

Dear Council Members,

The City of Napa is reviewing their water and sewer rates.

“The increase would typically add up to about \$5 per month in the winter and \$10 per month in the summer for average residential water users. Similar increases would be made to multifamily residential, commercial water rates and rates for irrigation.”

See Press Democrat Article:

<https://www.pressdemocrat.com/article/north-bay/napa-council-to-consider-water-rate-increase-approval-of-new-53-home-subdi/>

I would recommend all the Council Members read the study and documents from Napa. The water rate study is very well done and has a clear plan for infrastructure needs. Many funding options are discussed. The plans are easy to understand and include valuable detail.

Also of note are salary rates, especially for finance. It looks like the City of Napa, which is considerably larger and has more residents and businesses pays a similar amount for their Finance Department.

Here are relevant links:

<https://napacity.legistar.com/LegislationDetail.aspx?ID=6401316&GUID=BEF217F7-7C76-4317-8CAF-3ED76206B51B&Options=&Search=>

Attached is the water rate study.

As we will have our discussion of water and sewer rates in the near future, I hope all Council Members will begin to look at other municipalities to gain clarity on Sebastopol’s Water and Wastewater ratepayer obligations, expenses and infrastructure.

Thank you,  
Kate Haug

# WATER COST OF SERVICE STUDY

BLACK & VEATCH PROJECT NO. 412083

PREPARED FOR

City of Napa, CA

7 SEPTEMBER 2023



Table of Contents

**Disclaimer** ..... 1

**1.0 Executive Summary** ..... 1-1

    1.1 Water System..... 1-1

    1.2 Financial Plan ..... 1-1

    1.3 Adequacy of Existing Rates to Achieve Financial Plan ..... 1-2

    1.4 Revenue Required to Achieve Financial Plan..... 1-3

    1.5 Cost of Service Analysis ..... 1-3

    1.6 Rate Design..... 1-4

        1.6.1 Fixed Service Charge ..... 1-4

        1.6.2 Quantity Charge..... 1-5

        1.6.3 Pumped Zone Charge ..... 1-5

        1.6.4 Treat & Wheel Charge ..... 1-5

        1.6.5 Treat Only Charge ..... 1-5

        1.6.6 Fire Service Charge ..... 1-5

    1.7 Study Recommendations..... 1-6

**2.0 Revenue and Revenue Requirements** ..... 2-1

    2.1 Customer and Water Consumption Projections..... 2-1

    2.2 Revenue under Existing Rates ..... 2-4

    2.3 Other Revenue ..... 2-6

    2.4 Operating and Maintenance Expenses ..... 2-6

    2.5 Debt Service Requirements..... 2-7

    2.6 Capital Improvement Program ..... 2-8

        2.6.1 Capital Improvement Financing Plan..... 2-9

    2.7 Transfers..... 2-10

    2.8 Reserves..... 2-10

    2.9 Projected Operating Results ..... 2-11

**3.0 Cost of Service Allocation**..... 3-1

    3.1 Functional Cost Components ..... 3-2

    3.2 Allocation to Cost Components ..... 3-2

        3.2.1 System Base, Max Day, and Max Hour Allocations ..... 3-3

        3.2.2 Allocation of Operating and Maintenance Expenses..... 3-3

        3.2.3 Allocation of Capital Investments ..... 3-4

    3.3 Units of Service..... 3-4

    3.4 Cost of Service Allocations..... 3-4

        3.4.1 Units Costs of Service..... 3-4

        3.4.2 Distribution of Costs of Service to Customer Classes ..... 3-4

**4.0 Proposed Water Rate Adjustments** ..... 4-1

4.1	Existing Rates .....	4-1
4.2	Proposed Water Rates .....	4-1
4.2.1	Inside City and Outside City.....	4-2
4.2.2	Fixed Service Charge .....	4-2
4.2.3	Fire Service .....	4-3
4.2.4	Retail Quantity Charge .....	4-4
4.2.5	Pump Zone Charge .....	4-11
4.2.6	Contract Quantity Charge .....	4-12
<b>5.0</b>	<b>Summary of Proposed Rates and Typical Monthly Costs .....</b>	<b>5-13</b>
5.1	Proposed Rate Schedule.....	5-13
5.2	Typical Monthly Costs under Proposed Charges .....	5-14
5.3	Summary of Cost-of-Service Study .....	5-15

