BEAUMONT-CHERRY VALLEY WATER DISTRICT

Water Financial Plan and Utility Rate Study

Final Report / December 31, 2019

RAFTELIS

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December 31, 2019

Yolanda Rodriguez
Director of Finance & Administrative Services
Beaumont-Cherry Valley Water District
560 Magnolia Avenue
Beaumont, CA 92223

Subject: Water Financial Plan and Utility Rate Study

Dear Ms. Rodriguez,

Raftelis is pleased to provide this Water Financial Plan and Utility Rate Study Report for the Beaumont-Cherry Valley Water District. This report presents the analyses, rationale, and methodologies utilized in the study to determine water rates that meet the requirements of California Constitution Article XIII D, Section 6, commonly referred to as Proposition 218.

The study involved a comprehensive review of the District's current water rate structure, long-term financial plan, cost requirements, and alternative rate structures to determine proposed water rates that are in line with the District's policy objectives. The main objectives that informed the study include:

- Adequately recovering all costs for prudent fiscal management
- Evaluating alternative rate structures and tier definitions
- Minimizing customer impacts due to changes in rate structure

It has been a pleasure working with you and we thank you and other District staff for the support provided during this study.

Sincerely,

Sudhir Pardiwala
Executive Vice President

Lauren Demine
Consultant

Corrine Schrall
Consultant

445 South Figueroa Street, Suite 1925
Los Angeles, CA 90071
www.raftelis.com

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1. Executive Summary

1.1. System Overview

The Beaumont-Cherry Valley Water District (District) is an independent special district that has both a potable and non-potable water distribution system and serves approximately 19,000 connections, with over 90% of those connections as single-family residences. The District buys State Water Project (SWP) water from the San Gorgonio Pass Water Agency (SGPWA), has access to unused overlying water rights (within the Beaumont Basin), and has groundwater rights to water from Edgar Canyon. The District has stored water in the Beaumont Basin (Basin) and currently has over 35,000 acre-feet (AF) of water stored in the Basin. The District serves non-potable water which currently is raw water purchased from (SGPWA), recharged into the Beaumont Basin, and subsequently put in the non-potable system. In addition, for the non-potable system, the District will be purchasing recycled water from the City of Beaumont and converting certain potable customers to non-potable water service. The District has a total of 24 wells and 15 reservoirs ranging in size from 0.5 million gallons (MG) to 5 MG. Total storage is approximately 23 MG. In the early 2000s, the District Board authorized the purchase of 78.8 acres of land, and eventually constructed the Noble Creek Recharge Facility for the recharge of imported water from the SWP. In the future, storm runoff and possibly highly treated recycled water may be recharged at the facility or a similar facility. With these new water supplies and recharge capabilities, the District's revenue requirement and related expenses are continuing to evolve requiring a long-term financial plan to determine the fiscal impacts to the District and to appropriately establish rates for full cost recovery.

The primary project objectives of the study include:

1. Developing a long-term financial plan that the District may use to evaluate long-term impacts on its revenue requirements, capital needs, and reserves
2. Preparing defensible rates and charges consistent with the cost of providing service
3. Minimizing rate increases while avoiding rate "spikes", setting and maintaining appropriate operation and capital reserves, and maintaining adequate levels of service
4. Designing a rate structure that is responsive to demand fluctuations due to drought and other unforeseen factors through the establishment of pass-throughs and drought rates
5. Meeting external requirements for debt covenants and ensuring adequate capital reinvestment into the water system

1.2. Methodology

The water rates presented in this report were developed using cost of service principles set forth by the American Water Works Association *M1 Manual* titled *Principles of Water Rates, Fees and Charges* (AWWA M1 Manual). Cost of service principles endeavor to distribute costs to customer classes in accordance with the way each class uses the water system. This methodology is described in detail in Sections 4 and 5. The Base-Extra Capacity Method of the AWWA M1 Manual was used to distribute costs to customer classes and tiers. This method separates costs into four main components: (1) base costs, (2) extra capacity costs, (3) customer costs, and (4) fire protection costs. Base costs are costs associated with meeting average daily demand needs and include operations and maintenance costs and capital costs designed to meet average load conditions. Extra capacity costs are costs (both operating and capital costs) associated with meeting peak demand. Customer costs are associated with serving customers, such as meter reading, billing and customer service, etc. Fire protection costs are related solely to the fire protection function of a water system, such as fire hydrants and related mains and valves.

1.3. Proposed Financial Plan

Balancing the need for the District to meet its revenue requirements while mitigating increases to ratepayers' cost for service, Raftelis worked with staff to determine the revenue adjustment schedule in Table 1-1. All revenue adjustments are set for January of each calendar year except CY 2020, which will be effective in March. These adjustments apply only to the District's own rate revenue and do not include potential increases in revenue due to increases in imported water and electrical pass-through rates. Those rates are subject to the changes implemented by the wholesale water supplier or energy provider and the costs, including any rate fluctuations, are entirely passed through to customers. Automatic pass-through adjustments in water rates are allowed through the provisions of Government Code Section 53756 provided that the adjustments are noticed to ratepayers at least 30 days before the effective date.

Table 1-1: Proposed Revenue Adjustments

CY 2020	CY 2021	CY 2022	CY 2023	CY 2024
March	January	January	January	January
1.0%	7.0%	7.0%	7.0%	7.0%

As mentioned in the previous paragraph, the revenue adjustments shown above do not include increases in imported water and power costs which are passed through. However, it should be noted that in the first year (CY 2020) the total effective revenue adjustment, including increases in imported water and power rates that are passed through to customers, is approximately 10%.

Table 1-2 shows the revenues with the proposed revenue adjustments, the projected expenses, along with the net income and calculated debt coverage. As noted above, the District needed to balance its revenue needs with mitigating rate increases for customers. While the proposed financial plan still shows a significant deficit in funding for CY 2020 and CY 2021 (Line 45) due to significant improvement projects, it is able to exceed its required debt coverage ratio of 120 percent in CY 2022 onward (Rows 46 and 47) should it pursue debt funding at that time. The proposed financial plan is discussed further in Section 3.8.

Table 1-2: CY 2019 – CY 2024 Proposed Financial Plan[1]

Line No.	Revenue	CY 2019	CY 2020	CY 2021	CY 2022	CY 2023	CY 2024
1	Rate Revenue	$8,479,519	$8,633,305	$9,412,233	$10,186,696	$11,007,218	$11,881,993
2	Potable SGPWA Revenue	$1,923,431	$2,700,387	$3,014,385	$3,127,120	$3,242,973	$3,343,733
3	Potable Power Revenue	$1,379,853	$1,344,432	$1,405,173	$1,415,801	$1,423,989	$1,430,672
4	Non-Potable Supply Revenue	$369,401	$751,620	$649,965	$673,238	$698,094	$724,853
5	Non-Potable Power	$265,005	$246,923	$205,185	$211,908	$219,515	$228,182
6	**Other Revenue**						
7	Interest Income - General	$270,828	$159,651	$157,592	$120,584	$114,825	$108,015
8	Interest Income - Other	$53,900	$54,439	$54,983	$55,533	$56,089	$56,649
9	Fees	$736,500	$736,500	$736,500	$736,500	$736,500	$736,500
12	Other	$85,814	$85,814	$85,814	$85,814	$85,814	$85,814
13	Miscellaneous	$45,000	$45,000	$45,000	$45,000	$45,000	$45,000
14	**Total Other Revenue**	**$1,192,042**	**$1,081,404**	**$1,079,889**	**$1,043,431**	**$1,038,228**	**$1,031,979**
15	**Total Revenue**	**$13,609,251**	**$14,758,073**	**$15,766,831**	**$16,658,194**	**$17,630,017**	**$18,641,410**
16	**Expenditures**	**CY 2019**	**CY 2020**	**CY 2021**	**CY 2022**	**CY 2023**	**CY 2024**
17	**O&M**						
18	Potable Water Purchases	$4,182,474	$4,344,863	$4,371,660	$4,495,346	$4,619,635	$4,727,281
21	Non-Potable Water Purchases	$968,944	$1,017,381	$888,813	$921,412	$956,468	$994,442
26	Potable O&M	$8,243,155	$9,034,714	$9,548,373	$9,778,769	$10,142,399	$10,364,568
38	Non-Potable Water O&M	$0	$60,415	$258,896	$266,663	$274,663	$282,903
39	**Total O&M**	**$13,394,574**	**$14,457,372**	**$15,067,742**	**$15,462,189**	**$15,993,165**	**$16,369,194**
40	**Rate Funded Capital Projects**	$522,356	$7,579,036	$8,954,349	$769,641	$2,440,067	$2,057,249
41	**Debt Service**						
42	New Proposed Debt - Capital Replacement	$0	$0	$0	$390,309	$390,309	$390,309
43	**Total Debt Service**	**$0**	**$0**	**$0**	**$390,309**	**$390,309**	**$390,309**
44	**Total Expenses**	**$13,916,929**	**$22,036,408**	**$24,022,092**	**$16,622,139**	**$18,823,541**	**$18,816,752**
45	**Net Cashflow**	**($307,678)**	**($7,278,336)**	**($8,255,261)**	**$36,055**	**($1,193,524)**	**($175,341)**
46	Calculated Debt Coverage Ratio	0%	0%	0%	306%	419%	582%
47	Required Debt Coverage Ratio	120%	120%	120%	120%	120%	120%

[1] Line 21 includes all non-potable water purchases, including recycled water from the City of Beaumont and make-up water.

Figure 1-1 through Figure 1-4 display the financial plan in graphical format. Figure 1-1 shows the dollar value of the revenue adjustments (dark blue bars) for the next five years on the left-hand axis. It also graphs the calculated and required debt coverage ratios, as shown by the broken and solid blue lines respectively, on the right-hand axis.

Figure 1-1: Revenue Adjustments and Debt Coverage

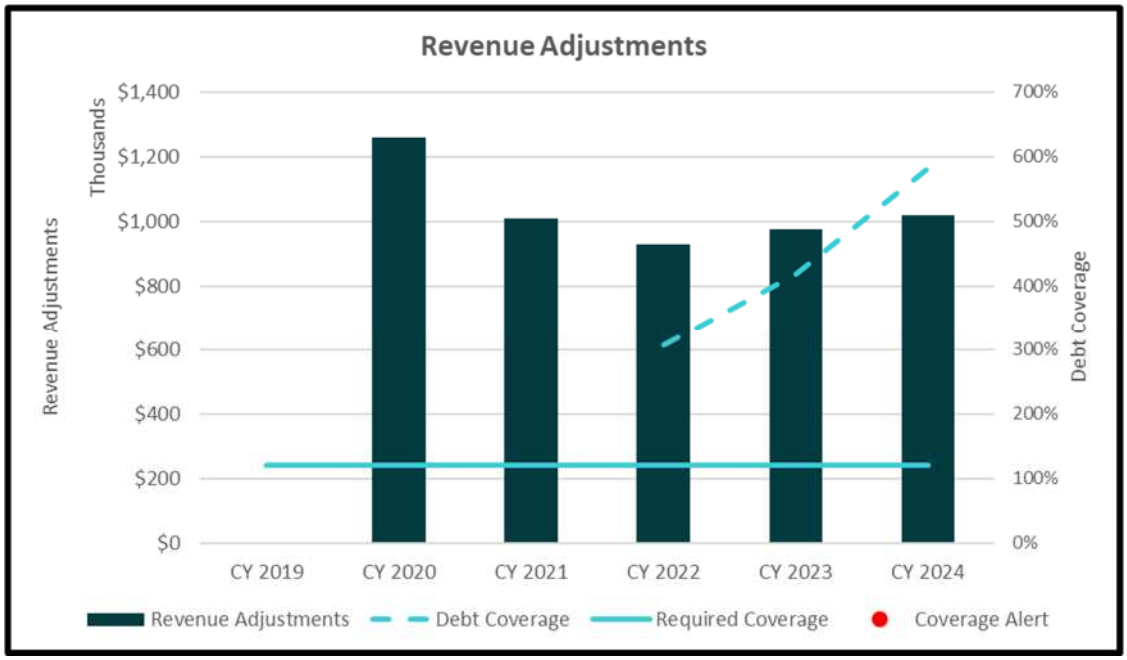


Figure 1-2 graphically illustrates the financial plan, comparing existing and proposed revenues (solid and broken black lines respectively) with projected expenses (bars). The expenses are represented by stacked bars to indicate each expense type's share of total expenses. The net cash flow is shown in yellow.

Figure 1-2: Operating Financial Plan

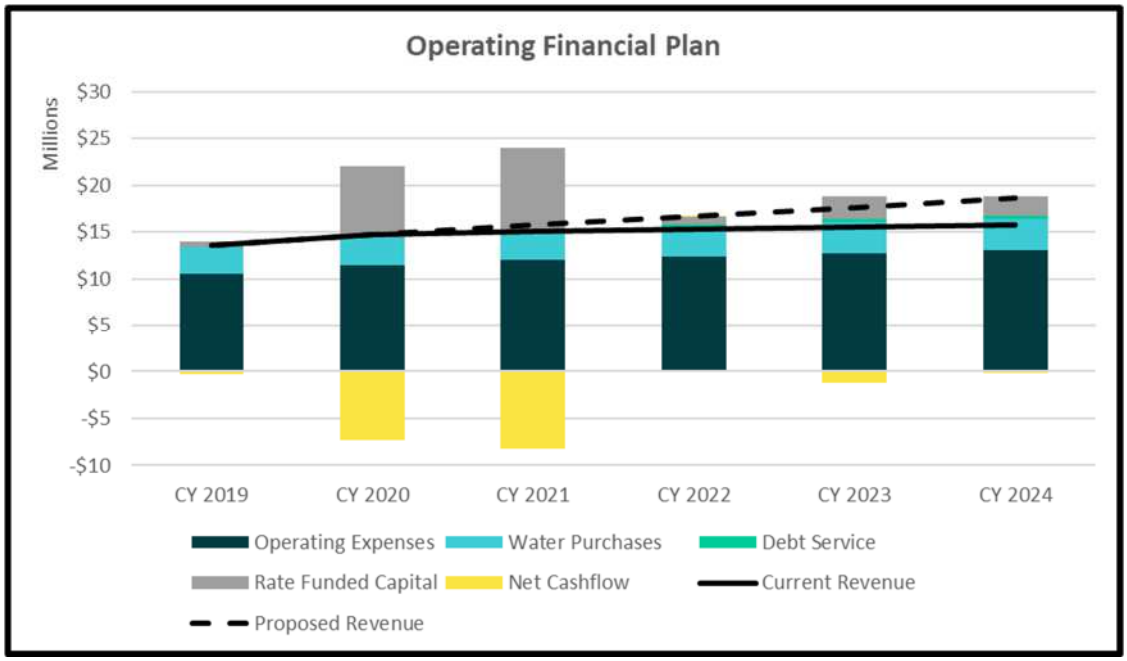


Figure 1-3 and Figure 1-4 show the replacement and expansion Capital Improvement Plans (CIP) using stacked bars that indicate funding by funding mechanism for that year's projects. Expansion projects will be implemented from development fee revenues as and when growth occurs. The replacement CIP is funded in part by a $6 million debt issue in CY 2022 (Figure 1-3 illustrates the debt proceeds of $5.5M). The replacement CIP is funded at 75% of the budgeted replacement CIP to mitigate the impacts of rate increases.

Figure 1-3: Capital Replacement Plan and Funding Sources

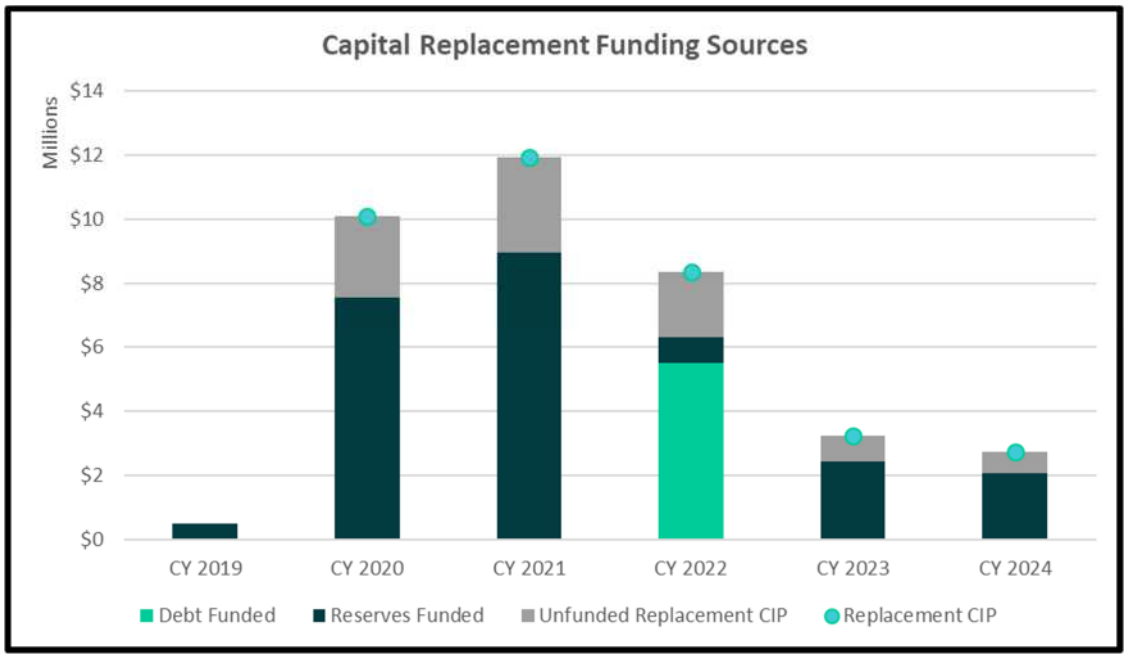
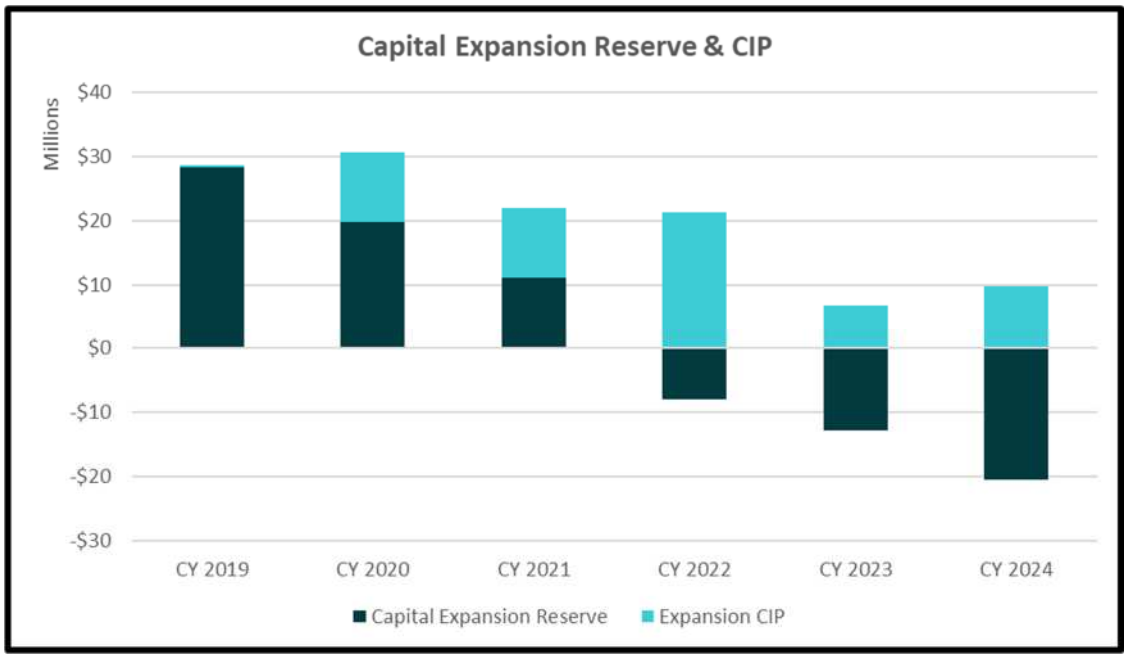


Figure 1-4: Capital Expansion Fund and CIP



1.4. Proposed Potable Water Rate Schedule

The proposed potable and non-potable rates are increased by the revenue adjustments in Table 1-1 to arrive at the 5-year rate schedules shown in in Table 1-3 and Table 1-5. The proposed Fire Service Charges are also escalated according to the rate adjustments in Table 1-1, resulting in the Fire Service Charge Schedule in Table 1-4. For non-fire related use, Fire Service customers also pay a commodity rate (Table 1-5) consisting of the Base Delivery ($0.48) and Peaking ($0.69) unit charges and resulting in the $1.17 CY 2020 rate, which is also escalated by the proposed rate adjustments through CY 2024.

