

Connection Size	Current	Proposed FY 2022 <i>(Jan. 2022)</i>	Proposed FY 2023 <i>(Jan. 2023)</i>	Proposed FY 2024 <i>(Jan. 2024)</i>	Proposed FY 2025 <i>(Jan. 2025)</i>	Proposed FY 2026 <i>(Jan. 2026)</i>
2"	\$9.20	\$3.37	\$3.47	\$3.57	\$3.67	\$3.78
3"	\$13.80	\$3.82	\$3.93	\$4.05	\$4.17	\$4.29
4"	\$18.40	\$4.59	\$4.72	\$4.86	\$5.00	\$5.14
6"	\$27.60	\$7.38	\$7.59	\$7.81	\$8.03	\$8.26
8"	\$36.80	\$12.17	\$12.52	\$12.88	\$13.25	\$13.63
10"	\$46.00	\$19.38	\$19.93	\$20.49	\$21.07	\$21.66

**Table 1-7: Proposed Five-Year Schedule of Commodity Rates (\$/hcf)**

Customer Class/Tier	Current (excl. MWD Surcharge)	Proposed FY 2022 <i>(Jan. 2022)</i>	Proposed FY 2023 <i>(Jan. 2023)</i>	Proposed FY 2024 <i>(Jan. 2024)</i>	Proposed FY 2025 <i>(Jan. 2025)</i>	Proposed FY 2026 <i>(Jan. 2026)</i>
Tier 1	\$1.62	\$1.67	\$1.72	\$1.77	\$1.82	\$1.88
Tier 2	\$2.16	\$2.07	\$2.13	\$2.19	\$2.26	\$2.33
Tier 3	\$2.71	\$3.55	\$3.65	\$3.76	\$3.87	\$3.98
Tier 4	\$3.07	\$3.76	\$3.87	\$3.98	\$4.10	\$4.22
Temporary	\$4.70	\$3.76	\$3.87	\$3.98	\$4.10	\$4.22

**Table 1-8: Proposed Five-Year Schedule of MWD Surcharges (\$/hcf)**

Customer Class/Tier	Current	Proposed FY 2022 <i>(Jan. 2022)</i>	Proposed FY 2023 <i>(Jan. 2023)</i>	Proposed FY 2024 <i>(Jan. 2024)</i>	Proposed FY 2025 <i>(Jan. 2025)</i>	Proposed FY 2026 <i>(Jan. 2026)</i>
Tier 1	\$0.29	N/A	N/A	N/A	N/A	N/A
Tier 2	\$0.29	N/A	N/A	N/A	N/A	N/A
Tier 3	\$0.29	TBD	TBD	TBD	TBD	TBD
Tier 4	\$0.29	TBD	TBD	TBD	TBD	TBD
Temporary	\$0.29	TBD	TBD	TBD	TBD	TBD

## 1.7 CUSTOMER BILL IMPACTS

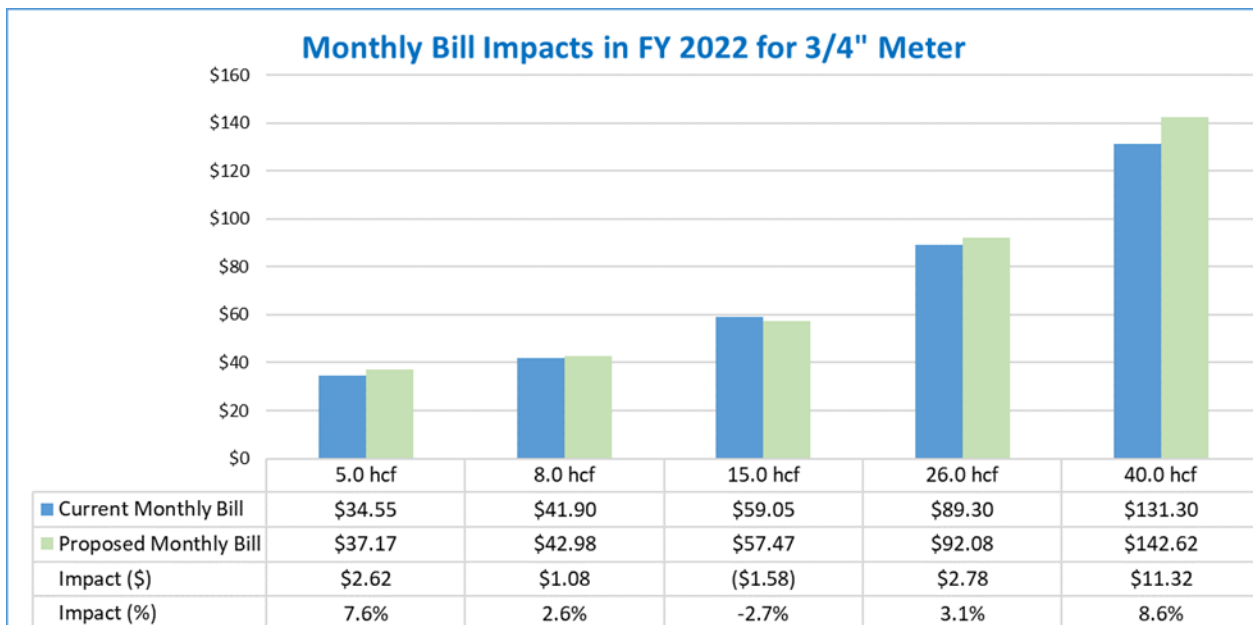
Figure 1-4 shows sample monthly water bills for single family residential customers with a 3/4-inch water meter at varying levels of water use under both current rates and proposed FY 2022 rates. The five different levels of monthly water use represent the following for 3/4-inch water meters based on actual FY 2019 billing data:

- » **10<sup>th</sup> percentile:** 5 hcf per month
- » **25<sup>th</sup> percentile:** 8 hcf per month
- » **Median:** 15 hcf per month
- » **75<sup>th</sup> percentile:** 26 hcf per month
- » **90<sup>th</sup> percentile:** 40 hcf per month

Current monthly bills include Meter Service Charges and Commodity rates. Proposed monthly bills include Meter Service Charges, IEUA Fixed Surcharges, and Commodity Rates. Different customers will experience differential bill increases in FY 2022 due to the impacts of the updated cost of service analysis. For example, residential customers with a 3/4-inch meter using 5 hcf per month benefit from the decreased Tier 1 Commodity Rate, but are disproportionately impacted by the increase in 3/4-inch fixed charges (Meter Service Charge and IEUA Fixed Surcharge).

Beyond FY 2022, Meter Service Charges and Commodity Rates will increase by 2.8 percent for all customers based on the proposed revenue adjustments. Fixed IEUA Surcharges and MWD Surcharge increases will depend on actual pass-through costs. Therefore, total monthly bills beyond FY 2022 cannot yet be precisely calculated.

**Figure 1-4: Typical Residential Customer Bill Impacts**



## 1.8 PROPOSED DROUGHT RATES

The District currently has a Water Supply Shortage Contingency Plan (WSSCP) in effect that specifies mandatory water use reductions for nine distinct stages. Each subsequent stage consists of progressively larger mandatory water use reductions. Water use reductions are only required when the District’s Board of Directors formally declares that a specific stage is in effect.

Periods of reduced water use can negatively impact the District’s financial health by decreasing the amount of variable rate revenue generated by Commodity Rates. To reduce this risk, the District developed “drought rates” during the prior rate study. Drought rates are only implemented during declared WSSCP stages. Under the existing drought rate structure, Commodity Rates per hcf increase with each subsequent stage. The purpose of increasing Commodity Rates during declared WSSCP stages is to recover reductions in net revenue resulting from decreased water use.

District staff directed Raftelis to develop a revised system of drought rates as part of this rate study. Under the revised system of drought rates presented below, Commodity Rates do not vary by stage. Alternatively, Raftelis proposes that tier definitions (i.e., monthly tier allotments in hcf) be reduced for each subsequent WSSCP stage. By reducing monthly tier allotments during declared WSSCP stages, water use charged at lower tier rates will effectively be charged at higher tier rates, thus recovering reduced rate revenue resulting from decreased water use.

The proposed tier adjustments for 3/4-inch water meters are shown in Table 1-9. The tier adjustments are designed to offset decreases in net revenue resulting from required water use reductions at each stage. Under the proposed system of drought rates, Tier 3 is effectively eliminated beginning in Stage 1. The Tier 2 allotment is then increasingly reduced with each progressive stage until it is effectively eliminated beginning in Stage 6. The Tier 1 allotment is not reduced until Stage 7. Tier allotments at each stage for all meter sizes larger than 3/4-inch are increased in proportion to meter capacity (which is consistent with how non-drought tier allotments are determined).

**Table 1-9: Proposed Tier Adjustments by WSSCP Stage – 3/4" Water Meters**

WSSCP Stage	Required Water Use Reduction	Tier 1 (hcf)	Tier 2 (hcf)	Tier 3 (hcf)	Tier 4 (hcf)
<b>Normal Conditions</b>	<i>0% reduction</i>	0-6	7-18	19-36	> 36
<b>Stage 1</b>	<i>10% reduction</i>	0-6	7-14	N/A	> 14
<b>Stage 2</b>	<i>15% reduction</i>	0-6	7-12	N/A	> 12
<b>Stage 3</b>	<i>20% reduction</i>	0-6	7-10	N/A	> 10
<b>Stage 4</b>	<i>25% reduction</i>	0-6	7-9	N/A	> 9
<b>Stage 5</b>	<i>30% reduction</i>	0-6	7-7	N/A	>7
<b>Stage 6</b>	<i>35% reduction</i>	0-6	N/A	N/A	> 6
<b>Stage 7</b>	<i>40% reduction</i>	0-5	N/A	N/A	>5
<b>Stage 8</b>	<i>50% reduction</i>	0-4	N/A	N/A	>4
<b>Stage 9</b>	<i>&gt;50% reduction</i>	0-3	N/A	N/A	> 3

## 2. INTRODUCTION

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### 2.1 BACKGROUND

The Cucamonga Valley Water District (District) is an independent special district that provides water, wastewater, and recycled water service to approximately 200,000 residents in the western area of San Bernardino County. The District was incorporated on March 25, 1955, and is governed by a five-member, elected Board of Directors. The District's service area includes the City of Rancho Cucamonga, portions of the cities of Upland, Ontario, and Fontana, and some unincorporated areas of San Bernardino County.

Public water utilities in California regularly perform a cost of service analysis to ensure that customers are appropriately charged for water service commensurate with the cost to provide service. The District's last cost of service study established proposed water rates over a four-year period for fiscal year (FY) 2016 through FY 2019. No rate increases have been implemented since the last year of adopted rates went into effect in FY 2019. The District retained Raftelis in late 2019 to conduct a comprehensive cost of service and rate design study for its potable water services. Due to the impacts of the COVID-19 pandemic, the District decided to delay its planned implementation of updated water rates from June 2020 to January 2022.

The major objectives of the Study are to:

- » Develop a proposed five-year financial plan for the District's Water Fund that sufficiently funds operating and capital expenses, maintains adequate reserves, and meets debt coverage requirements
- » Perform a cost of service analysis for the District's potable water services
- » Develop a five-year schedule of potable water rates that meet Proposition 218 requirements
- » Develop drought rates to be implemented during declared water shortage stages as defined by the District's Water Supply Shortage Contingency Plan
- » Develop an administrative record (i.e., this report) that demonstrates the nexus between the District's costs and rates to meet the requirements of Proposition 218

This 2021 Multi-Year Water Rate Study Report (Report) details the key calculations and results related to the development of the proposed Water Fund financial plan, cost of service analysis, and five-year water rate schedule.

### 2.2 KEY INFORMATION USED IN THE STUDY

The Study utilized the following key information provided by the District:

1. Actual water use by billing period for FY 2019 (July 1, 2018 to June 2019) for each potable water account served within the District's service area. Detailed account-level water use was performed for FY 2019, which was identified as an appropriate representative year in terms of water use patterns.
2. Summary of water meter counts by meter size, private fire line counts by connection size, and actual water use by tier for FY 2020.
3. FY 2020-FY 2022 operating budget for the Water Fund.

4. Detailed schedule of annual debt service payments through FY 2026.
5. District staff estimates of annual Capital Improvement Project (CIP) expenditures through FY 2026.
6. Detailed list of Water Fund capital assets.
7. Systemwide fire flow requirements from the District's 2017 Water System Master Plan.
8. Current Water Fund reserve policy.
9. Beginning Water Fund balance as of July 1, 2020 (FY 2021).

## 2.3 LEGAL DISCLAIMER

In performance of the services, it is understood that the District and/or others may supply Raftelis with certain information and/or data, and that Raftelis will rely on such information. The accuracy of such information is not within Raftelis 's control and Raftelis shall not be liable for its accuracy, nor for its verification, except to the extent that such verification is expressly a part of Raftelis 's scope of services. Raftelis' opinions, estimates, projections, and forecasts of current and future costs, revenues, other levels of any sort, and events shall be made on the basis of available information and Raftelis' expertise and qualifications as professional rate consultants. Raftelis does not warrant or guarantee that its opinions, estimates, projections, or forecasts will not vary from the District's estimates or forecasts or from actual outcomes. Raftelis identifies costs, allocates costs to customer classes, and develops rate models. It does not establish rates, which is the legislative responsibility of the District.

## 3. LEGAL FRAMEWORK AND RATE SETTING METHODOLOGY

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### 3.1 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 for fairness of the fees, as they relate to public water service, are as follows:

1. A property-related charge (such as water and recycled 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. No fee or charge may be imposed for general governmental services including, but not limited to, police, fire, ambulance or library services, where the service is available to the public at large in substantially the same manner as it is to property owners.
6. 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 AWWA's *Principles of Water Rates, Fees, and Charges: Manual of Water Supply Practices M1*, 6<sup>th</sup> edition (*M1 Manual*), "water rates and charges should be recovered from classes of customers in proportion to the cost of serving those customers." Proposition 218 requires that water rates cannot be "arbitrary and capricious," meaning that the rate-setting methodology must be sound and that there must be a nexus between the costs and the rates charged. This study follows industry standard rate setting methodologies set forth by the M1 Manual, adhering to Proposition 218 requirements by developing rates that do not exceed the proportionate cost of providing water services.

### 3.2 COST-BASED RATE-SETTING METHODOLOGY

The costs of water service should be recovered from classes of customers in proportion to the cost of serving those customers. To develop water rates that comply with Proposition 218 and industry standards while meeting other goals and objectives of the District, Raftelis conducted a detailed analysis based on the steps outlined below:

#### **Financial Plan Development**

The rate-making process begins with the development of a multi-year financial plan. The financial plan projects annual revenues under existing rates as well as various revenue requirements including operating expenses, capital expenditures, and reserve funding. If existing rates generate revenues that are insufficient to adequately fund all revenue requirements, the appropriate magnitude of annual

“revenue adjustments” (i.e., rate increases) is evaluated. The key result of the multi-year financial plan is the amount of revenue from water rates required each year to adequately fund all revenue requirements.

### **Cost of Service Analysis**

The annual cost of providing water service is distributed among customer classes commensurate with their service requirements. A cost of service analysis involves the following tasks:

1. **Calculate revenue requirement:** The cost of service process starts by determining the test year (rate-setting year) revenue requirement, which for this study is FY 2020.
2. **Functionalize costs:** Operating and capital costs are categorized based on function. Examples of functions are supply, treatment, transmission, distribution, storage, meter service, and customer service.
3. **Allocate functionalized costs to cost causation components:** Functionalized costs are next allocated to cost causation components. Examples of cost causation components include supply, base delivery, maximum day, maximum hour<sup>1</sup>, conservation, meter service, and customer service.
4. **Distribute cost causation components:** The portion of the total rate revenue requirement attributed to each cost causation component is allocated to customers in proportion to their demands on and use of the water system.

A cost of service analysis considers both the average quantity of water consumed (base costs) and the peak rate at which it is consumed (peaking or capacity costs as identified by maximum day and maximum hour demands). Peaking costs are costs that are incurred during times of peak water consumption. There are additional costs associated with designing, constructing, operating, and maintaining facilities to meet peak demands. These peak demand costs need to be allocated to those imposing such costs on the water system. In other words, not all customer classes share the same responsibility for peaking-related costs.

### **Rate Design and Calculations**

Proposed rates are calculated based on the results of the proposed financial plan and cost of service analysis. Within the legal framework and industry standards, properly designed rates should support and optimize a blend of various utility objectives, such as promoting water conservation, affordability for essential needs, and revenue stability among other objectives. Rates may also act as a public information tool in communicating policy objectives to customers.

### **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. Proposed rates may not be implemented until formal adoption by the District’s Board of Directors after a public hearing. Proposition 218 requires that the District’s customers must be mailed a public hearing notice detailing any proposed rate changes no fewer than 45 days before the public hearing date.

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<sup>1</sup> Maximum day and maximum hour costs are collectively referred to as peaking costs or capacity costs.

## 4. FINANCIAL POLICIES

### 4.1 RESERVE POLICY

A reserve policy is a written document that establishes reserve goals and targets. It provides guidelines for sound financial management with an overall long-range perspective to maintain financial solvency and mitigate financial risks associated with revenue instability, volatile capital costs, and emergencies. Adopting and adhering to a sustainable reserve policy enhances financial management transparency and can help achieve or maintain a preferred credit rating for future debt issues. Reserves can offset unanticipated reductions in revenues, fluctuations in costs, and fiscal emergencies such as revenue shortfalls, asset failure, and natural disaster. Capital reserves set funds aside for capital asset replacement as well as for new capital projects.

The appropriate amount of reserves and reserve types are determined by a variety of factors, such as the size of the operating budget, the amount of outstanding debt, the type of rate structure, frequency of customer billing, and risk of natural disaster. However, reserves tend to fall into the following categories: operating reserves, rate stabilization reserves, and capital reserves.

The District's existing reserve policy is shown in Table 4-1 below. Minimum and maximum reserve target levels for various accounts within the Water Fund are shown. Please refer to the District's Policy No. 1.3 (Reserve & Financial Benchmark Policy) for additional detailed information on each reserve component.

**Table 4-1: Current Reserve Policy**

Reserve	Minimum	Maximum
Water Banking Reserve	\$2,500,000	Cost of 5,000AF of MWD Tier II Water
Water Rate Stabilization Reserve	\$2,200,000	25% of Net Operating Revenue from prior fiscal year
Water Operations Reserve	20% of Operating Budget	50% of Operating Budget
Water Capital & Equipment Replacement Reserve	\$13,000,000	\$30,000,000
Water Capital Emergency Reserve	1% of Capital Assets <sup>2</sup>	4% of Capital Assets
Water Admin Capital Reserve	\$1,500,000	Inflated minimum
Local Water Resource Development Reserve	\$2,000,000	\$5,000,000

### 4.2 DEBT COVERAGE

The District is required to meet debt coverage requirements on its outstanding Water Fund debt. The required debt coverage ratio on senior obligation debt is 1.10, meaning that the Water Fund's net operating revenues (i.e. total revenues less operating expenses) must amount to at least 1.10 times the amount of annual senior obligation debt service. The required debt coverage ratio on parity obligation debt is 1.25. Failure to meet debt service coverage may result in technical default, which without

<sup>2</sup> Total capital asset value estimated at \$389.3 million.

foreseeable remedial action such as implementing rate increases, could result in a downgrade of credit rating, higher costs in future debt issuance, or even denial of credit.

Although not a formal requirement based on official debt agreements, the District also has a policy stating that the target debt coverage shall be 2.25. This target includes all debt service, including both senior and parity obligation debt.

**Table 4-2: Debt Coverage Requirements and Targets**

Description	Debt Coverage Ratio
<b>Official Requirement</b>	
Senior Obligation	1.10
Parity Obligation	1.25
<b>District Policy Target</b>	
All Debt	2.25

# 5. FINANCIAL PLAN

The financial plan provides multi-year financial projections for the Water Fund based on projected revenues, operations & maintenance (O&M) expenses, Capital Improvement Plan (CIP) expenditures, and debt service payments. The primary results of the financial plan include annual cash flow, reserve balance, and debt coverage projections which determine the amount of water rate revenues required in each year to achieve financial sufficiency. The following subsections describe the assumptions and calculation methodologies used to project revenues, O&M expenses, debt service, CIP expenditures, and reserve targets. The financial plan timeframe spans from FY 2021 through FY 2026. No revenue adjustments (i.e., rate increases) are considered prior to FY 2022 however, as implementation of updated rates is planned to occur beginning in January 2022.

## 5.1 FINANCIAL PLAN ASSUMPTIONS

The financial plan generally incorporates non-rate revenues and O&M expenses directly from the District’s adopted budget for FY 2021 and FY 2022. Exceptions are noted in detail in the following subsections. Beyond FY 2022, the financial plan relies on inflationary assumptions to forecast annual revenues and expenses through FY 2026. Raftelis worked with District staff to develop the inflationary assumptions shown in Table 5-1 based on historical cost increases, indices such as the Consumer Price Index (CPI), and projected values based on industry norms and professional judgement.

Because the District intends to pass through cost increases associated with wholesale imported water from the Metropolitan Water District of Southern California (MWD), the inflationary assumption for MWD supply costs shown below is 0 percent. This acknowledges that the impact of future cost increases in imported water from MWD (paid by the District to MWD) will be offset by pass-through adjustments (paid by the District’s customers to the District).

**Table 5-1: Inflationary Assumptions**

Escalation Factors	Annual Increase
<b>Expenses</b>	
General	3.0%
CPI	2.2%
Salaries	4.0%
Benefits	5.0%
Utilities	4.0%
Water Supply (MWD)	0.0%
Water Supply (Other)	5.0%
Chemical	2.2%
Non-Inflated	0.0%
Capital	3.1%
<b>Revenues</b>	
Miscellaneous Revenue	1.0%
Non-Inflated	0.0%

## 5.2 REVENUES UNDER CURRENT RATES

The District’s current water rate structure consists of the following rates and charges:

- » **Fixed Charges:**
  - **Meter Service Charge:** Monthly fixed charge paid by all customers; varies based on water meter size.
  - **Fire Line Service Charge:** Monthly fixed charge paid only by customers with a dedicated private fire line; varies based on fire line connection size.
- » **Variable Rates:**
  - **Commodity Rates:** Volumetric rates are charged per hundred cubic feet (hcf) of water delivered per billing period. All customers excluding temporary construction are subject to a four-tier commodity rate structure. Tier allotments vary by meter size in proportion to hydraulic capacity. Temporary customers are subject to a uniform commodity rate.
  - **MWD Surcharge:** All water use is subject to a uniform MWD Surcharge per hcf of water delivered. The MWD Surcharge is designed to recover additional increases in variable MWD water supply costs relative to projected costs from the prior rate study.

In order to evaluate the need for water rate increases, annual revenues are first projected over the financial plan study period under a status quo scenario (i.e., no change in the current rates). Table 5-2 shows current monthly Meter Service Charges by meter size as well the projected number of water meters each year over the financial plan study period. Annual increases in the number of water meters were provided by District staff and amount to an average annual increase of approximately 0.2 percent based on projected new development in the District’s service area. Projected monthly Meter Service Charge revenue under current rates is calculated for each meter size as follows:

$$= \text{Current Monthly Charge} \times \text{Number of Water Meters} \times 12 \text{ Billing Periods per Year}$$

**Table 5-2: Current Monthly Meter Service Charges and Projected Number of Water Meters**

Meter Size	Current Monthly Charge	Number of Water Meters					
		FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
3/4"	\$25.00	29,489	29,579	29,713	29,813	29,913	30,013
1"	\$41.67	14,244	14,244	14,244	14,244	14,244	14,244
1.5"	\$83.34	1,310	1,310	1,310	1,310	1,310	1,310
2"	\$133.34	2,292	2,293	2,294	2,294	2,294	2,294
3"	\$250.00	189	189	189	189	189	189
4"	\$416.67	100	100	100	100	100	100
6"	\$833.34	39	39	39	39	39	39
8"	\$1,333.34	64	64	64	64	64	64
10"	\$2,000.00	17	17	17	17	17	17
12"	\$3,000.00	0	0	0	0	0	0
<b>Total Water Meters</b>		<b>47,744</b>	<b>47,835</b>	<b>47,970</b>	<b>48,070</b>	<b>48,170</b>	<b>48,270</b>
<b>Projected Revenue</b>		<b>\$23,834,687</b>	<b>\$23,863,287</b>	<b>\$23,905,087</b>	<b>\$23,935,087</b>	<b>\$23,965,087</b>	<b>\$23,995,087</b>

Table 5-3 shows current monthly Fire Line Service charges by connection size as well the projected number of fire lines each year over the financial plan study period. District staff directed Raftelis to assume no growth in the number of fire lines over the study period. Projected monthly Fire Line Service charge revenue under current rates is calculated for each connection size as follows:

$$= \text{Current Monthly Charge} \times \text{Number of Fire Lines} \times 12 \text{ Billing Periods per Year}$$

**Table 5-3: Current Monthly Fire Line Service Charges and Projected Number of Fire Lines**

Fire Line Size	Current Monthly Charge	Number of Fire Lines					
		FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
2"	\$9.20	67	67	67	67	67	67
3"	\$13.80	2	2	2	2	2	2
4"	\$18.40	115	115	115	115	115	115
6"	\$27.60	398	398	398	398	398	398
8"	\$36.80	599	599	599	599	599	599
10"	\$46.00	229	229	229	229	229	229
<b>Total Fire Lines</b>		<b>1,410</b>	<b>1,410</b>	<b>1,410</b>	<b>1,410</b>	<b>1,410</b>	<b>1,410</b>
<b>Projected Revenue</b>		<b>\$555,864</b>	<b>\$555,864</b>	<b>\$555,864</b>	<b>\$555,864</b>	<b>\$555,864</b>	<b>\$555,864</b>

Table 5-4 shows current Commodity Rates as well as projected water use by tier in each year over the financial plan study period. District staff directed Raftelis to project water use in FY 2021 by increasing FY 2020 actual water use by a 3 percent demand factor before accounting for customer growth. This intermediate result was then increased by the percent increase in water meters in FY 2021 to account for customer growth. Projected annual water use beyond FY 2022 was increased based on customer growth only (i.e., the percent increase in number of water meters). Note that water use by tier shown below is based on current tier allotments rather than revised tier allotments shown in subsequent sections. Projected Commodity Rate revenue under current rates is calculated for each tier as follows:

$$= \text{Current Rate (\$/hcf)} \times \text{Annual Water Use (hcf)}$$

**Table 5-4: Current Commodity Rates and Projected Water Usage**

Tier	Current Rate (\$/hcf)	Water Usage (hcf)					
		FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
Tier 1	\$1.62	4,508,146	4,515,867	4,527,320	4,535,803	4,544,287	4,552,771
Tier 2	\$2.16	7,549,630	7,562,334	7,581,180	7,595,141	7,609,101	7,623,061
Tier 3	\$2.71	4,403,121	4,409,024	4,417,782	4,424,269	4,430,756	4,437,243
Tier 4	\$3.07	2,856,445	2,857,735	2,859,649	2,861,067	2,862,485	2,863,903
Temporary	\$4.70	30,855	30,855	30,855	30,855	30,855	30,855
<b>Total Water Usage</b>		<b>19,348,197</b>	<b>19,375,814</b>	<b>19,416,786</b>	<b>19,447,135</b>	<b>19,477,484</b>	<b>19,507,833</b>
		<b>44,417 AF</b>	<b>44,481 AF</b>	<b>44,575 AF</b>	<b>44,644 AF</b>	<b>44,714 AF</b>	<b>44,784 AF</b>
<b>Projected Revenue</b>		<b>\$44,457,158</b>	<b>\$44,517,064</b>	<b>\$44,605,936</b>	<b>\$44,671,767</b>	<b>\$44,737,598</b>	<b>\$44,803,429</b>

Table 5-5 shows current MWD Surcharge rates as well as total water use (from Table 5-4) in each year over the financial plan study period. Projected commodity rate revenue under current rates is calculated as follows:

$$= \text{Current MWD Surcharge (\$/hcf)} \times \text{Total Annual Water Use (hcf)}$$

**Table 5-5: Current MWD Surcharges and Projected Water Usage**

Tier	Current Rate (\$/hcf)	Water Usage (hcf)					
		FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
All Water Usage	\$0.29	19,348,197	19,375,814	19,416,786	19,447,135	19,477,484	19,507,833
<b>Projected Revenue</b>		<b>\$5,610,977</b>	<b>\$5,618,986</b>	<b>\$5,630,868</b>	<b>\$5,639,669</b>	<b>\$5,648,470</b>	<b>\$5,657,272</b>

Table 5-6 summarizes all Water Fund rate revenues under current rates as calculated in Table 5-2, Table 5-3, Table 5-4, and Table 5-5. This represents the total amount of rate revenue projected to be generated each year over the study period in the absence of any revenue adjustments (i.e., rate increases).