**LIST OF TABLES**

Table 1-1	Proposed Five-Year Rate Schedules .....	1-7
Table 2-1	Number of Customer Connections .....	2-2
Table 2-2	Billed Water Consumption .....	2-4
Table 2-3	Existing Water Rates .....	2-5
Table 2-4	Projected Revenue under Existing Water Rates .....	2-6
Table 2-5	O&M Expenses.....	2-7
Table 2-6	Debt Service .....	2-8
Table 2-7	Capital Improvement Projects .....	2-9
Table 2-8	CIP Financing Plan .....	2-10
Table 2-9	Reserve Balances .....	2-11
Table 2-10	Operating Fund .....	2-14
Table 3-1	Cost of Service Revenue from Rates.....	3-1
Table 3-2	Allocation of O&M Expenditures.....	3-1
Table 3-3	Allocation of Capital Costs .....	3-3
Table 3-4	Units of Service.....	3-6
Table 3-5	Units Cost of Service.....	3-7
Table 3-6	Distribution of Costs to Customer Classes .....	3-8
Table 4-1	Costs within the Fixed Charge for FY 2024 .....	4-3
Table 4-2	Proposed Fixed Service Charge.....	4-3
Table 4-3	Costs within the Fire Service Charge for FY 2024 .....	4-4
Table 4-4	Proposed Fire Service Charge .....	4-4
Table 4-5	Water Supply Unit Costs .....	4-5
Table 4-6	Water Sold by Customer Class .....	4-5

Table 4-7	Water Supply Unit Costs by Customer Class .....	4-6
Table 4-8	SFR Water Supply Unit Costs by Tier.....	4-7
Table 4-9	Water Delivery Unit Costs .....	4-7
Table 4-10	Common Water Peaking Unit Costs.....	4-8
Table 4-11	Inside City Water Peaking Unit Costs.....	4-8
Table 4-12	Outside City Water Peaking Unit Costs .....	4-8
Table 4-13	Water Conservation Unit Costs .....	4-9
Table 4-14	Common Water Unit Costs .....	4-10
Table 4-15	Inside City Water Unit Costs .....	4-10
Table 4-16	Outside City Water Unit Costs .....	4-10
Table 4-17	Proposed Quantity Charge.....	4-11
Table 4-18	Pump Zone Unit Costs .....	4-11
Table 4-19	Proposed Pump Zone Charges .....	4-12
Table 4-20	Treat & Wheel and Treat Only Unit Costs.....	4-12
Table 4-21	Proposed Treat & Wheel and Treat Only Charges .....	4-12
Table 5-1	Proposed Rate Schedule.....	5-13
Table 5-2	Typical Monthly Water Costs.....	5-14

**LIST OF FIGURES**

Figure 1-1	Status Quo Operating Cash Flow .....	1-3
Figure 1-2	Proposed Operating Cash Flow .....	1-3
Figure 2-1	Water Demand per Year .....	2-3
Figure 2-2	Status Quo Operating Cash Flow .....	2-12
Figure 2-3	Status Quo Debt Service Coverage .....	2-12
Figure 2-4	Proposed Operating Cash Flow.....	2-15
Figure 2-5	Proposed Debt Service Coverage.....	2-15
Figure 5-1	Comparison of Costs for Customers in the Bay Area .....	5-16

## Disclaimer

Black & Veatch has prepared this report for the City of Napa (City) and it is based on information not within the control of Black & Veatch. The City has not requested Black & Veatch to make an independent analysis, to verify the information provided to us, or to render an independent judgment of the validity of the information provided by others. Because of this, Black & Veatch cannot, and does not, guarantee the accuracy thereof to the extent that such information, data, or opinions were based on information provided by others.