Table 1-3: CY 2020-2024 Proposed Potable and Non-potable Bi-Monthly Meter Service Charges

Meter Size	Current Charge	March 2020	January 2021	January 2022	January 2023	January 2024
5/8"	$18.01	$22.58	$24.17	$25.87	$27.69	$29.63
3/4"	$27.02	$31.13	$33.31	$35.65	$38.15	$40.83
1"	$45.03	$48.24	$51.62	$55.24	$59.11	$63.25
1 1/2"	$90.06	$91.01	$97.39	$104.21	$111.51	$119.32
2"	$144.09	$142.33	$152.30	$162.97	$174.38	$186.59
3"	$288.18	$304.84	$326.18	$349.02	$373.46	$399.61
4"	$450.28	$544.34	$582.45	$623.23	$666.86	$713.55
6"	$900.55	$1,117.43	$1,195.66	$1,279.36	$1,368.92	$1,464.75
8"	$1,440.88	$2,400.46	$2,568.50	$2,748.30	$2,940.69	$3,146.54
10"	$2,071.27	$3,597.95	$3,849.81	$4,119.30	$4,407.66	$4,716.20
12"	$2,791.71	$4,538.84	$4,856.56	$5,196.52	$5,560.28	$5,949.50

Table 1-4: CY 2020 to 2024 Proposed Fire Service Charges

Fire Meter Size	Current Charge	March 2020	January 2021	January 2022	January 2023	January 2024
4"	$51.82	$44.25	$47.35	$50.67	$54.22	$58.02
6"	$150.53	$118.12	$126.39	$135.24	$144.71	$154.84
8"	$320.79	$245.52	$262.71	$281.10	$300.78	$321.84
10"	$576.89	$437.17	$467.78	$500.53	$535.57	$573.06
12"	$931.84	$702.78	$751.98	$804.62	$860.95	$921.22

Table 1-5: CY 2020-2024 Proposed Potable and Non-potable Commodity Rates ($/ccf[2])

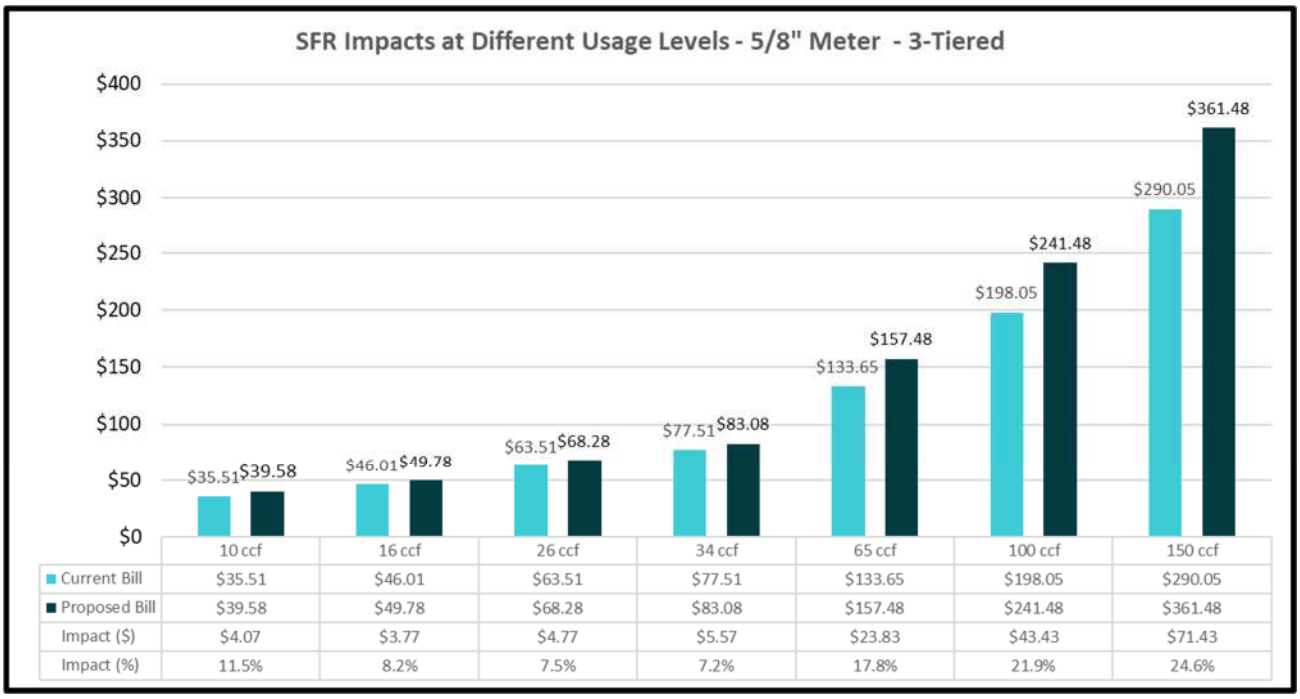
Customer Class	Bi-Monthly Tiers (ccf)	March 2020	January 2021	January 2022	January 2023	January 2024
Single Family						
Tier 1	16	$0.66	$0.71	$0.76	$0.82	$0.88
Tier 2	34	$0.81	$0.87	$0.94	$1.01	$1.09
Tier 3	34+	$1.36	$1.46	$1.57	$1.68	$1.80
Multi-Family	Uniform	$1.01	$1.09	$1.17	$1.26	$1.35
Commercial/Industrial	Uniform	$0.95	$1.02	$1.10	$1.18	$1.27
Fire Service	Uniform	$1.17	$1.26	$1.35	$1.45	$1.56
Landscape Irrigation	Uniform	$1.06	$1.14	$1.22	$1.31	$1.41
Schedule Irrigation	Uniform	$1.06	$1.14	$1.22	$1.31	$1.41
Construction	Uniform	$1.17	$1.26	$1.35	$1.45	$1.56
Non-Potable	Uniform	$0.72	$0.96	$0.96	$0.98	$0.98
State Project Water (SGPWA)		$0.72	*Pass-Through*	*Pass-Through*	*Pass-Through*	*Pass-Through*
SCE Power Charge (Pumping)		$0.32	*Pass-Through*	*Pass-Through*	*Pass-Through*	*Pass-Through*
Non-potable Water Supply		$0.93	*Pass-Through*	*Pass-Through*	*Pass-Through*	*Pass-Through*
Non-potable Water Power		$0.31	*Pass-Through*	*Pass-Through*	*Pass-Through*	*Pass-Through*

1.4.1. BILL IMPACTS

Figure 1-5 and Figure 1-6 compare the current rates (effective January 1, 2015) versus the proposed CY 2020 rates for two different customer classes. Figure 1-5 shows the impacts of the proposed rates on a hypothetical Single-Family Residential customer with a 5/8" meter at different usage levels. Figure 1-6 shows the impacts on a hypothetical Commercial or Industrial customer with a 2" meter and different levels of consumption.

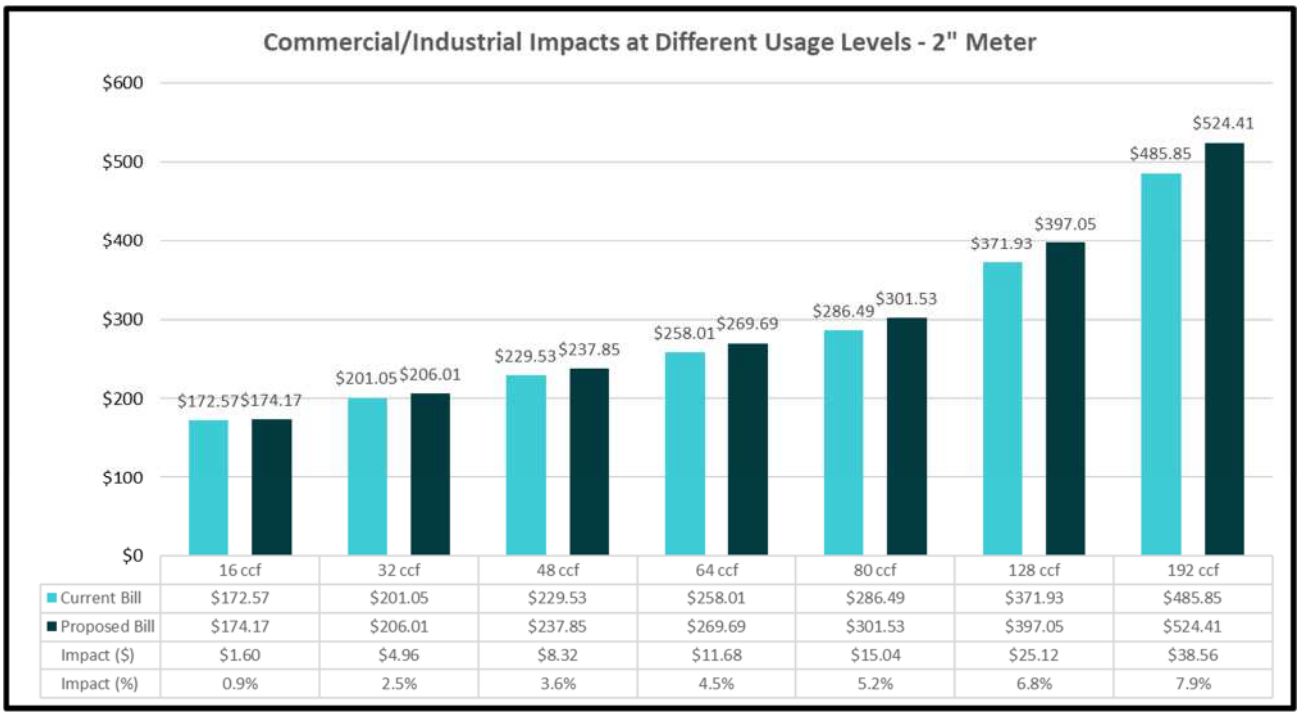
[2] One ccf is equal to one-hundred cubic-feet of water or 748.05 gallons

Figure 1-5: CY 2020 Single-Family Residential Bill Impact Analysis



	10 ccf	16 ccf	26 ccf	34 ccf	65 ccf	100 ccf	150 ccf
Current Bill	$35.51	$46.01	$63.51	$77.51	$133.65	$198.05	$290.05
Proposed Bill	$39.58	$49.78	$68.28	$83.08	$157.48	$241.48	$361.48
Impact ($)	$4.07	$3.77	$4.77	$5.57	$23.83	$43.43	$71.43
Impact (%)	11.5%	8.2%	7.5%	7.2%	17.8%	21.9%	24.6%

Figure 1-6: CY 2020 Commercial/ Industrial Bill Impact Analysis



	16 ccf	32 ccf	48 ccf	64 ccf	80 ccf	128 ccf	192 ccf
Current Bill	$172.57	$201.05	$229.53	$258.01	$286.49	$371.93	$485.85
Proposed Bill	$174.17	$206.01	$237.85	$269.69	$301.53	$397.05	$524.41
Impact ($)	$1.60	$4.96	$8.32	$11.68	$15.04	$25.12	$38.56
Impact (%)	0.9%	2.5%	3.6%	4.5%	5.2%	6.8%	7.9%

1.4.2. PROPOSED POTABLE DROUGHT RATES

In the event that the District activates its water supply drought rates, customers will be notified in advance. The District's drought rates would only be implemented by District Board action. Such action by the District is generally triggered by the declaration of a specific level of water shortage by the California Department of Water Resources (DWR).

Table 1-6 shows the drought rate surcharge that is applied to each potable commodity rate at a given drought stage. If a drought stage is declared at a level intermediate to the stages shown above, the drought surcharges may be prorated linearly. Drought rates are discussed further in Section 5.2.

Table 1-6: Drought Rate Surcharge

	Stage 1	Stage 2	Stage 3	Stage 4
Reduction in Use	10%	20%	30%	40%
Surcharge	$0.17	$0.36	$0.60	$0.92

2. Study Background

This section of the report discusses and provides the necessary context and background information on the District, regulatory framework, and industry-standard methodology utilized in conducting this study. Additionally, this report is based on the calendar year (CY) 2020 budget, with water use characteristics identified using CY 2018 usage data. Water volumes are expressed in acre feet (AF) or hundred cubic feet (ccf), with the latter used to assess volumetric charges on customers.

2.1. System Overview

The Beaumont-Cherry Valley Water District (District) is an independent special district that has both a potable and non-potable water distribution system and serves approximately 19,000 connections, with over 90% of those connections as single-family residences. The District buys State Water Project (SWP) water from the San Gorgonio Pass Water Agency (SGPWA), has access to unused overlying water rights (within the Beaumont Basin), and has groundwater rights to water from Edgar Canyon. The District has stored water in the Beaumont Basin (Basin) and currently has over 35,000 acre-feet (AF) of water stored in the Basin. The District serves non-potable water which currently is raw water purchased from (SGPWA), recharged into the Beaumont Basin, and subsequently put in the non-potable system. In addition, for the non-potable system, the District will be purchasing recycled water from the City of Beaumont and converting certain potable customers to non-potable water service. The District has a total of 24 wells and 15 reservoirs ranging in size from 0.5 million gallons (MG) to 5 MG. Total storage is approximately 23 MG. In the early 2000s, the District Board authorized the purchase of 78.8 acres of land, and in 2006 constructed the Noble Creek Recharge Facility for the recharge of imported water from the SWP. In the future, storm runoff and possibly highly treated recycled water may be recharged at the facility or a similar facility. With these new water supplies and recharge capabilities, the District's revenue requirement and related expenses are continuing to evolve requiring a long-term financial plan to determine the fiscal impacts to the District and to appropriately establish rates for full cost recovery.

The primary project objectives of the study include:

1. Developing a long-term financial plan that the District may use to evaluate long-term impacts on its revenue requirements, capital needs, and reserves
2. Preparing defensible rates and charges consistent with the cost of providing service
3. Minimizing rate increases while avoiding rate "spikes", setting and maintaining appropriate operations and capital reserves, and maintaining adequate levels of service
4. Designing a rate structure that is responsive to demand fluctuations due to drought and other unforeseen factors through the establishment of pass-throughs and drought rates
5. Meeting external requirements for debt covenants and ensuring adequate capital reinvestment into the water system

2.2. Legal Framework

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

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

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

As stated in the AWWA M1 Manual, "water rates and charges should be recovered from classes of customers in proportion to the cost of serving those customers." Raftelis follows industry standard rate setting methodologies set forth by the AWWA M1 Manual to ensure this study meets Proposition 218 requirements and establishes rates that do not exceed the proportionate cost of providing water services. The methodology in the M1 Manual is a nationally recognized industry ratemaking standard which courts have recognized as consistent with Proposition 218.

California Constitution Article X, Section 2

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

2.3. Rate-Setting Methodology

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

1. **Financial Plan:** The first study step is to develop a multi-year financial plan that projects the Water Enterprise's revenues, expenses, capital project financing, annual debt service, and reserve funding. The

financial plan is used to determine the revenue adjustment, which allows the water utility to recover adequate revenues to fund expenses and reserves.

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

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

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

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

5. **Administrative Record Preparation and Rate Adoption:** The final step in a rate study is to develop the administrative record in conjunction with the rate adoption process. This report serves as the administrative record for this study. The administrative record documents the study results and presents the methodologies, rationale, justifications, and calculations used to determine the proposed rates. A thorough and methodological administrative record serves two important functions: maintaining defensibility in a stringent legal environment and communicating the rate adoption process to customers and important stakeholders.

3. Financial Plan

3.1. Key Assumptions

This section describes the assumptions used to project the expenses and reserve targets that determine the District's revenue requirement. The revenue requirement is the basis for determining the necessary revenue adjustments (i.e., the average increase in rates for the entire District) for each year of the study period. Specific rate changes for individual classes are based on the cost of service and may vary from the average revenue adjustment or rate increase.

The revenue calculated for each of the fiscal years in the financial plan is a function of the number of meters, meter size, account growth, water use, and existing rates. Water demand has been projected (and the supply required to meet this demand) based on actual water use in CY 2018, with adjustments for usage growth in CY 2020 onwards using the inflationary factors in Table 3-1. The District expects to have stable demand during the study period, with no increase on a per account basis as indicated by the 100.0% demand factor for both potable and non-potable water.