**Table 5-6: Summary of Revenues from Current Rates**

Revenue from Current Rates	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
<b>Fixed Rate Revenue</b>						
Meter Service Charges	\$23,834,687	\$23,863,287	\$23,905,087	\$23,935,087	\$23,965,087	\$23,995,087
Fire Line Service Charges	\$555,864	\$555,864	\$555,864	\$555,864	\$555,864	\$555,864
<b>Subtotal</b>	<b>\$24,390,551</b>	<b>\$24,419,151</b>	<b>\$24,460,951</b>	<b>\$24,490,951</b>	<b>\$24,520,951</b>	<b>\$24,550,951</b>
<b>Variable Rate Revenue</b>						
Commodity Rates	\$44,457,158	\$44,517,064	\$44,605,936	\$44,671,767	\$44,737,598	\$44,803,429
MWD Surcharges	\$5,610,977	\$5,618,986	\$5,630,868	\$5,639,669	\$5,648,470	\$5,657,272
<b>Subtotal</b>	<b>\$50,068,135</b>	<b>\$50,136,050</b>	<b>\$50,236,804</b>	<b>\$50,311,436</b>	<b>\$50,386,068</b>	<b>\$50,460,700</b>
<b>Total</b>	<b>\$74,458,686</b>	<b>\$74,555,202</b>	<b>\$74,697,755</b>	<b>\$74,802,387</b>	<b>\$74,907,019</b>	<b>\$75,011,651</b>

### 5.3 OTHER REVENUES

Projections of all non-rate revenues are shown in Table 5-7. All non-rate revenues shown in FY 2021 and FY 2022 are directly from the District’s adopted budget with the exception of Water Development Fees. District staff directed Raftelis to incorporate reduced Water Development Fee revenue estimates in FY 2021 and FY 2022. Beyond FY 2022, all non-rate revenues are escalated annually by the revenue inflation assumptions (from Table 5-1) with the exception of Water Rights Transfers Agreements, Interest Income, and Water Development Fees. The Water Rights Transfers Agreement revenue is a one-time revenue resource, and therefore does not recur beyond FY 2022. Interest Income beyond FY 2022 was projected by Raftelis multiplying the average annual reserve balance (projected in later

subsections) by an assumed 1.5 percent annual interest rate on cash reserves. Water Development Fee revenue was projected beyond FY 2022 by multiplying the annual number of new water meters (based on projections shown in Table 5-2) by existing Water Development Fees per new connection.

**Table 5-7: Projected Non-Rate Revenues for Water Fund**

Non-Rate Revenues	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
<b>Other Operating Revenues</b>						
Other Water Sales	\$1,842,097	\$1,908,167	\$1,927,249	\$1,946,521	\$1,965,986	\$1,985,646
Water Rights Transfers Agreement	\$4,215,000	\$4,395,000	\$0	\$0	\$0	\$0
Penalty Fees	\$395,100	\$434,900	\$434,900	\$434,900	\$434,900	\$434,900
Misc. Operating Revenues	\$267,900	\$281,400	\$284,214	\$287,056	\$289,927	\$292,826
<b>Subtotal</b>	<b>\$6,720,097</b>	<b>\$7,019,467</b>	<b>\$2,646,363</b>	<b>\$2,668,477</b>	<b>\$2,690,813</b>	<b>\$2,713,372</b>
<b>Non-Operating Revenues</b>						
Rent & Lease Income	\$505,177	\$519,183	\$524,375	\$529,619	\$534,915	\$540,264
Energy Rebates	\$66,000	\$69,000	\$69,000	\$69,000	\$69,000	\$69,000
Misc. Non-Operating Revenues	\$77,100	\$80,900	\$80,900	\$80,900	\$80,900	\$80,900
Interest Income	\$856,800	\$656,400	\$579,348	\$548,278	\$537,410	\$532,137
Water Development Fees	\$2,010,000	\$2,050,000	\$1,270,160	\$911,600	\$911,600	\$911,600
Grants	\$537,280	\$0	\$0	\$0	\$0	\$0
Contribution in Aid	\$70,000	\$74,000	\$74,000	\$74,000	\$74,000	\$74,000
Other Capital Fund Revenues	\$75,000	\$75,000	\$75,000	\$75,000	\$75,000	\$75,000
<b>Subtotal</b>	<b>\$4,197,357</b>	<b>\$3,524,483</b>	<b>\$2,672,782</b>	<b>\$2,288,396</b>	<b>\$2,282,825</b>	<b>\$2,282,901</b>
<b>TOTAL</b>	<b>\$10,917,454</b>	<b>\$10,543,950</b>	<b>\$5,319,145</b>	<b>\$4,956,874</b>	<b>\$4,973,638</b>	<b>\$4,996,273</b>

## 5.4 OPERATIONS AND MAINTENANCE (O&M) EXPENSES

### 5.4.1 Purchased Water Supply Costs

O&M cost projections over the study period are generally calculated by escalating the adopted budget expenses by inflationary assumptions (from Table 5-1), with the notable exception of purchased water supply costs and direct pumping costs. These specific costs are closely related to the quantity of water demanded by customers each year. Therefore, more detailed calculation methodologies are applied to project water supply costs and direct pumping costs to ensure that these key variable O&M costs are consistent with customer water demand assumptions shown in the previous subsection.

Table 5-8 shows the total amount of water supply required after applying an assumed 6 percent water loss factor to total annual water sales (from Table 5-4). District staff provided Raftelis with total expected water availability each year from the following sources: local surface water, groundwater from the Cucamonga Basin, groundwater from the Chino Groundwater Basin (Chino Watermaster), and imported water from MWD (MWD Tier 1). The assumed water supply mix fully utilizes all available surface water, Cucamonga Basin water, and Chino Watermaster water. All remaining supply needs are

assumed to be met by MWD Tier 1 water. Note that the District expects to stay within the MWD Tier 1 threshold throughout the study period. Therefore, no MWD Tier 2 water is shown below. Imported water purchases from MWD are projected to decrease significantly in FY 2023 due to the projected increase in supply availability from the Chino Watermaster.

**Table 5-8: Projected Water Supply by Source**

Description	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
Water Sales	44,417 AF	44,481 AF	44,575 AF	44,644 AF	44,714 AF	44,784 AF
Water Loss (% of water sales)	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%
<b>Water Supply (Demand with Loss)</b>	<b>47,252 AF</b>	<b>47,320 AF</b>	<b>47,420 AF</b>	<b>47,494 AF</b>	<b>47,568 AF</b>	<b>47,642 AF</b>
<b>Water Supply Availability</b>						
Surface Water	2,500 AF	1,500 AF	1,500 AF	1,500 AF	1,500 AF	1,500 AF
Cucamonga Basin	6,205 AF	10,000 AF	10,000 AF	10,000 AF	10,000 AF	10,000 AF
Chino Watermaster	10,295 AF	7,820 AF	15,000 AF	15,000 AF	15,000 AF	15,000 AF
MWD Tier 1	42,600 AF	42,600 AF	42,600 AF	42,600 AF	42,600 AF	42,600 AF
<b>Total</b>	<b>61,600 AF</b>	<b>61,920 AF</b>	<b>69,100 AF</b>	<b>69,100 AF</b>	<b>69,100 AF</b>	<b>69,100 AF</b>
<b>Water Supply to meet Water Demand</b>						
Surface Water	2,500 AF	1,500 AF	1,500 AF	1,500 AF	1,500 AF	1,500 AF
Cucamonga Basin	6,205 AF	10,000 AF	10,000 AF	10,000 AF	10,000 AF	10,000 AF
Chino Watermaster	10,295 AF	7,820 AF	15,000 AF	15,000 AF	15,000 AF	15,000 AF
MWD Tier 1	28,252 AF	28,000 AF	20,920 AF	20,994 AF	21,068 AF	21,142 AF
<b>Total</b>	<b>47,252 AF</b>	<b>47,320 AF</b>	<b>47,420 AF</b>	<b>47,494 AF</b>	<b>47,568 AF</b>	<b>47,642 AF</b>

Table 5-9 shows detailed water supply cost projections over the study period. Fixed water supply costs do not vary based on the quantity of water supplied. Fixed IEUA and MWD water supply costs include a Meter Equivalent Unit Charge (IEUA MEU), Capacity Charge (MWD Capacity), and a third charge based on the ten year rolling average of water deliveries (MWD TYRA). District staff provided Raftelis with IEUA and MWD fixed charge costs for FY 2021 and FY 2022. Because the District plans to pass through all IEUA and MWD fixed water supply cost increases via the newly proposed IEUA Fixed Surcharge (discussed subsequently in Section 6), the three IEUA and MWD fixed water supply charges shown below are held constant beyond FY 2022. Remaining fixed water supply costs include Fontana Union Assessments and DOH Water System Fees. These two fixed charges match the adopted budget for FY 2021 and FY 2022 and are increased in subsequent years based on the “Water Supply (Other)” inflationary factor from Table 5-1.

Variable water supply costs vary based on the quantity of water obtained from each supply source, and include Chino Watermaster assessments and MWD Tier 1 rates. Chino Watermaster variable water supply costs were calculated by multiplying the prior year quantity of water supplied from the Chino Watermaster (AF) by the variable unit cost projections provided by District staff for each year (\$/AF). MWD variable water supply costs were similarly calculated by multiplying annual MWD Tier 1 purchases (AF) by the MWD Tier 1 rate (\$/AF). District staff provided Raftelis with MWD Tier 1 rates for FY 2021 and FY 2022. The Tier 1 rate was held constant beyond FY 2022, as the District intends to

recover any cost increases resulting from MWD Tier 1 rate increases via MWD Surcharges (which function as a direct pass-through of MWD variable cost increases to the District’s customers).

**Table 5-9: Projected Water Supply Costs**

Water Supply Cost Projections	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
<b>Fixed Water Supply Costs</b>						
IEUA MEU	\$1,320,446	\$1,373,760	\$1,373,760	\$1,373,760	\$1,373,760	\$1,373,760
MWD Capacity	\$628,090	\$770,250	\$770,250	\$770,250	\$770,250	\$770,250
MWD TYRA Charge	\$980,440	\$1,176,529	\$1,176,529	\$1,176,529	\$1,176,529	\$1,176,529
Fontana Union Assessments	\$596,000	\$696,000	\$730,800	\$767,340	\$805,707	\$845,992
DOH Water System Fees	\$120,000	\$120,000	\$126,000	\$132,300	\$138,915	\$145,861
<b>Subtotal - Fixed</b>	<b>\$3,644,977</b>	<b>\$4,136,539</b>	<b>\$4,177,339</b>	<b>\$4,220,179</b>	<b>\$4,265,161</b>	<b>\$4,312,392</b>
<b>Variable Water Supply Costs</b>						
<b>Chino Watermaster</b>						
Chino Watermaster Prior Year Supply	13,900 AF	10,295 AF	7,820 AF	15,000 AF	15,000 AF	15,000 AF
Variable Unit Cost	\$104/AF	\$106/AF	\$107/AF	\$107/AF	\$107/AF	\$107/AF
<b>Subtotal - Variable Chino Watermaster</b>	<b>\$1,442,959</b>	<b>\$1,093,535</b>	<b>\$836,740</b>	<b>\$1,605,000</b>	<b>\$1,605,000</b>	<b>\$1,605,000</b>
<b>MWD</b>						
MWD Tier 1 Supply	28,252 AF	28,000 AF	20,920 AF	20,994 AF	21,068 AF	21,142 AF
Variable Unit Cost	\$765/AF	\$777/AF	\$777/AF	\$777/AF	\$777/AF	\$777/AF
<b>Subtotal - Variable MWD</b>	<b>\$21,616,551</b>	<b>\$21,755,958</b>	<b>\$16,254,845</b>	<b>\$16,312,436</b>	<b>\$16,370,026</b>	<b>\$16,427,617</b>
<b>Subtotal - Variable</b>	<b>\$23,059,510</b>	<b>\$22,849,493</b>	<b>\$17,091,585</b>	<b>\$17,917,436</b>	<b>\$17,975,026</b>	<b>\$18,032,617</b>
<b>Total Water Supply Costs</b>	<b>\$26,704,487</b>	<b>\$26,986,031</b>	<b>\$21,268,924</b>	<b>\$22,137,614</b>	<b>\$22,240,187</b>	<b>\$22,345,008</b>

### 5.4.2 Direct Pumping Costs

Direct pumping costs are comprised mainly of electricity costs, which vary based on the quantity of water pumped. Pumping is required to obtain water from groundwater wells (groundwater pumping) and to convey water across elevation gradients (booster pumping). Table 5-10 shows the calculation of direct pumping costs in each year. District staff provided Raftelis with the projected cost per AF in each year for both groundwater pumping and booster pumping.<sup>3</sup> Groundwater pumping costs were calculated by multiplying the quantity of pumped groundwater (AF) by the unit cost (\$/AF). The quantity of groundwater pumped equals the quantity of water supplied from the Cucamonga Basin and

<sup>3</sup> The District projected unit pumping costs by analyzing historical data for water production and electricity costs. The unit cost of pumped groundwater is based on the electricity costs for groundwater well sites and groundwater well production. The unit cost of booster pumping is based on the electricity cost for booster pump sites and total water production from all sources.

the Chino Watermaster (from Table 5-8). Booster pumping costs were calculated by multiplying the total quantity of water supplied from all sources (AF) from Table 5-8 by the unit cost (\$/AF). Total Pumping-Utilities costs equal the sum of groundwater and booster pumping costs.

**Table 5-10: Projected Pumping-Utilities Costs**

Direct Pumping-Utilities Costs	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
<b>Groundwater Pumping</b>						
Pumped Groundwater	16,500 AF	17,820 AF	25,000 AF	25,000 AF	25,000 AF	25,000 AF
Groundwater Electricity Unit Cost	\$127.83/AF	\$131.68/AF	\$136.95/AF	\$142.43/AF	\$148.12/AF	\$154.05/AF
<b>Subtotal</b>	<b>\$2,109,195</b>	<b>\$2,346,538</b>	<b>\$3,423,680</b>	<b>\$3,560,627</b>	<b>\$3,703,052</b>	<b>\$3,851,174</b>
<b>Booster Pumping</b>						
Total Water Supply	47,252 AF	47,320 AF	47,420 AF	47,494 AF	47,568 AF	47,642 AF
Booster Electricity Unit Costs	\$54.06/AF	\$55.69/AF	\$57.92/AF	\$60.23/AF	\$62.64/AF	\$65.15/AF
<b>Subtotal</b>	<b>\$2,554,470</b>	<b>\$2,635,248</b>	<b>\$2,746,453</b>	<b>\$2,860,776</b>	<b>\$2,979,850</b>	<b>\$3,103,873</b>
<b>TOTAL</b>	<b>\$4,663,665</b>	<b>\$4,981,785</b>	<b>\$6,170,133</b>	<b>\$6,421,403</b>	<b>\$6,682,902</b>	<b>\$6,955,047</b>

### 5.4.3 Projected O&M Expenses

Table 5-11 shows a summary of projected annual O&M expenses over the study period. Purchased Water costs were previously calculated in Table 5-9. Note the significant reduction in FY 2021 O&M expenses, due largely to the assumed decrease in imported water purchases from MWD. Pumping-Utilities costs were previously calculated in Table 5-10. All other O&M expenses shown in FY 2021 and FY 2022 are from the District’s adopted budget, with the exception of Advance CalPERS Funding. District staff directed Raftelis to add \$1 million each year for Advance CalPERS Funding. Beyond FY 2022, O&M costs were generally escalated based on the inflationary assumptions shown in Table 5-1, with the following exceptions. District staff advised Raftelis to add in additional costs not reflected in the adopted budget in FY 2022. These additional costs include periodic expenses that don’t recur annually, including expenses associated with District elections (\$103,000 in FY 2023 and \$106,000 in FY 2025) and the next anticipated water rate study (\$100,000 in FY 2026).

**Table 5-11: Projected Water O&M Expenses**

O&M EXPENSES	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
Purchased Water	\$26,704,487	\$26,986,031	\$21,268,924	\$22,137,614	\$22,240,187	\$22,345,008
Pumping - Utilities	\$4,663,665	\$4,981,785	\$6,170,133	\$6,421,403	\$6,682,902	\$6,955,047
Treatment - Utilities/ Materials/ Supplies	\$3,059,400	\$3,108,300	\$3,190,361	\$3,272,883	\$3,357,630	\$3,444,667
Salaries & Wages	\$10,455,223	\$10,892,443	\$11,328,141	\$11,781,266	\$12,252,517	\$12,742,618
District Burden / Benefits	\$6,454,073	\$6,769,792	\$7,108,282	\$7,463,696	\$7,836,880	\$8,228,724
Advance CalPERS Funding	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000
Other O&M Expenses	\$8,253,468	\$8,337,075	\$8,626,658	\$8,714,446	\$9,015,624	\$9,209,020
<b>TOTAL</b>	<b>\$60,590,315</b>	<b>\$62,075,426</b>	<b>\$58,692,498</b>	<b>\$60,791,307</b>	<b>\$62,385,740</b>	<b>\$63,925,084</b>

## 5.5 DEBT SERVICE

District staff provided Raftelis with debt service payment schedules over the financial plan study period. Annual debt service is shown in Table 5-12 for each outstanding debt issue associated with the District’s Water Fund. The financial plan assumes that no new debt will be issued through the end of the study period in FY 2026.

**Table 5-12: Schedule of Current Debt Service**

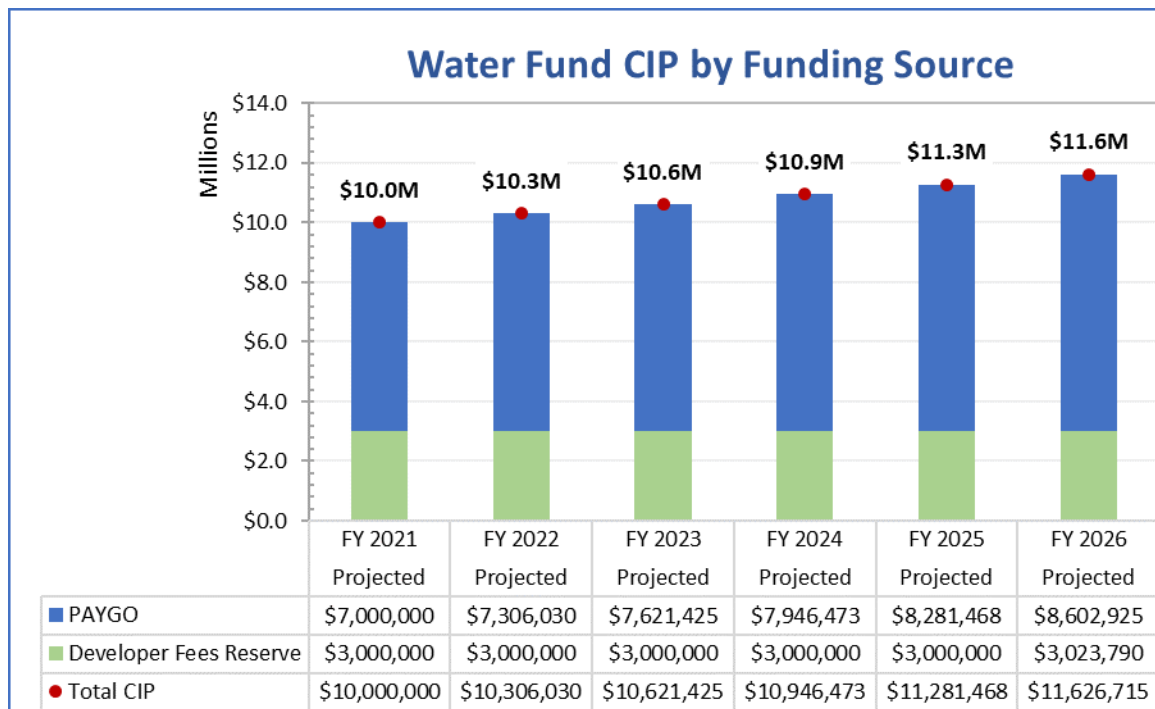
DEBT SERVICE	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
<b>Senior Obligation</b>						
2009 COP	\$2,055,125	\$0	\$0	\$0	\$0	\$0
2009 CREB	\$29,286	\$29,286	\$29,286	\$0	\$0	\$0
2011 Ref Bond	\$1,901,675	\$1,901,375	\$1,892,850	\$2,532,250	\$2,799,000	\$2,791,481
<b>Subtotal</b>	<b>\$3,986,086</b>	<b>\$1,930,661</b>	<b>\$1,922,136</b>	<b>\$2,532,250</b>	<b>\$2,799,000</b>	<b>\$2,791,481</b>
<b>Parity Obligation</b>						
2012 Rev Bond	\$2,273,088	\$2,271,588	\$2,273,588	\$2,273,988	\$2,272,788	\$2,274,888
2014 Rev Bond	\$1,114,288	\$1,115,338	\$1,115,838	\$1,821,213	\$928,338	\$930,338
2016 Rev Bond	\$1,182,138	\$3,015,263	\$3,017,638	\$439,763	\$439,763	\$439,763
2018A Rev Bond	\$401,175	\$401,175	\$401,175	\$401,175	\$401,175	\$401,175
2018B Rev Bond	\$4,567,218	\$4,567,782	\$4,552,967	\$6,200,921	\$6,892,185	\$6,900,903
<b>Subtotal</b>	<b>\$9,537,906</b>	<b>\$11,371,145</b>	<b>\$11,361,204</b>	<b>\$11,137,058</b>	<b>\$10,934,248</b>	<b>\$10,947,065</b>
<b>TOTAL</b>	<b>\$13,523,991</b>	<b>\$13,301,806</b>	<b>\$13,283,340</b>	<b>\$13,669,308</b>	<b>\$13,733,248</b>	<b>\$13,738,546</b>

## 5.6 CAPITAL IMPROVEMENT PLAN (CIP) FUNDING

District Staff directed Raftelis to assume annual CIP expenditures of \$10 million (current dollars) throughout the study period. To account for cost inflation, \$10 million was escalated by 3.1 percent annually based on the “Capital” inflation factor from Table 5-1. Annual CIP expenditures by funding source are shown below in Figure 5-1. All CIP is assumed to be funded by water rates (i.e., pay-as-you-go or PAYGO) or by the Water Fund’s Developer Fees Reserve.

Funding via the Developer Fees Reserve consists both of existing reserves as of the beginning of FY 2021 (shown subsequently in Table 5-13) as well as Water Development Fee revenue generated over the study period (from Table 5-7). Note that all available Developer Fee Reserve funds are assumed to be fully utilized to fund CIP by the end of the study period (subsequently demonstrated in Table 5-15 [Lines 41-44]).

Figure 5-1: Estimated Annual CIP Funding



## 5.7 FY 2021 BEGINNING WATER FUND BALANCE

Raftelis' financial plan cash flow projections begin in FY 2021. District staff therefore provided Raftelis with beginning Water Fund reserve balances for FY 2021 (as of July 1, 2020). Table 5-13 shows the beginning FY 2021 balance for each Water Fund reserve. Note that the Developer Fee Reserve is separated out from all other reserves. In all reserve balance projections presented subsequently in Section 5, the Developer Fee Reserve is also presented separately from all other reserves (which are commingled).