In conducting these analyses and in forming an opinion of the projection of future financial operations summarized in this report, Black & Veatch made certain assumptions on the conditions, events, and circumstances that may occur in the future. The methodology utilized in performing the analyses follows generally accepted practices for such projections. Such assumptions and methodologies are reasonable and appropriate for the purpose for which they are used. While we believe the assumptions are reasonable and the projection methodology valid, actual results may differ materially from those projected, as influenced by the conditions, events, and circumstances that actually occur. Such factors may include the Water Division's ability to execute the capital improvement program as scheduled and within budget, regional climate and weather conditions affecting the demand for water, and adverse legislative, regulatory, or legal decisions (including environmental laws and regulations) affecting the Water Division's ability to manage the system and meet water quality requirements.

## 1.0 Executive Summary

The City of Napa (City) commissioned Black & Veatch Management Consulting, LLC (Black & Veatch) to conduct a Water Rate Study (Study) for the Water Division. The Study included the development of a multi-year financial plan, a cost-of-service analysis, and the design of a rate structure for the City's Water Division. The specific objectives and goals of the Study were to:

- Evaluate the adequacy of projected revenues under existing rates to meet projected revenue requirements.
- Develop a sound financial plan for the Water Division covering a five-year Study period for both ongoing operations and planned capital improvements.
- Allocate the Water Division's projected Fiscal Year 2023-2024 (FY 2024) revenue requirements to the various customer classes in accordance with the respective service requirements.
- Develop a suitable rate schedule that produces revenues adequate to meet financial needs while recognizing customer costs of service and local and state policy considerations such as Proposition 218 and applicable judicial decisions.
- Allocate costs in the fixed element to more accurately reflect the level of service that is provided to customers each billing cycle, the costs incurred to maintain a reliable system, and ensure it is available 24/7 for drinking water and fire protection to structures on properties served City water whether water is used or not.
- Allocate costs in tiers to reflect more accurately changed usage patterns among customers that ensure cost recovery and corresponding allocation of system components.

### 1.1 Water System

The City of Napa's Water Division provides water services to over 24,650 residential, commercial, irrigation, schools, and agricultural accounts. In addition, the City maintains contracts to treat and deliver potable water to the cities of American Canyon, Calistoga, and other entities. The City obtains raw water from two local sources: surface water impounded at Lake Hennessey and Milliken reservoirs, and from the State Water Project (SWP) operated by the California State Department of Water Resources. The SWP contracted entitlements are administered through the Napa County Flood Control and Water Conservation District.

Surface water at Lake Hennessey and Milliken Reservoir provide the City a storage capacity of 31,000 and 1,390 acre-feet respectively. The City receives SWP water through the North Bay Aqueduct (NBA) and it provides the City with an annual allocation or portion of its 21,900 acre-feet of entitlements. Local treatment plants with a total capacity of 43.5 million gallons per day (MGD) treat the surface and SWP water. The City delivers all treated water through an extensive system of 350 miles of transmission and distribution pipelines.

### 1.2 Financial Plan

The City operates the Water Division as a self-supporting enterprise. As such, the Water Division must develop a financial plan (also known as revenue requirements) that provides sufficient levels of revenue to meet all operation and maintenance expenses, debt service requirements, routine annual renewal and replacement of aging assets funded from current revenues, and consistent investments in capital improvements.

The Study develops a financial plan that projects operating revenue, expenses, and capital financing costs for the Water Division over a five-year planning period beginning July 1, 2023 and ending June 30, 2028. The financial plan projected future rate revenues under existing rates, operations and maintenance (O&M) expense, principal and interest expense on bonded debt, and capital improvement requirements. In the projection of rate revenues, annual projections of customers and water use rely upon City estimates based on a reasonable increase from recent drought-constrained demands while considering the public's desire to conserve and the urban water use targets established by the State's Senate Bill (SB) 606/Assembly Bill (AB) 1668. This legislative package, also known as "Making Water Conservation a California Way of Life," creates unique community budgets for indoor residential use, outdoor residential use, irrigation of landscapes with dedicated irrigation meters, and water losses. It is the aggregate sum of the four budgets that must be met, with escalating enforcement by the State Water Board through the decade. Even with growth projections, the Water Division is expected to remain under these targets set forth by SB 606/AB 1668.