Table 3-1: Key Revenue Assumptions

	CY 2020	CY 2021	CY 2022	CY 2023	CY 2024
Revenue Escalation Factors					
Non-Inflated	0.0%	0.0%	0.0%	0.0%	0.0%
Non-Rate Revenues	0.0%	0.0%	0.0%	0.0%	0.0%
Interest Income	1.0%	1.0%	1.0%	1.0%	1.0%
Demand Factor					
Potable	100.0%	100.0%	100.0%	100.0%	100.0%
Non-potable	100.0%	100.0%	100.0%	100.0%	100.0%
Account Growth					
Single Family Residential	1.2%	1.2%	1.0%	0.7%	0.6%
Multi-Family Residential	0.0%	0.0%	0.0%	0.0%	0.0%
Irrigation	0.0%	0.0%	0.0%	0.0%	0.0%
Non-Residential	0.0%	0.0%	0.0%	0.0%	0.0%
Non-potable	1.2%	1.1%	1.1%	1.1%	1.1%

To ensure that future costs are reasonably projected, it is necessary to make informed assumptions about inflationary factors and water costs. O&M projections are based on the District's CY 2020 adopted budget and the projected budgetary increases in subsequent years based on the assumptions shown in Table 3-2. The District uses different inflation factors for different expenditures within the budget.

Table 3-2: Key Cost Escalation Factors

	CY 2020	CY 2021	CY 2022	CY 2023	CY 2024
Escalation Factors					
General	3.0%	3.0%	3.0%	3.0%	3.0%
Salary	8.7%	6.0%	3.0%	3.0%	3.0%
Benefits	7.2%	6.0%	3.0%	3.0%	3.0%
General Utilities	3.0%	3.0%	3.0%	3.0%	3.0%
Power	5.0%	5.0%	5.0%	5.0%	5.0%
Non-Inflated	0.0%	0.0%	0.0%	0.0%	0.0%
Demand Driven Costs					
Fixed	**100%**	**100%**	**100%**	**100%**	**100%**
Variable - Potable	101%	101%	101%	101%	100%
Variable - Non-Potable	101%	108%	104%	104%	104%

3.2. Existing Rate Structure and Rates

The District bills every two months (bi-monthly), resulting in six total bills per year for most customers. The existing rate structure for potable water consists of a bi-monthly fixed charge based on meter size and by customer class. The classes for the potable water meter service charges are:

1. **Domestic/ Commercial/ Non-potable:** Single family residential, single business commercial unit, or non-potable water service unit per meter.
2. **Multiple Residential/ Multiple Commercial:** Residential or commercial customers with multiple units on one meter. For example, an apartment building would fall into this classification.
3. **Outside Service:** Customers located outside the District's designated service area but are also served by the District.[3]

Table 3-3: Current Bi-Monthly Potable Water Meter Service Charges

Meter Size	Domestic/ Commercial/ Non-potable	Multiple Residential/ Multiple Commercial	Outside Service
5/8"	$18.01	$12.01	$24.00
3/4"	$27.02	$18.01	$34.50
1"	$45.03	$30.02	$56.00
1 1/2"	$90.06	$60.04	$108.00
2"	$144.09	$96.06	$170.00
3"	$288.18	$192.12	$316.00
4"	$450.28	$300.19	$524.00
6"	$900.55	$600.37	$1,044.00
8"	$1,440.88	$960.59	$1,668.00
10"	$2,071.27	$1,380.85	$2,396.00
12"	$2,791.71	$1,861.14	$4,476.00

Additionally, all customers pay a commodity rate by customer class on all water consumption. These rates are shown in Table 3-4. Domestic and Multi-Family residential customers pay a two-tiered rate based on consumption

[3] There are very few existing Outside Service accounts and no new customers are accepted if they are located outside of the District's service area.

at each tier level. All other customers pay a uniform rate per ccf consumed. Additionally, the District passes through imported water charges and the cost of power to transmit and distribute water to all customers.

Table 3-4: Current Potable and Non-potable Commodity Rates ($/ccf)

Commodity Rate	Tier Width (ccf)	CY 2019
	Bi-Monthly	
Domestic (Single-Family Residential)		
Block 1	0-44 ccf	$0.96
Block 2	45+ ccf	$1.05
Multi-Family Residential		
Block 1	0-35 ccf	$0.96
Block 2	36+ ccf	$0.98
Commercial/Fire Service	Uniform	$0.99
Multiple Commercial	Uniform	$0.99
Landscape	Uniform	$1.15
Schedule Irrigation	Uniform	$1.01
Construction	Uniform	$1.15
Non-potable	Uniform	$1.15
SCE Power Charge		$0.33
State Project Water		$0.46

Finally, private fire service lines also pay a fixed charge, shown in Table 3-5. Customers also pay a commodity rate, shown in Table 3-6 and the purchased water and power charge shown in Table 3-4 above for non-fire related water consumption.

Table 3-5: Current Bi-Monthly Fire Line Charges

Meter Size	CY 2019
Private Fire Lines	
4"	$51.82
6"	$150.53
8"	$320.79
10"	$576.89
12"	$931.84

Table 3-6: Current Fire Service Rate ($/ccf)

	CY 2019
Fire Service Rate	$0.99

3.3. Account and Usage Projections

Table 3-7 shows the estimated number of water accounts by meter size for CY 2019 through CY 2024. The projections are based on account data provided by the District for CY 2018. The number of accounts is used to forecast the amount of fixed revenue the District will receive from the bi-monthly meter service charges. Note that

the Multiple Residential/ Multiple Commercial class is not charged by meter size but by dwelling unit, which is 2/3 the cost of the 5/8" charge (Table 3-3). They have been categorized as 5/8" meters in the table below, which is the total dwelling units. Though this table separates inside and outside District accounts, Raftelis recommends identical rates for both inside- and outside- customers. Table 3-8 shows the projected fire service accounts and hydrants for the study period and Table 3-9 shows the projection of the non-potable meters in the system.

Table 3-7: Potable Water Meters

Customer Class	Meter Size	CY 2019	CY 2020	CY 2021	CY 2022	CY 2023	CY 2024
Potable Water Meters							
	5/8"	13,451	13,610	13,764	13,896	13,997	14,080
	3/4"	404	408	413	417	419	422
	1"	4,274	4,323	4,370	4,410	4,441	4,466
	1 1/2"	93	93	94	94	94	94
	2"	179	179	179	179	179	179
	3"	1	1	1	1	1	1
	4"	2	2	2	2	2	2
	6"	0	0	0	0	0	0
	8"	1	1	1	1	1	1
Total Potable Water Meters		**18,405**	**18,617**	**18,823**	**18,999**	**19,134**	**19,245**
Multiple Residential / Multiple Commercial							
	Equivalent Dwelling Units	961	961	961	961	961	961
Total Multiple Residential / Multiple Commercial		**961**	**961**	**961**	**961**	**961**	**961**
Outside Service							
	5/8"	5	5	5	5	5	5
	3/4"	0	0	0	0	0	0
	1"	1	1	1	1	1	1
Total Outside Service		**6**	**6**	**6**	**6**	**6**	**6**

Table 3-8: Total Fire Service Lines and Hydrants

Meter Size	CY 2019	CY 2020	CY 2021	CY 2022	CY 2023	CY 2024
Private Fire Lines						
4"	72	72	72	72	72	72
6"	22	22	22	22	22	22
8"	47	47	47	47	47	47
10"	15	15	15	15	15	15
12"	12	12	12	12	12	12
Total Private Fire Lines	**168**	**168**	**168**	**168**	**168**	**168**
Public Fire Hydrants	**1,900**	**1,900**	**1,900**	**1,900**	**1,900**	**1,900**

Table 3-9: Non-potable Water Meters

Customer Class	CY 2019	CY 2020	CY 2021	CY 2022	CY 2023	CY 2024
Non-potable Water Meters						
5/8"	1	1	1	1	1	1
3/4"	0	0	0	0	0	0
1"	38	38	39	39	40	40
1 1/2"	87	88	89	90	91	92
2"	174	176	178	180	182	184
Total Non-potable Water Meters	**300**	**303**	**307**	**310**	**314**	**318**

Table 3-10 projects the potable and non-potable water consumption by class for the study period based on CY 2018 usage data.

Table 3-10: Potable and Non-potable Water Use by Class (ccf)

Line No.	Customer Class	CY 2019	CY 2020	CY 2021	CY 2022	CY 2023	CY 2024
	A	B	C	D	E	F	G
1	Single-Family Residential						
2	Block 1	2,598,289	2,629,483	2,659,725	2,685,513	2,705,379	2,721,594
3	Block 2	646,738	654,502	662,030	668,449	673,393	677,429
4	Multi-Family Residential						
5	Block 1	30,559	30,559	30,559	30,559	30,559	30,559
6	Block 2	108,498	108,498	108,498	108,498	108,498	108,498
7	Commercial/Industrial	466,805	466,805	466,805	466,805	466,805	466,805
8	Fire Service	102,242	102,242	102,242	102,242	102,242	102,242
9	Multiple Commercial	0	0	0	0	0	0
10	Landscape Irrigation	84,948	84,948	84,948	84,948	84,948	84,948
11	Schedule Irrigation	20,914	20,914	20,914	20,914	20,914	20,914
12	Construction	122,380	122,380	122,380	122,380	122,380	122,380
13	**"No Charge" Accounts**	14,351	14,351	14,351	14,351	14,351	14,351
14	**Total Potable Usage**	**4,195,723**	**4,234,681**	**4,272,451**	**4,304,658**	**4,329,469**	**4,349,719**
15	**Total Potable Usage (AF)**	**9,632**	**9,721**	**9,808**	**9,882**	**9,939**	**9,986**
16	**Total Non-potable Usage**	**803,045**	**812,360**	**879,738**	**914,724**	**949,711**	**984,698**
17	**Total Non-Potable Usage (AF)**	**1,844**	**1,865**	**2,020**	**2,100**	**2,180**	**2,261**

3.4. O&M Expenses

As detailed in Section 2.1, the District's potable water supply consists of local groundwater and imported water purchases. The non-potable water service is currently supplied by imported water purchases, also referred to as make-up water, from SGPWA. However, the District anticipates that it will begin purchasing recycled water from the City of Beaumont in CY 2021. In order to meet demand, the District must purchase sufficient water to account for water lost in the system.

Table 3-11: Projected Potable and Non-potable Water Loss (%)

	CY 2019	CY 2020	CY 2021	CY 2022	CY 2023	CY 2024
Water Loss						
Potable	11.5%	11.5%	11.5%	11.5%	11.5%	11.5%
Non-potable	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%

The relevant water loss factor is applied to the potable and non-potable water usage in Line 15 and Line 17 of Table 3-10 so the District purchases sufficient water to meet its demand after water losses. The resulting water production to meet demand is shown below in Table 3-12. The following equation is used to calculate potable and non-potable water production:

Total Sales / (1 - Water Loss) = Total Water Production

Table 3-12: Projected Water Production to Meet Demand (AF)

	CY 2019	CY 2020	CY 2021	CY 2022	CY 2023	CY 2024
Potable	10,884	10,985	11,083	11,166	11,231	11,283
Non-Potable						
Make Up Water	1,862	1,884	939	959	990	1,034
Recycled	0	0	1,101	1,162	1,212	1,250
Total Non-Potable	1,862	1,884	2,040	2,121	2,202	2,283
Total Water Production	**12,746**	**12,868**	**13,123**	**13,287**	**13,433**	**13,567**

Table 3-13 provides the per acre foot water supply costs. These costs include not only the price of imported water, but also the treatment and pumping costs. The cost of recycled water from the City of Beaumont is an estimate based on the District's current coordinated efforts with the City. Note, too, that per Line 13 and Line 14 (Table 3-13), due to a partial year rate change in 2019, 21.8% of potable and non-potable water is multiplied by the CY 2018 water purchase costs while the remainder is calculated using CY 2019 water purchase costs.

Table 3-13: Potable and Non-potable Water Costs ($/AF)

Line No.		CY 2018	CY 2019	CY 2020	CY 2021	CY 2022	CY 2023	CY 2024
1	**Water Unit Cost ($/AF)**							
2	SGPWA Imported Water	$317	$399	$399	$399	$399	$399	$399
3	Unused Overlying Production Pumping	$133	$131	$131	$131	$131	$131	$131
4	Edgar Canyon Pumping	$65	$68	$68	$68	$68	$68	$68
5	Beaumont Basin Pumping	$133	$131	$131	$131	$131	$131	$131
6	**Recycled Water Unit Cost ($/AF)**							
7	City of Beaumont Recycled Water	$250	$250	$250	$250	$250	$250	$250
8	Make-Up Water (SGPWA)	$317	$399	$399	$399	$399	$399	$399
9	Recycled Water Treatment	$0	$0	$0	$22	$23	$23	$24
10	Make-Up Water Treatment	$0	$10	$10	$10	$10	$11	$11
11	Recycled Water Pumping	$0	$62	$62	$62	$62	$62	$62
12	Make-Up Water Pumping	$0	$145	$145	$145	$145	$145	$145
13	**% of Usage at prior rate:**	0.0%	21.8%	0.0%	0.0%	0.0%	0.0%	0.0%
14	**% of Usage at current rate:**	100.0%	78.2%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 3-14 provides the distribution of water purchases across the different sources. The purchases by source are then multiplied by the costs in Table 3-13 to arrive at the potable and non-potable water supply costs in Table 3-15.

Table 3-14: Potable and Non-potable Water Purchases by Source (AF)[4]

Water Availability & Purchase (AF)	CY 2019	CY 2020	CY 2021	CY 2022	CY 2023	CY 2024
Potable						
SGPWA Imported Water	7,476	7,520	7,555	7,837	8,128	8,380
Unused Overlying Production	1,905	1,962	2,025	1,826	1,600	1,400
Beaumont Basin (excluding Make Up Water)	9,381	9,482	9,580	9,663	9,728	9,780
Edgar Canyon	1,503	1,503	1,503	1,503	1,503	1,503
Total Potable	**10,884**	**10,985**	**11,083**	**11,166**	**11,231**	**11,283**
Non-Potable						
Make up Water	1,862	1,884	939	959	990	1,034
Recycled Water	0	0	1,101	1,162	1,212	1,250
Toal Non-Potable	**1,862**	**1,884**	**2,040**	**2,121**	**2,202**	**2,283**

Table 3-15 shows the District's total budgeted and projected O&M expenses for CY 2019 to CY 2024. Expenses are separated according to water service type (potable or non-potable). O&M expenses include staff salary and benefit expenses, water supply costs, administration expenses, equipment, and other miscellaneous costs. Raftelis also projected water supply costs for each source. Raftelis projected future water supply costs using the current rates, the District's supply mix projections (Table 3-14), projected demand (Table 3-1), and the District's water loss factor (Table 3-11). To ensure that future costs are reasonably projected, it is necessary to make informed assumptions about inflationary factors and water costs. O&M projections are based on the District's CY 2020 adopted budget and the projected budgetary increases in subsequent years based on the assumptions shown in Table 3-2. The District uses different inflation factors for different expenditures within the budget.

Table 3-2

[4] Quantities in this table are rounded to the nearest AF.

Table 3-15: Operating Expenditures Summary

Line No.	A	CY 2019 B	CY 2020 C	CY 2021 D	CY 2022 E	CY 2023 F	CY 2024 G
1	**Potable Water Purchases**						
2	State Project Water Purchases	$2,849,213	$3,000,430	$3,014,385	$3,127,120	$3,242,973	$3,343,733
3	Potable Pumping Costs	$1,333,261	$1,344,432	$1,357,275	$1,368,226	$1,376,662	$1,383,548
4	**Non-Potable Water Purchases**						
5	City of Beaumont Recycled Water	$0	$0	$275,159	$290,425	$303,033	$312,449
6	Make-Up Water (SGPWA)	$709,714	$751,620	$374,807	$382,813	$395,061	$412,403
7	Non-potable Water Treatment	$14,562	$18,838	$33,663	$36,266	$38,859	$41,408
8	Non-potable Water Pumping	$244,668	$246,923	$205,185	$211,908	$219,515	$228,182
9	**Potable O&M**						
10	Board of Directors	$167,988	$79,909	$123,761	$75,973	$153,253	$80,600
11	Engineering	$569,722	$693,378	$741,197	$762,968	$785,378	$808,445
12	Professional Services	$274,000	$334,390	$344,339	$354,584	$365,134	$375,997
13	Finance and Administrative Services	$2,448,492	$2,700,662	$2,843,643	$2,924,482	$3,007,746	$3,093,509
14	Information Technology	$449,893	$463,100	$484,841	$499,318	$514,228	$529,582
15	Human Resources and Risk Management	$136,732	$208,046	$217,928	$224,465	$231,199	$238,135
16	Source of Supply	$1,136,449	$1,136,759	$1,195,066	$1,231,599	$1,269,075	$1,307,581
17	Transmission & Distribution	$1,992,619	$2,093,746	$2,211,523	$2,277,740	$2,345,941	$2,416,183
18	Inspections	$55,445	$80,856	$85,707	$88,279	$90,927	$93,655
19	Customer Service and Meter Reading	$368,421	$370,636	$393,369	$405,148	$417,281	$429,777
20	Maintenance and General Plant	$643,394	$873,232	$907,001	$934,211	$962,238	$991,105
21	**Non-Potable Water O&M**	$0	$60,415	$258,896	$266,663	$274,663	$282,903
22	**Total Expenditures**	**$13,394,574**	**$14,457,372**	**$15,067,742**	**$15,462,189**	**$15,993,165**	**$16,369,194**

3.5. Capital Improvement Plan

Table 3-16 details the District's proposed capital improvement plans for replacement and expansion projects for CY 2019 to CY 2024. Inflated project costs in all years throughout the study period were provided by the District. The replacement CIP represents the infrastructure improvements needed to repair and replace aging infrastructure needed to maintain safe and reliable service to current customers. The expansion CIP represents projects the District will need to undertake to expand the system to meet the demand of new customers that will join the system during the study period.

Raftelis examined different CIP schedules for both the replacement and expansion projects. The District ultimately decided to fund 75% of its planned CIP for each year to minimize impacts on customers. Additionally, the District expects that they will be limited in staff time to accomplish planned improvements, which would reduce these costs from planned. Expansion projects will be funded from capacity fees as they become available based on growth.