**Table 5-13: FY 2021 Beginning Water Fund Balance**

Reserve	Beginning FY 2021 Balance (as of 7/1/2020)
Water Rate Stabilization Reserve	\$10,310,722
Water Banking Reserve	\$2,500,000
Water Operations Reserve	\$2,743,613
Water Capital & Equipment Replacement	\$12,000,000
Water Capital Emergency	\$3,600,000
Water Admin Capital	\$1,500,000
Local Water Resource Development	\$1,000,000
<b>TOTAL (excluding Developer Fee Reserve)</b>	<b>\$33,654,335</b>
Developer Fee Reserve	\$9,958,830

## 5.8 PROJECTED RESERVE TARGETS

Table 5-14 shows projected minimum and maximum reserve target balances in each year over the study period based on the current reserve policy (from Table 4-1). Some reserve targets were calculated by Raftelis based on assumptions provided by District staff or based on projections previously developed in Section 5. For example, the Water Banking Reserve maximum target was calculated based on projected MWD Tier II wholesale water rates (provided by District staff to Raftelis). Similarly, the Water Operations Reserve targets were calculated based on projected O&M expenses excluding Advance CalPERS Funding (from Table 5-11).

**Table 5-14: Projected Reserve Targets**

Reserve	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
<b>Minimum Target Balance</b>						
Water Banking Reserve	\$2,500,000	\$2,500,000	\$2,500,000	\$2,500,000	\$2,500,000	\$2,500,000
Water Rate Stabilization	\$2,200,000	\$2,200,000	\$2,200,000	\$2,200,000	\$2,200,000	\$2,200,000
Water Operations Reserve	\$11,918,063	\$12,215,085	\$11,538,500	\$11,958,261	\$12,277,148	\$12,585,017
Water Capital & Equipment Replacement	\$13,000,000	\$13,000,000	\$13,000,000	\$13,000,000	\$13,000,000	\$13,000,000
Water Capital Emergency	\$4,011,881	\$4,134,656	\$4,261,189	\$4,391,595	\$4,525,991	\$4,664,499
Water Admin Capital	\$1,500,000	\$1,500,000	\$1,500,000	\$1,500,000	\$1,500,000	\$1,500,000
Local Water Resource Dev	\$2,000,000	\$2,000,000	\$2,000,000	\$2,000,000	\$2,000,000	\$2,000,000
<b>Total Minimum</b>	<b>\$37,129,944</b>	<b>\$37,549,742</b>	<b>\$36,999,689</b>	<b>\$37,549,856</b>	<b>\$38,003,139</b>	<b>\$38,449,516</b>
<b>Maximum Target Balance</b>						
Water Banking Reserve	\$4,169,005	\$4,252,385	\$4,337,433	\$4,424,182	\$4,512,665	\$4,602,919
Water Rate Stabilization	\$6,017,908	\$5,523,386	\$5,455,503	\$5,732,766	\$5,755,988	\$5,926,575
Water Operations Reserve	\$29,795,158	\$30,537,713	\$28,846,249	\$29,895,654	\$30,692,870	\$31,462,542
Water Capital & Equipment Replacement	\$30,000,000	\$30,000,000	\$30,000,000	\$30,000,000	\$30,000,000	\$30,000,000
Water Capital Emergency	\$16,047,524	\$16,538,626	\$17,044,758	\$17,566,378	\$18,103,962	\$18,657,998
Water Admin Capital	\$3,883,046	\$3,969,588	\$4,058,059	\$4,148,501	\$4,240,960	\$4,335,479
Local Water Resource Dev	\$5,000,000	\$5,000,000	\$5,000,000	\$5,000,000	\$5,000,000	\$5,000,000
<b>Total Maximum</b>	<b>\$94,912,640</b>	<b>\$95,821,699</b>	<b>\$94,742,001</b>	<b>\$96,767,481</b>	<b>\$98,306,445</b>	<b>\$99,985,512</b>

## 5.9 STATUS QUO FINANCIAL PLAN

To evaluate the need for revenue adjustments (i.e., rate increases), Raftelis first developed a status quo financial plan. The status quo financial plan assumes that current water rates remain in effect over the study period. Table 5-15 combines projected rate revenues from current rates (from Table 5-6), non-rate revenues (from Table 5-7)<sup>4</sup>, O&M expenses (from Table 5-11), debt service payments (from Table 5-12), capital expenditures (from Figure 5-1), and FY 2021 beginning fund balance (Table 5-13) to develop status quo cash flow projections through FY 2026. Projected ending reserve balances in each year are then compared to minimum and maximum reserve targets (from Table 5-14), while projected debt coverage is compared to debt coverage requirements and targets (from Table 4-2).

The status quo financial plan shown in Table 5-15 demonstrates that in the absence of any revenue adjustments, reserves are projected to fall below the minimum target amount in each year (see Line 38). By the end of FY 2026, reserves are projected to drop significantly from over \$33 million at the beginning of the study period to less than \$19 million. Additionally, parity obligation debt coverage is projected to fall below the required ratio in FY 2026 (see Lines 47-48). The results of the status quo financial plan clearly illustrate that revenue adjustments are necessary over the next five years to maintain adequate reserves and meet debt coverage requirements.

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<sup>4</sup> Interest Income in Table 5-15 differs from what was previously shown in Table 5-7. This is because the depletion of reserves under the status quo results in lower interest earnings. Table 5-7 reflects Interest Earnings under the proposed financial plan scenario presented in Table 5-17.

**Table 5-15: Status Quo Water Fund Financial Plan (No Revenue Adjustments)**

Line	Description	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
	<b>REVENUES</b>						
	<b>Revenue from Rates</b>						
1	Current Meter Service Charges	\$23,834,687	\$23,863,287	\$23,905,087	\$23,935,087	\$23,965,087	\$23,995,087
2	Current Fire Line Service Charges	\$555,864	\$555,864	\$555,864	\$555,864	\$555,864	\$555,864
3	Current Commodity Rates	\$44,457,158	\$44,517,064	\$44,605,936	\$44,671,767	\$44,737,598	\$44,803,429
4	Current MWD Surcharges	\$5,610,977	\$5,618,986	\$5,630,868	\$5,639,669	\$5,648,470	\$5,657,272
5	Revenue Adjustments	\$0	\$0	\$0	\$0	\$0	\$0
6	<b>Subtotal</b>	<b>\$74,458,686</b>	<b>\$74,555,202</b>	<b>\$74,697,755</b>	<b>\$74,802,387</b>	<b>\$74,907,019</b>	<b>\$75,011,651</b>
	<b>Other Operating Revenues</b>						
7	Other Water Sales	\$1,842,097	\$1,908,167	\$1,927,249	\$1,946,521	\$1,965,986	\$1,985,646
8	Water Rights Transfers Agreement	\$4,215,000	\$4,395,000	\$0	\$0	\$0	\$0
9	Penalty Fees	\$395,100	\$434,900	\$434,900	\$434,900	\$434,900	\$434,900
10	Misc. Operating Revenues	\$267,900	\$281,400	\$284,214	\$287,056	\$289,927	\$292,826
11	<b>Subtotal</b>	<b>\$6,720,097</b>	<b>\$7,019,467</b>	<b>\$2,646,363</b>	<b>\$2,668,477</b>	<b>\$2,690,813</b>	<b>\$2,713,372</b>
	<b>Non-Operating Revenues</b>						
12	Rent & Lease Income	\$505,177	\$519,183	\$524,375	\$529,619	\$534,915	\$540,264
13	Energy Rebates	\$66,000	\$69,000	\$69,000	\$69,000	\$69,000	\$69,000
14	Misc. Non-Operating Revenues	\$77,100	\$80,900	\$80,900	\$80,900	\$80,900	\$80,900
15	Interest Income	\$856,800	\$656,400	\$541,410	\$448,237	\$342,241	\$207,324
16	Water Development Fees	\$2,010,000	\$2,050,000	\$1,270,160	\$911,600	\$911,600	\$911,600
17	Grants	\$537,280	\$0	\$0	\$0	\$0	\$0
18	Contribution in Aid	\$70,000	\$74,000	\$74,000	\$74,000	\$74,000	\$74,000
19	Other Capital Fund Revenues	\$75,000	\$75,000	\$75,000	\$75,000	\$75,000	\$75,000
20	<b>Subtotal</b>	<b>\$4,197,357</b>	<b>\$3,524,483</b>	<b>\$2,634,845</b>	<b>\$2,188,356</b>	<b>\$2,087,656</b>	<b>\$1,958,088</b>
21	<b>TOTAL REVENUES</b>	<b>\$85,376,140</b>	<b>\$86,096,437</b>	<b>\$79,978,963</b>	<b>\$79,659,220</b>	<b>\$79,685,488</b>	<b>\$79,683,112</b>
	<b>O&amp;M EXPENSES</b>						
22	Purchased Water	\$26,704,487	\$26,986,031	\$21,268,924	\$22,137,614	\$22,240,187	\$22,345,008
23	Pumping - Utilities	\$4,663,665	\$4,981,785	\$6,170,133	\$6,421,403	\$6,682,902	\$6,955,047
24	Treatment - Utilities/ Materials/ Supplies	\$3,059,400	\$3,108,300	\$3,190,361	\$3,272,883	\$3,357,630	\$3,444,667
25	Salaries & Wages	\$10,455,223	\$10,892,443	\$11,328,141	\$11,781,266	\$12,252,517	\$12,742,618
26	District Burden / Benefits	\$6,454,073	\$6,769,792	\$7,108,282	\$7,463,696	\$7,836,880	\$8,228,724
27	Advance CalPERS Funding	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000
28	Other O&M Expenses	\$8,253,468	\$8,337,075	\$8,626,658	\$8,714,446	\$9,015,624	\$9,209,020
29	<b>TOTAL O&amp;M EXPENSES</b>	<b>\$60,590,315</b>	<b>\$62,075,426</b>	<b>\$58,692,498</b>	<b>\$60,791,307</b>	<b>\$62,385,740</b>	<b>\$63,925,084</b>

Line	Description	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
	<b>DEBT SERVICE</b>						
30	Senior Debt	\$3,986,086	\$1,930,661	\$1,922,136	\$2,532,250	\$2,799,000	\$2,791,481
31	Parity Debt	\$9,537,906	\$11,371,145	\$11,361,204	\$11,137,058	\$10,934,248	\$10,947,065
32	<b>TOTAL DEBT SERVICE</b>	<b>\$13,523,991</b>	<b>\$13,301,806</b>	<b>\$13,283,340</b>	<b>\$13,669,308</b>	<b>\$13,733,248</b>	<b>\$13,738,546</b>
	<b>CIP EXPENDITURES</b>						
33	PAYGO	\$7,000,000	\$7,306,030	\$7,621,425	\$7,946,473	\$8,281,468	\$8,602,925
34	Developer Fees Reserve	\$3,000,000	\$3,000,000	\$3,000,000	\$3,000,000	\$3,000,000	\$3,023,790
35	<b>TOTAL CIP EXPENDITURES</b>	<b>\$10,000,000</b>	<b>\$10,306,030</b>	<b>\$10,621,425</b>	<b>\$10,946,473</b>	<b>\$11,281,468</b>	<b>\$11,626,715</b>
	<b>WATER FUND BALANCE (excl. Developer Fees Reserve)</b>						
36	Beginning Fund Balance	\$33,654,335	\$35,906,168	\$36,272,058	\$35,383,597	\$31,724,129	\$26,097,562
37	Net Cash Change <sup>5</sup>	\$2,251,833	\$365,890	(\$888,461)	(\$3,659,468)	(\$5,626,567)	(\$7,495,043)
38	<b>ENDING FUND BALANCE</b>	<b>\$35,906,168</b>	<b>\$36,272,058</b>	<b>\$35,383,597</b>	<b>\$31,724,129</b>	<b>\$26,097,562</b>	<b>\$18,602,518</b>
39	Minimum Reserve Target Balance	\$37,129,944	\$37,549,742	\$36,999,689	\$37,549,856	\$38,003,139	\$38,449,516
40	Maximum Reserve Target Balance	\$94,912,640	\$95,821,699	\$94,742,001	\$96,767,481	\$98,306,445	\$99,985,512
	<b>DEVELOPER FEES RESERVE BALANCE</b>						
41	Beginning Fund Balance	\$9,958,830	\$8,968,830	\$8,018,830	\$6,288,990	\$4,200,590	\$2,112,190
42	Water Development Fee Revenue	\$2,010,000	\$2,050,000	\$1,270,160	\$911,600	\$911,600	\$911,600
43	Use of Funds for CIP	(\$3,000,000)	(\$3,000,000)	(\$3,000,000)	(\$3,000,000)	(\$3,000,000)	(\$3,023,790)
44	<b>ENDING FUND BALANCE</b>	<b>\$8,968,830</b>	<b>\$8,018,830</b>	<b>\$6,288,990</b>	<b>\$4,200,590</b>	<b>\$2,112,190</b>	<b>\$0</b>
	<b>DEBT COVERAGE</b>						
	<b>Senior Obligation</b>						
45	Projected Debt Coverage <sup>6</sup>	6.22	11.93	11.07	7.45	6.18	5.65
46	Required Debt Coverage	1.10	1.10	1.10	1.10	1.10	1.10
	<b>Parity Obligation</b>						
47	Projected Debt Coverage <sup>7</sup>	2.14	1.84	1.69	1.44	1.30	1.16
48	Required Debt Coverage	1.25	1.25	1.25	1.25	1.25	1.25
	<b>Total Debt Service</b>						
49	Projected Debt Coverage <sup>8</sup>	1.83	1.73	1.60	1.38	1.26	1.15
50	Target Debt Coverage	2.25	2.25	2.25	2.25	2.25	2.25

<sup>5</sup> = Total Revenues (Line 21) – Water Development Fees (Line 16) – Total O&M Expenses (Line 29) – Total Debt Service (Line 32) – PAYGO CIP (Line 33)

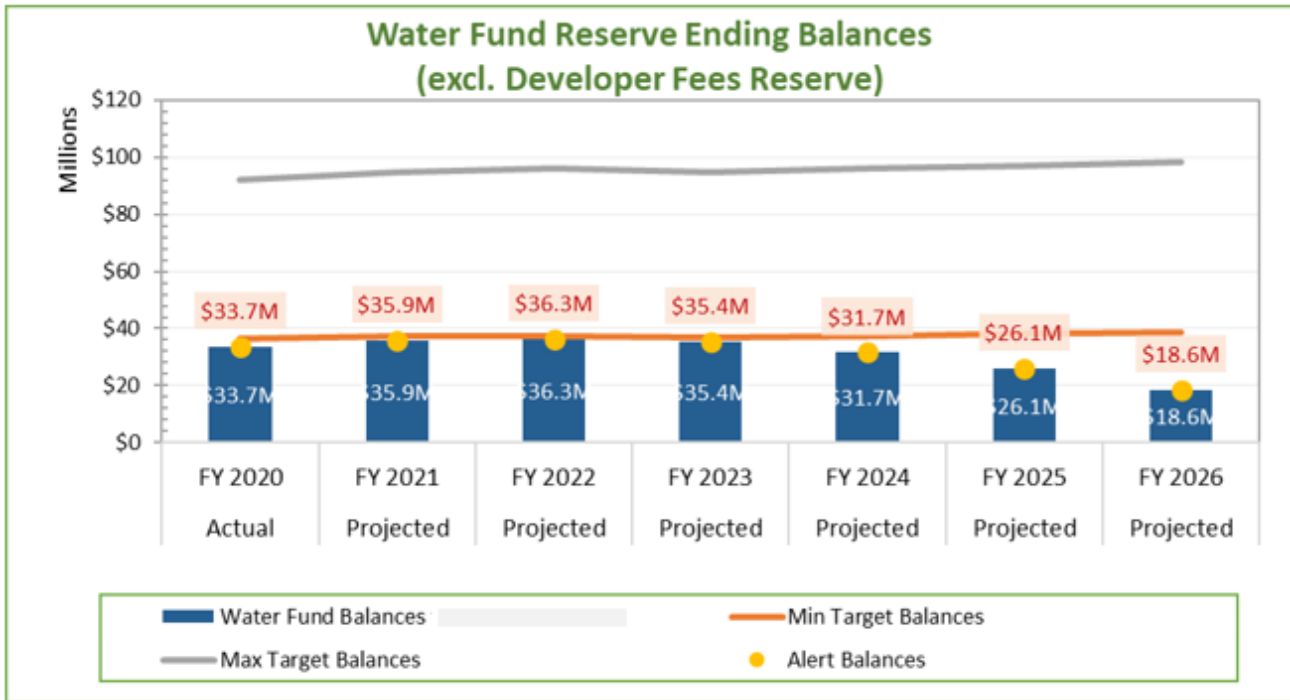
<sup>6</sup> = [Total Revenues (Line 21) – Total O&M Expenses (Line 29)] ÷ Senior Debt Service (Line 30)

<sup>7</sup> = [Total Revenues (Line 21) – Total O&M Expenses (Line 29) – Senior Debt Service (Line 30) × 1.10] ÷ Parity Debt Service (Line 31)

<sup>8</sup> = [Total Revenues (Line 21) – Total O&M Expenses (Line 29)] ÷ Total Debt Service (Line 32)

Water Fund ending balances under the status quo financial plan (previously calculated in Table 5-15) are shown in graphical format below in Figure 5-2. Minimum reserve target balances are represented by the orange line. Maximum reserve target balances are represented by the grey line. Under the status quo financial plan, reserves are projected to decrease steadily over the study period and fall well below the minimum target by the end of the study period in FY 2026.

**Figure 5-2: Projected Water Fund Ending Balance without Revenue Adjustments**



## 5.10 PROPOSED FINANCIAL PLAN

The Water Fund must increase its revenues from water rates over the study period to adequately fund its operating and capital expenditures, meet required debt coverage, and maintain sufficient reserve levels. Raftelis worked closely with District staff to identify financial plan options for the District’s Board of Directors to consider. After close consideration of multiple options, the District’s Board of Directors and Finance Committee directed District staff to proceed with the proposed revenue adjustments presented below in Table 5-16. Revenue adjustments are shown as annual percent increases in rate revenue, and represent incremental increases in rate revenue collected as a result of proposed rate increases. The proposed financial plan provides for 2.8 percent annual revenue adjustments each year beginning in FY 2022. All revenue adjustments are proposed to be implemented in January of each fiscal year (i.e., the midpoint of each fiscal year).

Please note that the proposed revenue adjustments shown below are exclusive of pass-through adjustments. The District may implement pass-through adjustments each year to recover incremental cost increases resulting increases in IEUA and MWD fixed and variable water supply costs. These pass-through adjustments may be recovered from customers via MWD Surcharges and a newly proposed IEUA Fixed Surcharge (described in detail subsequently in Section 6).

**Table 5-16: Proposed Water Fund Revenue Adjustments**

Fiscal Year	Effective Date	Water Fund Revenue Adjustments
<b>FY 2022</b>	January 1, 2022	2.8%
<b>FY 2023</b>	January 1, 2023	2.8%
<b>FY 2024</b>	January 1, 2024	2.8%
<b>FY 2025</b>	January 1, 2025	2.8%
<b>FY 2026</b>	January 1, 2026	2.8%

The proposed financial plan is shown in detail in Table 5-17. Reserve balance and debt coverage projections are calculated in the same manner as the status quo financial plan (from Table 5-15). The key difference between the status quo financial plan and proposed financial plan is the impact of revenue adjustments (Line 5). Revenue adjustments in dollars are calculated by applying the proposed revenue adjustment percentages (from Table 5-16) to current rate revenues.

Under the proposed financial plan, reserves are projected to meet the minimum target amount in each year beginning in FY 2023 (see Line 38). Additionally, both senior and parity obligation debt coverage is projected to meet the required ratio in all years (see Lines 45-48). Note that the overall debt coverage target based on District policy is not projected to be achieved over the study period. Raftelis and District staff determined that the magnitude of revenue adjustments necessary to achieve the overall debt coverage target was not feasible due to the unacceptably high customer bill increases that would occur. The primary consideration in selecting the proposed revenue adjustments was creating balance between the competing priorities of financial resiliency and customer affordability.

**Table 5-17: Proposed Water Fund Financial Plan (with Revenue Adjustments)**

Line	Description	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
	<b>REVENUES</b>						
	<b>Revenue from Rates</b>						
1	Current Meter Service Charges	\$23,834,687	\$23,863,287	\$23,905,087	\$23,935,087	\$23,965,087	\$23,995,087
2	Current Fire Line Service Charges	\$555,864	\$555,864	\$555,864	\$555,864	\$555,864	\$555,864
3	Current Commodity Rates	\$44,457,158	\$44,517,064	\$44,605,936	\$44,671,767	\$44,737,598	\$44,803,429
4	Current MWD Surcharges	\$5,610,977	\$5,618,986	\$5,630,868	\$5,639,669	\$5,648,470	\$5,657,272
5	Revenue Adjustments	\$0	\$997,285	\$3,025,823	\$5,116,598	\$7,271,983	\$9,493,876
6	<b>Subtotal</b>	<b>\$74,458,686</b>	<b>\$75,552,487</b>	<b>\$77,723,578</b>	<b>\$79,918,985</b>	<b>\$82,179,002</b>	<b>\$84,505,528</b>
	<b>Other Operating Revenues</b>						
7	Other Water Sales	\$1,842,097	\$1,908,167	\$1,927,249	\$1,946,521	\$1,965,986	\$1,985,646
8	Water Rights Transfers Agreement	\$4,215,000	\$4,395,000	\$0	\$0	\$0	\$0
9	Penalty Fees	\$395,100	\$434,900	\$434,900	\$434,900	\$434,900	\$434,900
10	Misc. Operating Revenues	\$267,900	\$281,400	\$284,214	\$287,056	\$289,927	\$292,826
11	<b>Subtotal</b>	<b>\$6,720,097</b>	<b>\$7,019,467</b>	<b>\$2,646,363</b>	<b>\$2,668,477</b>	<b>\$2,690,813</b>	<b>\$2,713,372</b>
	<b>Non-Operating Revenues</b>						
12	Rent & Lease Income	\$505,177	\$519,183	\$524,375	\$529,619	\$534,915	\$540,264
13	Energy OC Energy Reimbursement	\$66,000	\$69,000	\$69,000	\$69,000	\$69,000	\$69,000
14	Misc. Non-Operating Revenues	\$77,100	\$80,900	\$80,900	\$80,900	\$80,900	\$80,900
15	Interest Income	\$856,800	\$656,400	\$579,348	\$548,278	\$537,410	\$532,137
16	Water Development Fees	\$2,010,000	\$2,050,000	\$1,270,160	\$911,600	\$911,600	\$911,600
17	Grants	\$537,280	\$0	\$0	\$0	\$0	\$0
18	Contribution in Aid	\$70,000	\$74,000	\$74,000	\$74,000	\$74,000	\$74,000
19	Other Capital Fund Revenues	\$75,000	\$75,000	\$75,000	\$75,000	\$75,000	\$75,000
20	<b>Subtotal</b>	<b>\$4,197,357</b>	<b>\$3,524,483</b>	<b>\$2,672,782</b>	<b>\$2,288,396</b>	<b>\$2,282,825</b>	<b>\$2,282,901</b>
21	<b>TOTAL REVENUES</b>	<b>\$85,376,140</b>	<b>\$86,096,437</b>	<b>\$83,042,723</b>	<b>\$84,875,858</b>	<b>\$87,152,640</b>	<b>\$89,501,801</b>
	<b>O&amp;M EXPENSES</b>						
22	Purchased Water	\$26,704,487	\$26,986,031	\$21,268,924	\$22,137,614	\$22,240,187	\$22,345,008
23	Pumping - Utilities	\$4,663,665	\$4,981,785	\$6,170,133	\$6,421,403	\$6,682,902	\$6,955,047
24	Treatment - Utilities/ Materials/ Supplies	\$3,059,400	\$3,108,300	\$3,190,361	\$3,272,883	\$3,357,630	\$3,444,667
25	Salaries & Wages	\$10,455,223	\$10,892,443	\$11,328,141	\$11,781,266	\$12,252,517	\$12,742,618
26	District Burden / Benefits	\$6,454,073	\$6,769,792	\$7,108,282	\$7,463,696	\$7,836,880	\$8,228,724
27	Advance CalPERS Funding	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000
28	Other O&M Expenses	\$8,253,468	\$8,337,075	\$8,626,658	\$8,714,446	\$9,015,624	\$9,209,020
29	<b>TOTAL O&amp;M EXPENSES</b>	<b>\$60,590,315</b>	<b>\$62,075,426</b>	<b>\$58,692,498</b>	<b>\$60,791,307</b>	<b>\$62,385,740</b>	<b>\$63,925,084</b>