Table 3-16: Capital Replacement at 75% of Plan and Expansion Improvement Plans

Line No.	A	CY 2019 B	CY 2020 C	CY 2021 D	CY 2022 E	CY 2023 F	CY 2024 G
1	**Percent of CIP to Fund**	**75%**	**75%**	**75%**	**75%**	**75%**	**75%**
2	**Capital Replacement Projects**						
3	Potable Infrastructure Projects	$147,768	$3,425,346	$4,370,885	$4,029,278	$576,431	$569,890
4	Non-Potable Infrastructure Projects	$0	$0	$0	$0	$0	$0
5	Potable Pipeline Replacement Projects	$33,914	$1,712,142	$2,612,590	$835,641	$660,376	$683,643
6	IT Infrastructure Projects	$242,369	$1,306,730	$1,076,988	$948,417	$1,028,460	$803,716
7	Aministrative Projects & Acquisitions	$10,827	$147,160	$28,633	$30,246	$0	$0
8	Vehicle and Equipment Acquisitions	$87,478	$62,859	$120,453	$270,951	$0	$0
9	Engineering and Operations Center (EOC)	$0	$750,000	$570,000	$0	$0	$0
10	Disaster Preparedness Equipment	$0	$174,800	$174,800	$174,800	$174,800	$0
11	**Subtotal Capital Replacement Projects**	**$522,356**	**$7,579,036**	**$8,954,349**	**$6,289,333**	**$2,440,067**	**$2,057,249**
12							
13	**Capital Expansion Projects**						
14	Potential Costs for SWP Newsource Purchase	$196,574	$70,286	$70,286	$389,732	$649,553	$779,465
15	Potable Infrastructure Projects	$26,216	$7,022,432	$5,677,569	$7,102,339	$1,892,696	$4,327,260
16	Non-Potable Infrastructure Projects	$0	$925,935	$2,584,589	$10,670,725	$4,002,489	$1,268,542
17	Potable Pipeline Projects	$0	$2,683,303	$2,541,967	$3,034,927	$220,216	$3,324,313
18	**Subtotal Capital Expansion Projects**	**$222,790**	**$10,701,955**	**$10,874,411**	**$21,197,724**	**$6,764,954**	**$9,699,579**

3.6. Debt Service

The District does not currently have any debt service obligations. However, the District is considering issuing new debt in CY 2022 to fund its replacement CIP shown in Table 3-16 and to mitigate rate increases to customers, thus the model incorporates the following proposed debt and financing assumptions for a $6M bond issue. This proposed debt issue provides a balance between rate adjustment levels and moderate debt obligations. Issuing debt not only allows the District to provide a more immediate response to infrastructure needs but also stabilizes the financial impact of such expenses. Rather than requiring significant rate increases in the short term in order to pay as they go (PAYGO), loan repayments are equally spread over a longer period. This supports the District's ability to provide a more stable rate schedule with generally lower rate increases.

Table 3-17: Proposed Debt

	CY 2022
Debt Assumptions	
Interest	5.0%
Term (# of Years)	30
Issuance Cost	1.5%
Debt Reserve Requirement	6.5%
Debt Issue	$6,000,000
Debt Proceeds	$5,519,691
Annual Debt Service	$390,309
% to Fund Capital Replaceme	100%
% to Fund Capital Expansion	0%

3.7. Status Quo Financial Plan

Table 3-18 below shows the financial plan for the District during the study period and under current rates with no adjustments. As shown in Line 45 of this table, the District is unable to meet its expenses, with particularly large deficits in CY 2020 and CY 2021 due to significant capital projects. Additionally, it is unable to meet debt coverage requirements should it issue debt in CY 2022 without increasing rate revenues (Lines 46 and 47 in Table 3-18). The debt coverage ratio indicates the ability of the District is to fund annual debt payments with revenues remaining after payment of operating expenditures. It is the ratio of revenues net of O&M to the total debt service payments in each year.

$$(Total\ Revenue - Operating\ Expenditures)/(Annual\ Debt\ Payment) = Debt\ Coverage\ Ratio$$

$$\frac{Line\ 15 - Line\ 39}{Line\ 42} = Line\ 46$$

Typically bond buyers require a debt coverage ratio of between 1.10 and 1.25.

Table 3-18: CY 2019 – CY 2024 Financial Plan under Current Rates

Line No.	Revenue	CY 2019	CY 2020	CY 2021	CY 2022	CY 2023	CY 2024
1	Rate Revenue	$8,479,519	$8,561,956	$8,709,386	$8,809,361	$8,896,206	$8,974,966
2	Potable SGPWA Revenue	$1,923,431	$1,941,352	$1,958,726	$1,973,541	$1,984,954	$1,994,269
3	Potable Power Revenue	$1,379,853	$1,392,709	$1,405,173	$1,415,801	$1,423,989	$1,430,672
4	Non-Potable Supply Revenue	$369,401	$373,686	$404,679	$420,773	$436,867	$452,961
5	Non-Potable Power	$265,005	$268,079	$290,313	$301,859	$313,405	$324,950
6	**Other Revenue**						
7	Interest Income - General	$270,828	$159,294	$153,364	$105,922	$82,586	$50,375
8	Interest Income - Other	$53,900	$54,439	$54,983	$55,533	$56,089	$56,649
9	Fees	$736,500	$736,500	$736,500	$736,500	$736,500	$736,500
12	Other	$85,814	$85,814	$85,814	$85,814	$85,814	$85,814
13	Miscellaneous	$45,000	$45,000	$45,000	$45,000	$45,000	$45,000
14	**Total Other Revenue**	**$1,192,042**	**$1,081,047**	**$1,075,662**	**$1,028,769**	**$1,005,989**	**$974,339**
15	**Total Revenue**	**$13,609,251**	**$13,618,829**	**$13,843,940**	**$13,950,105**	**$14,061,410**	**$14,152,157**
16	**Expenditures**	**CY 2019**	**CY 2020**	**CY 2021**	**CY 2022**	**CY 2023**	**CY 2024**
17	**O&M**						
18	Potable Water Purchases	$4,182,474	$4,344,863	$4,371,660	$4,495,346	$4,619,635	$4,727,281
21	Non-Potable Water Purchases	$968,944	$1,017,381	$902,160	$939,581	$977,012	$1,014,458
26	Potable O&M	$8,243,155	$9,034,714	$9,548,373	$9,778,769	$10,142,399	$10,364,568
38	Non-Potable Water O&M	$0	$60,415	$258,896	$266,663	$274,663	$282,903
39	**Total O&M**	**$13,394,574**	**$14,457,372**	**$15,081,089**	**$15,480,358**	**$16,013,709**	**$16,389,209**
40	**Rate Funded Capital Projects**	$522,356	$7,579,036	$8,954,349	$769,641	$2,440,067	$2,057,249
41	**Debt Service**						
42	New Proposed Debt - Capital Replacement	$0	$0	$0	$390,309	$390,309	$390,309
43	**Total Debt Service**	**$0**	**$0**	**$0**	**$390,309**	**$390,309**	**$390,309**
44	**Total Expenses**	**$13,916,929**	**$22,036,408**	**$24,035,439**	**$16,640,308**	**$18,844,085**	**$18,836,767**
45	**Net Cashflow**	**($307,678)**	**($8,417,580)**	**($10,191,499)**	**($2,690,203)**	**($4,782,675)**	**($4,684,611)**
46	Calculated Debt Coverage Ratio	0%	0%	0%	-392%	-500%	-573%
47	Required Debt Coverage Ratio	120%	120%	120%	120%	120%	120%

3.8. Proposed Financial Plan

Balancing the need for the District to meet its revenue requirements while mitigating increases to ratepayers' cost of service, Raftelis worked with staff to determine the revenue adjustment schedule in Table 3-19. All revenue adjustments are set for January of each calendar year except CY 2020.These adjustments apply only to the District's own rates and do not include potential increases in imported water and power pass-through rates. Those rates are subject to the changes implemented by the wholesale water supplier or energy provider. Those costs, including any rate fluctuations, are directly passed through in their entirety to customers. Automatic pass-through adjustments in water rates are allowed through the provisions of Government Code Section 53756 provided that the adjustments are noticed to ratepayers at least 30 days before the effective date.

Table 3-19: Proposed Revenue Adjustments

CY 2020	CY 2021	CY 2022	CY 2023	CY 2024
March	January	January	January	January
1.0%	7.0%	7.0%	7.0%	7.0%

Table 3-20 incorporates the proposed revenue adjustments into the financial plan. As noted above, the District needs to balance its revenue needs with mitigating rate increases for customers. While the proposed financial plan still shows a significant deficit in funding for CY 2020 and CY 2021 (Table 3-20, Line 45) due to significant improvement projects, it is able to exceed its required debt coverage ratio of 1.20 in CY 2022 onward (Table 3-20, Rows 46 and 47) should it pursue debt funding at that time.

Table 3-20: CY 2019 – CY 2024 Proposed Financial Plan

Line No.	Revenue	CY 2019	CY 2020	CY 2021	CY 2022	CY 2023	CY 2024
1	Rate Revenue	$8,479,519	$8,633,305	$9,412,233	$10,186,696	$11,007,218	$11,881,993
2	Potable SGPWA Revenue	$1,923,431	$2,700,387	$3,014,385	$3,127,120	$3,242,973	$3,343,733
3	Potable Power Revenue	$1,379,853	$1,344,432	$1,405,173	$1,415,801	$1,423,989	$1,430,672
4	Non-Potable Supply Revenue	$369,401	$751,620	$649,965	$673,238	$698,094	$724,853
5	Non-Potable Power	$265,005	$246,923	$205,185	$211,908	$219,515	$228,182
6	**Other Revenue**						
7	Interest Income - General	$270,828	$159,651	$157,592	$120,584	$114,825	$108,015
8	Interest Income - Other	$53,900	$54,439	$54,983	$55,533	$56,089	$56,649
9	Fees	$736,500	$736,500	$736,500	$736,500	$736,500	$736,500
12	Other	$85,814	$85,814	$85,814	$85,814	$85,814	$85,814
13	Miscellaneous	$45,000	$45,000	$45,000	$45,000	$45,000	$45,000
14	**Total Other Revenue**	**$1,192,042**	**$1,081,404**	**$1,079,889**	**$1,043,431**	**$1,038,228**	**$1,031,979**
15	**Total Revenue**	**$13,609,251**	**$14,758,073**	**$15,766,831**	**$16,658,194**	**$17,630,017**	**$18,641,410**
16	**Expenditures**	**CY 2019**	**CY 2020**	**CY 2021**	**CY 2022**	**CY 2023**	**CY 2024**
17	**O&M**						
18	Potable Water Purchases	$4,182,474	$4,344,863	$4,371,660	$4,495,346	$4,619,635	$4,727,281
21	Non-Potable Water Purchases	$968,944	$1,017,381	$888,813	$921,412	$956,468	$994,442
26	Potable O&M	$8,243,155	$9,034,714	$9,548,373	$9,778,769	$10,142,399	$10,364,568
38	Non-Potable Water O&M	$0	$60,415	$258,896	$266,663	$274,663	$282,903
39	**Total O&M**	**$13,394,574**	**$14,457,372**	**$15,067,742**	**$15,462,189**	**$15,993,165**	**$16,369,194**
40	**Rate Funded Capital Projects**	$522,356	$7,579,036	$8,954,349	$769,641	$2,440,067	$2,057,249
41	**Debt Service**						
42	New Proposed Debt - Capital Replacemer	$0	$0	$0	$390,309	$390,309	$390,309
43	**Total Debt Service**	**$0**	**$0**	**$0**	**$390,309**	**$390,309**	**$390,309**
44	**Total Expenses**	**$13,916,929**	**$22,036,408**	**$24,022,092**	**$16,622,139**	**$18,823,541**	**$18,816,752**
45	**Net Cashflow**	**($307,678)**	**($7,278,336)**	**($8,255,261)**	**$36,055**	**($1,193,524)**	**($175,341)**
46	Calculated Debt Coverage Ratio	0%	0%	0%	306%	419%	582%
47	Required Debt Coverage Ratio	120%	120%	120%	120%	120%	120%

Figure 3-1 through Figure 3-4 display the Financial Plan in graphical format. Figure 3-1 shows the dollar value of the revenue adjustments (green bars) for the next five years on the left axis. It also graphs the calculated and required debt coverage ratios, as shown by the broken and solid blue lines respectively, on the right axis. Since debt is proposed to be issued only in 2022 the debt coverage line starts in 2022.

Figure 3-1: Revenue Adjustments and Debt Coverage

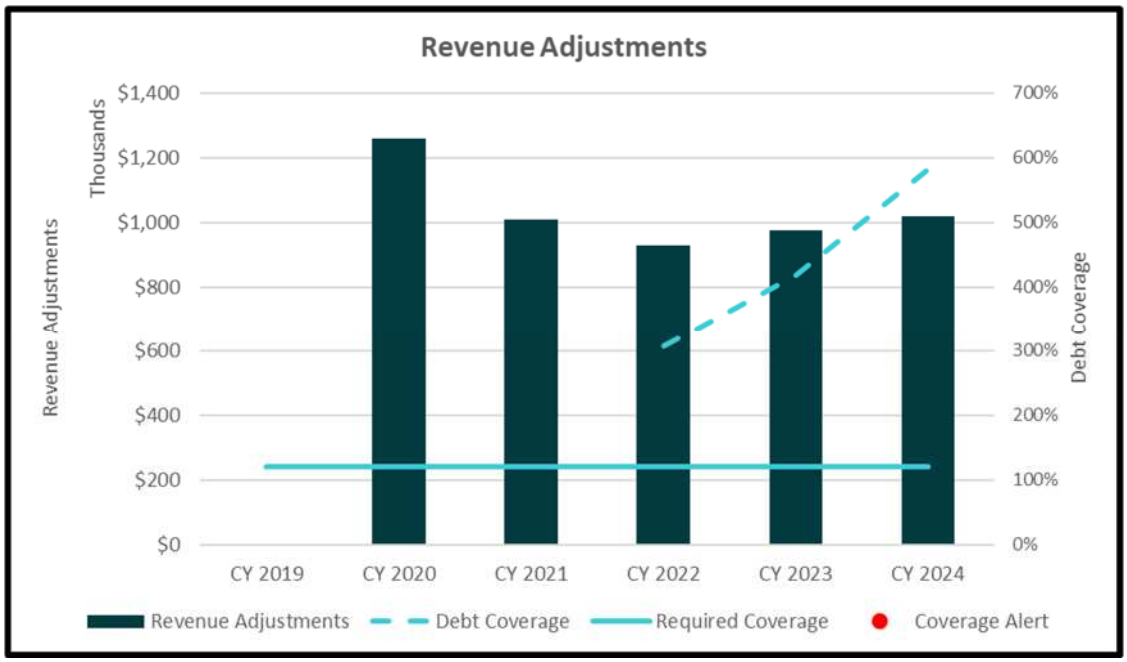


Figure 3-2 graphically illustrates the financial plan, comparing existing and proposed revenues (solid and broken black lines respectively) with projected expenses (bars). The expenses are represented by stacked bars to indicate each expense type's share of total costs. The net cash flow is shown in yellow and represents the use of reserves in most years to fund CIP.

Figure 3-2: Operating Financial Plan

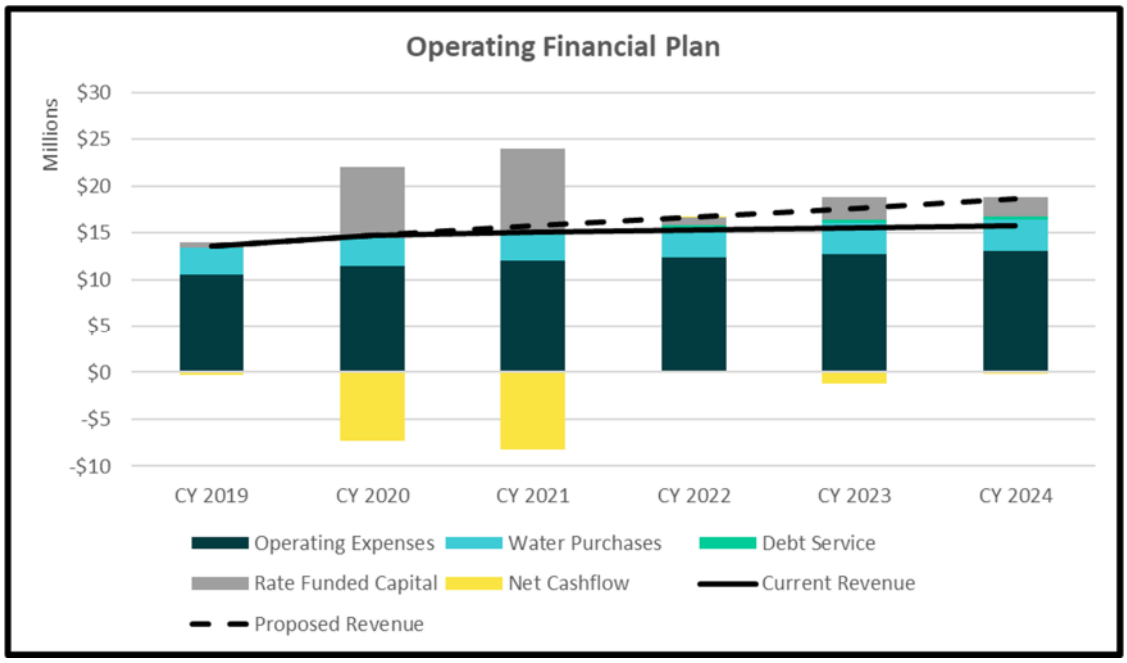


Figure 3-3 and Figure 3-4 show the replacement and expansion CIPs using stacked bars that indicate funding by funding mechanism for that year's projects. Note that Figure 3-4 shows negative reserves as the model is only funding the total expansion CIP with the conservatively estimated $2M in capacity fee revenue. The District will only fund capital expansion projects based on actual capacity fee revenue in each year. Essentially, if the District sees less development during the study period than in the last decade, it will not be funding expansion infrastructure projects as originally scheduled under the current CIP.

Figure 3-3: Capital Replacement Plan and Funding Sources

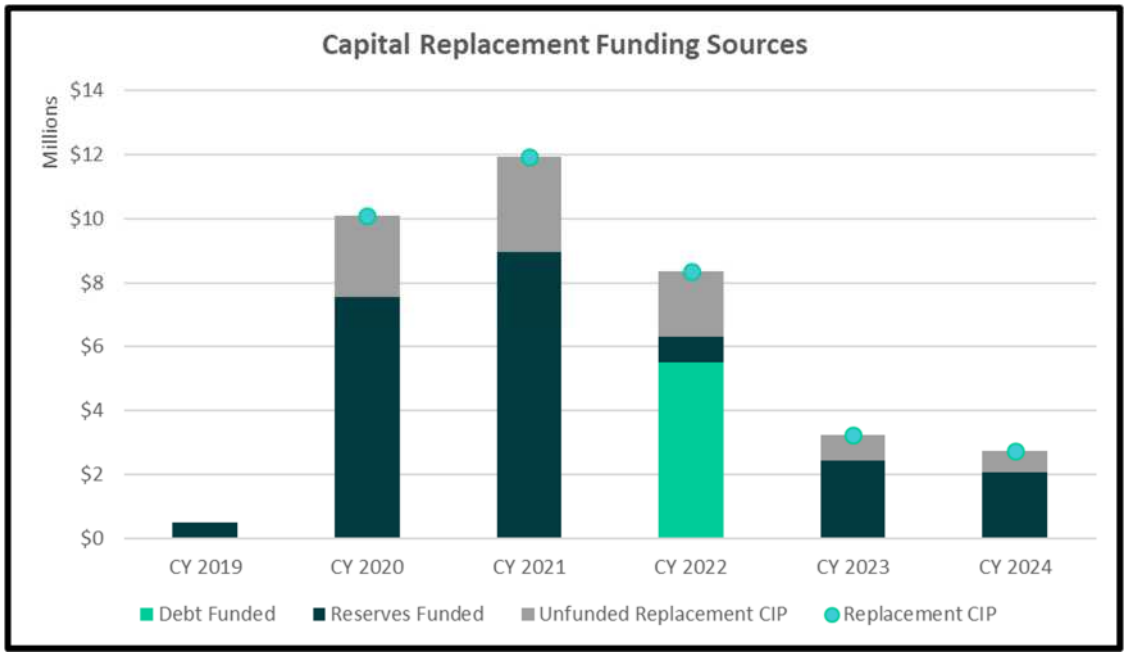
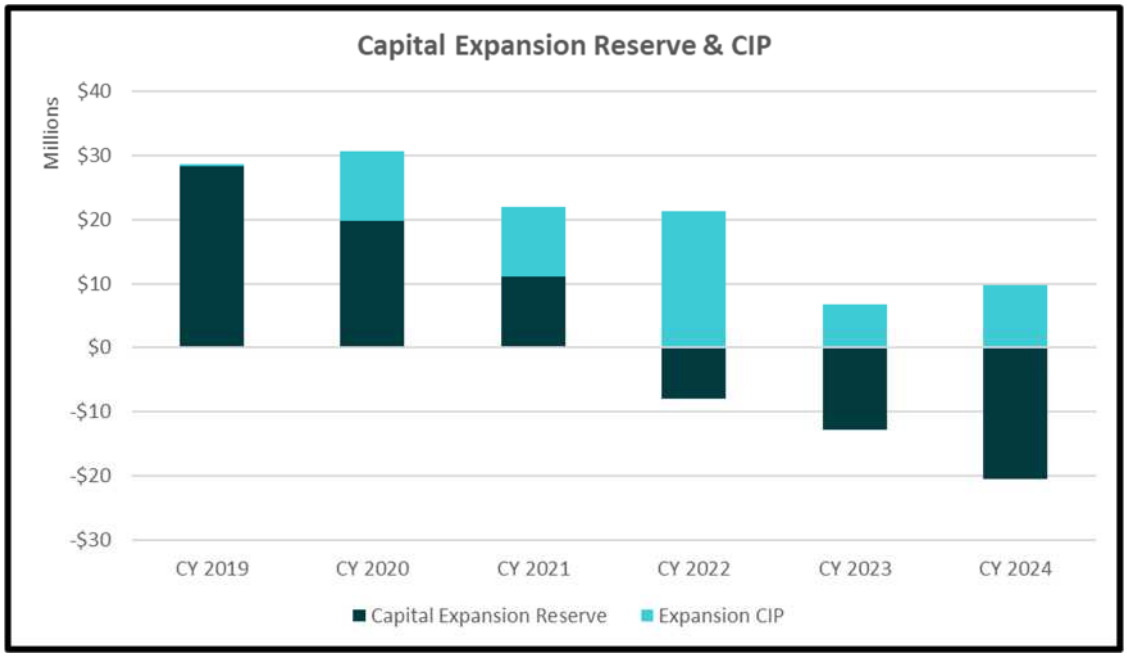


Figure 3-4: Capital Expansion Fund and CIP



3.9. Reserve Policy

3.9.1. RESERVE POLICY OVERVIEW

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

The appropriate amount of reserves and reserve types are determined by a variety of factors, such as the size of the operating budget, the amount of debt, the type of rate structure, frequency of customer billing, and risk of natural disaster. The District employs the following reserves and funds:

1. Operating Reserve
2. Capital Replacement Reserve
3. Capital Expansion Fund (Reserves Restricted for Future Capital Commitments)
4. Emergency Reserve
5. Debt Service Reserve

3.9.2. RECOMMENDED RESERVE POLICIES

To enhance financial management transparency and financial risk management, District policy requires, and Raftelis recommends, the Water Fund to maintain these reserves. In addition, should the District decide to issue new debt in CY 2022, Raftelis recommends maintaining a Debt Service Reserve to directly reserve funds for annual payments. The following sections describe Raftelis' recommendations in detail for each reserve.

3.9.2.1. Operating Reserve

The purpose of an operating reserve is to provide working capital to support the operation, maintenance, and administration of the utility. From a risk management perspective, the O&M reserve supports the District's cash flow needs during normal operations and additionally ensures that operations can continue should there be significant events that impact cash flows. As it is unlikely for a utility to perfectly predict the revenues and revenue requirements for each billing period, a reserve set aside to hedge the risk of monthly negative cash positions is prudent in financial planning. Another factor to consider when creating a cash flow reserve is the frequency of billing. A utility that bills once a month would require a lower minimum reserve than a utility that bills bi-monthly or once a year.

Raftelis recommends that the District maintain its current policy with a minimum 90 days of operating expenses and a target balance of 180 days to ensure adequate working capital for operating expenses. The District bills bi-monthly; thus 180 days provides sufficient working capital to account for when expenses occur, and revenues are collected. Additionally, this accounts for revenues varying seasonally while most expenses remain relatively static.

3.9.2.2. Capital Replacement Reserve

Adequate and timely capital replacement planning is a critical task to ensure reliability and sustainability of the water system. Capital reserves are used to provide funding for capital expenditures due to the capital-intensive nature of the water system. The District currently conducts an annual review to determine maximum and minimum reserve level targets. Raftelis recommends the District adopt a policy using the estimated 5-year average CIP as the target balance. In CY 2020, this average is $4.0 million.

3.9.2.3. Capital Expansion Fund

The Capital Expansion Fund reserves are restricted for future capital commitments. It is used to finance the necessary capital improvements to expand system capacity to accommodate growth in the District's customer base. Expansion capital projects are funded through restricted new development facility (capacity) fees. The region has experienced significant growth for the last ten years. However, the District is uncertain if development will maintain its momentum during the study period. Resultantly, the District conservatively estimates that it will receive approximately $2,000,000 in restricted capacity fees each year that will be added to the reserve's current balance to fund the proposed expansion CIP defined in this report in Table 3-16. The Expansion CIP will depend on the restricted capacity fee revenue based on growth.

3.9.2.4. Emergency Reserve

The purpose of an emergency reserve is to allow the utility to provide uninterrupted service in a fiscal emergency, natural disaster, or facility failure. An emergency reserve decreases risk by recognizing the high capital costs of the facilities and setting aside adequate funds to restore service after an unanticipated event or replace an essential facility.

Raftelis recommends that the District maintain its existing reserve policy for its Emergency Reserve. The target balance for this reserve is 15% of annual operating expenses. This amounts to $2.2M to be set aside for emergency use in CY 2020. Although this level of emergency reserve is sufficient for now, the reserve should be re-evaluated periodically to ensure adequate reserves in the event of an emergency in light of rising construction and other costs.

3.9.2.5. Debt Service Reserve

The District is considering issuing debt in CY 2022. Should the District decide to use debt funding, Raftelis recommends that it maintain its Debt Service Reserve by allocating sufficient annual funding of its annual debt service obligations.

3.9.2.6. Recommended Total Reserve Targets

Table 3-21 summarizes the reserve policies proposed by Raftelis for the District. Table 3-22 and Table 3-23 show the projected cash balance and reserve targets for each of the funds for the study period.

Table 3-21: Proposed Reserve Targets

Reserve	Policy
Operating	Minimum: 90 days Target: 180 days
Capital Replacement	5-Year Average CIP
Emergency	15% of Annual Operating Expenses
Debt Service Reserve	One Year of Debt Service

Table 3-22: Operating and Emergency Reserves Projected Targets and Balances

Operating Reserve	CY 2020	CY 2021	CY 2022	CY 2023	CY 2024
Beginning Balance	$3,183,701	$11,025,065	$2,769,804	$2,805,859	$1,612,334
Rate Revenue	$13,676,669	$14,686,942	$15,614,763	$16,591,789	$17,609,432
Other Revenue	$867,314	$867,314	$867,314	$867,314	$867,314
Interest Income - General	$159,651	$157,592	$120,584	$114,825	$108,015
Interest Income - Other	$54,439	$54,983	$55,533	$56,089	$56,649
Total Income	**$14,758,073**	**$15,766,831**	**$16,658,194**	**$17,630,017**	**$18,641,410**
Total Expenses	$22,036,408	$24,022,092	$16,622,139	$18,823,541	$18,816,752
Water to Storage	($119,700)	$0	$0	$0	$0
Transfers from (to) Capital Replacement	**$15,000,000**	**$0**	**$0**	**$0**	**$0**
Ending Balance	**$11,025,065**	**$2,769,804**	**$2,805,859**	**$1,612,334**	**$1,436,993**
Target	$3,614,343	$3,766,936	$3,865,547	$3,998,291	$4,092,298

Emergency Reserve	CY 2020	CY 2021	CY 2022	CY 2023	CY 2024
Beginning Balance	$2,009,186	$2,168,606	$2,260,161	$2,319,328	$2,398,975
Transfers from Capital Replacement	$159,420	$91,555	$59,167	$79,646	$56,404
Subtotal	**$2,168,606**	**$2,260,161**	**$2,319,328**	**$2,398,975**	**$2,455,379**
Interest Income	*$20,889*	*$22,144*	*$22,897*	*$23,592*	*$24,272*
Ending Balance	**$2,168,606**	**$2,260,161**	**$2,319,328**	**$2,398,975**	**$2,455,379**
Minimum Target	$2,168,606	$2,260,161	$2,319,328	$2,398,975	$2,455,379

Table 3-23: Capital Replacement Reserve and Expansion Fund Projected Targets and Balances

Capital Replacement Reserve	CY 2020	CY 2021	CY 2022	CY 2023	CY 2024
Beginning Balance	$21,931,360	$6,771,940	$6,680,385	$6,621,218	$6,541,571
Transfers from (to) Operating	($15,000,000)	$0	$0	$0	$0
New Debt Proceeds	$0	$0	$5,519,691	$0	$0
Debt Funded Capital Replacement Projec	$0	$0	($5,519,691)	$0	$0
Transfers to Emergency	($159,420)	($91,555)	($59,167)	($79,646)	($56,404)
Ending Balance	**$6,771,940**	**$6,680,385**	**$6,621,218**	**$6,541,571**	**$6,485,167**
Interest Income	*$143,517*	*$67,262*	*$66,508*	*$65,814*	*$65,134*
Target	$4,053,090	$4,360,069	$3,285,239	$1,811,557	$2,551,336

Capital Expansion Reserve	CY 2020	CY 2021	CY 2022	CY 2023	CY 2024
Beginning Balance	$28,299,009	$19,836,535	$11,116,118	($8,066,433)	($12,831,387)
Facilities Charges	$2,000,000	$2,000,000	$2,000,000	$2,000,000	$2,000,000
New Debt Proceeds	$0	$0	$0	$0	$0
Debt Service - Expansion	$0	$0	$0	$0	$0
Capital Projects	($10,701,955)	($10,874,411)	($21,197,724)	($6,764,954)	($9,699,579)
Subtotal	**$19,597,055**	**$10,962,124**	**($8,081,606)**	**($12,831,387)**	**($20,530,966)**
Interest Income	*$239,480*	*$153,993*	*$15,173*	*$0*	*$0*
Ending Balance	**$19,836,535**	**$11,116,118**	**($8,066,433)**	**($12,831,387)**	**($20,530,966)**

4. Cost of Service Analysis

4.1. Cost of Service Methodology

A cost of service analysis distributes a utility's revenue requirements (costs) to each customer class equitably. After determining a utility's revenue requirements, the next step in a cost of service analysis is to functionalize its O&M costs, based on the District's current O&M budget:

a. Administration – overhead costs associated with the management of the utility
b. Billing – all customer billing costs
c. Customer Service – represents the costs associated with meter reading, billing and customer and meter service
d. Supply – represents the cost of producing water from various sources
e. Production – the costs of producing potable water (e.g. treatment)
f. Transmission & Distribution – costs associated with transporting water to each metered connection
g. General - costs not associated with a specific function, rather the overall functioning of the utility
h. Capital – infrastructure costs
i. Pumping – the cost of pumping water from the ground or to meters located in higher elevations
j. Non-potable - all costs relating to the non-potable water service

Capital costs are similarly functionalized based on the assets which include storage, pumping, pipelines, fire hydrants, treatment, administration, meters, equipment, wells, general, and non-potable.

The functionalization of costs allows better allocation of the functionalized costs to the cost causation components. The cost causation components include:

a. Supply – variable costs associated with providing water supply to all customers
b. Base Delivery – fixed costs associated with providing service under average conditions
c. Peaking (maximum day and maximum hour) – costs associated with meeting demand in excess of average use
d. Fire – costs associated with providing fire protection capacity
e. Meters – costs associated with maintenance of meters and associated capital costs
f. Customer – costs incurred to provide meter reading, billing and customer service
g. General – costs that cannot be allocated directly to any one cost causation

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

4.2. Revenue Requirement Determination

The revenue requirement for the proposed rates will be based on CY 2020, designated the Test Year. Table 4-1 shows the revenue requirement derivation with the total revenue required from rates. The totals shown in the "Operating" and "Capital" columns are the total O&M and capital revenue requirements, respectively, that are to be recovered through rates. The operating costs (Line 9, Table 4-1) flow from Table 3-15. The Debt Service

category (Line 13, Table 4-1) represents both replacement capital projects (from Table 3-16) and any proposed debt. Note there is no debt issuance proposed for CY 2020. Revenue offsets are composed of non-rate revenues, shown in Table 3-20, Lines 7-14. To arrive at the rate revenue requirement, these revenue offsets are subtracted from the combined operating and debt service costs. Since the new rates will go into effect in March 2020, the revenue adjustment is annualized and also adjusted for transfers from reserves. These adjustments are then combined to arrive at the total annual revenue requirement from rates. This is the amount that the District's rates are designed to collect, for a full year, in the "Total" column at Line 25 in Table 4-1 below.

Table 4-1: Revenue Requirement Determination

Line No	Revenue Requirements	Operating	Capital	Total
1	**Operating Costs**			
2	State Project Water (SPW) Purchases	$3,000,430		$3,000,430
3	Potable Pumping Costs	$1,344,432		$1,344,432
4	Make-Up Water (SGPWA/SPW)	$751,620		$751,620
5	Non-potable Water Treatment	$18,838		$18,838
6	Non-potable Water Pumping	$246,923		$246,923
7	Potable O&M	$9,034,714		$9,034,714
8	Non-Potable Water O&M	$60,415		$60,415
9	**Subtotal Operating Costs**	**$14,457,372**	**$0**	**$14,457,372**
10	**Debt Service**			
11	Rate Funded Capital Projects		$7,579,036	$7,579,036
12	New Proposed Debt - Capital Replacement		$0	$0
13	**Subtotal Debt Service**	**$0**	**$7,579,036**	**$7,579,036**
14	**Total Revenue Requirements**	**$14,457,372**	**$7,579,036**	**$22,036,408**
15	**Less: Revenue Offsets**			
16	Interest Income	$214,090		$214,090
17	Fees	$736,500		$736,500
18	Other	$85,814		$85,814
19	Miscellaneous	$45,000		$45,000
20	**Total Revenue Offsets**	**$1,081,404**	**$0**	**$1,081,404**
21	**Less: Adjustments**			
22	Transfer from (to) Reserves	$0	$7,278,336	$7,278,336
23	Revenue to Annualize Revenue Increa	($14,270)		($14,270)
24	**Total Adjustments**	**($14,270)**	**$7,278,336**	**$7,264,066**
25	**Total Revenue Requirement from Rates**	**$13,390,238**	**$300,700**	**$13,690,939**

4.3. Peaking Factors

Water systems are designed to handle maximum day (Max Day) and maximum hour (Max Hour) demands. Different facilities, such as distribution and storage facilities, are designed to meet the peaking demands of customers. Therefore, peaking costs, also known as extra capacity costs, are associated with meeting peak customer demand. Peaking costs are therefore based on Max Day and Max Hour demands.

Table 4-2 shows the system-wide peaking factors used to derive the cost component allocation bases for Base Delivery, Max Day, and Max Hour costs. The Base Delivery, or Base Use is considered average daily demand over one year, which has been normalized to a factor of 1.00 (Column B, Line 1). The Max Day peaking factor (Line 2) indicates that the Max Day demand is 2 times greater than the average daily demand. Similarly, the Max Hour peaking factor (Line 3) shows that the Max Hour demand is 5.78 times greater than average demand. These factors were determined during the development of the District's 2016 Potable Water System Master Plan.

The percentage allocations of costs are calculated using the equations outlined.

The Base allocation is 1/1 x 100%= 100%

The Max Day allocation are calculated as follows:
» Base Delivery: 1 / 2 x 100% = 50%
» Max Day: (2 - 1) / 2 x 100% = 50%

The Max Hour allocations are calculated as follows:
» Base Delivery: 1 / 5.78 x 100% = 17%
» Max Day: (2 - 1) / 5.78 x 100% = 17%
» Max Hour: (5.78 - 2) / 5.78 x 100% = 65%

The Average Max Day / Max Hour allocation averages the Max Day and Max Hour allocations to Base, Max Day, and Max Hour, respectively, and is used to allocate the cost of transmission and distribution which are not identified separately.

Table 4-2: System Peaking Factors

Line No.	Allocation Factor	System Peaking Factor	Base	Max Day	Max Hour	Total
	A	B	C	D	E	F
1	Base	1.00	100%	0%	0%	100%
2	Max Day	2.00	50%	50%	0%	100%
3	Max Hour	5.78	17%	17%	65%	100%
4	Average Max Day/Max Hour		34%	34%	33%	100%

Table 4-3 shows the derivation of the peaking factors by customer class and tier, determined by dividing the total maximum monthly usage (Column C) by the average monthly usage (Column D) for each customer class and tier. For this analysis, the classes and tiers used in the proposed rate schedule are employed. These peaking factors are used to allocate the peaking costs to each customer class and tier. See the Rate Derivation section of this report (Section 5) for a detailed discussion of tier widths and the use of peaking factors in determining rates.