Line	Description	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
	<b>DEBT SERVICE</b>						
30	Senior Debt	\$3,986,086	\$1,930,661	\$1,922,136	\$2,532,250	\$2,799,000	\$2,791,481
31	Parity Debt	\$9,537,906	\$11,371,145	\$11,361,204	\$11,137,058	\$10,934,248	\$10,947,065
32	<b>TOTAL DEBT SERVICE</b>	<b>\$13,523,991</b>	<b>\$13,301,806</b>	<b>\$13,283,340</b>	<b>\$13,669,308</b>	<b>\$13,733,248</b>	<b>\$13,738,546</b>
	<b>CIP EXPENDITURES</b>						
33	PAYGO	\$7,000,000	\$7,306,030	\$7,621,425	\$7,946,473	\$8,281,468	\$8,602,925
34	Developer Fees Reserve	\$3,000,000	\$3,000,000	\$3,000,000	\$3,000,000	\$3,000,000	\$3,023,790
35	<b>TOTAL CIP EXPENDITURES</b>	<b>\$10,000,000</b>	<b>\$10,306,030</b>	<b>\$10,621,425</b>	<b>\$10,946,473</b>	<b>\$11,281,468</b>	<b>\$11,626,715</b>
	<b>WATER FUND BALANCE (excl. Developer Fees Reserve)</b>						
36	Beginning Fund Balance	\$33,654,335	\$35,906,168	\$37,269,343	\$39,444,643	\$41,001,812	\$42,842,397
37	Net Cash Change <sup>9</sup>	\$2,251,833	\$1,363,175	\$2,175,300	\$1,557,170	\$1,840,585	\$2,323,646
38	<b>ENDING FUND BALANCE</b>	<b>\$35,906,168</b>	<b>\$37,269,343</b>	<b>\$39,444,643</b>	<b>\$41,001,812</b>	<b>\$42,842,397</b>	<b>\$45,166,043</b>
39	<i>Minimum Reserve Target Balance</i>	<i>\$37,129,944</i>	<i>\$37,549,742</i>	<i>\$36,999,689</i>	<i>\$37,549,856</i>	<i>\$38,003,139</i>	<i>\$38,449,516</i>
40	<i>Maximum Reserve Target Balance</i>	<i>\$94,912,640</i>	<i>\$95,821,699</i>	<i>\$94,742,001</i>	<i>\$96,767,481</i>	<i>\$98,306,445</i>	<i>\$99,985,512</i>
	<b>DEVELOPER FEES RESERVE BALANCE</b>						
41	Beginning Fund Balance	\$9,958,830	\$8,968,830	\$8,018,830	\$6,288,990	\$4,200,590	\$2,112,190
42	Water Development Fee Revenue	\$2,010,000	\$2,050,000	\$1,270,160	\$911,600	\$911,600	\$911,600
43	Use of Funds for CIP	(\$3,000,000)	(\$3,000,000)	(\$3,000,000)	(\$3,000,000)	(\$3,000,000)	(\$3,023,790)
44	<b>ENDING FUND BALANCE</b>	<b>\$8,968,830</b>	<b>\$8,018,830</b>	<b>\$6,288,990</b>	<b>\$4,200,590</b>	<b>\$2,112,190</b>	<b>\$0</b>
	<b>DEBT COVERAGE</b>						
	<b>Senior Obligation</b>						
45	Projected Debt Coverage <sup>10</sup>	6.22	12.44	12.67	9.51	8.85	9.16
46	Required Debt Coverage	1.10	1.10	1.10	1.10	1.10	1.10
	<b>Parity Obligation</b>						
47	Projected Debt Coverage <sup>11</sup>	2.14	1.93	1.96	1.91	1.98	2.06
48	Required Debt Coverage	1.25	1.25	1.25	1.25	1.25	1.25
	<b>Total Debt Service</b>						
49	Projected Debt Coverage <sup>12</sup>	1.83	1.81	1.83	1.76	1.80	1.86
50	Target Debt Coverage	2.25	2.25	2.25	2.25	2.25	2.25

<sup>9</sup> = Total Revenues (Line 21) – Water Development Fees (Line 16) – Total O&M Expenses (Line 29) – Total Debt Service (Line 32) – PAYGO CIP (Line 33)

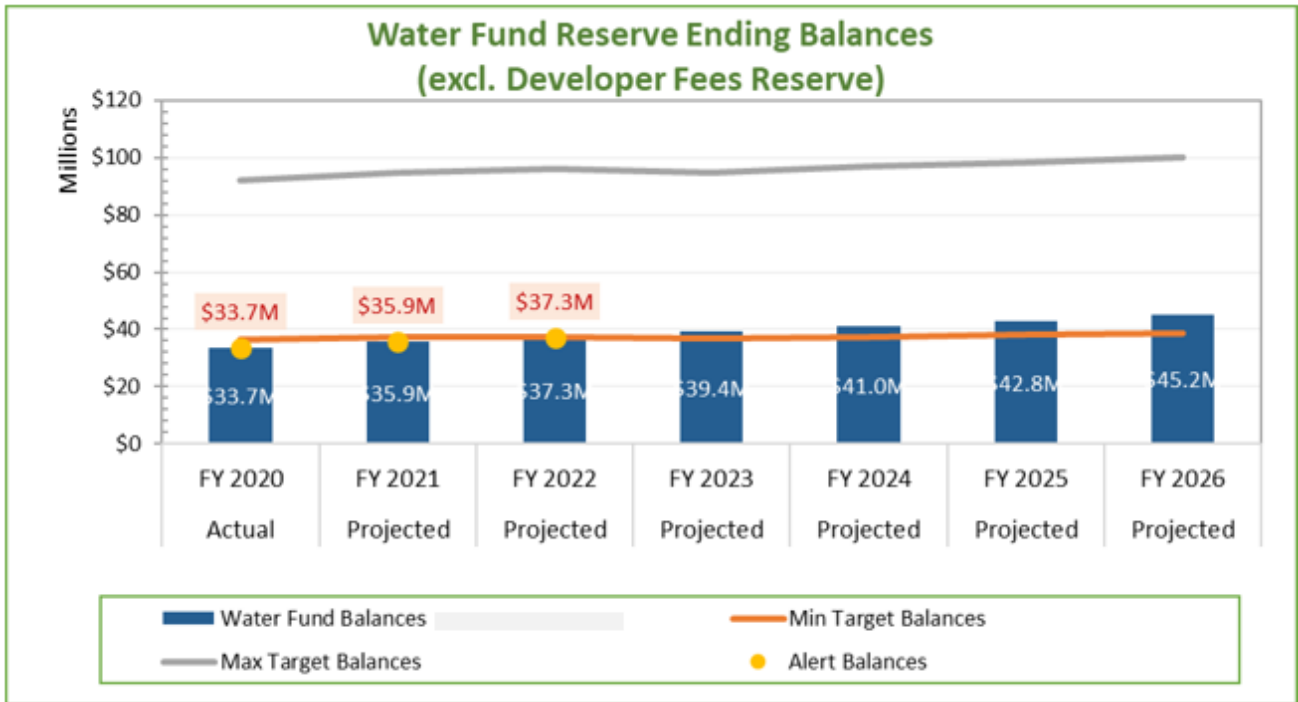
<sup>10</sup> = [Total Revenues (Line 21) – Total O&M Expenses (Line 29)] ÷ Senior Debt Service (Line 30)

<sup>11</sup> = [Total Revenues (Line 21) – Total O&M Expenses (Line 29) - Senior Debt Service (Line 30) × 1.10] ÷ Parity Debt Service (Line 31)

<sup>12</sup> = [Total Revenues (Line 21) – Total O&M Expenses (Line 29)] ÷ Total Debt Service (Line 32)

Water Fund ending balances under the proposed financial plan (previously calculated in Table 5-17) are shown in graphical format below in Figure 5-3. Minimum reserve target balances are represented by the orange line. Maximum reserve target balances are represented by the grey line. Under the proposed financial plan, reserves are projected to increase gradually over the study period. With the exclusion of the Developer Fees Reserve, total reserves are projected to exceed the minimum target level by the end of FY 2023.

**Figure 5-3: Projected Water Fund Ending Balance with Proposed Revenue Adjustments**



## 6. PROPOSED RATE STRUCTURE CHANGES

Raftelis worked closely with District staff to evaluate the need for revisions to the District’s current rate structure. After careful consideration, the following three changes to the District’s current rate structure are proposed:

1. Revised tier definitions based on updated water supply and demand assumptions
2. Elimination of MWD Surcharges for Tier 1 and Tier 2 water use
3. Implementation of a new “Fixed IEUA Surcharge” to recover fixed IEUA and MWD water supply costs

### 6.1 REVISED TIER DEFINITIONS

The District’s commodity rate structure for all customers (excluding temporary construction) consists of four tiers. The monthly allotment of water within each tier varies by meter size in proportion to hydraulic capacity. For customers with a 3/4-inch meter, the first 5 hcf of water used each month is charged at the lowest rate (Tier 1), the next 15 hcf of water used is charged at the second lowest rate (Tier 2), the next 30 hcf is charged at a higher rate (Tier 3), and any water use in excess of 50 hcf is charged at the highest rate (Tier 4). Table 6-1 shows the current monthly tier definitions by meter size. The current Tier 1 was designed to provide for basic indoor water needs; Tier 2 was designed to provide sufficient water for landscaping; Tier 3 was designed to represent moderate to high water use; and Tier 4 was designed to apply to the top 15 percent of residential water use.

**Table 6-1: Current Monthly Tier Definitions by Meter Sizes**

Meter Size	Current Tier 1 (hcf)	Current Tier 2 (hcf)	Current Tier 3 (hcf)	Current Tier 4 (hcf)
3/4"	0-5	6-20	21-50	>50
1"	0-9	10-34	35-84	>84
1 1/2"	0-17	18-67	68-167	>167
2"	0-27	28-107	108-267	>267
3"	0-50	51-200	201-500	>500
4"	0-84	85-334	335-834	>834
6"	0-167	168-667	668-1667	>1667
8"	0-267	268-1067	1068-2667	>2667
10"	0-400	401-1600	1601-4000	>4000
12"	0-600	601-2400	2401-6000	>6000

Raftelis worked with District staff to develop revised monthly tier definitions based on updated water supply and demand assumptions. Table 6-2 shows revised monthly tier definitions based on the proposed changes. Monthly tier allotments are increased by meter size in proportion to the meter capacity ratios<sup>13</sup> shown. The proposed basis for each monthly tier definition is as follows:

<sup>13</sup> Meter capacity ratios are described in greater detail in Section 7 (refer to Table 7-14).

- » **Tier 1 Monthly Allotment:** Designed such that projected Tier 1 water use would approximately equal the water supply availability of the District’s least expensive water supply sources (surface water and Cucamonga Groundwater Basin).
- » **Tier 2 Monthly Allotment:** Designed such that projected Tier 2 water use would approximately equal the water supply availability from the District’s next most affordable water supply source (Chino Groundwater Basin).
- » **Tier 3 Monthly Allotment:** Designed such that the available MWD Tier 1 water supply is apportioned to all customers evenly on an equivalent meter unit<sup>14</sup> basis.
- » **Tier 4 Monthly Allotment:** All water use in excess of Tier 3.

**Table 6-2: Revised Monthly Tier Definitions by Meter Sizes**

Meter Size	Meter Capacity Ratios	Revised Tier 1 (hcf)	Revised Tier 2 (hcf)	Revised Tier 3 (hcf)	Revised Tier 4 (hcf)
3/4"	1.00	0-6	7-18	19-36	> 36
1"	1.67	0-10	11-30	31-60	> 60
1 1/2"	3.33	0-20	21-60	61-120	> 120
2"	5.33	0-32	33-96	97-192	> 192
3"	10.67	0-64	65-192	193-384	> 384
4"	16.67	0-100	101-300	301-600	> 600
6"	33.33	0-200	201-600	601-1,200	> 1,200
8"	53.33	0-320	321-960	961-1,920	> 1,920
10"	80.00	0-480	481-1,440	1,441-2,880	> 2,880
12"	112.50	0-675	676-2,025	2,026-4,050	> 4,050

Raftelis analyzed account level customer water use data by billing period for FY 2019 to evaluate the changes in water use by tier resulting from the proposed changes to tier definitions. Figure 6-1 summarizes the usage under current (blue) and proposed tiers (orange). Tier 1 water use will increase slightly, while Tier 2 and Tier 3 water use will decrease. Tier 4 water use is expected to increase due to the reduction in the Tier 3 definition from 50 hcf per month to 36 hcf (for a 3/4" water meter).

<sup>14</sup> Equivalent meter units are explained in greater detail in Section 7.

**Figure 6-1: Water Usage Summary by Tiers**

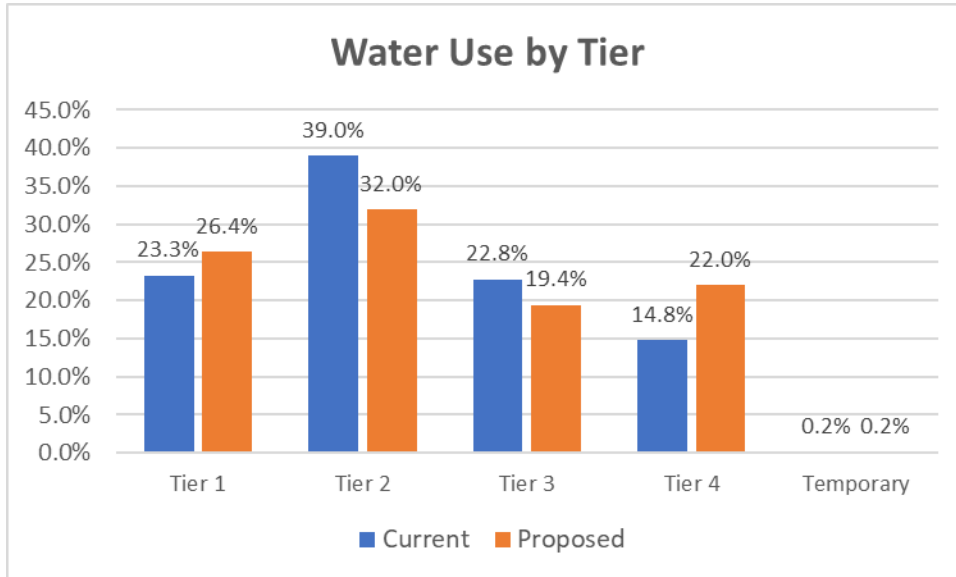


Table 6-3 shows total actual FY 2020 water sales. Raftelis estimated the amount of water use that would fall under each tier if the revised tier definitions had been in place in FY 2020 based on the water use analysis shown in Figure 6-1.

**Table 6-3: FY 2020 Water Sales in Revised Tiers**

	Revised Tiers	%	FY 2020 Usage (hcf)
		A	B
1	Tier 1	26.4%	4,945,738
2	Tier 2	32.0%	5,987,406
3	Tier 3	19.4%	3,636,042
4	Tier 4	22.0%	4,123,624
5	Temporary	0.2%	30,855
6	<b>Total</b>	<b>100%</b>	<b>18,723,664</b>

## 6.2 PROPOSED CHANGES TO MWD SURCHARGE

The District has utilized MWD Surcharges since 2010 to pass through increases in MWD water supply costs to District customers under certain conditions. More specifically, MWD Surcharges may only recover increases in the cost of MWD water that exceed cost projections in the rate study from which the District’s adopted rates are based on. An additional limitation is that in no event shall the MWD Surcharge exceed \$1.00 per hcf.

As a result of this rate study, the MWD Surcharge will be reset in January 2022 based on the incremental increase in the MWD Tier 1 rate in 2022 relative to the current rate of \$777 per AF. The MWD Surcharge Rate will continue to be utilized by the District over the study period. More specifically, the MWD Surcharge may be used over the study period to recover increases in MWD variable water supply costs resulting from any increase in the MWD Tier 1 water supply rate above projections shown in Table 5-9.

All water use is currently subject to the District's existing MWD Surcharge. However, the revised tier definitions presented in Section 6.1 attribute imported water supplies from MWD to customer water use within Tier 3 and Tier 4. Therefore, Raftelis recommends that water use falling within Tier 1 and Tier 2 be exempted from MWD Surcharge rates over the study period. Under the proposed change, only Tier 3, Tier 4, and temporary water use would be subject to any MWD Surcharges implemented through FY 2026.

### 6.3 PROPOSED IEUA FIXED SURCHARGES

As described above in Section 6.2, the District will continue to utilize MWD Surcharges to ensure sufficient cost recovery of variable MWD water supply costs. Because future MWD cost increases over the next five years are uncertain and beyond the control of the District, pass-through mechanisms such as the MWD Surcharge are an effective tool to mitigate the risk posed by uncertain wholesale water supply costs in the future.

The District faces similar risk due to the future cost uncertainty of fixed IEUA and MWD water supply costs. Therefore, Raftelis proposes that a new pass-through mechanism be introduced to recover actual increases in IEUA and MWD fixed supply costs. These fixed supply costs consist of three specific charges shown previously in Table 5-9 (specifically the IEUA MEU, MWD Capacity, and MWD TYRA Charges). IEUA and MWD fixed supply costs are projected to total \$3,320,539 in FY 2022 based on projections from IEUA obtained by District staff. Raftelis proposes the introduction of a new monthly fixed charge to specifically recover IEUA and MWD fixed supply costs each year. This newly proposed charge, which all water meters will be subject to in addition to the existing monthly Meter Service Charge, is herein referred to as the "IEUA Fixed Surcharge."<sup>15</sup>

The new IEUA Fixed Surcharge will increase with meter size in proportion to meter capacity in the exact same manner as Meter Service Charges to reflect how the District incurs the costs recovered from the IEUA Fixed Surcharge. Beyond FY 2022, the IEUA Fixed Surcharge will be increased by the amount necessary to recover actual IEUA and MWD fixed supply costs in excess of projected values shown in Table 5-9. Therefore, the IEUA Fixed Surcharge will function as a direct pass-through of IEUA and MWD fixed supply costs. The introduction of the IEUA Fixed Surcharge does not change the total rate revenue requirement in the cost of service analysis presented in Section 7. It simply changes the manner in which costs are assigned to be recovered by the District's fixed charges and variable water rates.

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<sup>15</sup> The District purchases water from MWD through the Inland Empire Utilities Agency (IEUA). For this reason, the newly proposed charge is referred to as the IEUA Fixed Surcharge.

## 7. COST OF SERVICE ANALYSIS

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Section 7 details the cost of service analysis performed for the Water Fund for FY 2020. The cost of service analysis allocates the overall rate revenue requirement to customer classes based on their proportion of use of and burden on the water system. This provides the basis for the development of proposed water rates for FY 2022 through FY 2026.

### 7.1 PROPORTIONALITY

The water rate development process must demonstrate proportionality to ensure compliance with Proposition 218. While not a legal authority, the AWWA Manual M1 provides guidance on how to establish rates for water service that are consistent with Proposition 218, and states that “the costs of water rates and charges should be recovered from classes of customers in proportion to the cost of serving those customers.” The agency’s revenue requirements are, by definition, the cost of providing service. This cost is then used as the basis to develop unit costs for various rate components, which are allocated to various customer classes in proportion to the water services rendered.

Individual customer demands vary depending on meter size. For example, customers with larger meters impose higher demands on water system capacity. The concept of proportionality requires that cost allocations consider both the average quantity of water consumed (base) and the peak rate at which it is consumed (peaking). A water system is designed to meet peak demands. The additional costs associated with designing, constructing, and maintaining facilities to meet these peak demands must be allocated to those customers whose usage requires facilities to upsize in response to peak demand. When performing a cost of service analysis, California public agencies are authorized to group customers with similar system needs and demands.

Generally speaking, customers place demands on the water system in proportion to:

- » The system capacity<sup>16</sup> (for treatment, storage, and distribution) that must be maintained to provide reliable service to all customers at all times.
- » The number of customers requiring customer services such as bill processing, customer service support, and other administrative services.

Joint costs are proportionately shared among all customers served by the water system based on their service requirements; some specific costs, such as private fire protection costs, are borne by a subgroup of customers based on the characteristics of that group alone (i.e. customers with private fire lines).

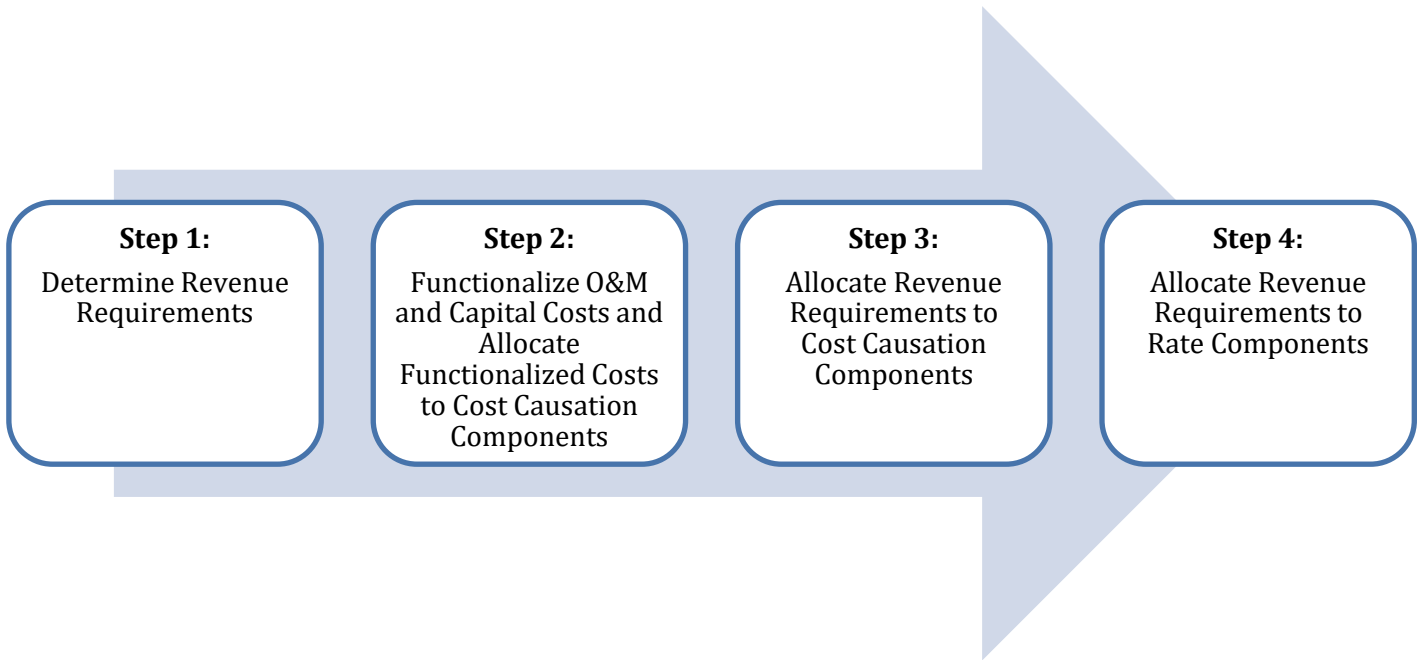
### 7.2 WATER COST OF SERVICE ANALYSIS

A cost of service analysis distributes a utility’s revenue requirements (costs) to each customer class. Figure 7-1 provides a general overview of a cost of service analysis. Each step shown below is described in greater detail in the following subsections.

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<sup>16</sup> System capacity is the system’s ability to supply water to all delivery points at the time when demanded. The time of greatest demand is known as peak demand.

Figure 7-1: Cost of Service Process



### 7.2.1 Step 1 – Determine Revenue Requirements

A cost of service analysis must be conducted based on a specific single year, referred to as a test year. A recent representative historical year is commonly utilized as the test year in cost of service studies. In this study, the selected test year is FY 2020. The results of the cost of service analysis are directly utilized in subsequent report sections to determine “revised” water rates for FY 2020. These revised test year water rates provide the basis for the proposed five-year water rate schedule shown subsequently in Section 8.

The first step in a cost of service analysis is to determine the rate revenue requirement for the test year. The rate revenue requirement represents the total amount of revenue that must be generated by water rates. Because the test year is a historical year, the rate revenue requirement simply equals Raftelis’ estimated rate revenues in FY 2020 under current water rates. Therefore, the cost of service analysis in FY 2020 is effectively revenue neutral. The revised test year rates are designed to collect the same amount of revenue in FY 2020 as the current rates. The objective of the cost of service analysis is simply to update the District’s water rates and charges to account for changes in cost structure and cost causation since the prior cost of service was conducted.

The rate revenue requirement for FY 2020 is calculated below in Table 7-1. Note that the financial plan projections presented in Section 5 are for FY 2021 through FY 2026. The rate revenue requirement shown below however is for FY 2020. Revenue requirements include O&M expenses, debt service, CIP, and reserve funding. Revenue offsets include non-rate revenues that can be applied to offset revenue requirements and effectively reduce the amount of revenue required from water rates.

Values shown in Table 7-1 were determined based on the same projection methodology outlined in Section 5. The adopted FY 2020 budget provides the basis for O&M expenses and non-rate revenues with the exception of water supply and pumping costs (which were calculated for FY 2020 using the same methodology outlined in Section 5.4.1 and Section 5.4.2). Debt service and CIP in FY 2020 was provided to

Raftelis by District staff. Reserve funding in FY 2020 equals total revenues less total O&M expenses, debt service, and CIP.

**Table 7-1: Test Year Rate Revenue Requirement (FY 2020)**

	Test Year Rate Revenue Requirement	FY 2020
	<b>Revenue Requirements</b>	
1	O&M Expenses	\$56,877,149
2	Debt Service	\$13,529,932
3	CIP	\$10,000,000
4	Reserve Funding	\$5,250,798
5	<b>Total Revenue Requirements</b>	<b>\$85,657,879</b>
	<b>Revenue Offsets</b>	
6	Other Water Sales	(\$1,103,756)
7	Water Rights Transfers Agreement	(\$4,080,000)
8	Penalty Fees	(\$469,800)
9	Misc. Operating Revenues	(\$277,500)
10	Rent & Lease Income	(\$490,308)
11	SMWD Transfer Agreement	(\$471,600)
12	Energy Rebates	(\$150,000)
13	Misc. Non-Operating Revenues	(\$107,500)
14	Interest Income	(\$1,474,500)
15	Water Development Fees	(\$4,209,951)
16	Contribution in Aid	(\$95,000)
17	Other Capital Fund Revenues	(\$75,000)
18	<b>Total Revenue Offsets</b>	<b>(\$13,004,915)</b>
19	<b>Total Rate Revenue Requirement</b>	<b>\$72,652,964</b>

### 7.2.2 Step 2 – Functionalize Costs and Allocate to Cost Causation Components

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

- » **Variable Water Supply:** MWD variable water supply costs, Chino Watermaster water supply costs, variable pumping costs, and variable treatment costs
- » **Other Water Supply:** other water supply costs not assigned to the Variable Water Supply function
- » **Storage:** relating to water storage tanks and reservoirs
- » **Pumping:** relating to transporting water across elevation gradients
- » **Treatment:** relating to treating water to drinking water standards
- » **Transmission:** relating to transporting water from the point of treatment through a major trunk to locations within the distribution system
- » **Distribution:** relating to the smaller local service distribution mains transporting water to specific locations within the service area
- » **Transmission & Distribution:** relating to both transmission and distribution
- » **Meters:** relating to meter maintenance/repair

- » **Billing and Customer Service:** relating to meter reading, billing, and other customer service activities
- » **IEUA Fixed Surcharge:** IEUA and MWD fixed water supply costs (specifically the IEUA MEU, MWD Capacity, and MWD TYRA Charges)
- » **General & Administrative:** anything not specifically related to the above functions

Raftelis reviewed and functionalized the Water Fund’s O&M expenses and asset list. Table 7-2 summarizes the functionalized O&M costs for the Water Fund for test year FY 2020. Table 7-3 shows the functionalization of fixed asset values of the Water Fund using replacement costs less depreciation (RCLD). To reduce rate variability from year to year, allocation of fixed assets to cost causation components is used to attribute capital-related costs to functions. Basing asset value off of RCLD accounts for both depreciation and inflation, and thus provides more consistent allocation of costs compared to other asset valuation methods. See Appendices 1 and 2 for detailed assignments of O&M costs and capital assets to functions.