Table 4-3: Customer Class Peaking Factors

Line No.	Customer Class	Selected Bi-Monthly Tiers (ccf)	Max Month (ccf)	Average Month (ccf)	Peaking Factor
	A	B	C	D	E
1	**Single Family**				
2	Tier 1	16	126,657	121,513	1.04
3	Tier 2	34	113,715	84,852	1.34
4	Tier 3	34+	203,407	84,408	2.41
5	**Multi-Family**		21,454	12,460	1.72
6	**Commercial/Industrial**		67,310	41,828	1.61
7	**Fire Service**		15,623	9,162	1.71
8	**Landscape Irrigation**		13,187	7,612	1.83
9	**Schedule Irrigation**		6,638	3,213	1.83
10	**Construction**		22,381	10,966	2.04
11	**Non-Potable**		116,524	68,286	1.71

4.4. Equivalent Meters

To allocate meter-related costs appropriately, the concept of equivalent meters needs to be understood. By using equivalent meters instead of a straight meter count, the analysis accounts for the fact that larger meters impose greater demands on the system and are more expensive to install, maintain, and replace than smaller meters. Equivalent meters are used in calculating meter service costs.

Equivalent meters are based on meter hydraulic capacity. Equivalent meters represent the potential demand on the water system in terms of the base or smallest meter size. A ratio of hydraulic capacity is calculated by dividing large meter capacities by the base meter capacity. The capacity ratio is calculated using the meter capacity in gallons per minute (gpm) provided in the AWWA M1 Manual Principles of Water Rates, Fees and Charges (7th Edition).

The base meter is the smallest meter, in this case, a 5/8-inch meter. The actual number of meters by size is multiplied by the corresponding capacity ratio to calculate equivalent meters. Table 4-4 and Table 4-5 show the equivalent meters for CY 2020 for potable and non-potable water service respectively.

Note that equivalent capacity associated with fire service line accounts and hydrants are calculated separately, with their own hydraulic capacity ratios based on industry standards (Table 4-6). Public fire capacity represents 78% of the total fire capacity:

Total Equivalent Hydrants/(Total Equivalent Hydrants + Total Equivalent Fire Lines) = Public Fire Capacity

$$\frac{Line\ 11}{(Line\ 11 + Line\ 6)} = 78\%$$

Table 4-4: Potable Water Equivalent Meters[5]

Potable Meter Size	Capacity (gpm)	AWWA Ratio	Number of Meters	Equivalent Meters
5/8"	20	1.00	13,685	13,685
3/4"	30	1.50	412	619
1"	50	2.50	4,375	10,936
1 1/2"	100	5.00	105	526
2"	160	8.00	193	1,544
3"	350	17.50	1	18
4"	630	31.50	2	63
6"	1,300	65.00	-	-
8"	2,800	140.00	1	140
10"	4,200	210.00	-	-
12"	5,300	265.00	-	-
Total Potable Meters			**18,774**	**27,531**

Table 4-5: Non-potable Water Equivalent Meters

Non-Potable Meter Size	Capacity (gpm)	AWWA Ratio	Number of Meters	Equivalent Meters
5/8"	20	1.00	1	1
3/4"	30	1.50	-	-
1"	50	2.50	38	96
1 1/2"	100	5.00	88	440
2"	160	8.00	176	1,408
Total Non-potable Meters			**303**	**1,945**

[5] Equivalent meters are rounded to the nearest whole number

Table 4-6: Equivalent Fire Lines

Line No.	Fire Line Size	Fire Ratio	Number of Lines	Equivalent Lines
1	4"	0.34	72	25
2	6"	1.00	22	22
3	8"	2.13	47	100
4	10"	3.83	15	57
5	12"	6.19	12	74
6	**Total Fire Lines**		**168**	**279**

	Hydrant Size	Fire Ratio	Number of Hydrants	Equivalent Lines
7	4": 1 x 2.5"	0.10	95	10
8	4": 2 x 2.5"	0.20	456	91
9	6": 1 x 4.5", 1 x 2.5"	0.57	152	87
10	6": 1 x 4.5", 2 x 2.5"	0.67	1,197	801
11	**Total - Public Fire Hydrants**		**1,900**	**988**

4.5. Allocation of Costs

As detailed in Section 4.1, functionalizing costs allows for better distribution of costs to the cost causation components. Table 4-7 shows the function categories used in this study in Column A. Column B identifies the chosen rationale for distributing these functionalized costs to the cost causation components. For example, all costs allocated to the Administration function (Column A, Line 1) are all initially allocated to the General cost causation components (Column L, Line 1). Transmission & Distribution costs (Line 6) are based on a modification of the Max Hour allocations shown in Table 4-2 to account for meters in the distribution system. Line 8 shows the distribution of Capital costs based on the District's total current asset value distributed to the relevant cost allocations.

Table 4-7: Functionalized O&M Cost Distributions to Cost Causation Factors

Line No.	Function	Rationale	Supply	Base Delivery	Max Day	Max Hour	Pumping	Meter	Customer	Non-Potable	Offset	General	Total
	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Administration	General										100%	100%
2	Billing	Customer							100%				100%
3	Customer Service	Customer							100%				100%
4	Supply	Supply	100%										100%
5	Production	Max Day		50%	50%								100%
6	Transmission & Distribution	Max Hour		16%	16%	62%		5%					100%
7	General	General										100%	100%
8	Capital	Capital		29%	29%	17%		2%		5%		18%	100%
9	Pumping	Pumping					100%						100%
10	Non-potable	Non-potable								100%			100%

Using Table 4-7 as a guide, all of the operating costs are then allocated based on their related function's cost allocation distribution. Table 4-8 shows first the percent distributions, then dollar allocations of each O&M cost.

Table 4-8: O&M Cost Allocations

O&M Allocation	Function	Supply	Base Delivery	Max Day	Max Hour	Pumping	Meter	Customer	Non-Potable	Offset	General	Total
State Project Water Purchases	Supply	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%
Potable Pumping Costs	Pumping	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	100%
Make-Up Water (SGPWA)	Non-potable	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	100%
Non-potable Water Treatment	Non-potable	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	100%
Non-potable Water Pumping	Non-potable	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	100%
Board of Directors	Administration	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%
Engineering	Capital	0%	29%	29%	17%	0%	2%	0%	5%	0%	18%	100%
Professional Services	Administration	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%
Finance and Administrative Servic	Administration	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%
Information Technology	Administration	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%
Human Resources and Risk Manag	Administration	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%
Source of Supply	Production	0%	50%	50%	0%	0%	0%	0%	0%	0%	0%	100%
Transmission & Distribution	Transmission & Distribution	0%	16%	16%	62%	0%	5%	0%	0%	0%	0%	100%
Inspections	Customer Service	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	100%
Customer Service and Meter Reac	Customer Service	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	100%
Maintenance and General Plant	General	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%
Non-Potable Water Purchases	Non-potable	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	100%

O&M Allocation	Function	Supply	Base Delivery	Max Day	Max Hour	Pumping	Meter	Customer	Non-Potable	Offset	General	Total
State Project Water Purchases	Supply	$3,000,430	$0	$0	$0	$0	$0	$0	$0	$0	$0	$3,000,430
Potable Pumping Costs	Pumping	$0	$0	$0	$0	$1,344,432	$0	$0	$0	$0	$0	$1,344,432
Make-Up Water (SGPWA)	Non-potable	$0	$0	$0	$0	$0	$0	$0	$751,620	$0	$0	$751,620
Non-potable Water Treatment	Non-potable	$0	$0	$0	$0	$0	$0	$0	$18,838	$0	$0	$18,838
Non-potable Water Pumping	Non-potable	$0	$0	$0	$0	$0	$0	$0	$246,923	$0	$0	$246,923
Board of Directors	Administration	$0	$0	$0	$0	$0	$0	$0	$0	$0	$79,909	$79,909
Engineering	Capital	$0	$197,962	$197,962	$121,169	$0	$15,114	$0	$34,669	$0	$126,503	$693,378
Professional Services	Administration	$0	$0	$0	$0	$0	$0	$0	$0	$0	$334,390	$334,390
Finance and Administrative Servic	Administration	$0	$0	$0	$0	$0	$0	$0	$0	$0	$2,700,662	$2,700,662
Information Technology	Administration	$0	$0	$0	$0	$0	$0	$0	$0	$0	$463,100	$463,100
Human Resources and Risk Manag	Administration	$0	$0	$0	$0	$0	$0	$0	$0	$0	$208,046	$208,046
Source of Supply	Production	$0	$568,380	$568,380	$0	$0	$0	$0	$0	$0	$0	$1,136,759
Transmission & Distribution	Transmission & Distribution	$0	$344,128	$344,128	$1,300,803	$0	$104,687	$0	$0	$0	$0	$2,093,746
Inspections	Customer Service	$0	$0	$0	$0	$0	$80,856	$0	$0	$0	$0	$80,856
Customer Service and Meter Reac	Customer Service	$0	$0	$0	$0	$0	$0	$370,636	$0	$0	$0	$370,636
Maintenance and General Plant	General	$0	$0	$0	$0	$0	$0	$0	$0	$0	$873,232	$873,232
Non-Potable Water Purchases	Non-potable	$0	$0	$0	$0	$0	$0	$0	$60,415	$0	$0	$60,415
Total O&M Expenses		**$3,000,430**	**$1,110,469**	**$1,110,469**	**$1,421,972**	**$1,344,432**	**$200,657**	**$370,636**	**$1,112,465**	**$0**	**$4,785,842**	**$14,457,372**
O&M Allocation		***21%***	***8%***	***8%***	***10%***	***9%***	***1%***	***3%***	***8%***	***0%***	***33%***	***100%***

Table 4-9 distributes the functionalized capital asset values to cost causation factors similar to Table 4-7 and Table 4-10 shows the resulting percent and dollar allocations of the different capital assets. Capital costs are allocated based on the system assets because capital costs are incurred to refurbish and replace existing system assets. Using system assets takes a longer-term view of the allocations of capital costs and provides a consistent allocation of costs from year to year even if the capital costs associated with different types of system assets change every year. In valuing the assets, the original cost less depreciation was utilized to account for aging of the assets, thus a decrease in the value. For example, Storage costs are allocated according to Max Day rationale because storage is constructed to meet base and peak day demand. Contrastingly, other costs, such as Meter, Non-potable, General and Administrative costs are allocated 100% to their relevant cost causation factor.

Table 4-9: Functionalized Capital Cost Distributions to Cost Causation Factors

Function	Rationale	Supply	Base Delivery	Max Day	Max Hour	Pumping	Meter	Customer	Non-Potable	Offset	General	Total
Storage	Max Day		50%	50%	0%							100%
Pumping	Max Day		50%	50%	0%							100%
Pipelines	Avg. Max Day/Hour		34%	34%	33%							100%
Fire Hydrants	Max Hour		17%	17%	65%							100%
Treatment	Max Day		50%	50%	0%							100%
Administration	General										100%	100%
Meters	Meter						100%					100%
Equipment	Transmission & Distribution		16%	16%	62%		5%					100%
Wells	Max Day		50%	50%								100%
General	General										100%	100%
Non-potable	Non-potable								100%			100%

Table 4-10: Capital Cost Allocations

Capital Asset Allocation	Function	Supply	Base Delivery	Max Day	Max Hour	Pumping	Meter	Customer	Non-Potable	Offset	General	Total
Land	General	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%
Pump House Structures	Pumping	0%	50%	50%	0%	0%	0%	0%	0%	0%	0%	100%
Well Casings & Development	Wells	0%	50%	50%	0%	0%	0%	0%	0%	0%	0%	100%
Chlorinators	Treatment	0%	50%	50%	0%	0%	0%	0%	0%	0%	0%	100%
Pumping Equipment	Pumping	0%	50%	50%	0%	0%	0%	0%	0%	0%	0%	100%
Reservoirs & Tanks	Storage	0%	50%	50%	0%	0%	0%	0%	0%	0%	0%	100%
Transmission Mains	Pipelines	0%	34%	34%	33%	0%	0%	0%	0%	0%	0%	100%
Telemetering Equipment	Meters	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	100%
Meters & Meter Services	Meters	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	100%
Fire Hydrants	Fire Hydrants	0%	17%	17%	65%	0%	0%	0%	0%	0%	0%	100%
Buildings & Improvements	General	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%
Office Furniture & Equipment	General	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%
Vehicles & Equipment	Equipment	0%	16%	16%	62%	0%	5%	0%	0%	0%	0%	100%
General Equipment	Equipment	0%	16%	16%	62%	0%	5%	0%	0%	0%	0%	100%
Non-potable	Non-potable	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	100%

Capital Asset Allocation	Function	Supply	Base Delivery	Max Day	Max Hour	Pumping	Meter	Customer	Non-Potable	Offset	General	Total
Land	General	$0	$0	$0	$0	$0	$0	$0	$0	$0	$7,335,644	$7,335,644
Pump House Structures	Pumping	$0	$11,073	$11,073	$0	$0	$0	$0	$0	$0	$0	$22,146
Well Casings & Development	Wells	$0	$2,949,796	$2,949,796	$0	$0	$0	$0	$0	$0	$0	$5,899,592
Chlorinators	Treatment	$0	$49,845	$49,845	$0	$0	$0	$0	$0	$0	$0	$99,690
Pumping Equipment	Pumping	$0	$1,507,684	$1,507,684	$0	$0	$0	$0	$0	$0	$0	$3,015,367
Reservoirs & Tanks	Storage	$0	$7,711,401	$7,711,401	$0	$0	$0	$0	$0	$0	$0	$15,422,801
Transmission Mains	Pipelines	$0	$20,313,927	$20,313,927	$19,739,497	$0	$0	$0	$0	$0	$0	$60,367,351
Telemetering Equipment	Meters	$0	$0	$0	$0	$0	$7,824	$0	$0	$0	$0	$7,824
Meters & Meter Services	Meters	$0	$0	$0	$0	$0	$2,465,173	$0	$0	$0	$0	$2,465,173
Fire Hydrants	Fire Hydrants	$0	$4,252	$4,252	$16,074	$0	$0	$0	$0	$0	$0	$24,578
Buildings & Improvements	General	$0	$0	$0	$0	$0	$0	$0	$0	$0	$13,137,511	$13,137,511
Office Furniture & Equipment	General	$0	$0	$0	$0	$0	$0	$0	$0	$0	$359,422	$359,422
Vehicles & Equipment	Equipment	$0	$36,967	$36,967	$139,736	$0	$11,246	$0	$0	$0	$0	$224,916
General Equipment	Equipment	$0	$15,576	$15,576	$58,876	$0	$4,738	$0	$0	$0	$0	$94,766
Non-potable	Non-potable	$0	$0	$0	$0	$0	$0	$0	$5,709,304	$0	$0	$5,709,304
Total Capital Assets		**$0**	**$32,600,520**	**$32,600,520**	**$19,954,183**	**$0**	**$2,488,981**	**$0**	**$5,709,304**	**$0**	**$20,832,577**	**$114,186,087**
Capital Asset Allocation		***0%***	***29%***	***29%***	***17%***	***0%***	***2%***	***0%***	***5%***	***0%***	***18%***	***100%***

The goal of allocating the costs and asset values in Table 4-8 and Table 4-10 is to allocate the total O&M costs and capital assets to the different cost causation components. This results in a percent distribution shown in the last line each of Table 4-8 and Table 4-10. Table 4-11 summarizes those cost allocations in addition to defining the allocation of revenue offsets entirely to the Offset cost causation component.

Table 4-11: Cost Allocation Distribution Summary

Function	Rationale	Supply	Base Delivery	Max Day	Max Hour	Pumping	Meter	Customer	Non-Potable	Offset	General	Total
O&M	O&M Expenses	21%	8%	8%	10%	9%	1%	3%	8%		33%	100%
Capital	Capital Assets		29%	29%	17%		2%		5%		18%	100%
Offset	Revenue Offsets									100%		100%

4.6. Unit Cost Causation Component Derivations

The goal is to proportionately distribute costs to each user class. To accomplish this, unit costs for each cost causation component are calculated. The first step in this process is to calculate the total number of service units demanded by each class for each cost causation component. This is shown in Table 4-12. The capacity or peaking factor for each customer class was derived in Table 4-3. The total equivalent meters are from Table 4-4, Table 4-5, and Table 4-6. The max day and hour capacities are calculated by multiplying the average daily use by the capacity factor for each class and tier. This results in the total capacity, with extra capacity calculated by subtracting the average daily use from the total capacity for either Max Day or Max Hour.

Table 4-12: Derivation of Cost Causation Component Units of Service

Customer Class	Bi-Monthly Tiers (ccf)	Percent in Tier	Annual Use (ccf)	Average Daily Use (ccf/day)	Max Day			Max Hour			Number of Equivalent Meters/Lines	Number of Customers
					Capacity Factor	Total Capacity (ccf/day)	Extra Capacity (ccf/day)	Capacity Factor	Total Capacity (ccf/day)	Extra Capacity (ccf/day)		
Single Family			**3,283,985**								24,359	17,913
Tier 1	16	42%	1,373,941	3,764	1.04	3,915	151	3.01	11,314	7,399		
Tier 2	34	29%	957,531	2,623	1.34	3,515	892	3.87	10,159	6,644		
Tier 3	34+	29%	952,514	2,610	2.41	6,289	3,680	6.96	18,176	11,887		
Tier 4												
Multi-Family			139,056	381	1.72	655	274	4.97	1,894	1,238	401	163
Commercial/Industrial			466,805	1,279	1.61	2,058	779	4.65	5,948	3,890	1,894	561
Fire Service			102,242	280	2.04	572	292	5.90	1,652	1,081	279	168
Landscape Irrigation			84,948	233	1.83	426	194	5.29	1,232	806	410	56
Schedule Irrigation			20,914	57	1.83	105	48	5.29	303	198	468	87
Construction			122,380	335	2.04	684	349	5.90	1,978	1,293		
Non-Potable			812,360	2,226	1.71	3,798	1,572	4.93	10,976	7,178	1,945	303
Total			**5,032,691**	**13,788**		**22,018**	**6,658**		**52,656**	**34,436**	**29,755**	**19,252**

The calculation of public and private fire service capacity for fire service is shown in Table 4-13. Line 1 assumes the average fire lasts four hours. To fight that fire, fire services needs 5,000 gallons/minute (kgals/minute). Seventy-eight percent of the District's fire costs are allocated to Public Fire due to the public fire hydrant's share of total equivalent fire lines (Table 4-6, Line 11/(Line 6 + Line 11)). Max Day Capacity Demanded for Fire (Table 4-13, Line 4) is then determined by converting 5 kgals/minute to kgals/hour, then multiplying it by the four-hour duration of a typical fire. This is then converted to acre feet (AF). A similar calculation is done for the Max Hour capacity, multiplying the Max Day capacity by 24 hours less the capacity already allocated to Max Day. Public Fire is then allocated 78% each of those capacities.