**Table 7-2: FY 2020 Functionalized Water Fund O&M Costs**

Function	O&M Expenses FY 2020
Variable Water Supply	\$26,366,949
Other Water Supply	\$3,242,000
Pumping	\$1,011,956
Treatment	\$2,886,258
Transmission & Distribution	\$4,133,026
Billing & Customer Service	\$2,502,820
IEUA Fixed Surcharge	\$2,705,005
General & Administrative	\$14,029,135
<b>Total</b>	<b>\$56,877,149</b>

**Table 7-3: FY 2020 Functionalized Water Fund Assets**

Function	Replacement Cost Less Depreciation (FY 2020)
Water Supply	\$22,125,099
Storage	\$29,732,948
Pumping	\$7,069,783
Treatment	\$95,439,472
Transmission	\$146,093,891
Distribution	\$91,028,842
Meters	\$57,236,617
General & Administrative	\$210,615,089
<b>Total</b>	<b>\$659,341,741</b>

This cost of service analysis utilizes the Base-Extra Capacity method. The Base-Extra Capacity method allocates functionalized costs to various cost causation components. Some cost causation components correspond directly to a specific function. Other cost causation components are associated with multiple functions. The cost causation components used in this study include:

- » **Variable Water Supply:** Specifically includes MWD variable water supply costs, Chino Watermaster water supply costs, variable pumping costs, and variable treatment costs (directly corresponds to the Variable Water Supply function).
- » **Base Delivery:** Operating and capital costs of the water system associated with serving customers at a constant, or average, rate of water use.
- » **Peaking:** Peaking costs represent the costs incurred to meet customer peak demands for water in excess of average day usage. Total extra capacity costs are subdivided into costs associated with maximum day and maximum hour demands. The maximum day (**Max Day**) demand is the maximum amount of water used in a single day in a year. The maximum hour (**Max Hour**) demand is the maximum usage in an hour on the maximum usage day. Various facilities are designed to meet customer peaking needs. For example, transmission lines or reservoirs are designed to meet Max Day requirements. The cost associated with constructing a larger transmission line or reservoir is based on system wide peaking factors. For example, if the Max Day factor is 2.0, then certain system facilities have to be designed at least twice as large as required to meet average daily demand. In this case, half of the cost would be allocated to Base (or average day demand) and the other half allocated to Max Day. Peaking places unique demands on the water system, and causes the District to incur costs to accommodate peak use. Identifying peaking costs allows the District to allocate impacts of such demand to customers that cause the District to incur such costs.
- » **Conservation:** Costs associated with conservation and/or efficiency programs.
- » **Billing & Customer Service (CS):** Costs including meter reading, billing, collecting, and customer accounting (directly corresponds with the Billing and Customer Service Function).
- » **Meter Service:** Costs including maintenance and capital costs associated with servicing meters. These costs increase with meter size in proportion to meter capacity (directly corresponds with the Meters Function).
- » **IEUA Fixed:** IEUA and MWD fixed water supply costs, which specifically include the IEUA MEU, MWD Capacity, and MWD TYRA Charges (directly corresponds to the IEUA Fixed Surcharge function).
- » **General:** All other costs that do not serve a specific function.

The next step is to allocate the functionalized expenses to cost causation components. To do so, we must first identify system-wide peaking factors. The system-wide peaking factors are used to derive the cost causation component allocation bases (i.e., percentages) for certain functions including Storage, Pumping, Treatment, Transmission, and Distribution. Costs associated with these functions vary based on required system capacity. Customers with higher peak use require a greater proportion of system capacity. Therefore, peaking factors provide the most appropriate basis for allocating capacity-related costs.

To understand the interpretation of the peaking allocation percentages, we must first define base use as the average daily water demand during the year. The Max Day and Max Hour values shown in Table 7-4 were provided by District Staff. The base demand is assigned a value of 1.0 and represents average day demand. Max Day demand represents the ratio of maximum day demand to average day demand. Max Hour demand represent the ratio of maximum hour demand to average day demand.

**Table 7-4: Water System Peaking Factors**

	Description	Peaking Demand <sup>17</sup>	Peaking Factors
1	Average Day Demand	43.90 MGD	1.00
2	Max Day Demand	70.20 MGD	1.60
3	Max Hour Demand	87.80 MGD	2.00

To determine the relative proportion of costs to assign to the Base Delivery, Max Day, and Max Hour cost causation components, allocations are calculated based on the above peaking factors. Cost causation components that are solely related to providing average day demand, are allocated entirely to Base Delivery. Cost components that are designed to meet Max Day peaks, such as reservoirs and transmission facilities, are allocated to both Base Delivery and Max Day factors.

The Max Day factor of the District’s system is 1.60, which means that Max Day demand is expected to be 160 percent of average day demand. The Max Day allocation basis is calculated as follows:

$$\text{Base Delivery Allocation} = \frac{\text{Base}}{\text{Max Day}} = \frac{1}{1.60} \approx 62.5\%$$

$$\text{Max Day Allocation} = 1 - \text{Base/Max Day} \approx 37.5\%$$

Facilities designed for Max Hour peaks, such as distribution system facilities, are allocated similarly. The Max Hour factor is 2.00, meaning that Max Hour facilities must provide 200 percent of the average day demand during maximum hour peak demand conditions. The Max Hour allocation bases is calculated as follows:

$$\text{Base Delivery Allocation} = \frac{\text{Base}}{\text{Max Hour}} = \frac{1}{2.00} = 50\%$$

$$\text{Max Day Allocation} = \frac{\text{Max Day} - \text{Base}}{\text{Max Hour}} = \frac{1.60 - 1.00}{2.00} = 30\%$$

$$\text{Max Hour Allocation} = 1 - 50\% - 30\% = 20\%$$

The results of the peaking allocations calculated above are presented below in Table 7-5. These percentages are to be used in subsequent sections to allocate certain functionalized costs amongst Base Delivery, Max Day, and Max Hour cost causation components.

**Table 7-5: Allocation of Extra Capacity Functional Costs to Cost Causation Categories**

Description	Peaking Factor	Base	Max Day	Max Hour
<b>Base</b>	1.00	100.0%		
<b>Max Day</b>	1.60	62.5%	37.5%	
<b>Max Hour</b>	2.00	50.0%	30.0%	20.0%

<sup>17</sup> Provided by District Staff.

Table 7-6 shows the allocation of each function (rows) to the various cost causation components (columns). Some functions are simply allocated entirely to the directly corresponding cost causation component. The Storage, Treatment, and Transmission functions are allocated based on Max Day factors (from Table 7-5) because infrastructure associated with these functions are typically designed based on maximum day capacity. The Pumping and Distribution functions are allocated based on Max Hour factors (from Table 7-5) because infrastructure associated with these functions are typically designed based on maximum hour capacity. The Transmission & Distribution function is allocated to the cost causation components based on a weighted average of Max Day and Max Hour factors from Table 7-5.<sup>18</sup> Because some costs associated with the Billing & Customer Service function vary based on meter size, Raftelis recommends an even allocation of Billing & Customer Service costs between the Billing & CS and Meter Service cost causation components. Lastly, Raftelis allocated approximately 2 percent of General & Administrative costs to the Conservation cost causation component based on an estimate of District costs associated with conservation and efficiency-related efforts.

**Table 7-6: Allocation of Water Cost Functions to Cost Causation Components**

FUNCTIONS	COST CAUSATION COMPONENTS									TOTAL
	Variable Water Supply	Base Delivery	Max Day	Max Hour	Conser- vation	Billing & CS	Meter Service	Gen- eral	IEUA Fixed	
Variable Water Supply	100.0%									100.0%
Other Water Supply		100.0%								100.0%
Storage		62.5%	37.5%							100.0%
Pumping		50.0%	30.0%	20.0%						100.0%
Treatment		62.5%	37.5%							100.0%
Transmission		62.5%	37.5%							100.0%
Distribution		50.0%	30.0%	20.0%						100.0%
Transmission & Distribution		57.7%	34.6%	7.7%						100.0%
Meters							100.0%			100.0%
Billing & Customer Service						50.0%	50.0%			100.0%
IEUA Fixed Surcharge									100.0%	100.0%
General & Administrative					2.0%			98.0%		100.0%

Table 7-7 shows the allocation functionalized O&M expenses (from Table 7-2) to each cost causation component based on the allocation factors developed in Table 7-6. Please refer to Appendix 1 for a more detailed table showing the allocation of O&M expenses to each cost causation component based on assigned functions.

<sup>18</sup> The functionalized asset base from Table 7-3 attributes \$146,093,891 to the Transmission function and \$91,028,842 to the Distribution function. The weighting in determining the Transmission & Distribution allocation is therefore 62% to Transmission ( $[\$146,093,891] / [\$146,093,891 + \$91,028,842]=62\%$ ) and 38% to Distribution ( $[\$91,028,842] / [\$146,093,891 + \$91,028,842]=38\%$ ).

**Table 7-7: Results of O&M Cost Allocations**

Cost Causation Component	O&M Cost Allocation (\$)	O&M Cost Allocation (%)
	A	B
Variable Water Supply	\$26,366,949	46.4%
Base Delivery	\$7,938,637	14.0%
Max Day	\$2,813,703	4.9%
Max Hour	\$520,900	0.9%
Conservation	\$280,583	0.5%
Billing & CS	\$1,251,410	2.2%
Meter Services	\$1,251,410	2.2%
General	\$13,748,552	24.2%
IEUA Fixed	\$2,705,005	4.8%
<b>Total</b>	<b>\$56,877,149</b>	<b>100.0%</b>

Table 7-8 shows the allocation of functionalized capital asset values (from Table 7-3) to each cost causation component based on the allocation factors developed in Table 7-6. Please refer to Appendix 2 for a more detailed table showing the allocation of assets to each cost causation component based on assigned functions.

**Table 7-8: Results of Asset Value Cost Allocations for Capital Cost Allocations**

Cost Causation Component	Capital Asset Allocation (\$)	Capital Cost Allocation (%)
	A	B
Variable Water Supply	\$0	0.0%
Base Delivery	\$240,812,461	36.5%
Max Day	\$131,013,157	19.9%
Max Hour	\$19,664,417	3.0%
Conservation	\$4,212,302	0.6%
Billing & CS	\$0	0.0%
Meter Services	\$57,236,617	8.7%
General	\$206,402,787	31.3%
IEUA Fixed	\$0	0.0%
<b>Total</b>	<b>\$659,341,741</b>	<b>100.0%</b>

**7.2.3 Step 3 – Allocate Revenue Requirements to Cost Causation Components**

The next step of the cost of service analysis is to allocate the rate revenue requirement from Step 1 to the various cost causation components based on the allocation bases developed in Step 2. The revenue requirement calculation (from Table 7-1) is shown again in Table 7-9, but with a specific allocation basis specified for each individual revenue requirement and revenue offset.

O&M expenses (Line 1) are to be allocated to each cost causation component based on the results of the O&M allocation calculations in Column A of Table 7-7. Debt service, CIP, and Reserve Funding (Lines 2-4) are associated most closely with capital rather than operating costs. Therefore, the totals shown are to be

allocated to each cost causation component based on the capital allocation percentages developed in Column B of Table 7-8.

Revenue offsets most closely associated with capital funding (Lines 15-17) are also allocated based on the capital allocation percentages developed in Column B of Table 7-8. All other revenue offsets (Lines 6-14) are allocated 98 percent to the General cost causation component and 2 percent to the Conservation cost causation component based on the General & Administrative (G&A) allocation basis shown in Table 7-6.

**Table 7-9: Allocation Basis for Rate Revenue Requirement**

	Test Year Rate Revenue Requirement	FY 2020	Allocation Factors
	<b>Revenue Requirements</b>		
1	O&M Expenses	\$56,877,149	<i>O&amp;M (Table 7-7)</i>
2	Debt Service	\$13,529,932	<i>Capital (Table 7-8)</i>
3	CIP	\$10,000,000	<i>Capital (Table 7-8)</i>
4	Reserve Funding	\$5,250,798	<i>Capital (Table 7-8)</i>
5	<b>Total Revenue Requirements</b>	<b>\$85,657,879</b>	
	<b>Revenue Offsets</b>		
6	Other Water Sales	(\$1,103,756)	<i>G&amp;A (Table 7-6)</i>
7	Water Rights Transfers Agreement	(\$4,080,000)	<i>G&amp;A (Table 7-6)</i>
8	Penalty Fees	(\$469,800)	<i>G&amp;A (Table 7-6)</i>
9	Misc. Operating Revenues	(\$277,500)	<i>G&amp;A (Table 7-6)</i>
10	Rent & Lease Income	(\$490,308)	<i>G&amp;A (Table 7-6)</i>
11	SMWD Transfer Agreement	(\$471,600)	<i>G&amp;A (Table 7-6)</i>
12	Energy OC Energy Reimbursement	(\$150,000)	<i>G&amp;A (Table 7-6)</i>
13	Misc. Non-Operating Revenues	(\$107,500)	<i>G&amp;A (Table 7-6)</i>
14	Interest Income	(\$1,474,500)	<i>G&amp;A (Table 7-6)</i>
15	Water Development Fees	(\$4,209,951)	<i>Capital (Table 7-8)</i>
16	Contribution in Aid	(\$95,000)	<i>Capital (Table 7-8)</i>
17	Other Capital Fund Revenues	(\$75,000)	<i>Capital (Table 7-8)</i>
18	<b>Total Revenue Offsets</b>	<b>(\$13,004,915)</b>	
19	<b>Total Rate Revenue Requirement</b>	<b>\$72,652,964</b>	

Table 7-10 shows the allocation of the total rate revenue requirement in FY 2020 to each cost causation component based on allocation bases specified in Table 7-9. Please refer to Appendix 3 for a more detailed table showing the allocation of each individual revenue requirement and revenue offset to the cost causation components.

**Table 7-10: Allocation of Rate Revenue Requirement to Cost Causation Components**

	Cost Causation Component	Rate Revenue Requirement
1	Variable Water Supply	\$26,366,949
2	Base Delivery	\$16,850,574
3	Max Day	\$7,662,210
4	Max Hour	\$1,248,636
5	Conservation	\$263,971
6	Billing & CS	\$1,251,410
7	Meter Services	\$3,369,611
8	General	\$12,934,598
9	IEUA Fixed	\$2,705,005
10	<b>Total Rate Revenue Requirement</b>	<b>\$72,652,964</b>

General costs are not attributable to specific functions, and are therefore allocated proportionally to all other cost causation components with the exception of the Variable Water Supply, Conservation, and IEUA Fixed cost causation components. Variable Water Supply and IEUA and MWD Fixed cost causation components are excluded because these cost causation components are designed to only include very specific water supply-related O&M expenses. Conservation is excluded because a portion of General & Administrative costs were already allocated to the Conservation cost causation component (as shown in Table 7-6). Table 7-11 shows the proportional reallocation of the General cost causation component (Line 8) to all other cost causation components excluding the exceptions noted above.

**Table 7-11: General Cost Reallocation**

	Cost Causation Component	Rate Revenue Requirement <i>A (Table 7-10)</i>	General Cost Reallocation (%) <i>B</i>	General Cost Reallocation (\$) <i>C</i>	Reallocated Rate Revenue Requirement <i>D = A + C</i>
1	Variable Water Supply	\$26,366,949	N/A	N/A	\$26,366,949
2	Base Delivery	\$16,850,574	55.5%	\$7,173,729	\$24,024,303
3	Max Day	\$7,662,210	25.2%	\$3,262,003	\$10,924,213
4	Max Hour	\$1,248,636	4.1%	\$531,577	\$1,780,213
5	Conservation	\$263,971	N/A	N/A	\$263,971
6	Billing & CS	\$1,251,410	4.1%	\$532,758	\$1,784,168
7	Meter Services	\$3,369,611	11.1%	\$1,434,531	\$4,804,142
8	General	\$12,934,598	N/A	(\$12,934,598)	\$0
9	IEUA Fixed	\$2,705,005	N/A	N/A	\$2,705,005
10	<b>Total Rate Revenue Requirement</b>	<b>\$72,652,964</b>	<b>100.0%</b>	<b>\$0</b>	<b>\$72,652,964</b>

After reallocation of General costs, the next part of Step 3 is to identify costs to be attributed specifically to private fire lines. Cost of service analyses utilizing the Base-Extra Capacity method typically allocate costs to private fire lines by identifying the proportion of system peaking attributable to providing water capacity for fire protection purposes. In order to do so, peaking units must be developed based on actual water use data and fire flow demand assumptions.

Maximum month peaking factors must first be calculated to determine systemwide peaking units. Table 7-12 shows the calculation of maximum month peaking factors based on Raftelis' analysis of account level customer water use data for each billing period of FY 2019. The maximum month factor represents the

ratio of maximum month water use to average monthly water use over a one year period. Total FY 2019 water use is broken out based on the revised tier definitions (based on Figure 6-1).

**Table 7-12: FY 2019 Peaking Usage Analysis**

Revised Tiers	FY 2019 Usage	%	Average monthly	Max monthly	Max Month Peaking Factor
	<i>A</i>	<i>B</i>	<i>C</i>	<i>D (July 2018)</i>	<i>E = D / C</i>
Tier 1	4,879,771 hcf	26.2%	406,648 hcf	425,373 hcf	1.0460
Tier 2	5,902,080 hcf	31.6%	491,840 hcf	616,368 hcf	1.2532
Tier 3	3,608,798 hcf	19.3%	300,733 hcf	459,264 hcf	1.5271
Tier 4	4,266,335 hcf	22.9%	355,528 hcf	642,434 hcf	1.8070
<b>Total</b>	<b>18,656,984 hcf</b>	<b>100%</b>	<b>1,554,749 hcf</b>	<b>2,143,439 hcf</b>	<b>1.3786</b>

Table 7-13 shows the calculation of peaking units associated with customer water use exclusive of fire protection purposes. Max Day peaking units are represented by Extra Max Day Capacity in hcf per day (Line 6). Max Hour peaking units are represented by Extra Max Hour Capacity in hcf per day (Line 10). Please refer to the Notes column of Table 7-13 for details on each calculation step.

**Table 7-13: Water System Average and Peak Demand**

	Description	Value	Units	Notes
1	Annual Water Usage (FY 2020)	18,723,664	hcf	
2	Average Daily Water Usage	51,298	hcf per day	= [1]/ 365 days
3	Systemwide Monthly Peaking Factor	1.379		Table 7-12
4	Systemwide Max Day Factor	1.60		Table 7-4
5	Max Day Total Daily Capacity	113,089	hcf per day	= [2] x [3] x [4]
6	Extra Max Day Capacity	61,792	hcf per day	= [5] - [2]
7	Systemwide Monthly Peaking Factor	1.379		Table 7-12
8	Systemwide Max Hour Factor	2.00		Table 7-4
9	Max Hour Total Daily Capacity	226,179	hcf per day	= [2] x [7] x [8]
10	Extra Max Hour Capacity	113,089	hcf per day	= [9] - [6] - [2]

Table 7-14 shows the calculation of FY 2020 bills and equivalent meter units (EMUs), which are utilized to calculate unit costs in subsequent steps of the cost of service analysis. EMUs are calculated using meter capacity ratios, which are determined based on the safe operating capacity in gallons per day (gpd) for various meter types and sizes (from Table B-1 of the AWWA M1 Manual). Meter capacity ratios represent the safe operating capacity of larger meter sizes relative to the capacity of a 3/4" meter. For example, a 1" meter has the equivalent capacity of 1.67 times the capacity of a 3/4" meter (Column D, Line 3). Meter capacity ratios are necessary in order to equitably distribute costs that increase with meter size.

To calculate total EMUs, FY 2020 meter counts (Column A) are multiplied first by twelve monthly billing periods per year and then by the respective meter capacity ratios (Column D). Note that private fire lines are not converted into EMUs, as a distinct methodology presented in subsequent sections is used to establish equivalencies between different fire line connection sizes. Because private lines do receive

separate bills from water meters on the same account, fire lines counts are included in the monthly bill totals shown in Column B.

**Table 7-14: Meter Ratios and Equivalent Meter Units (EMUs)**

	Meter Size	FY 2020 Water Meters	Number of Monthly Bills	Meter Hydraulic Capacity (gpm) <sup>19</sup>	Meter Capacity Ratios	Equivalent Meter Units (EMUs)
		<i>A</i>	<i>B = A x 12 bills</i>	<i>C</i>	<i>D = C / 30<sup>20</sup></i>	<i>E = B x D</i>
	<b>Water</b>					
2	3/4"	29,293	351,516	30	1.00	351,516
3	1"	14,244	170,928	50	1.67	284,880
4	1.5"	1,310	15,720	100	3.33	52,400
5	2"	2,289	27,468	160	5.33	146,496
6	3"	189	2,268	320	10.67	24,192
7	4"	100	1,200	500	16.67	20,000
8	6"	35	420	1,000	33.33	14,000
9	8"	64	768	1,600	53.33	40,960
10	10"	13	156	2,400	80.00	12,480
11	12"	0	0	3,375	112.50	0
<b>12</b>	<b>Total Meters</b>	<b>47,537</b>	<b>570,444</b>			<b>946,924</b>
13						
	<b>Private Fire</b>					
15	2"	67	804			
16	3"	2	24			
17	4"	115	1,380			
18	6"	398	4,776			
19	8"	599	7,188			
20	10"	229	2,748			
<b>21</b>	<b>Total Fire Lines</b>	<b>1,410</b>	<b>16,920</b>			
22						
<b>23</b>	<b>Total</b>	<b>48,947</b>	<b>587,364</b>			<b>946,924</b>

Water systems are designed to meet fire protection needs, which place significant demand on the water system over short periods of time. Raftelis calculated peaking units associated with fire protection in Table 7-15. The calculation methodology shown in Table 7-15 is based on guidance in the AWWA M1 Manual. Assumed fire flow requirements from the District’s 2017 Water System Master Plan were used to calculate Max Day (Line 3) and Max Hour (Line 4) peaking units.

<sup>19</sup> AWWA M1 Manual, 7<sup>th</sup> edition, Table B-1

<sup>20</sup> The hydraulic capacity for 3/4 inch meters is 30 gpm.

**Table 7-15: Fire Protection Capacity Demand**

	Description	Value A	Units B	Conversion to hcf = [A] / [748 gallons]	Notes
1	Flow Rate	4,000	gallons per minute		Source: 2017 Water System Master Plan
2	Duration	4	hours		Source: 2017 Water System Master Plan
3	Max Day Extra Capacity	960,000	gallons per day	1,283 hcf per day	4000gpm x 4hrs x 60min/hr
4	Max Hour Extra Capacity	4,800,000	gallons per day	6,417 hcf per day	4000gpm x 24hrs x 60min/hr -960,000 gallons per day

Extra capacity for fire protection must next be distinguished between public fire protection (from fire hydrants) and private fire protection (from private fire lines). Table 7-16 shows the calculation of equivalent fire demand units (Column F), which is necessary to account for differences in potential water flow through different sized connections. Equivalent fire demand units are calculated by multiplying the number of public fire hydrants and private fire line connections in FY 2020 by the respective fire demand factor (Column D). The fire demand factor reflects the relative amount of water flow through a pipe based on the diameter of the connection.<sup>21</sup> Private fire lines constitute 40 percent of total equivalent fire demand units (Line 9). Therefore, 40 percent of costs associated with fire protection are to be attributed to private fire lines.

**Table 7-16: Public and Private Fire Demand Units**

	Description	Connec-tion Size (inches)	Port Size	# of Ports	Fire Demand Factors	# of Connections	Equivalent Fire Demand Units	% Total
		A	B	C	$D = A^{2.63} + C \times B^{2.63}$	E	$F = E \times D$	$G = F / F10$
	<b>Public Fire</b>							
1	Fire Hydrant	4.00	2.0	2	50.7	8,400	425,879	
2	<b>Total Public Fire</b>					<b>8,400</b>	<b>425,879</b>	<b>60%</b>
	<b>Private Fire</b>							
3	2-inch	2.00			6.19	67	415	
4	3-inch	3.00			17.98	2	36	
5	4-inch	4.00			38.32	115	4,407	
6	6-inch	6.00			111.31	398	44,302	
7	8-inch	8.00			237.21	599	142,087	
8	10-inch	10.00			426.58	229	97,687	
9	<b>Total Private Fire</b>					<b>1,410</b>	<b>288,933</b>	<b>40%</b>
10	<b>Total</b>					<b>9,810</b>	<b>714,811</b>	<b>100%</b>

Table 7-17 shows the calculation of private fire protection costs. The total revenue requirement allocated to the Max Day and Max Hour cost causation components (Line 1) was previously calculated in Table 7-11. Peaking units associated with customer water use exclusive of fire protection (Line 2) and for fire

<sup>21</sup> Per the Hazen-Williams equation and AWWA Manual M1:  $[Fire\ Demand\ Factor = (Diameter\ in\ inches)^{2.63}]$ .

protection (Line 3) were previously calculated in Table 7-13 and Table 7-15 respectively, and are summed to establish total peaking units (Line 4). Total Max Day and Max Hour costs (Line 1) are divided by total peaking units (Line 4) to develop unit costs (Line 5). Unit costs (Line 5) are then multiplied by fire protection peaking units (Line 3) to determine total fire protection costs (Line 7). Private fire protection costs are calculated by multiplying total fire protection costs (Line 7) by 40 percent (based on the proportion of equivalent fire demand units attributable to private fire lines).