Table 4-13: Calculation of Fire Service Capacity

Line No.	Fire Estimate	Max Day	Max Hour
1	**Hours for Fire**	4	
2	**Kgals/minute**	5	5
3	**Cost to Public Fire**	78%	78%
4	**Capacity Demanded for Fire (ccf)**	1,604	8,021
5	Public Fire	1,251	6,257
6	Private Fire	353	1,764
7	**Total Fire**	1,604	8,021
8	**Total Capacity**	8,262	42,457

Table 4-14 shows the cost causation component unit cost derivations. The operating revenue requirement shown in Table 4-1, Line 1 is allocated to the cost causation components using the resulting O&M allocation from Table 4-11. Similarly, the capital revenue requirement in Line 2 of Table 4-14 is allocated to the cost causation factors per Table 4-11. General costs in Line 5 of Table 4-14, which cannot be tied to a specific function, are redistributed in proportion to the resulting allocations of the other cost causation components, except Supply and Pumping. The revenue offsets are also distributed accordingly. A portion of Max Hour and Max Day costs are redistributed to the Meter component. Finally, a small portion of non-potable water costs are allocated back to Max Day and Max Hour as potable water customers benefit from the reduction in demand on their water sources resulting from a separate non-potable water service. Based on the Max Day and Max Hour fire demands, a portion of Max Day and Max Hour costs are allocated to Private Fire/Backflow based on its share of these costs. This was calculated based on the proportion of Private Fire Capacity to Total Capacity for Max Day and Max Hour needs.

Table 4-14: Unit Cost Calculation

Line No.	Cost Allocation	Supply	Base Delivery	Max Day	Max Hour	Private Fire/ Backflow	Pumping	Meter	Customer	Non-Potable	Offset	General	Total
1	Operating Revenue Requirement	$3,003,392	$1,111,565	$1,111,565	$1,423,375		$1,345,759	$200,855	$371,001	$1,113,563	$0	$4,790,566	$14,471,642
2	Capital Revenue Requirement	$0	$85,851	$85,851	$52,548			$6,555	$0	$15,035	$0	$54,861	$300,700
3	Revenue Offsets	$0	$0	$0	$0			$0	$0	$0	($1,081,404)	$0	($1,081,404)
4	**Total Cost of Service**	**$3,003,392**	**$1,197,416**	**$1,197,416**	**$1,475,923**	**$0**	**$1,345,759**	**$207,410**	**$371,001**	**$1,128,598**	**($1,081,404)**	**$4,845,426**	**$13,690,939**
5	Allocation of General and Offset Costs		$808,048	$808,048	$995,992	$0	$0	$139,966	$250,362	$761,608	$1,081,404	($4,845,426)	$0
6	Allocation to Public Fire			($303,746)	($364,268)			$668,014					$0
7	Allocation to Private Fire			($85,655)	($102,721)	$188,376							$0
8	Allocation of Peak to Meter			($808,032)	($1,002,463)			$1,810,494					$0
9	Allocation of Non-potable			$44,630	$55,370					($100,000)			$0
10	**Total Adjusted Cost of Service**	**$3,003,392**	**$2,005,464**	**$852,662**	**$1,057,832**	**$188,376**	**$1,345,759**	**$2,825,884**	**$621,363**	**$1,790,205**	**$0**	**$0**	**$13,690,939**
11	**Unit of Service**	4,220,330	4,220,330	6,658	34,436	1,672	4,220,330	165,188	113,691	812,360			
12	Unit	ccf	ccf	ccf/day	ccf/day	equiv. line/yr	ccf	equiv. meter/yr	bills/yr	ccf			
13	**Unit Cost**	**$0.71**	**$0.48**	**$128.08**	**$30.72**	**$112.65**	**$0.32**	**$17.11**	**$5.47**	**$2.20**			
14	Unit	ccf	ccf	ccf/day	ccf/day	equiv.line/2-mo	ccf	equiv.meter/ 2-mo	per bi-monthly bill	ccf			

The total adjusted cost of service (Line 10) is divided by the relevant units of service in Line 11 (and from Table 4-12) to calculate the unit cost (Line 13 and Line 14). For example, the unit cost for the Base Delivery component is determined by dividing the total base delivery cost by total water use in ccf, while annual Customer costs are divided by the estimated number of bills in each year. These unit costs will next be used to distribute the cost causation components to the customer classes. Fire service units are from Table 4-6 and annualized by six bills per year.

4.7. Distribution of Cost Causation Components

The final step in the cost of service analysis is to distribute the cost causation components to the user classes using the unit costs derived in Table 4-14, thereby arriving at the cost to serve each customer class. Table 4-15 shows the cost allocation to each class. To derive the cost to serve each class, the unit costs from Table 4-14 are multiplied by the service units shown in Table 4-12 for each customer class and tier. For example, the supply costs for Tier 1 Single Family usage is calculated by multiplying the supply unit cost by that class' annual usage in Tier 1. Similarly, the Customer costs are derived by multiplying the Customer unit cost by the total number of bills by class in each year. Similar calculations yield the total cost to serve each user class, as shown in the last column of Table 4-15. The cost to serve each user class has now been calculated and rates that collect the cost to serve each class can be derived.

Table 4-15: Allocation of Costs to Customer Classes

Customer Class	Supply	Base Delivery	Max Day	Max Hour	Private Fire	Pumping	Meter	Customer	Non-Potable	Offset	Total COS
Single Family							$2,500,303	$587,423			$9,433,778
Tier 1	$977,763	$652,885	$19,284	$227,287		$438,116				$0	
Tier 2	$681,425	$455,010	$114,236	$204,095		$305,333					
Tier 3	$677,855	$452,626	$471,262	$365,142		$303,733					
Multi-Family	$98,959	$66,078	$35,165	$38,060		$44,342	$41,160	$5,345			$329,109
Commercial/Industrial	$332,201	$221,822	$99,784	$119,486		$148,853	$194,353	$18,396			$1,134,896
Fire Service	$72,761	$48,585	$37,345	$33,192	$188,376	$32,603		$5,509			$418,371
Landscape Irrigation	$60,453	$40,367	$24,783	$24,747		$27,088	$42,083	$1,836			$221,357
Schedule Irrigation	$14,883	$9,938	$6,101	$6,093		$6,669	$47,985	$2,853			$94,523
Construction	$87,091	$58,154	$44,701	$39,730		$39,024					$268,700
Non-Potable									$1,790,205		$1,790,205
Total Cost of Service	**$3,003,392**	**$2,005,464**	**$852,662**	**$1,057,832**	**$188,376**	**$1,345,759**	**$2,825,884**	**$621,363**	**$1,790,205**	**$0**	**$13,690,939**

5. Rate Design

This section includes the calculation of rates and the results of the study. It also includes bill impacts for different customer classes under the proposed rates. Rates and charges are designed for the study period, CY 2020 to CY 2024. CY 2020's rates and charges will be implemented in March 2020, with all subsequent rate adjustments occurring in January of each year.

5.1. Water Rate Development

5.1.1. DERIVATION OF THE PROPOSED BI-MONTHLY FIXED CHARGE

Raftelis proposes that the District retain its schedule of a bi-monthly fixed charges by meter size for most customer classes. Table 5-1 shows the derivation of the bi-monthly fixed charge, which represents the Meter and Customer cost components determined in Table 4-14. This charge accounts for the fact that even when a customer does not use any water, the District incurs fixed costs related to maintaining the ability to serve each connection.

Meter Component

The meter component consists of costs to the District that vary based on meter size. It reflects the fact that larger meters have the potential to demand more capacity compared to smaller meters. The potential capacity demanded is proportional to the potential flow through each meter size as established by the AWWA hydraulic capacity ratios which are shown in the "Capacity Ratio" column of Table 5-1. The ratios show the potential flow through each meter size compared to the flow through a 5/8-inch meter. The Meter capacity component for larger meters is scaled up using the AWWA capacity ratios shown in the "AWWA Ratio" column. Allocating capacity costs by meter size is a common way to reliably recover the fixed cost of operating the utility.

Customer

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

The Meter and Customer components are combined to form the proposed charge by meter size. Table 5-1 also compares the proposed charges with the current charges in both dollars and percent.

Table 5-1: Derivation of the Bi-Monthly Fixed Charges

Bi-Monthly Service Charge	Capacity Ratio	Meter	Customer	Proposed Charge	Current Charge	Difference ($)	Difference (%)
5/8"	1.00	$17.11	$5.47	$22.58	$18.01	$4.57	25%
3/4"	1.50	$25.66	$5.47	$31.13	$27.02	$4.11	15%
1"	2.50	$42.77	$5.47	$48.24	$45.03	$3.21	7%
1 1/2"	5.00	$85.54	$5.47	$91.01	$90.06	$0.95	1%
2"	8.00	$136.86	$5.47	$142.33	$144.09	-$1.76	-1%
3"	17.50	$299.37	$5.47	$304.84	$288.18	$16.66	6%
4"	31.50	$538.87	$5.47	$544.34	$450.28	$94.06	21%
6"	65.00	$1,111.96	$5.47	$1,117.43	$900.55	$216.88	24%
8"	140.00	$2,394.99	$5.47	$2,400.46	$1,440.88	$959.58	67%
10"	210.00	$3,592.48	$5.47	$3,597.95	$2,071.27	$1,526.68	74%
12"	265.00	$4,533.37	$5.47	$4,538.84	$2,791.71	$1,747.13	63%

5.1.2. DERIVATION OF THE PROPOSED COMMODITY RATES

5.1.2.1. Unit Cost Definitions

The commodity rates for each class and tier are derived by summing of the unit rates ($/ccf) for:

1. Supply
2. Base Delivery
3. Peaking
4. Pumping

Supply

Supply costs are those related to the cost of purchasing and producing water. Table 5-2 lists the District's three different supply sources, their available supply, and the total cost associated with each. It then derives the per ccf unit cost.

Table 5-2: Water Supplies and Associated Cost

Water Supply Cost	Edgar Canyon	Unused Overlying	SGPWA	Total Potable
Available Supply (ccf)	577,398	753,800	2,889,133	4,220,330
Total COS	$0	$0	$3,003,392	$3,003,392
Unit Cost	$0.00	$0.00	$1.04	$0.71
Rank	1	2	3	

Since the District will be passing through the water supply cost to all customers, the average blended supply cost for all potable water shown in Table 5-2 is used for all potable customers, as shown in Table 5-3.

Table 5-3: Customer Class Water Supply Allocations

Line No.	Customer Class	Annual Use (ccf)	Edgar Canyon	Unused Overlying	SGPWA	Total Use (ccf)	Total Cost	Supply Unit Cost
1	**Single Family**	**3,283,985**	**449,293**	**586,557**	**2,248,134**	**3,283,985**	**$2,337,043**	**$0.71**
2	**Multi-Family**	139,056	19,025	24,837	95,195	139,056	$98,959	$0.71
3	**Commercial/Industrial**	466,805	63,865	83,377	319,563	466,805	$332,201	$0.71
4	**Fire Service**	102,242	13,988	18,262	69,993	102,242	$72,761	$0.71
5	**Landscape Irrigation**	84,948	11,622	15,173	58,153	84,948	$60,453	$0.71
6	**Schedule Irrigation**	20,914	2,861	3,735	14,317	20,914	$14,883	$0.71
7	**Construction**	122,380	16,743	21,858	83,778	122,380	$87,091	$0.71
8	**Total**	**4,220,330**	**577,398**	**753,800**	**2,889,133**	**4,220,330**	**$3,003,392**	**$0.71**

Base Delivery

Base Delivery costs are the operating and capital costs associated with delivering water to all customers at a constant average rate of use – also known as serving customers under average daily demand conditions. Therefore, the base delivery rate of $0.48 (Table 4-15) is spread over all units of water irrespective of customer class or tier.

Peaking

Peaking costs represent the cost of providing Max Day and Max Hour flow capacity to each customer class and are assessed based on total usage. Table 5-4 combines the Max Day and Max hour costs in Table 4-15 into Peaking Costs. These costs are divided by total annual use by class and tier to arrive at the Peaking unit cost for each.

Table 5-4: Peaking Unit Cost by Class and Tier

Customer Class	Annual Use (ccf)	Peaking Costs	Unit Cost
Single Family			
Tier 1	1,373,941	$246,572	$0.18
Tier 2	957,531	$318,331	$0.33
Tier 3	952,514	$836,404	$0.88
Multi-Family	139,056	73,225	$0.53
Commercial/Industrial	466,805	$219,271	$0.47
Fire Service	102,242	$70,538	$0.69
Landscape Irrigation	84,948	$49,530	$0.58
Schedule Irrigation	20,914	$12,194	$0.58
Construction	122,380	$84,431	$0.69

Pumping

Finally, the costs to pump water from the ground and to customers is allocated equally across all demand. The rate of $0.32 was derived in Table 4-14. Table 5-5 shows the proposed commodity rates, combining the four rate components for each customer class. As with the fixed charges, the proposed rates are compared to the current rates in both dollars and percentages.

Table 5-5: Derivation of the Commodity Rates ($/ccf)

Customer Class	Bi-Monthly Tiers	Supply	Base Delivery	Peaking	Pumping	Proposed Rate	Current Rate	Difference ($)	Difference (%)
Single Family									
Tier 1	16	$0.71	$0.48	$0.18	$0.32	$1.69	$1.75	-$0.06	-3%
Tier 2	34	$0.71	$0.48	$0.33	$0.32	$1.84	$1.75	$0.09	5%
Tier 3	34+	$0.71	$0.48	$0.88	$0.32	$2.39	$1.75	$0.64	37%
Multi-Family	Uniform	$0.71	$0.48	$0.53	$0.32	$2.04	$1.77	$0.27	15%
Commercial/Industrial		$0.71	$0.48	$0.47	$0.32	$1.98	$1.78	$0.20	11%
Fire Service		$0.71	$0.48	$0.69	$0.32	$2.20	$1.78	$0.42	24%
Landscape Irrigation		$0.71	$0.48	$0.58	$0.32	$2.09	$1.94	$0.15	8%
Schedule Irrigation		$0.71	$0.48	$0.58	$0.32	$2.09	$1.80	$0.29	16%
Construction		$0.71	$0.48	$0.69	$0.32	$2.20	$1.94	$0.26	13%
Non-Potable		$0.93	$0.72		$0.30	$1.95	$1.94	$0.01	1%

5.1.3. PROPOSED POTABLE WATER RATE SCHEDULE

The proposed rates derived in Table 5-1 and Table 5-5 are inflated annually by the proposed revenue adjustments shown in Table 3-19 and shown again below in Table 5-6. The resulting proposed rates for the study period are provided in Table 5-7 and Table 5-8.

Table 5-6: Proposed Rate Adjustments

CY 2020	CY 2021	CY 2022	CY 2023	CY 2024
March	January	January	January	January
1.0%	7.0%	7.0%	7.0%	7.0%

Table 5-7: CY 2020-2024 Proposed Bi-Monthly Charges

Meter Size	Current Charge	March 2020	January 2021	January 2022	January 2023	January 2024
5/8"	$18.01	$22.58	$24.17	$25.87	$27.69	$29.63
3/4"	$27.02	$31.13	$33.31	$35.65	$38.15	$40.83
1"	$45.03	$48.24	$51.62	$55.24	$59.11	$63.25
1 1/2"	$90.06	$91.01	$97.39	$104.21	$111.51	$119.32
2"	$144.09	$142.33	$152.30	$162.97	$174.38	$186.59
3"	$288.18	$304.84	$326.18	$349.02	$373.46	$399.61
4"	$450.28	$544.34	$582.45	$623.23	$666.86	$713.55
6"	$900.55	$1,117.43	$1,195.66	$1,279.36	$1,368.92	$1,464.75
8"	$1,440.88	$2,400.46	$2,568.50	$2,748.30	$2,940.69	$3,146.54
10"	$2,071.27	$3,597.95	$3,849.81	$4,119.30	$4,407.66	$4,716.20
12"	$2,791.71	$4,538.84	$4,856.56	$5,196.52	$5,560.28	$5,949.50

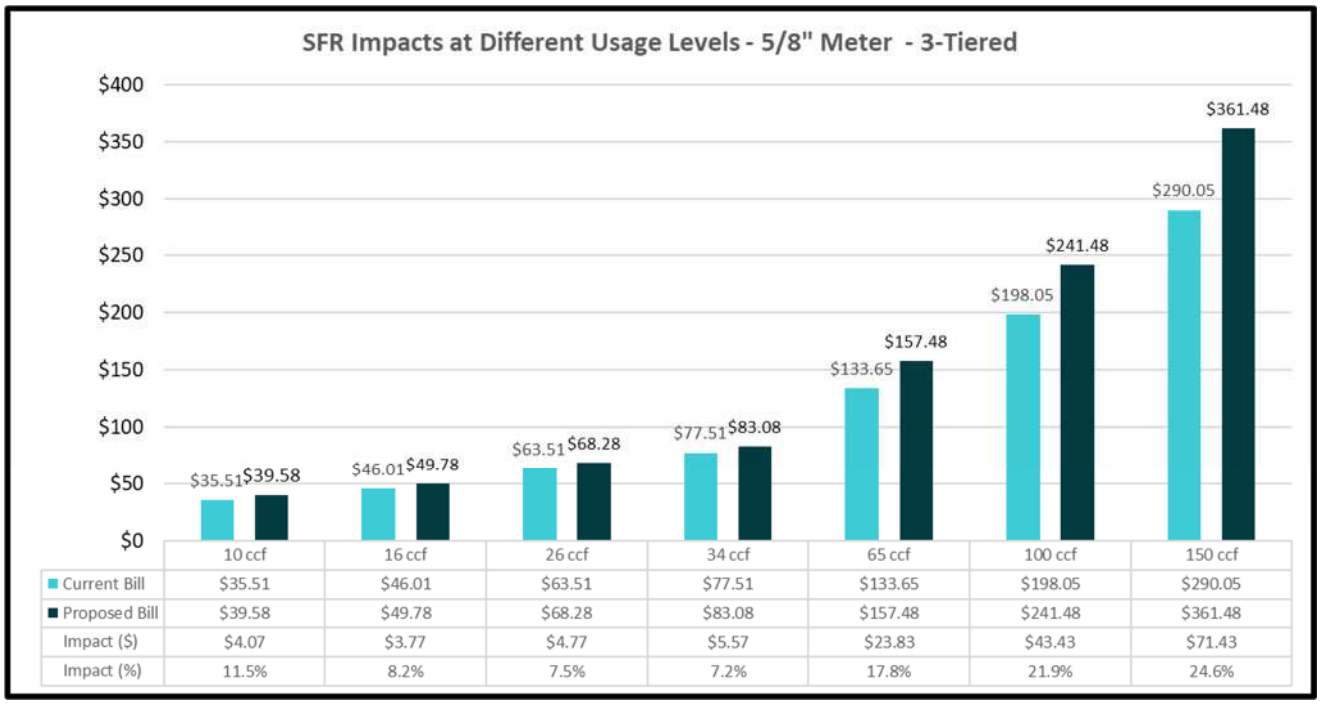
Table 5-8: CY 2020-2024 Proposed Commodity Rates