**Table 7-17: Private Fire Protection Costs**

	Description	Max Day	Max Hour	Total	Notes
		A	B	C = A + B	
1	Allocated Costs	\$10,924,213	\$1,780,213	\$12,704,426	Table 7-11
2	Extra Capacity Demand (hcf/day)	61,792	113,089		Table 7-13
3	Fire Capacity Demand (hcf/day)	1,283	6,417		Table 7-15
4	Total Extra Capacity Demand (hcf/day)	63,075	119,506		= [2]+[3]
5	Unit Cost of Service (per hcf/day)	\$173.19	\$14.90		= [1] / [4]
6					
7	Total Fire Protection	\$222,266	\$95,585	\$317,851	= [5] x [3]
8	Private Fire Protection (40%)	\$89,842	\$38,636	\$128,478	= [40%] x [7]

Table 7-18 shows the reallocation of private fire protection costs (from Table 7-17) from the Max Day and Max Hour cost causation components to a newly introduced Private Fire Protection cost causation component. The rate revenue requirement prior to the reallocation of private fire protection costs (Column A) was previously calculated in Table 7-11. The Private Fire Protection cost causation component is necessary in order to isolate costs to be recovered specifically from monthly Fire Line Service Charges.

**Table 7-18: Reallocation of Costs for Private Fire Protection**

	Cost Causation Component	Rate Revenue Requirement	Private Fire Protection Reallocation	Reallocated Rate Revenue Requirement
		A (Table 7-11)	B (Table 7-17)	C = A + B
1	Variable Water Supply	\$26,366,949		\$26,366,949
2	Base Delivery	\$24,024,303		\$24,024,303
3	Max Day	\$10,924,213	(\$89,842)	\$10,834,371
4	Max Hour	\$1,780,213	(\$38,636)	\$1,741,577
5	Conservation	\$263,971		\$263,971
6	Billing & CS	\$1,784,168		\$1,784,168
7	Meter Services	\$4,804,142		\$4,804,142
8	IEUA Fixed	\$2,705,005		\$2,705,005
9	Private Fire Protection	N/A	\$128,478	\$128,478
10	<b>Total Rate Revenue Requirement</b>	<b>\$72,652,964</b>	<b>\$0</b>	<b>\$72,652,964</b>

Table 7-19 shows a final adjustment to the cost of service allocation developed in Table 7-18. Under the District's existing rate structure, approximately 34 percent of all rate revenues are generated by fixed charges. Raftelis recommends that the District maintain the existing revenue split of 34 percent from fixed charges and the remaining 66 percent from variable water rates. Fixed charge revenue is significantly more

reliable and stabler than variable rate revenue, which fluctuates with the quantity of water used by customers. Therefore, maintaining the existing revenue split will ensure continued revenue stability. In order to maintain the existing fixed/variable split in rate revenue, Raftelis reallocated 65 percent of the Base Delivery revenue requirement (which is to be recovered by variable rates) to the Meter Services revenue requirement (which is to be recovered by fixed charges). This is appropriate because Base Delivery and Meter Services costs are uniformly allocated to all District customers (excluding private fire lines) in proportion to water use or meter capacity.

**Table 7-19: Reallocation of Costs for Revenue Stability**

	Cost Causation Component	Rate Revenue Requirement	Cost Reallocation	Reallocated Rate Revenue Requirement
		<i>A (Table 7-18)</i>	<i>B (65% of Base Delivery to Meter Services)</i>	<i>C = A + B</i>
1	Variable Water Supply	\$26,366,949		\$26,366,949
2	Base Delivery	\$24,024,303	(\$15,615,797)	\$8,408,506
3	Max Day	\$10,834,371		\$10,834,371
4	Max Hour	\$1,741,577		\$1,741,577
5	Conservation	\$263,971		\$263,971
6	Billing & CS	\$1,784,168		\$1,784,168
7	Meter Services	\$4,804,142	\$15,615,797	\$20,419,938
8	IEUA Fixed	\$2,705,005		\$2,705,005
9	Private Fire Protection	\$128,478		\$128,478
10	<b>Total Rate Revenue Requirement</b>	<b>\$72,652,964</b>	<b>\$0</b>	<b>\$72,652,964</b>

#### 7.2.4 Step 4 – Allocate Revenue Requirements to Rate Components

Table 7-20 shows how the revenue requirement for each cost causation component will be recovered. The Variable Water Supply, Base Delivery, Max Day, Max Hour, and Conservation revenue requirements are to be recovered by variable water rates (i.e., Commodity Rates). The Billing & CS, Meter Services, IEUA Fixed, and Private Fire Protection revenue requirements are to be recovered by fixed charges (i.e., Meter Service Charges, Fire Line Service Charges, and IEUA Fixed Surcharges).

**Table 7-20: FY 2020 Adjusted Revenues Requirement in Water Rates Components**

	Cost Causation Component	Rate Revenue Requirement <i>(Table 7-19)</i>	Fixed Charges	Variable Rates
1	Variable Water Supply	\$26,366,949		\$26,366,949
2	Base Delivery	\$8,408,506		\$8,408,506
3	Max Day	\$10,834,371		\$10,834,371
4	Max Hour	\$1,741,577		\$1,741,577
5	Conservation	\$263,971		\$263,971
6	Billing & CS	\$1,784,168	\$1,784,168	
7	Meter Services	\$20,419,938	\$20,419,938	
8	IEUA Fixed	\$2,705,005	\$2,705,005	
9	Private Fire Protection	\$128,478	\$128,478	
10	<b>Total Rate Revenue Requirement</b>	<b>\$72,652,964</b>	<b>\$25,037,590</b>	<b>\$47,615,374</b>

## 8. WATER RATES DEVELOPMENT

Section 8 shows detailed calculations of proposed water rates through FY 2026. All proposed rates are first calculated directly from the results of the cost of service analysis (in Section 7) for FY 2020 (i.e., the “test year”). Note however that proposed rates will not be implemented until FY 2022. Therefore, all FY 2020 “revised” rates and charges shown represent intermediate results of the rate design process and will not actually be implemented. However, FY 2020 revised rates and charges must be first calculated to provide a basis for proposed rates for FY 2022 through FY 2026 (shown in Section 8.3).

### 8.1 REVISED MONTHLY FIXED CHARGES (TEST YEAR)

Fixed charges include Meter Service charges, IEUA Fixed Surcharges, and Fire Line Service Charges. Fixed charges are designed to recover the revenue requirements allocated to the Billing & CS, Meter Service, IEUA Fixed, and Private Fire Protection cost causation components. Individual “unit charges” must first be calculated for each cost causation component in order to develop revised fixed charges for the test year FY 2020. Table 8-1 shows the development of unit charges for the Billing & CS, Meter Service, and IEUA Fixed cost causation components.

Billing & CS costs do not vary based on meter size. Therefore, the Billing & CS revenue requirement (from Table 7-20) is divided by total monthly bills (from Table 7-14) to establish the Billing & CS unit charge. Meter Service costs do vary based on meter size. Therefore, the Meter Service revenue requirement (from Table 7-20) is divided by total EMUs (from Table 7-14) to establish the Meter Service unit charge. The IEUA Fixed revenue requirement consists of fixed IEUA and MWD supply costs, which are based in part on the number of EMUs served by the District. It is therefore most appropriate to recover IEUA Fixed costs from customers in proportion to meter capacity. Therefore, the IEUA Fixed revenue requirement (from Table 7-20) is divided by total EMUs (from Table 7-14) to establish the IEUA Fixed unit charge.

**Table 8-1: Development of Fixed Unit Charges**

	Description	Billing & CS	Meter Service	IEUA Fixed	Notes
1	Revenue Requirement	\$1,784,168	\$20,419,938	\$2,705,005	Table 7-20
2	Units of Service	587,364 monthly bills	946,924 EMUs	946,924 EMUs	Table 7-14
3	<b>Monthly Unit Charge</b>	<b>\$3.04</b>	<b>\$21.56</b>	<b>\$2.86</b>	= [1] / [2]

Table 8-2 shows the calculation of Private Fire Protection unit charges for the test year FY 2020. Larger sized private fire connections require greater capacity, and are responsible for more fire protection-related peaking costs relative to smaller connection sizes. Private Fire Protection costs are therefore recovered from customers in proportion to equivalent fire demand. In Table 8-2, the Private Fire Protection revenue requirement (from Table 7-20) is divided by total equivalent fire demand units associated with private fire lines (from Table 7-16) to establish the Private Fire Protection unit charge.

**Table 8-2: Development of Private Fire Protection Unit Charges**

	Description	FY 2020	Notes
1	Private Fire Protection Revenue Requirement	\$128,478	Table 7-20
2	Units of Service	288,933 Fire Demand Units	Table 7-16
3	Annual Units of Service	3,467,191 Fire Demand Units	= [2] x [12 months]
4	<b>Monthly Unit Charge</b>	<b>\$0.04</b>	= [1] / [2]

Revised Meter Service Charges for the test year FY 2020 are calculated in Table 8-3 based on the Billing & CS and Meter Service unit charges from Table 8-1. Billing & CS charges (Column C) do not vary by meter size. Meter Service charges (Column D) are determined for each meter size by multiplying the unit charge by each respective meter capacity ratio (from Table 7-14). The revised FY 2020 monthly charge (Column E) equals the sum of the Billing & CS and Meter Service charges.

**Table 8-3: FY 2020 Revised Monthly Meter Service Charges**

Meter Size	FY 2020 Meter Count	Meter Capacity Ratios	Billing & CS	Meter Service	Revised Monthly Charge
	<i>A</i>	<i>B (Table 7-14)</i>	<i>C = \$3.04</i>	<i>D = \$21.56 x B</i>	<i>E = C + D</i>
3/4"	29,293	1.00	\$3.04	\$21.56	<b>\$24.61</b>
1"	14,244	1.67	\$3.04	\$35.94	<b>\$38.98</b>
1.5"	1,310	3.33	\$3.04	\$71.88	<b>\$74.92</b>
2"	2,289	5.33	\$3.04	\$115.01	<b>\$118.05</b>
3"	189	10.67	\$3.04	\$230.02	<b>\$233.06</b>
4"	100	16.67	\$3.04	\$359.41	<b>\$362.45</b>
6"	35	33.33	\$3.04	\$718.82	<b>\$721.86</b>
8"	64	53.33	\$3.04	\$1,150.11	<b>\$1,153.15</b>
10"	13	80.00	\$3.04	\$1,725.16	<b>\$1,728.20</b>
12"	0	112.50	\$3.04	\$2,426.01	<b>\$2,429.05</b>

FY 2020 IEUA Fixed Surcharges are calculated in Table 8-4 based on the IEUA Fixed unit charge from Table 8-1. IEUA Fixed charges (Column C) are determined for each meter size by multiplying the unit charge by each respective meter capacity ratio (from Table 7-14). The FY 2020 monthly charge (Column D) simply equals the result in Column C.

**Table 8-4: FY 2020 Monthly IEUA Fixed Surcharges**

Meter Size	FY 2020 Meter Count	Meter Capacity Ratios	IEUA Fixed	Monthly Charge
	<i>A</i>	<i>B (Table 7-14)</i>	<i>C = \$2.86 x B</i>	<i>D = C</i>
3/4"	29,293	1.00	\$2.86	<b>\$2.86</b>
1"	14,244	1.67	\$4.77	<b>\$4.77</b>
1.5"	1,310	3.33	\$9.53	<b>\$9.53</b>
2"	2,289	5.33	\$15.24	<b>\$15.24</b>
3"	189	10.67	\$30.48	<b>\$30.48</b>
4"	100	16.67	\$47.62	<b>\$47.62</b>
6"	35	33.33	\$95.23	<b>\$95.23</b>
8"	64	53.33	\$152.36	<b>\$152.36</b>
10"	13	80.00	\$228.53	<b>\$228.53</b>
12"	0	112.50	\$321.38	<b>\$321.38</b>

Revised Fire Line Service Charges for the test year FY 2020 are calculated in Table 8-5 based on the Billing & CS unit charge from Table 8-1 and Private Fire Protection unit charge from Table 8-2. Billing & CS charges (Column C) do not vary by connection size. Private Fire Protection charges (Column D) are determined for each connection size by multiplying the unit charge by each respective fire demand factor (from Table 7-16). The revised FY 2020 monthly charge (Column E) equals the sum of the Billing & CS and Private Fire Protection charges. Note that Fire Line Service Charges include Billing & CS costs because private fire lines receive separate bills.

**Table 8-5: FY 2020 Revised Monthly Fire Line Service Charges**

Connection Size	FY 2020 Meter Count	Fire Demand Ratio	Billing & CS	Private Fire Protection	Revised Monthly Charge
	<i>A</i>	<i>B (Table 7-16)</i>	<i>C = \$3.04</i>	<i>D = \$0.04 x B</i>	<i>E = C + D</i>
2"	67	6.19	\$3.04	\$0.23	<b>\$3.27</b>
3"	2	17.98	\$3.04	\$0.67	<b>\$3.71</b>
4"	115	38.32	\$3.04	\$1.42	<b>\$4.46</b>
6"	398	111.31	\$3.04	\$4.12	<b>\$7.17</b>
8"	599	237.21	\$3.04	\$8.79	<b>\$11.83</b>
10"	229	426.58	\$3.04	\$15.81	<b>\$18.85</b>

Table 8-6 compares current monthly fixed charges to the revised FY 2020 charges developed in Table 8-3, Table 8-4, and Table 8-5. Revised Meter Service Charges and IEUA Fixed Surcharges are combined in Table 8-6 to provide a clearer comparison of monthly fixed charges that each meter size is subject to. Each meter size experiences a different percentage change in monthly charges due to the shifting of costs between Billing & CS (which do not vary by meter size) and the other cost causation components (which do vary by meter size) relative to the prior cost of service study. Additionally, 3" meters experience an increase due to an update to the assumed meter capacity ratio for 3" meters relative to the prior cost of service study.

**Table 8-6: Comparison of Revised and Current Monthly Fixed Charges**

Meter/ Connection Size	FY 2020 Count	Revised Monthly Charge	Current Monthly Charge	Difference (\$)	Difference (%)
<b>Monthly Meter Service Charges (incl. IEUA Fixed Surcharge)</b>					
3/4"	29,293	<b>\$27.47</b>	\$25.00	\$2.47	9.9%
1"	14,244	<b>\$43.75</b>	\$41.67	\$2.09	5.0%
1.5"	1,310	<b>\$84.45</b>	\$83.34	\$1.12	1.3%
2"	2,289	<b>\$133.29</b>	\$133.34	(\$0.04)	0.0%
3"	189	<b>\$263.54</b>	\$250.00	\$13.54	5.4%
4"	100	<b>\$410.07</b>	\$416.67	(\$6.60)	-1.6%
6"	35	<b>\$817.09</b>	\$833.34	(\$16.25)	-1.9%
8"	64	<b>\$1,305.51</b>	\$1,333.34	(\$27.83)	-2.1%
10"	13	<b>\$1,956.73</b>	\$2,000.00	(\$43.27)	-2.2%
12"	0	<b>\$2,750.43</b>	\$3,000.00	(\$249.57)	-8.3%
<b>Monthly Fire Line Service Charge</b>					
2"	67	<b>\$3.27</b>	\$9.20	(\$5.93)	-64.5%
3"	2	<b>\$3.71</b>	\$13.80	(\$10.09)	-73.1%
4"	115	<b>\$4.46</b>	\$18.40	(\$13.94)	-75.8%
6"	398	<b>\$7.17</b>	\$27.60	(\$20.43)	-74.0%
8"	599	<b>\$11.83</b>	\$36.80	(\$24.97)	-67.9%
10"	229	<b>\$18.85</b>	\$46.00	(\$27.15)	-59.0%

## 8.2 REVISED COMMODITY RATES (TEST YEAR)

The revised Commodity Rates are designed to recover the revenue requirements allocated to the Variable Water Supply, Base Delivery, Max Day, Max Hour, and Conservation cost causation components. Individual “unit rates” must first be calculated for each cost causation component in order to develop revised Commodity Rates for the test year FY 2020. Base Delivery unit rates are the same for all tiers. Variable Water Supply, Peaking (Max Day and Max Hour), and Conservation unit rates however are differentiated by tier. The following subsections show the unit rate development for each cost causation component.

### 8.2.1 Variable Water Supply Unit Rates

The Variable Water Supply cost causation component consists specifically of variable water supply costs from the Chino Watermaster, variable MWD water supply costs, variable pumping costs, and variable treatment costs. Raftelis worked with District staff to determine the proposed method of distributing variable Chino Watermaster and MWD costs to each tier.

The proposed method was to first calculate a “blended” unit cost designed to recover Chino Watermaster variable costs from water use supplied by surface water, the Cucamonga Basin, and the Chino Watermaster. This approach was deemed appropriate because water use in all tiers requires a portion of Chino Watermaster supplies to satisfy demand. The MWD Tier 1 unit cost was designed to recover MWD Tier 1 costs from water use supplied by MWD only. The blended and MWD Tier 1 unit

costs are calculated in Table 8-7 by dividing FY 2020 water supply costs by the quantity demanded (AF), and then converting from \$/AF to \$/hcf by dividing by 435.06 hcf/AF.

**Table 8-7: Water Supply Unit Cost by Sources**

Water Supply Source	Quantity Supplied	Quantity Demanded (5% water loss)	FY 2020 Water Supply Costs	Unit Cost
	<i>A</i>	$B = A \times (100\% - 5\%)$	<i>C</i>	$D = C / B / 435.06^{22}$
<b>Blended Supply</b>				
Surface Water	2,536 AF	2,409 AF	\$0	
Cucamonga Basin	7,320 AF	6,954 AF	\$0	
Chino Watermaster	13,900 AF	13,205 AF	\$1,959,200	
<b>Blended Supply</b>	<b>23,756 AF</b>	<b>22,568 AF</b>	<b>\$1,959,200</b>	<b>\$0.199 / hcf</b>
<b>MWD Tier 1</b>	<b>21,490 AF</b>	<b>20,415 AF</b>	<b>\$15,946,376</b>	<b>\$1.793 / hcf</b>
<b>TOTAL</b>	<b>45,246 AF</b>	<b>42,984 AF</b>	<b>\$17,905,576</b>	

Table 8-8 shows the allocation of variable Chino Watermaster and MWD water supply costs to each tier as well as the calculation of direct water supply unit costs. This first required the attribution of water supplies to meet demand in each tier for the test year FY 2020. The less expensive blended supply was allocated to Tier 1. All remaining blended supply was allocated to Tier 2. MWD Tier 1 water is then attributed to all remaining Tier 2 demand. All Tier 3, Tier 4, and Temporary water demand is thus assumed to be satisfied solely by MWD Tier 1 water for the purposes of the Variable Water Supply unit rate calculation. Allocated supply costs in Column D are calculated by multiplying the assumed water use from each source by the unit costs developed in Table 8-7. The direct water supply unit cost for each tier (Column E) is calculated by dividing allocated supply costs (Column D) by total water sales in each tier (Column C).

**Table 8-8: Direct Water Supply Unit Cost Calculations**

Customer Class/ Tier	Blended Supply	MWD Tier 1	Total Water Sales	Allocated Supply Costs	Direct Water Supply Unit Cost
	<i>A</i>	<i>B</i>	<i>C</i>	$D = [A \times \$0.199] + [B \times \$1.793]$	$E = D / C$
Tier 1	4,945,738 hcf	0 hcf	4,945,738 hcf	\$985,655	<b>\$0.199 / hcf</b>
Tier 2	4,884,970 hcf	1,102,436 hcf	5,987,406 hcf	\$2,950,374	<b>\$0.493 / hcf</b>
Tier 3	0 hcf	3,636,042 hcf	3,636,042 hcf	\$6,519,957	<b>\$1.793 /hcf</b>
Tier 4	0 hcf	4,123,624 hcf	4,123,624 hcf	\$7,394,263	<b>\$1.793 / hcf</b>
Temporary	0 hcf	30,855 hcf	30,855 hcf	\$55,327	<b>\$1.793 /hcf</b>
<b>Total</b>	<b>9,830,708 hcf</b>	<b>8,892,956 hcf</b>	<b>18,723,664 hcf</b>	<b>\$17,905,576</b>	
<b>Unit cost</b>	<b>\$0.199 / hcf</b>	<b>\$1.793 /hcf</b>			

<sup>22</sup> One acre-foot is equal to 435.06 hundred cubic feet.

Table 8-9 shows the calculation of unit costs for pumping and treatment. Variable pumping and treatment costs are distributed evenly to all water use. Total variable costs associated with pumping and treatment (Line 1) are divided by total FY 2020 water use (Line 2) to establish unit costs for each (Line 3).

**Table 8-9: Pumping & Treatment Unit Cost Calculations**

	Description	Pumping	Treatment	Notes
1	FY 2020 Costs	\$5,286,613	\$3,174,760	
2	Total FY 2020 Water Use	18,723,664 hcf	18,723,664 hcf	Table 6-3
3	<b>Unit Cost</b>	<b>\$0.282 /hcf</b>	<b>\$0.170 /hcf</b>	= [1] / [2]

Table 8-10 shows the calculation of Variable Water Supply unit rates for each tier. The Variable Water Supply unit rates simply equal the sum of direct water supply unit costs (from Table 8-8), pumping unit costs (from Table 8-9), and treatment unit cost (from Table 8-9).

**Table 8-10: Variable Water Supply Unit Rate Calculations**

Customer Class/ Tier	Direct Water Supply	Pumping	Treatment	Variable Water Supply Unit Rate
	<i>A (Table 8-8)</i>	<i>B (Table 8-9)</i>	<i>C (Table 8-9)</i>	<i>D = A + B + C</i>
Tier 1	\$0.199	\$0.282	\$0.170	<b>\$0.651 / hcf</b>
Tier 2	\$0.493	\$0.282	\$0.170	<b>\$0.945 / hcf</b>
Tier 3	\$1.793	\$0.282	\$0.170	<b>\$2.245 / hcf</b>
Tier 4	\$1.793	\$0.282	\$0.170	<b>\$2.245 /hcf</b>
Temporary	\$1.793	\$0.282	\$0.170	<b>\$2.245 /hcf</b>

### 8.2.2 Base Delivery Unit Rates

Table 8-11 shows calculation of the Base Delivery unit rate for the test year FY 2020. All water use is subject to the same Base Delivery unit rate. Therefore, the unit rate is calculated by dividing the Base Delivery revenue requirement (from Table 7-20) by total FY 2020 water use (from Table 6-3).

**Table 8-11: Base Delivery Unit Rate Calculations**

	Description	FY 2020	Notes
1	Base Delivery Revenue Requirement	\$8,408,506	Table 7-20
2	Total Water Use	18,723,664 hcf	Table 6-3
3	<b>Base Delivery Unit Rate</b>	<b>\$0.449 / hcf</b>	= [1] / [2]

### 8.2.3 Peaking Unit Rates

Peaking unit rates are designed to recover the Max Day and Max Hour revenue requirements. Peaking unit rates are differentiated by tier based on each tier's relative share of peaking units. Table 8-12 provides a basis for allocating Max Day and Max Hour costs to each tier. Total FY 2020 water use by tier under the revised tier definitions (from Table 6-3) is multiplied by the respective maximum month peaking factor (from Table 7-12) to establish equivalent usage in hcf (Column C).

The proportion of equivalent usage within each tier (Column D) provides the basis for allocating peaking costs to each tier.

Peaking factors for each customer class and tier provide the most appropriate basis for allocating extra capacity-related costs in proportion to the burden placed by customers on the water system during periods of peak water use. Because higher tier water use fluctuates more significantly during periods of systemwide peak water use, it therefore contributes disproportionately to peaking-related costs. This is reflected by the maximum month peaking factors shown below, which increase with each subsequent tier.

**Table 8-12: FY 2020 Projected Water Sales for Peaking Rate**

	Customer Class/ Tier	FY 2020 Water Use	Max Month Peaking Factor	Equivalent Usage	Equivalent Usage (%)
		<i>A (Table 6-3)</i>	<i>B (Table 7-12)</i>	<i>C = A x B</i>	<i>D</i>
1	Tier 1	4,945,738 hcf	1.0460	5,173,480 hcf	20.1%
2	Tier 2	5,987,406 hcf	1.2532	7,503,346 hcf	29.2%
3	Tier 3	3,636,042 hcf	1.5271	5,552,773 hcf	21.6%
4	Tier 4	4,123,624 hcf	1.8070	7,451,331 hcf	29.0%
5	Temporary	30,855 hcf	1.8070	55,754 hcf	0.2%
6	<b>Total</b>	<b>18,723,664 hcf</b>		<b>25,736,684 hcf</b>	<b>100.0%</b>

Table 8-13 shows the Peaking unit rate calculation for each tier. Total Max Day and Max Hour revenue requirements (from Table 7-20) are multiplied by the equivalent usage percentages in Column A (from Table 8-12) to determine the peaking cost allocation to each tier in Column B. The Peaking unit rates in Column D are then calculated by dividing peaking costs in Column B by FY 2020 water use in Column C (from Table 6-3).