Customer Class	Bi-Monthly Tiers (ccf)	March 2020	January 2021	January 2022	January 2023	January 2024
Single Family						
Tier 1	16	$0.66	$0.71	$0.76	$0.82	$0.88
Tier 2	34	$0.81	$0.87	$0.94	$1.01	$1.09
Tier 3	34+	$1.36	$1.46	$1.57	$1.68	$1.80
Multi-Family	Uniform	$1.01	$1.09	$1.17	$1.26	$1.35
Commercial/Industrial	Uniform	$0.95	$1.02	$1.10	$1.18	$1.27
Fire Service	Uniform	$1.17	$1.26	$1.35	$1.45	$1.56
Landscape Irrigation	Uniform	$1.06	$1.14	$1.22	$1.31	$1.41
Schedule Irrigation	Uniform	$1.06	$1.14	$1.22	$1.31	$1.41
Construction	Uniform	$1.17	$1.26	$1.35	$1.45	$1.56
State Project Water (SGPWA)		$0.72	*Pass-Through*	*Pass-Through*	*Pass-Through*	*Pass-Through*
SCE Power Charge (Pumping)		$0.32	*Pass-Through*	*Pass-Through*	*Pass-Through*	*Pass-Through*

5.1.4. BILL IMPACTS

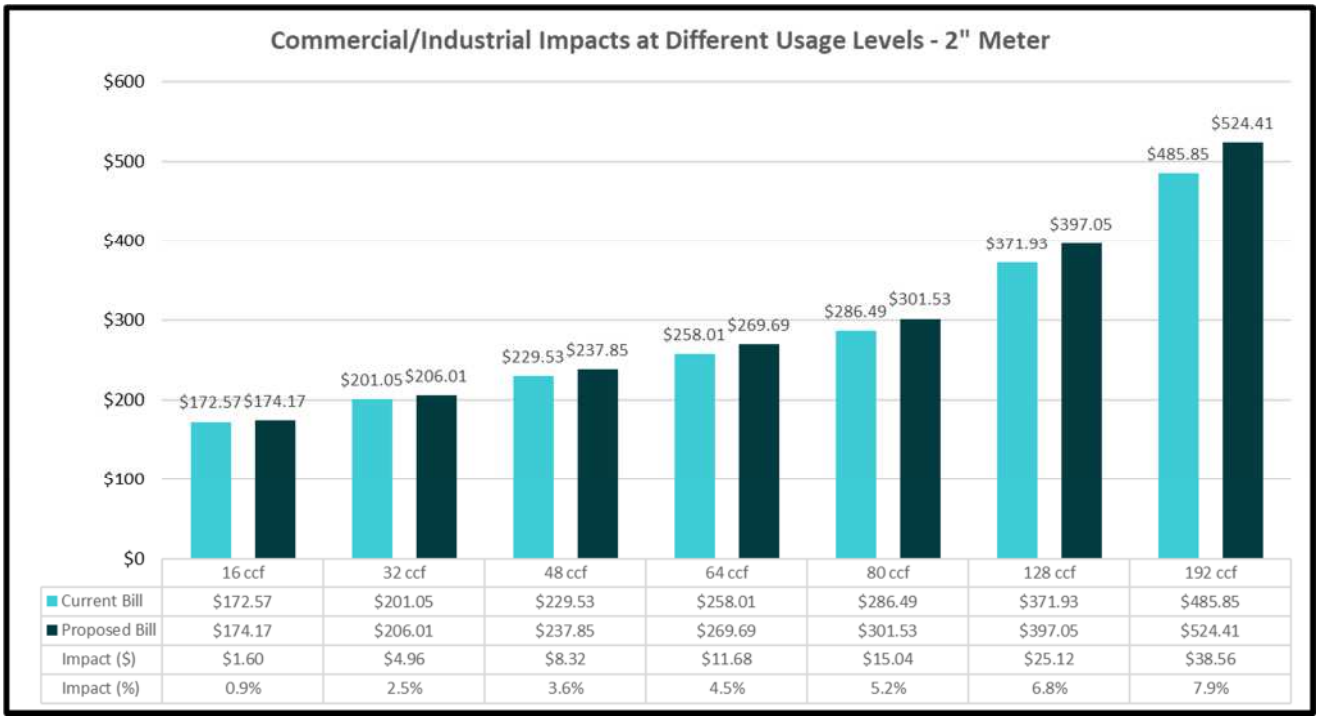
Figure 5-1 and Figure 5-2 compare the current rates (effective January 1, 2015) versus the proposed CY 2020 rates for two different customer classes. Figure 5-1 shows the impacts of the proposed rates on a hypothetical Single-Family Residential customer with a 5/8" meter at different usage levels. Figure 5-2 shows the impacts on a hypothetical Commercial or Industrial customer with a 2" meter and different levels of consumption.

Figure 5-1: Single-Family Residential Bill Impact Analysis



	10 ccf	16 ccf	26 ccf	34 ccf	65 ccf	100 ccf	150 ccf
Current Bill	$35.51	$46.01	$63.51	$77.51	$133.65	$198.05	$290.05
Proposed Bill	$39.58	$49.78	$68.28	$83.08	$157.48	$241.48	$361.48
Impact ($)	$4.07	$3.77	$4.77	$5.57	$23.83	$43.43	$71.43
Impact (%)	11.5%	8.2%	7.5%	7.2%	17.8%	21.9%	24.6%

Figure 5-2: Commercial/ Industrial Bill Impact Analysis



	16 ccf	32 ccf	48 ccf	64 ccf	80 ccf	128 ccf	192 ccf
Current Bill	$172.57	$201.05	$229.53	$258.01	$286.49	$371.93	$485.85
Proposed Bill	$174.17	$206.01	$237.85	$269.69	$301.53	$397.05	$524.41
Impact ($)	$1.60	$4.96	$8.32	$11.68	$15.04	$25.12	$38.56
Impact (%)	0.9%	2.5%	3.6%	4.5%	5.2%	6.8%	7.9%

5.2. Drought Rates

5.2.1. DROUGHT RATE BACKGROUND

Consistent with its water supply shortage response plan, the District can establish drought rates to:

1. Recover lost revenue due to decreased consumption during a drought
2. Encourage water conservation to meet the desired conservation goals for each drought stage.

Drought rates help send a conservation signal to maximize the probability that the District will meet its target use, escape penalties and meet its costs. Drought rates help the District recoup lost revenues when District customers curtail their water consumption during periods of drought.

In the event that the District activates its water supply drought rates, customers will be notified in advance. The District's drought rates would only be implemented by District Board action. Such action by the District is generally triggered by the declaration of a specific level of water shortage by the California Department of Water Resources (DWR).

Revenue Collection During a Drought

During a drought, the District's revenue requirement (costs) decreases along with revenue. However, the District's revenue decreases more than its costs. The majority of the District's costs are fixed (salaries, benefits, debt service, etc.) and since a portion of the fixed costs are collected through the variable commodity rates, the District suffers a net revenue loss with reduced sales. Drought rates are required to recover lost revenue to cover its fixed costs. The District's drought revenue requirement is lower than its non-drought revenue requirement because, as the District serves less water, it also purchases and treats less water, thereby saving the associated costs.

Customer Bills During a Drought

Provided that customers cutback their water use in line with the drought cutback goal, their total water bill should be lower than their bill during "normal" water/rainfall years. Conversely, those that do not cutback consumption will face higher charges.

5.2.2. POTABLE DROUGHT RATE CALCULATIONS

The first step in calculating drought rates is to estimate the cutback in potable water use from each customer class. Raftelis estimated the cutback in use by using District customer use data and estimating various percent cutbacks for each tier at each stage of reduction. Table 5-9 shows the estimated cutbacks, in percent and volume, for each class and tier. The resulting total cutback in ccf and percent for each drought level are shown on the last two rows of the table.

Table 5-9: Estimated Potable Demand Reductions

Customer Class	Normal Conditions	Reductions by Class (%)				Reductions by Class (ccf)			
		Stage 1	Stage 2	Stage 3	Stage 4	Stage 1	Stage 2	Stage 3	Stage 4
Single Family									
Tier 1 16 ccf	1,373,941	2%	4%	7%	10%	1,346,462	1,318,983	1,277,765	1,236,547
Tier 2 34 ccf	957,531	10%	25%	40%	50%	861,778	718,148	574,518	478,765
Tier 3 34+ ccf	952,514	25%	43%	56%	76%	714,385	542,933	419,106	228,603
Multi-Family	139,056	5%	10%	15%	20%	132,104	125,151	118,198	111,245
Commercial/Industrial	466,805	5%	10%	15%	20%	443,465	420,125	396,784	373,444
Fire Service	102,242	0%	0%	0%	0%	102,242	102,242	102,242	102,242
Landscape Irrigation	84,948	20%	40%	60%	75%	67,958	50,969	33,979	21,237
Schedule Irrigation	20,914	5%	10%	15%	20%	19,868	18,822	17,777	16,731
Construction	122,380	0%	20%	65%	80%	122,380	97,904	42,833	24,476
Total Potable Consumption	**4,220,330**					**3,810,642**	**3,395,277**	**2,983,203**	**2,593,291**
% Reduction						10%	20%	29%	39%

Table 5-10 shows the calculation of the drought rate for each stage. Line 3 shows the total revenue under the proposed non-drought commodity rates to generate the total revenue under each stage without the drought surcharge. Line 4 provides the revenue loss in each stage compared to under normal conditions. Line 8 calculates the cost to supply the total consumption at each stage. While the District loses revenue with each deduction, it also saves in in purchased water costs. These savings by stage are shown in Line 9. The Net Costs (Line 10) result from subtracting the cost savings from the revenue lost. This is the total additional revenue that the reduced demand must also generate in order to sustain revenues under normal conditions. Those net costs are then divided by the total consumption under each stage (Line 1) to arrive at the drought rate for each.

Table 5-10: Potable Drought Rate Calculation[6]

Line No.	Customer Class	Normal Conditions	Stage 1	Stage 2	Stage 3	Stage 4
1	**Total Potable Consumption**	**4,220,330 ccf**	**3,810,642 ccf**	**3,395,277 ccf**	**2,983,203 ccf**	**2,593,291 ccf**
2	% Reduction		10%	20%	29%	39%
3	Commodity Revenues	$8,283,298	$7,372,867	$6,478,216	$5,615,441	$4,759,249
4	**Revenue Loss**		**$910,431**	**$1,805,082**	**$2,667,857**	**$3,524,049**
5	Potable Sales, AF	9,689	8,748	7,794	6,848	5,953
6	% Losses	11.5%	11.5%	11.5%	11.5%	11.5%
7	Potable Purchases, AF	10,948	9,885	8,807	7,738	6,727
8	Purchase Costs	$3,003,392	$2,711,837	$2,416,243	$2,122,992	$1,845,511
9	Cost Savings		$291,554	$587,148	$880,400	$1,157,880
10	**Net Costs**		**$618,877**	**$1,217,934**	**$1,787,457**	**$2,366,169**
11	**Drought Rate**		**$0.17**	**$0.36**	**$0.60**	**$0.92**

Every single commodity rate will be increased by the drought rate shown above at each stage. For a reduction in use intermediate to the reductions shown the drought rate surcharge should be linearly prorated. For example, a 15% reduction would require a drought surcharge of $0.27 per ccf.

[6] The percent reduction in Line 2 is rounded to the nearest whole percent and the drought rate in Line 11 is rounded to the nearest penny.

Table 5-11 shows the CY 2020 rates for all classes and tiers with the drought surcharges from Table 5-11, Line 11 added for each stage.

Table 5-11: Potable Rate Schedule with Drought Rate Surcharges

Customer Class	Normal Conditions	Stage 1 10%	Stage 2 20%	Stage 3 30%	Stage 4 40%
Single Family					
Tier 1 16 ccf	$1.70	$1.87	$2.06	$2.30	$2.62
Tier 2 34 ccf	$1.85	$2.02	$2.21	$2.45	$2.77
Tier 3 34+ ccf	$2.40	$2.57	$2.76	$3.00	$3.32
Multi-Family	$2.05	$2.22	$2.41	$2.65	$2.97
Commercial/Industrial	$1.99	$2.16	$2.35	$2.59	$2.91
Fire Service	$2.21	$2.38	$2.57	$2.81	$3.13
Landscape Irrigation	$2.10	$2.27	$2.46	$2.70	$3.02
Schedule Irrigation	$2.10	$2.27	$2.46	$2.70	$3.02
Construction	$2.21	$2.38	$2.57	$2.81	$3.13

5.3. Non-potable Water Rate Development

Table 5-12 projects the non-potable water meters by meter size according to the inflation factors in Table 3-1. Non-potable water customers pay the same bi-monthly meter service charges as potable water customers. Table 5-13 shows the calculation of the non-potable water commodity rate. The projected meters by meter size in CY 2020 are multiplied by their corresponding bi-monthly meter charges in Table 5-7, then by six bi-monthly bills per year to arrive at the total CY 2020 revenue from the bi-monthly meter service charges (Line 2, Table 5-13). This is subtracted from the total revenue requirement (Line 1, Table 5-13) from Table 4-14, Line 10, to arrive at the total commodity rate revenue requirement (Line 3,Table 5-13). This then is divided by total non-potable water consumption (Line 4,Table 5-13) to arrive at the proposed CY 2020 rate in Line 5 (Table 5-13).

Table 5-12: Total Non-potable Water Accounts

Customer Class	CY 2019	CY 2020	CY 2021	CY 2022	CY 2023	CY 2024
Non-potable Water Meters						
5/8"	1	1	1	1	1	1
3/4"	0	0	0	0	0	0
1"	38	38	39	39	40	40
1 1/2"	87	88	89	90	91	92
2"	174	176	178	180	182	184
Total Non-potable Water Meters	**300**	**303**	**307**	**310**	**314**	**318**

Table 5-13: Non-potable Water Commodity Rate Calculation[7]

Line No.		CY 2020
1	Total Non-potable Water Revenue Requirement	$1,790,205
2	Total Revenue from Fixed Charges	$209,638
3	**Total Commodity Rate Revenue Requirement**	**$1,580,568**
4	Total Non-potable Water Consumption	812,360
5	**Proposed CY 2020 Non-potable Water Commodity Rate**	**$1.95**

This resulting rate is shown in Table 5-14 and divided into its three components: non-potable base, water supply, and power. Note that the operating costs increase with the purchase of recycled water in CY 2021 and beyond; however, the pass-through supply and pumping rates will decrease in CY 2021 and beyond.

Table 5-14: CY 2020 to CY 2024 Proposed Non-potable Water Commodity Rates

Customer Class	Bi-Monthly Tiers (ccf)	March 2020	January 2021	January 2022	January 2023	January 2024
Non-Potable	Uniform	$0.72	$0.96	$0.96	$0.98	$0.98
Non-potable Water Supply		$0.93	*Pass-Through*	*Pass-Through*	*Pass-Through*	*Pass-Through*
Non-potable Water Power		$0.31	*Pass-Through*	*Pass-Through*	*Pass-Through*	*Pass-Through*

[7] Values are rounded

5.4. Fire Service

The bi-monthly fire service charges consist of the Fire unit charge and the Customer unit charge (Table 4-14). As with the potable and non-potable customers, all fire line sizes are equally charged the Customer unit cost. The Fire component varies in cost based on the size of the fire line drawing water in an emergency. It is based on a 6" fire line with the Fire unit charge multiplied by the respective capacity ratio of the different fire line sizes. Table 5-15 then compares the proposed and current charges as with the previous charges.

Table 5-15: Derivation of Bi-Monthly Fire Service Charges

Bi-Monthly Fire Service Charge	Capacity Ratio	Fire	Customer	Proposed Charge	Current Charge	Difference ($)	Difference (%)
4"	0.34	$38.78	$5.47	$44.25	$51.82	-$7.57	-15%
6"	1.00	$112.65	$5.47	$118.12	$150.53	-$32.41	-22%
8"	2.13	$240.05	$5.47	$245.52	$320.79	-$75.27	-23%
10"	3.83	$431.70	$5.47	$437.17	$576.89	-$139.72	-24%
12"	6.19	$697.31	$5.47	$702.78	$931.84	-$229.06	-25%

The proposed Fire Service Charges are also escalated according to the rate adjustments in Table 5-6, resulting in the Fire Service Charge Schedule below.

Table 5-16: CY 2020 to 2024 Proposed Fire Service Charges

Fire Meter Size	Current Charge	March 2020	January 2021	January 2022	January 2023	January 2024
4"	$51.82	$44.25	$47.35	$50.67	$54.22	$58.02
6"	$150.53	$118.12	$126.39	$135.24	$144.71	$154.84
8"	$320.79	$245.52	$262.71	$281.10	$300.78	$321.84
10"	$576.89	$437.17	$467.78	$500.53	$535.57	$573.06
12"	$931.84	$702.78	$751.98	$804.62	$860.95	$921.22

Fire Service customers also pay a commodity rate consisting of the Base Delivery ($0.48) and Peaking ($0.69) unit charges and resulting in the $1.17 CY 2020 rate, which is also escalated by the proposed rate adjustments through CY 2024. Additionally, the rate will recover the cost of supply and power.

Table 5-17: CY 2020 to CY 2024 Proposed Fire Service Commodity Rates

Customer Class	Bi-Monthly Tiers (ccf)	March 2020	January 2021	January 2022	January 2023	January 2024
Fire Service	Uniform	$1.17	$1.26	$1.35	$1.45	$1.56
State Project Water (SGPWA)		$0.72	*Pass-Through*	*Pass-Through*	*Pass-Through*	*Pass-Through*
SCE Power Charge (Pumping)		$0.32	*Pass-Through*	*Pass-Through*	*Pass-Through*	*Pass-Through*