**Table 8-13: Peaking Unit Rate Calculations**

	Customer Class/ Tier	Equivalent Usage (%)	Peaking Cost Allocation	FY 2020 Water Use	Unit Rate
		<i>A (Table 8-12)</i>	<i>B = B6 x A</i>	<i>C (Table 6-3)</i>	<i>D = B / C</i>
1	Tier 1	20.1%	\$2,527,964	4,945,738 hcf	<b>\$0.511 / hcf</b>
2	Tier 2	29.2%	\$3,666,428	5,987,406 hcf	<b>\$0.612 / hcf</b>
3	Tier 3	21.6%	\$2,713,302	3,636,042 hcf	<b>\$0.746 / hcf</b>
4	Tier 4	29.0%	\$3,641,011	4,123,624 hcf	<b>\$0.883 / hcf</b>
5	Temporary	0.2%	\$27,244	30,855 hcf	<b>\$0.883 / hcf</b>
6	<b>Total</b>	<b>100.0%</b>	<b>\$12,575,948</b>	<b>18,723,664 hcf</b>	

### 8.2.4 Conservation Unit Rates

Table 8-14 shows calculation of the Conservation unit rate for the test year FY 2020. Only Tier 4 and Temporary water use is subject to the Conservation unit rate. Water use in Tiers 1-3 is exempt because conservation and efficiency efforts typically are intended to reduce inefficient and excessive water use falling within Tier 4. The unit rate is calculated by dividing the Conservation revenue requirement (from Table 7-20) by Tier 4 and Temporary water use in FY 2020 (from Table 6-3).

**Table 8-14: Conservation Unit Rate Calculations**

	Description	FY 2020	Notes
1	Conservation Revenue Requirement	\$263,971	Table 7-20
2	Units of Service	4,154,479 hcf	Tier 4 and temporary water use only (from Table 6-3 [B4 +B5])
3	<b>Conservation Unit Rate</b>	<b>\$0.064 / hcf</b>	= [1] / [2]

**8.2.5 Revised Commodity Rates (Test Year)**

Revised Commodity Rates for the test year FY 2020 are shown below in Table 8-15. Revised Commodity Rates in Column D for each tier are calculated by summing the Variable Water Supply unit rate (from Table 8-10), Base Delivery unit rate (from Table 8-11), Peaking unit rate (from Table 8-13), and Conservation unit rate (from Table 8-14).

**Table 8-15: FY 2020 Revised Water Commodity Rates**

Customer Class/ Tier	Variable Water Supply	Base Delivery	Peaking	Conservation	Revised Commodity Rate
	A (Table 8-10)	B (Table 8-11)	C (Table 8-13)	D (Table 8-14)	D = A + B + C + D
Tier 1	\$0.651	\$0.449	\$0.511	\$0.000	<b>\$1.62 / hcf</b>
Tier 2	\$0.945	\$0.449	\$0.612	\$0.000	<b>\$2.01 / hcf</b>
Tier 3	\$2.245	\$0.449	\$0.746	\$0.000	<b>\$3.45 / hcf</b>
Tier 4	\$2.245	\$0.449	\$0.883	\$0.064	<b>\$3.65 / hcf</b>
Temporary	\$2.245	\$0.449	\$0.883	\$0.064	<b>\$3.65 / hcf</b>

Table 8-16 compares current Commodity Rates to the revised FY 2020 Commodity Rates developed in Table 8-15. Current Commodity Rates shown include the current MWD Surcharge rate of \$0.29 per hcf in order to provide a clearer comparison of the total effective variable rate for each tier. The revised Commodity Rates decrease for Tier 1, Tier 2, and Temporary water use and increase for Tier 3 and Tier 4.

**Table 8-16: Comparison of Revised and Current Commodity Rates**

Customer Class/ Tier	FY 2020 Revised Rates	Current Rates (incl. MWD Surcharge)	Change (\$)	Change (%)
Tier 1	\$1.62 / hcf	\$1.91 / hcf	(\$0.29)	-15.2%
Tier 2	\$2.01 / hcf	\$2.45 / hcf	(\$0.44)	-18.0%
Tier 3	\$3.45 / hcf	\$3.00 / hcf	\$0.45	15.0%
Tier 4	\$3.65 / hcf	\$3.36 / hcf	\$0.29	8.6%
Temporary	\$3.65 / hcf	\$4.99 / hcf	(\$1.34)	-26.9%

**8.3 PROPOSED FIVE-YEAR RATE SCHEDULE**

Section 8.3 shows the development of a proposed schedule of five-year water rates based on the revised FY 2020 rates developed in Section 8.1 and Section 8.2. With the exception of IEUA Fixed Surcharges and MWD Surcharges, all proposed rates are calculated by increasing the revised FY 2020 rates each year by the proposed 2.8 percent annual revenue adjustments from the proposed financial plan (as shown in Table 5-16).

Table 8-17 shows the proposed five-year schedule of Meter Service Charges for FY 2022 through FY 2026. The revised FY 2020 Meter Service Charges (from Table 8-3) are increased by 2.8 percent each year to determine the proposed monthly charges.

**Table 8-17: Proposed Five-Year Schedule of Monthly Meter Service Charges**

Meter Size	Current	Revised Test Year	Proposed FY 2022 (Jan. 2022)	Proposed FY 2023 (Jan. 2023)	Proposed FY 2024 (Jan. 2024)	Proposed FY 2025 (Jan. 2025)	Proposed FY 2026 (Jan. 2026)
3/4"	\$25.00	\$24.61	\$25.30	\$26.01	\$26.74	\$27.49	\$28.26
1"	\$41.67	\$38.98	\$40.08	\$41.21	\$42.37	\$43.56	\$44.78
1.5"	\$83.34	\$74.92	\$77.02	\$79.18	\$81.40	\$83.68	\$86.03
2"	\$133.34	\$118.05	\$121.36	\$124.76	\$128.26	\$131.86	\$135.56
3"	\$250.00	\$233.06	\$239.59	\$246.30	\$253.20	\$260.29	\$267.58
4"	\$416.67	\$362.45	\$372.60	\$383.04	\$393.77	\$404.80	\$416.14
6"	\$833.34	\$721.86	\$742.08	\$762.86	\$784.23	\$806.19	\$828.77
8"	\$1,333.34	\$1,153.15	\$1,185.44	\$1,218.64	\$1,252.77	\$1,287.85	\$1,323.91
10"	\$2,000.00	\$1,728.20	\$1,776.59	\$1,826.34	\$1,877.48	\$1,930.05	\$1,984.10
12"	\$3,000.00	\$2,429.05	\$2,497.07	\$2,566.99	\$2,638.87	\$2,712.76	\$2,788.72

Table 8-18 shows the proposed five-year schedule of IEUA Fixed Surcharges. Due to the proposed changes to the District’s fixed charges, all water meters will be subject to a monthly IEUA Fixed Surcharge in addition to the monthly Meter Service Charge beginning in January 2022. Test year IEUA Fixed Surcharges were developed in Table 8-4. IEUA Fixed Surcharges are not subject to the proposed revenue adjustments (from Table 5-16). The proposed FY 2022 charges were calculated based on a direct pass through of IEUA and MWD fixed water supply charges.<sup>23</sup> Beyond FY 2022, IEUA Fixed Surcharges will be increased by the amount necessary to recover increases in IEUA and MWD fixed water supply costs<sup>24</sup> in excess of the costs shown in Table 5-9. IEUA Fixed Surcharges beyond FY 2022 will depend on actual pass-through costs, and therefore cannot yet be determined.

<sup>23</sup> IEUA and MWD fixed water supply costs in FY 2020 (\$2,928,777) are expected to increase to increase by 22.8 percent by FY 2022 (\$3,320,539). Therefore, proposed FY 2022 IEUA Fixed Surcharges were calculated by proportionally increasing test year FY 2020 charges by 22.8 percent.

<sup>24</sup> IEUA and MWD fixed water supply costs specifically refer to the IEUA MEU, MWD Capacity, and MWD TYRA Charges shown in Table 5-9.

**Table 8-18: Proposed IEUA Fixed Surcharges**

Meter Size	Current	Revised Test Year	Proposed FY 2022 (Jan. 2022)	Proposed FY 2023 (Jan. 2023)	Proposed FY 2024 (Jan. 2024)	Proposed FY 2025 (Jan. 2025)	Proposed FY 2026 (Jan. 2026)
3/4"	N/A	\$2.86	\$3.52	TBD	TBD	TBD	TBD
1"	N/A	\$4.77	\$5.87	TBD	TBD	TBD	TBD
1.5"	N/A	\$9.53	\$11.70	TBD	TBD	TBD	TBD
2"	N/A	\$15.24	\$18.72	TBD	TBD	TBD	TBD
3"	N/A	\$30.48	\$37.43	TBD	TBD	TBD	TBD
4"	N/A	\$47.62	\$58.47	TBD	TBD	TBD	TBD
6"	N/A	\$95.23	\$116.91	TBD	TBD	TBD	TBD
8"	N/A	\$152.36	\$187.04	TBD	TBD	TBD	TBD
10"	N/A	\$228.53	\$280.55	TBD	TBD	TBD	TBD
12"	N/A	\$321.38	\$394.52	TBD	TBD	TBD	TBD

Table 8-19 shows the proposed five-year schedule of Fire Line Service Charges for FY 2022 through FY 2026. The revised FY 2020 Fire Line Service Charges (from Table 8-5) are increased by 2.8 percent each year to determine the proposed monthly charges.

**Table 8-19: Proposed Five-Year Schedule of Monthly Fire Line Service Charges**

Connection Size	Current	Revised Test Year	Proposed FY 2022 (Jan. 2022)	Proposed FY 2023 (Jan. 2023)	Proposed FY 2024 (Jan. 2024)	Proposed FY 2025 (Jan. 2025)	Proposed FY 2026 (Jan. 2026)
2"	\$9.20	\$3.27	\$3.37	\$3.47	\$3.57	\$3.67	\$3.78
3"	\$13.80	\$3.71	\$3.82	\$3.93	\$4.05	\$4.17	\$4.29
4"	\$18.40	\$4.46	\$4.59	\$4.72	\$4.86	\$5.00	\$5.14
6"	\$27.60	\$7.17	\$7.38	\$7.59	\$7.81	\$8.03	\$8.26
8"	\$36.80	\$11.83	\$12.17	\$12.52	\$12.88	\$13.25	\$13.63
10"	\$46.00	\$18.85	\$19.38	\$19.93	\$20.49	\$21.07	\$21.66

Table 8-20 shows the proposed five-year schedule of Commodity Rates for FY 2022 through FY 2026. The revised FY 2020 Commodity Rates (from Table 8-15) are increased by 2.8 percent each year to determine the proposed rates.

**Table 8-20: Proposed Five-Year Schedule of Commodity Rates (\$/hcf)**

Customer Class/Tier	Current (excl. MWD Surcharge)	Revised Test Year	Proposed FY 2022 (Jan. 2022)	Proposed FY 2023 (Jan. 2023)	Proposed FY 2024 (Jan. 2024)	Proposed FY 2025 (Jan. 2025)	Proposed FY 2026 (Jan. 2026)
Tier 1	\$1.62	\$1.62	\$1.67	\$1.72	\$1.77	\$1.82	\$1.88
Tier 2	\$2.16	\$2.01	\$2.07	\$2.13	\$2.19	\$2.26	\$2.33
Tier 3	\$2.71	\$3.45	\$3.55	\$3.65	\$3.76	\$3.87	\$3.98
Tier 4	\$3.07	\$3.65	\$3.76	\$3.87	\$3.98	\$4.10	\$4.22
Temporary	\$4.70	\$3.65	\$3.76	\$3.87	\$3.98	\$4.10	\$4.22

Table 8-21 shows the proposed five-year schedule of MWD Surcharge. Under the proposed rate structure changes, Tier 1 and Tier 2 water use will no longer be subject to MWD Surcharges. For all other water use, the revised FY 2020 MWD Surcharge rate was reset to \$0.00 per hcf. MWD

Surcharges are not subject to the proposed revenue adjustments (from Table 5-16). However, MWD Surcharge rates beginning in January 2022 will be calculated based on incremental increases in the MWD Tier 1 rates relative to the current rate of \$777 per AF. MWD Surcharge rates beginning in FY 2022 will depend on actual pass-through costs, and therefore cannot yet be determined.

**Table 8-21: Proposed Five-Year Schedule of MWD Surcharges (\$/hcf)**

Customer Class/Tier	Current	Revised Test Year	Proposed FY 2022 (Jan. 2022)	Proposed FY 2023 (Jan. 2023)	Proposed FY 2024 (Jan. 2024)	Proposed FY 2025 (Jan. 2025)	Proposed FY 2026 (Jan. 2026)
Tier 1	\$0.29	N/A	N/A	N/A	N/A	N/A	N/A
Tier 2	\$0.29	N/A	N/A	N/A	N/A	N/A	N/A
Tier 3	\$0.29	\$0.00	TBD	TBD	TBD	TBD	TBD
Tier 4	\$0.29	\$0.00	TBD	TBD	TBD	TBD	TBD
Temporary	\$0.29	\$0.00	TBD	TBD	TBD	TBD	TBD

# 9. CUSTOMER IMPACT ANALYSIS

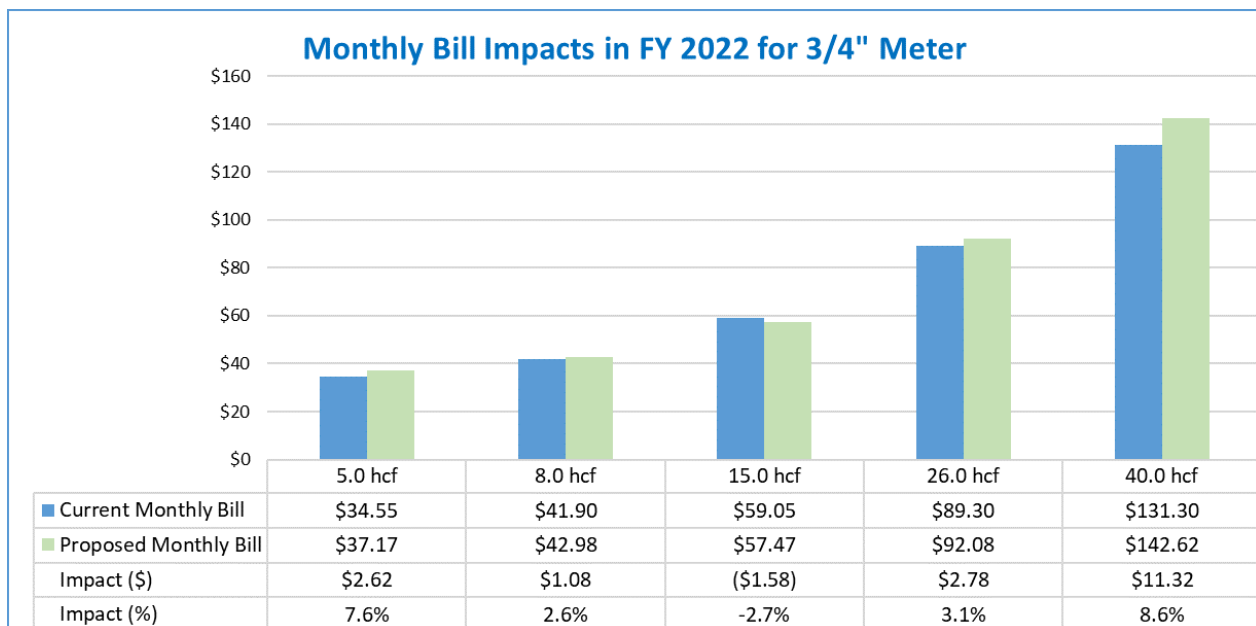
Figure 9-1 shows sample monthly water bills for single family residential customers with a 3/4-inch water meter at varying levels of water use under both current rates and proposed FY 2022 rates. Note that approximately 70 percent of single family residential customers have a 3/4-inch meter. The five different levels of monthly water use represent the following for 3/4-inch meters based on actual FY 2019 billing data:

- » **10<sup>th</sup> percentile:** 5 hcf per month
- » **25<sup>th</sup> percentile:** 8 hcf per month
- » **Median:** 15 hcf per month
- » **75<sup>th</sup> percentile:** 26 hcf per month
- » **90<sup>th</sup> percentile:** 40 hcf per month

Current monthly bills include Meter Service Charges and Commodity rates. Proposed monthly bills include Meter Service Charges, IEUA Fixed Surcharges, and Commodity Rates. Different customers will experience differential bill increases in FY 2022 due to the impacts of the updated cost of service analysis. For example, residential customers with a 3/4-inch meter using 5 hcf per month benefit from the decreased Tier 1 Commodity Rate, but are disproportionately impacted by the increase in 3/4-inch fixed charges (Meter Service Charge and IEUA Fixed Surcharge).

Beyond FY 2022, Meter Service Charges and Commodity Rates will increase by 2.8 percent for all customers based on the proposed revenue adjustments. Fixed IEUA Surcharge and MWD Surcharge increases will depend on actual pass-through costs. Therefore, total monthly bills beyond FY 2022 cannot yet be precisely calculated.

**Figure 9-1: Typical Residential Customer Bill Impacts**



## 10. DROUGHT RATES DEVELOPMENT

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The District currently has a Water Supply Shortage Contingency Plan (WSSCP) in effect that specifies mandatory water use reductions for nine distinct stages. Each subsequent stage consists of progressively larger mandatory water use reductions. Water use reductions are only required when the District's Board of Directors formally declares that a specific stage is in effect.

Periods of reduced water use can negatively impact the District's financial health by decreasing the amount of variable rate revenue generated by Commodity Rates. To reduce this risk, the District developed "drought rates" during the prior rate study. Drought rates are only implemented during declared WSSCP stages. Under the existing drought rate structure, Commodity Rates per hcf increase with each subsequent stage. The purpose of increasing Commodity Rates during declared WSSCP stages is to recover reductions in net revenue resulting from decreased water use.

District staff directed Raftelis to develop a revised system of drought rates as part of this rate study. Under the revised system of drought rates presented below, Commodity Rates do not vary by stage. Alternatively, Raftelis proposes that tier definitions (i.e., monthly tier allotments in hcf) be reduced for each subsequent WSSCP stage. By reducing monthly tier allotments during declared WSSCP stages, water use normally charged at lower tier rates will effectively be charged at higher tier rates, thus recovering reduced rate revenue resulting from decreased water use.

Raftelis developed a customized Macro in Microsoft Excel to calculate proposed tier adjustments for each WSSCP stage. The tier adjustments for each meter size<sup>25</sup> are shown in Table 10-1 through Table 10-10. The tier adjustments are designed to offset decreases in net revenue resulting from required water use reductions at each stage. Changes in net revenue account for both reduced revenue from variable water rates as well as reduced variable water supply O&M expenses.<sup>26</sup> Under the proposed system of drought rates, Tier 3 is effectively eliminated beginning in Stage 1. The Tier 2 allotment is then increasingly reduced with each progressive stage until it is effectively eliminated beginning in Stage 6. The Tier 1 allotment is not reduced until Stage 7.

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<sup>25</sup> Tier allotments for all meter sizes larger than 3/4-inch were calculated by multiplying the proposed tier definitions in Table 10-1 for 3/4-inch meters by the meter capacity ratios shown in Table 7-14.

<sup>26</sup> Specifically MWD Tier 1 costs, Chino Watermaster variable costs, and variable pumping and treatment costs.

**Table 10-1: Proposed Tier Adjustments by WSSCP Stage – 3/4" Water Meters**

WSSCP Stage	Required Water Use Reduction	Tier 1 (hcf)	Tier 2 (hcf)	Tier 3 (hcf)	Tier 4 (hcf)
<b>Normal Conditions</b>	<i>0% reduction</i>	0-6	7-18	19-36	> 36
<b>Stage 1</b>	<i>10% reduction</i>	0-6	7-14	N/A	> 14
<b>Stage 2</b>	<i>15% reduction</i>	0-6	7-12	N/A	> 12
<b>Stage 3</b>	<i>20% reduction</i>	0-6	7-10	N/A	> 10
<b>Stage 4</b>	<i>25% reduction</i>	0-6	7-9	N/A	> 9
<b>Stage 5</b>	<i>30% reduction</i>	0-6	7-7	N/A	>7
<b>Stage 6</b>	<i>35% reduction</i>	0-6	N/A	N/A	> 6
<b>Stage 7</b>	<i>40% reduction</i>	0-5	N/A	N/A	>5
<b>Stage 8</b>	<i>50% reduction</i>	0-4	N/A	N/A	>4
<b>Stage 9</b>	<i>&gt;50% reduction</i>	0-3	N/A	N/A	> 3

**Table 10-2: Proposed Tier Adjustments by WSSCP Stage – 1" Water Meters**

WSSCP Stage	Required Water Use Reduction	Tier 1 (hcf)	Tier 2 (hcf)	Tier 3 (hcf)	Tier 4 (hcf)
<b>Normal Conditions</b>	<i>0% reduction</i>	0-10	11-30	31-60	>60
<b>Stage 1</b>	<i>10% reduction</i>	0-10	11-23	N/A	>23
<b>Stage 2</b>	<i>15% reduction</i>	0-10	11-20	N/A	>20
<b>Stage 3</b>	<i>20% reduction</i>	0-10	11-17	N/A	>17
<b>Stage 4</b>	<i>25% reduction</i>	0-10	11-15	N/A	>15
<b>Stage 5</b>	<i>30% reduction</i>	0-10	11-12	N/A	>12
<b>Stage 6</b>	<i>35% reduction</i>	0-10	N/A	N/A	>10
<b>Stage 7</b>	<i>40% reduction</i>	0-8	N/A	N/A	>8
<b>Stage 8</b>	<i>50% reduction</i>	0-7	N/A	N/A	>7
<b>Stage 9</b>	<i>&gt;50% reduction</i>	0-5	N/A	N/A	>5

**Table 10-3: Proposed Tier Adjustments by WSSCP Stage – 1.5" Water Meters**

WSSCP Stage	Required Water Use Reduction	Tier 1 (hcf)	Tier 2 (hcf)	Tier 3 (hcf)	Tier 4 (hcf)
<b>Normal Conditions</b>	<i>0% reduction</i>	0-20	21-60	61-120	>120
<b>Stage 1</b>	<i>10% reduction</i>	0-20	21-47	N/A	>47
<b>Stage 2</b>	<i>15% reduction</i>	0-20	21-40	N/A	>40
<b>Stage 3</b>	<i>20% reduction</i>	0-20	21-33	N/A	>33
<b>Stage 4</b>	<i>25% reduction</i>	0-20	21-30	N/A	>30
<b>Stage 5</b>	<i>30% reduction</i>	0-20	21-23	N/A	>23
<b>Stage 6</b>	<i>35% reduction</i>	0-20	N/A	N/A	>20
<b>Stage 7</b>	<i>40% reduction</i>	0-17	N/A	N/A	>17
<b>Stage 8</b>	<i>50% reduction</i>	0-13	N/A	N/A	>13
<b>Stage 9</b>	<i>&gt;50% reduction</i>	0-10	N/A	N/A	>10

**Table 10-4: Proposed Tier Adjustments by WSSCP Stage – 2" Water Meters**

WSSCP Stage	Required Water Use Reduction	Tier 1 (hcf)	Tier 2 (hcf)	Tier 3 (hcf)	Tier 4 (hcf)
<b>Normal Conditions</b>	<i>0% reduction</i>	0-32	33-96	97-192	>192
<b>Stage 1</b>	<i>10% reduction</i>	0-32	33-75	N/A	>75
<b>Stage 2</b>	<i>15% reduction</i>	0-32	33-64	N/A	>64
<b>Stage 3</b>	<i>20% reduction</i>	0-32	33-53	N/A	>53
<b>Stage 4</b>	<i>25% reduction</i>	0-32	33-48	N/A	>48
<b>Stage 5</b>	<i>30% reduction</i>	0-32	33-37	N/A	>37
<b>Stage 6</b>	<i>35% reduction</i>	0-32	N/A	N/A	>32
<b>Stage 7</b>	<i>40% reduction</i>	0-27	N/A	N/A	>27
<b>Stage 8</b>	<i>50% reduction</i>	0-21	N/A	N/A	>21
<b>Stage 9</b>	<i>&gt;50% reduction</i>	0-16	N/A	N/A	>16

**Table 10-5: Proposed Tier Adjustments by WSSCP Stage – 3" Water Meters**

WSSCP Stage	Required Water Use Reduction	Tier 1 (hcf)	Tier 2 (hcf)	Tier 3 (hcf)	Tier 4 (hcf)
<b>Normal Conditions</b>	<i>0% reduction</i>	0-64	65-192	193-384	>384
<b>Stage 1</b>	<i>10% reduction</i>	0-64	65-149	N/A	>149
<b>Stage 2</b>	<i>15% reduction</i>	0-64	65-128	N/A	>128
<b>Stage 3</b>	<i>20% reduction</i>	0-64	65-107	N/A	>107
<b>Stage 4</b>	<i>25% reduction</i>	0-64	65-96	N/A	>96
<b>Stage 5</b>	<i>30% reduction</i>	0-64	65-75	N/A	>75
<b>Stage 6</b>	<i>35% reduction</i>	0-64	N/A	N/A	>64
<b>Stage 7</b>	<i>40% reduction</i>	0-53	N/A	N/A	>53
<b>Stage 8</b>	<i>50% reduction</i>	0-43	N/A	N/A	>43
<b>Stage 9</b>	<i>&gt;50% reduction</i>	0-32	N/A	N/A	>32

**Table 10-6: Proposed Tier Adjustments by WSSCP Stage – 4" Water Meters**

WSSCP Stage	Required Water Use Reduction	Tier 1 (hcf)	Tier 2 (hcf)	Tier 3 (hcf)	Tier 4 (hcf)
<b>Normal Conditions</b>	<i>0% reduction</i>	0-100	101-300	301-600	>600
<b>Stage 1</b>	<i>10% reduction</i>	0-100	101-233	N/A	>233
<b>Stage 2</b>	<i>15% reduction</i>	0-100	101-200	N/A	>200
<b>Stage 3</b>	<i>20% reduction</i>	0-100	101-167	N/A	>167
<b>Stage 4</b>	<i>25% reduction</i>	0-100	101-150	N/A	>150
<b>Stage 5</b>	<i>30% reduction</i>	0-100	101-117	N/A	>117
<b>Stage 6</b>	<i>35% reduction</i>	0-100	N/A	N/A	>100
<b>Stage 7</b>	<i>40% reduction</i>	0-83	N/A	N/A	>83
<b>Stage 8</b>	<i>50% reduction</i>	0-67	N/A	N/A	>67
<b>Stage 9</b>	<i>&gt;50% reduction</i>	0-50	N/A	N/A	>50

**Table 10-7: Proposed Tier Adjustments by WSSCP Stage – 6" Water Meters**

WSSCP Stage	Required Water Use Reduction	Tier 1 (hcf)	Tier 2 (hcf)	Tier 3 (hcf)	Tier 4 (hcf)
<b>Normal Conditions</b>	<i>0% reduction</i>	0-200	201-600	601-1,200	>1,200
<b>Stage 1</b>	<i>10% reduction</i>	0-200	201-467	N/A	>467
<b>Stage 2</b>	<i>15% reduction</i>	0-200	201-400	N/A	>400
<b>Stage 3</b>	<i>20% reduction</i>	0-200	201-333	N/A	>333
<b>Stage 4</b>	<i>25% reduction</i>	0-200	201-300	N/A	>300
<b>Stage 5</b>	<i>30% reduction</i>	0-200	201-233	N/A	>233
<b>Stage 6</b>	<i>35% reduction</i>	0-200	N/A	N/A	>200
<b>Stage 7</b>	<i>40% reduction</i>	0-167	N/A	N/A	>167
<b>Stage 8</b>	<i>50% reduction</i>	0-133	N/A	N/A	>133
<b>Stage 9</b>	<i>&gt;50% reduction</i>	0-100	N/A	N/A	>100

**Table 10-8: Proposed Tier Adjustments by WSSCP Stage – 8" Water Meters**

WSSCP Stage	Required Water Use Reduction	Tier 1 (hcf)	Tier 2 (hcf)	Tier 3 (hcf)	Tier 4 (hcf)
<b>Normal Conditions</b>	<i>0% reduction</i>	0-320	321-960	961-1,920	>1,920
<b>Stage 1</b>	<i>10% reduction</i>	0-320	321-747	N/A	>747
<b>Stage 2</b>	<i>15% reduction</i>	0-320	321-640	N/A	>640
<b>Stage 3</b>	<i>20% reduction</i>	0-320	321-533	N/A	>533
<b>Stage 4</b>	<i>25% reduction</i>	0-320	321-480	N/A	>480
<b>Stage 5</b>	<i>30% reduction</i>	0-320	321-373	N/A	>373
<b>Stage 6</b>	<i>35% reduction</i>	0-320	N/A	N/A	>320
<b>Stage 7</b>	<i>40% reduction</i>	0-267	N/A	N/A	>267
<b>Stage 8</b>	<i>50% reduction</i>	0-213	N/A	N/A	>213
<b>Stage 9</b>	<i>&gt;50% reduction</i>	0-160	N/A	N/A	>160

**Table 10-9: Proposed Tier Adjustments by WSSCP Stage – 10" Water Meters**

WSSCP Stage	Required Water Use Reduction	Tier 1 (hcf)	Tier 2 (hcf)	Tier 3 (hcf)	Tier 4 (hcf)
<b>Normal Conditions</b>	<i>0% reduction</i>	0-480	481-1,440	1,441-2,880	>2,880
<b>Stage 1</b>	<i>10% reduction</i>	0-480	481-1,120	N/A	>1,120
<b>Stage 2</b>	<i>15% reduction</i>	0-480	481-960	N/A	>960
<b>Stage 3</b>	<i>20% reduction</i>	0-480	481-800	N/A	>800
<b>Stage 4</b>	<i>25% reduction</i>	0-480	481-720	N/A	>720
<b>Stage 5</b>	<i>30% reduction</i>	0-480	481-560	N/A	>560
<b>Stage 6</b>	<i>35% reduction</i>	0-480	N/A	N/A	>480
<b>Stage 7</b>	<i>40% reduction</i>	0-400	N/A	N/A	>400
<b>Stage 8</b>	<i>50% reduction</i>	0-320	N/A	N/A	>320
<b>Stage 9</b>	<i>&gt;50% reduction</i>	0-240	N/A	N/A	>240

**Table 10-10: Proposed Tier Adjustments by WSSCP Stage – 12" Water Meters**

<b>WSSCP Stage</b>	<b>Required Water Use Reduction</b>	<b>Tier 1 (hcf)</b>	<b>Tier 2 (hcf)</b>	<b>Tier 3 (hcf)</b>	<b>Tier 4 (hcf)</b>
<b>Normal Conditions</b>	<i>0% reduction</i>	0-675	676-2,025	2,026-4,050	>4,050
<b>Stage 1</b>	<i>10% reduction</i>	0-675	676-1,575	N/A	>1,575
<b>Stage 2</b>	<i>15% reduction</i>	0-675	676-1,350	N/A	>1,350
<b>Stage 3</b>	<i>20% reduction</i>	0-675	676-1,125	N/A	>1,125
<b>Stage 4</b>	<i>25% reduction</i>	0-675	676-1,013	N/A	>1,013
<b>Stage 5</b>	<i>30% reduction</i>	0-675	676-788	N/A	>788
<b>Stage 6</b>	<i>35% reduction</i>	0-675	N/A	N/A	>675
<b>Stage 7</b>	<i>40% reduction</i>	0-563	N/A	N/A	>563
<b>Stage 8</b>	<i>50% reduction</i>	0-450	N/A	N/A	>450
<b>Stage 9</b>	<i>&gt;50% reduction</i>	0-338	N/A	N/A	>338

# APPENDIX

## Appendix 1 – O&M Cost Functionalization and Allocation to Cost Causation Components

Cucamonga Valley Water District		Water Rate Model FY 2020										
Water O&M Allocation		Functions	Variable Water Supply	Base Fixed	Max Day	Max Hour	Conservation	Billing & CS	Meters & Services	General	IEUA Fixed Surcharge	Total
<b>Water Supply</b>												
Professional Services	Supply	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Materials & Supplies	Supply	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Outside Services	Supply	\$0	\$40,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$40,000
Purchased Water	Supply	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Water Inventory	Supply	\$0	\$2,000,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,000,000
Kaiser	Supply	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
MWD	Variable Water Supply	\$15,946,376	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$15,946,376
Ready To Serve Charge	IEUA Fixed Surcharge	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,705,005	\$0	\$2,705,005
Interconnection Purchases	Supply	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Watermaster Assessments	Variable Water Supply	\$1,959,200	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,959,200
Fontana Union Assessments	Supply	\$0	\$1,100,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,100,000
DOH Water System Fees	Supply	\$0	\$102,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$102,000
RW in Storage	Supply	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Permit Fees	Supply	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>Pumping</b>												
Salaries & Wages (110)	Pumping	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
District Burden / Benefits (110)	Pumping	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Salaries & Wages	Pumping	\$0	\$253,198	\$151,688	\$101,510	\$0	\$0	\$0	\$0	\$0	\$0	\$506,396
District Burden / Benefits	Pumping	\$0	\$156,105	\$93,521	\$62,584	\$0	\$0	\$0	\$0	\$0	\$0	\$312,210
Outside Labor	Pumping	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Professional Services	Pumping	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Utilities	Variable Water Supply	\$5,186,613	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$5,186,613
Materials & Supplies	Variable Water Supply	\$100,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$100,000
Equipment Replacement	Pumping	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Outside Services	Pumping	\$0	\$65,875	\$39,465	\$26,410	\$0	\$0	\$0	\$0	\$0	\$0	\$131,750
Safety	Pumping	\$0	\$6,300	\$3,774	\$2,526	\$0	\$0	\$0	\$0	\$0	\$0	\$12,600
Permit Fees	Pumping	\$0	\$19,000	\$11,383	\$7,617	\$0	\$0	\$0	\$0	\$0	\$0	\$38,000
Other Items	Pumping	\$0	\$5,500	\$3,295	\$2,205	\$0	\$0	\$0	\$0	\$0	\$0	\$11,000
<b>Treatment</b>												
Salaries & Wages (110)	Treatment	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
District Burden / Benefits (110)	Treatment	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Salaries & Wages	Treatment	\$0	\$963,517	\$577,233	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,540,750
District Burden / Benefits	Treatment	\$0	\$529,263	\$317,075	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$846,338
Outside Labor	Treatment	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Legal Notices	Treatment	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Utilities	Variable Water Supply	\$284,570	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$284,570
Materials & Supplies	Variable Water Supply	\$2,890,190	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,890,190
Equipment Replacement	Treatment	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Outside Services	Treatment	\$0	\$287,751	\$172,389	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$460,140
Safety	Treatment	\$0	\$9,443	\$5,657	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$15,100
Permit Fees	Treatment	\$0	\$2,645	\$1,585	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$4,230
Other Items	Treatment	\$0	\$12,320	\$7,380	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$19,700

Cucamonga Valley Water District		Water Rate Model FY 2020										
Water O&M Allocation		Functions	Variable Water Supply	Base Fixed	Max Day	Max Hour	Conservation	Billing & CS	Meters & Services	General	IEUA Fixed Surcharge	Total
<b>Transmission &amp; Distribution</b>												
Salaries & Wages (110)	T&D		\$0	\$11,617	\$6,960	\$1,549	\$0	\$0	\$0	\$0	\$0	\$20,126
District Burden / Benefits (110)	T&D		\$0	\$7,536	\$4,515	\$1,005	\$0	\$0	\$0	\$0	\$0	\$13,055
Salaries & Wages	T&D		\$0	\$1,129,801	\$676,851	\$150,617	\$0	\$0	\$0	\$0	\$0	\$1,957,270
District Burden / Benefits	T&D		\$0	\$612,604	\$367,004	\$81,668	\$0	\$0	\$0	\$0	\$0	\$1,061,276
Outside Labor	T&D		\$0	\$19,049	\$11,412	\$2,539	\$0	\$0	\$0	\$0	\$0	\$33,000
Professional Development	T&D		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Professional Services / Legal Services	T&D		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Utilities	T&D		\$0	\$16,119	\$9,657	\$2,149	\$0	\$0	\$0	\$0	\$0	\$27,925
Materials & Supplies	T&D		\$0	\$289,427	\$173,393	\$38,584	\$0	\$0	\$0	\$0	\$0	\$501,404
Equipment Replacement	T&D		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Outside Services	T&D		\$0	\$258,023	\$154,579	\$34,398	\$0	\$0	\$0	\$0	\$0	\$447,000
Safety	T&D		\$0	\$20,232	\$12,121	\$2,697	\$0	\$0	\$0	\$0	\$0	\$35,050
Permit Fees	T&D		\$0	\$3,994	\$2,393	\$533	\$0	\$0	\$0	\$0	\$0	\$6,920
Other Items	T&D		\$0	\$17,317	\$10,374	\$2,309	\$0	\$0	\$0	\$0	\$0	\$30,000
<b>Billing, Customer Service &amp; Meter Maintenance</b>												
Salaries & Wages (110)	Meters Maintenance		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
District Burden / Benefits (110)	Meters Maintenance		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Salaries & Wages	Billing & CS		\$0	\$0	\$0	\$0	\$0	\$582,973	\$582,973	\$0	\$0	\$1,165,945
District Burden / Benefits	Billing & CS		\$0	\$0	\$0	\$0	\$0	\$282,947	\$282,947	\$0	\$0	\$565,894
Outside Labor	Billing & CS		\$0	\$0	\$0	\$0	\$0	\$42,700	\$42,700	\$0	\$0	\$85,400
Professional Development	Billing & CS		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Professional Services / Legal Services	Billing & CS		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Personnel Costs / Employee Relations	Billing & CS		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Collection	Billing & CS		\$0	\$0	\$0	\$0	\$0	\$20,500	\$20,500	\$0	\$0	\$41,000
Utilities	Billing & CS		\$0	\$0	\$0	\$0	\$0	\$7,450	\$7,450	\$0	\$0	\$14,900
Materials & Supplies	Billing & CS		\$0	\$0	\$0	\$0	\$0	\$149,750	\$149,750	\$0	\$0	\$299,500
Equipment Replacement	Billing & CS		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Outside Services	Billing & CS		\$0	\$0	\$0	\$0	\$0	\$10,941	\$10,941	\$0	\$0	\$21,881
Safety	Billing & CS		\$0	\$0	\$0	\$0	\$0	\$6,150	\$6,150	\$0	\$0	\$12,300
Permit Fees	Billing & CS		\$0	\$0	\$0	\$0	\$0	\$142,000	\$142,000	\$0	\$0	\$284,000
Other Items	Billing & CS		\$0	\$0	\$0	\$0	\$0	\$6,000	\$6,000	\$0	\$0	\$12,000
<b>General &amp; Administrative (100)</b>												
Salaries & Wages	G&A		\$0	\$0	\$0	\$0	\$79,644	\$0	\$0	\$3,902,541	\$0	\$3,982,185
District Burden / Benefits	G&A		\$0	\$0	\$0	\$0	\$49,121	\$0	\$0	\$2,406,923	\$0	\$2,456,044
Outside Labor	G&A		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Professional Development	G&A		\$0	\$0	\$0	\$0	\$9,494	\$0	\$0	\$465,201	\$0	\$474,695
Professional Services / Legal Services	G&A		\$0	\$0	\$0	\$0	\$16,215	\$0	\$0	\$794,532	\$0	\$810,747
Legal Notices	G&A		\$0	\$0	\$0	\$0	\$605	\$0	\$0	\$29,621	\$0	\$30,225
Election	G&A		\$0	\$0	\$0	\$0	\$14,000	\$0	\$0	\$686,000	\$0	\$700,000
Personnel Costs / Employee Relations	G&A		\$0	\$0	\$0	\$0	\$3,050	\$0	\$0	\$149,464	\$0	\$152,514
Insurance	G&A		\$0	\$0	\$0	\$0	\$6,242	\$0	\$0	\$305,857	\$0	\$312,099
Utilities	G&A		\$0	\$0	\$0	\$0	\$7,770	\$0	\$0	\$380,735	\$0	\$388,505
Materials & Supplies	G&A		\$0	\$0	\$0	\$0	\$12,394	\$0	\$0	\$607,321	\$0	\$619,715
Equipment Replacement	G&A		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Outside Services	G&A		\$0	\$0	\$0	\$0	\$26,398	\$0	\$0	\$1,293,523	\$0	\$1,319,921
Safety	G&A		\$0	\$0	\$0	\$0	\$400	\$0	\$0	\$19,576	\$0	\$19,975
Permit Fees	G&A		\$0	\$0	\$0	\$0	\$1,355	\$0	\$0	\$66,390	\$0	\$67,745
Other Items	G&A		\$0	\$0	\$0	\$0	\$501	\$0	\$0	\$24,529	\$0	\$25,030

Cucamonga Valley Water District		Water Rate Model FY 2020										
Water O&M Allocation		Functions	Variable Water Supply	Base Fixed	Max Day	Max Hour	Conservation	Billing & CS	Meters & Services	General	IEUA Fixed Surcharge	Total
<b>General &amp; Administrative (105)</b>												
Salaries & Wages	G&A	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
District Burden / Benefits	G&A	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Professional Development	G&A	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Professional Services / Legal Services	G&A	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Insurance	G&A	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Utilities	G&A	\$0	\$0	\$0	\$0	\$0	\$779	\$0	\$0	\$38,171	\$0	\$38,950
Materials & Supplies	G&A	\$0	\$0	\$0	\$0	\$140	\$0	\$0	\$0	\$6,860	\$0	\$7,000
Outside Services	G&A	\$0	\$0	\$0	\$0	\$1,344	\$0	\$0	\$0	\$65,856	\$0	\$67,200
Permit Fees	G&A	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>General &amp; Administrative (110)</b>												
Salaries & Wages	G&A	\$0	\$0	\$0	\$0	\$19,385	\$0	\$0	\$0	\$949,873	\$0	\$969,258
District Burden / Benefits	G&A	\$0	\$0	\$0	\$0	\$11,395	\$0	\$0	\$0	\$558,332	\$0	\$569,727
Professional Services / Consulting	G&A	\$0	\$0	\$0	\$0	\$12	\$0	\$0	\$0	\$588	\$0	\$600
Materials & Supplies	G&A	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Outside Services	G&A	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Permit Fees	G&A	\$0	\$0	\$0	\$0	\$340	\$0	\$0	\$0	\$16,660	\$0	\$17,000
<b>Capital Fund Expenses (999)</b>												
Salaries & Wages	Capital Costs w/o Supply	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
District Burden / Benefits	Capital Costs w/o Supply	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>Advance CalPERS Funding</b>	G&A	\$0	\$0	\$0	\$0	\$20,000	\$0	\$0	\$0	\$980,000	\$0	\$1,000,000
<b>Transfers to Rate Stabilization Reserve</b>	G&A	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>TOTAL EXPENSES</b>			<b>\$26,366,949</b>	<b>\$7,938,637</b>	<b>\$2,813,703</b>	<b>\$520,900</b>	<b>\$280,583</b>	<b>\$1,251,410</b>	<b>\$1,251,410</b>	<b>\$13,748,552</b>	<b>\$2,705,005</b>	<b>\$56,877,149</b>
<i>O&amp;M Expense Allocation</i>			46.4%	14.0%	4.9%	0.9%	0.5%	2.2%	2.2%	24.2%	4.8%	100.0%

## Appendix 2 – Capital Asset Functionalization and Allocation to Cost Causation Components

Cucamonga Valley Water District		Water Rate Model FY 2020						
Water Asset Allocation		Base Delivery	Max Day	Max Hour	Conservation	Meters Services	General	Total RCLD
Asset Description	Functions							
Water Canyons & Tunnels	Supply	\$4,709,928	\$0	\$0	\$0	\$0	\$0	\$4,709,928
Water Mains - Deeded	Distribution	\$44,342,673	\$26,565,200	\$17,777,472	\$0	\$0	\$0	\$88,685,345
Water Meters - Developers	Meters	\$0	\$0	\$0	\$0	\$38,177,754	\$0	\$38,177,754
Water Mains - Developers	Distribution	\$1,171,749	\$701,982	\$469,767	\$0	\$0	\$0	\$2,343,497
Water Mains - District	Transmission	\$89,622,655	\$53,691,932	\$0	\$0	\$0	\$0	\$143,314,588
Water Pumping Plant	Pumping	\$253,717	\$151,999	\$101,718	\$0	\$0	\$0	\$507,434
Auto & Trucks	G&A	\$0	\$0	\$0	\$18,706	\$0	\$916,595	\$935,301
Office Building & Improvmts	G&A	\$0	\$0	\$0	\$573,627	\$0	\$28,107,706	\$28,681,332
Communication Equip	G&A	\$0	\$0	\$0	\$3,015	\$0	\$147,729	\$150,743
Computer System	G&A	\$0	\$0	\$0	\$5,159	\$0	\$252,774	\$257,932
GIS Systems	G&A	\$0	\$0	\$0	\$522	\$0	\$25,574	\$26,096
Hydro-Electric	G&A	\$0	\$0	\$0	\$118	\$0	\$5,776	\$5,894
Office Equipment	G&A	\$0	\$0	\$0	\$3,431	\$0	\$168,110	\$171,541
Shop Equipment	G&A	\$0	\$0	\$0	\$16,142	\$0	\$790,959	\$807,101
Shop Building & Improvmts	G&A	\$0	\$0	\$0	\$160,806	\$0	\$7,879,512	\$8,040,318
Software	G&A	\$0	\$0	\$0	\$7,478	\$0	\$366,412	\$373,890
Geological Gauging	G&A	\$0	\$0	\$0	\$46	\$0	\$2,252	\$2,298
Intangible Assets	G&A	\$0	\$0	\$0	\$3,300,571	\$0	\$161,727,987	\$165,028,558
Water Supply Mains	Transmission	\$1,738,054	\$1,041,249	\$0	\$0	\$0	\$0	\$2,779,303
Water Meters - District	Meters	\$0	\$0	\$0	\$0	\$19,058,863	\$0	\$19,058,863
Motors & Electrical	G&A	\$0	\$0	\$0	\$122,567	\$0	\$6,005,759	\$6,128,326
Pumps & Pumping Equipment	Pumping	\$3,281,174	\$1,965,715	\$1,315,459	\$0	\$0	\$0	\$6,562,348
Reservoir	Storage	\$18,593,681	\$11,139,267	\$0	\$0	\$0	\$0	\$29,732,948
Telementary Equipment	Treatment	\$929,355	\$556,766	\$0	\$0	\$0	\$0	\$1,486,121
LWMTP & RNWTP	Treatment	\$54,527,215	\$32,666,646	\$0	\$0	\$0	\$0	\$87,193,862
ABWTP (West)	Treatment	\$4,227,088	\$2,532,401	\$0	\$0	\$0	\$0	\$6,759,490
Water Wells	Supply	\$17,415,171	\$0	\$0	\$0	\$0	\$0	\$17,415,171
Geological Gauging	G&A	\$0	\$0	\$0	\$115	\$0	\$5,644	\$5,759
<b>TOTAL ASSET VALUE</b>		<b>\$240,812,461</b>	<b>\$131,013,157</b>	<b>\$19,664,417</b>	<b>\$4,212,302</b>	<b>\$57,236,617</b>	<b>\$206,402,787</b>	<b>\$659,341,741</b>
<i>Asset Allocation</i>		<i>36.5%</i>	<i>19.9%</i>	<i>3.0%</i>	<i>0.6%</i>	<i>8.7%</i>	<i>31.3%</i>	<i>100.0%</i>

### Appendix 3 – Allocation of FY 2020 Rate Revenue Requirement to Cost Causation Components

FY 2020 Rate Revenue Requirement	Allocation Basis	Variable Water Supply	Base Delivery	Max Day	Max Hour	Conservation	Billing & CS	Meter Services	General	IEUA Fixed	Total
<b>REVENUE REQUIREMENTS</b>											
O&M Expenses	O&M	\$26,366,949	\$7,938,637	\$2,813,703	\$520,900	\$280,583	\$1,251,410	\$1,251,410	\$13,748,552	\$2,705,005	\$56,877,149
Debt Service	Capital	\$0	\$4,941,559	\$2,688,438	\$403,521	\$86,438	\$0	\$1,174,516	\$4,235,460	\$0	\$13,529,932
CIP	Capital	\$0	\$3,652,316	\$1,987,030	\$298,243	\$63,886	\$0	\$868,087	\$3,130,437	\$0	\$10,000,000
Reserve Funding	Capital	\$0	\$1,917,758	\$1,043,349	\$156,601	\$33,545	\$0	\$455,815	\$1,643,729	\$0	\$5,250,798
<b>SUBTOTAL REVENUE REQUIREMENTS</b>		<b>\$26,366,949</b>	<b>\$18,450,270</b>	<b>\$8,532,519</b>	<b>\$1,379,265</b>	<b>\$464,453</b>	<b>\$1,251,410</b>	<b>\$3,749,829</b>	<b>\$22,758,179</b>	<b>\$2,705,005</b>	<b>\$85,657,879</b>
<b>Less OTHER REVENUES</b>											
Other Water Sales	G&A	\$0	\$0	\$0	\$0	(\$22,075)	\$0	\$0	(\$1,081,681)	\$0	(\$1,103,756)
Water Rights Transfers Agreement	G&A	\$0	\$0	\$0	\$0	(\$81,600)	\$0	\$0	(\$3,998,400)	\$0	(\$4,080,000)
Penalty Fees	G&A	\$0	\$0	\$0	\$0	(\$9,396)	\$0	\$0	(\$460,404)	\$0	(\$469,800)
Misc. Operating Revenues	G&A	\$0	\$0	\$0	\$0	(\$5,550)	\$0	\$0	(\$271,950)	\$0	(\$277,500)
Rent & Lease Income	G&A	\$0	\$0	\$0	\$0	(\$9,806)	\$0	\$0	(\$480,502)	\$0	(\$490,308)
SMWD Transfer Agreement	G&A	\$0	\$0	\$0	\$0	(\$9,432)	\$0	\$0	(\$462,168)	\$0	(\$471,600)
Energy OC Energy Reimbursement	G&A	\$0	\$0	\$0	\$0	(\$3,000)	\$0	\$0	(\$147,000)	\$0	(\$150,000)
Misc. Non-Operating Revenues	G&A	\$0	\$0	\$0	\$0	(\$2,150)	\$0	\$0	(\$105,350)	\$0	(\$107,500)
Interest Income	G&A	\$0	\$0	\$0	\$0	(\$29,490)	\$0	\$0	(\$1,445,010)	\$0	(\$1,474,500)
Water Development Fees	Capital	\$0	(\$1,537,607)	(\$836,530)	(\$125,559)	(\$26,896)	\$0	(\$365,460)	(\$1,317,899)	\$0	(\$4,209,951)
Contribution in Aid	Capital	\$0	(\$34,697)	(\$18,877)	(\$2,833)	(\$607)	\$0	(\$8,247)	(\$29,739)	\$0	(\$95,000)
Other Capital Fund Revenues	Capital	\$0	(\$27,392)	(\$14,903)	(\$2,237)	(\$479)	\$0	(\$6,511)	(\$23,478)	\$0	(\$75,000)
<b>SUBTOTAL OTHER REVENUES</b>		<b>\$0</b>	<b>(\$1,599,697)</b>	<b>(\$870,309)</b>	<b>(\$130,629)</b>	<b>(\$200,481)</b>	<b>\$0</b>	<b>(\$380,218)</b>	<b>(\$9,823,581)</b>	<b>\$0</b>	<b>(\$13,004,915)</b>
<b>TOTAL RATE REVENUE REQUIREMENT</b>		<b>\$26,366,949</b>	<b>\$16,850,574</b>	<b>\$7,662,210</b>	<b>\$1,248,636</b>	<b>\$263,971</b>	<b>\$1,251,410</b>	<b>\$3,369,611</b>	<b>\$12,934,598</b>	<b>\$2,705,005</b>	<b>\$72,652,964</b>