The Water Division's revenue requirements are shown in Table 2-10 and key areas summarized below:

- Operation and Maintenance Expenses: O&M expenses as shown in Table 2-5, range from \$35.2M in FY 2024 to \$39.0M in FY2028
- Debt Service: Existing debt service is projected to remain stable at \$3.1M per fiscal year. In FY 2027, the City anticipates the issuance of Revenue Bonds for \$100.0M, for improvements to the Hennessey Water Treatment Plant and Spillway, which will add an additional \$7.2M of annual debt service.
- Capital Improvements: The identified capital needs average \$16.9M per year over the five-year study period. The Study incorporates the known capital needs; however, the City is in the process of updating the Water Master Plan which will prioritize capital investments for a 30-year timeframe. The Water Master Plan is expected to be complete by July 2024.

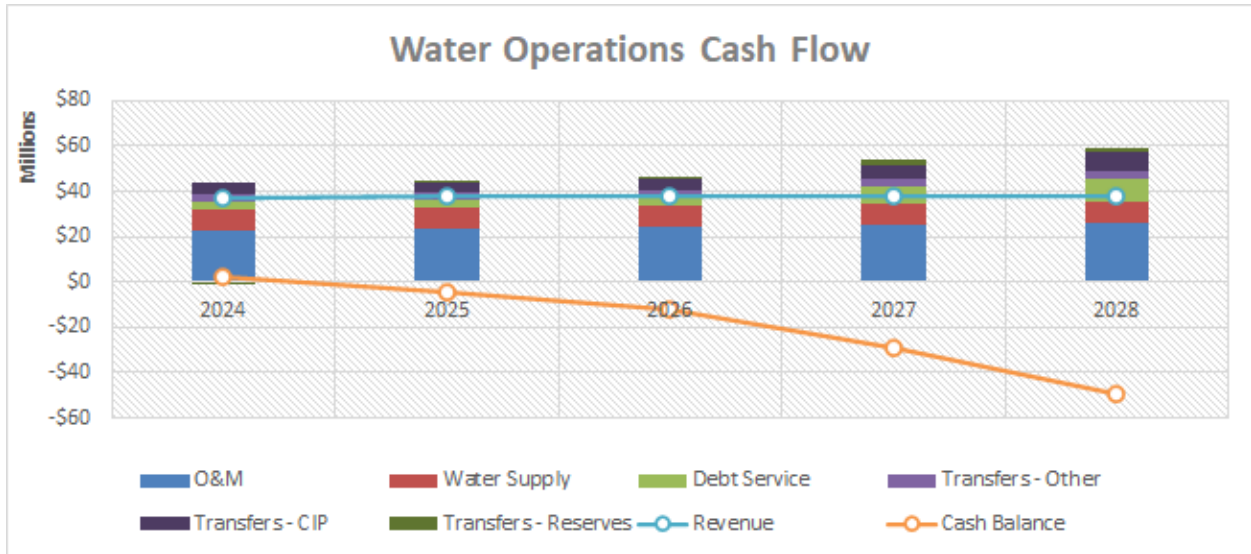
### **1.3 Adequacy of Existing Rates to Achieve Financial Plan**

The last rate study was conducted in 2017 and set rates that took effect on October 1 of each year in 2017 through 2021. Rates remained flat in 2022 and 2023 with no increases. Over the past couple of years, water sales have decreased due to two years of drought in 2021 and 2022 requiring restrictions on outdoor irrigation practices. In 2023 water supplies were replenished locally and regionally ending the drought restrictions, however a wet spring and unseasonably cool temperatures through the end of June resulted in suppressed sales through the end of FY23. Customer habits have changed in the wake of increased concern over climate change and observations of extreme weather patterns. In addition, the pandemic and inflationary periods were not predicted during the 2017 cost of service analysis. The costs of critical consumables including chemicals, pipe, and repair clamps have increased beyond what was projected in 2017.

The projected increase in revenues from existing rates are relatively flat at an average of 1.0% over the Study period. Figure 1-1 shows the projected cost of providing reliable water service and investing in capital improvements exceeds the revenue generated from existing rates and depletes the cash balance in 2025. Since the existing rates do not recover sufficient revenue to provide the necessary service, rates must be adjusted to recover revenue commensurate with the cost to provide service.



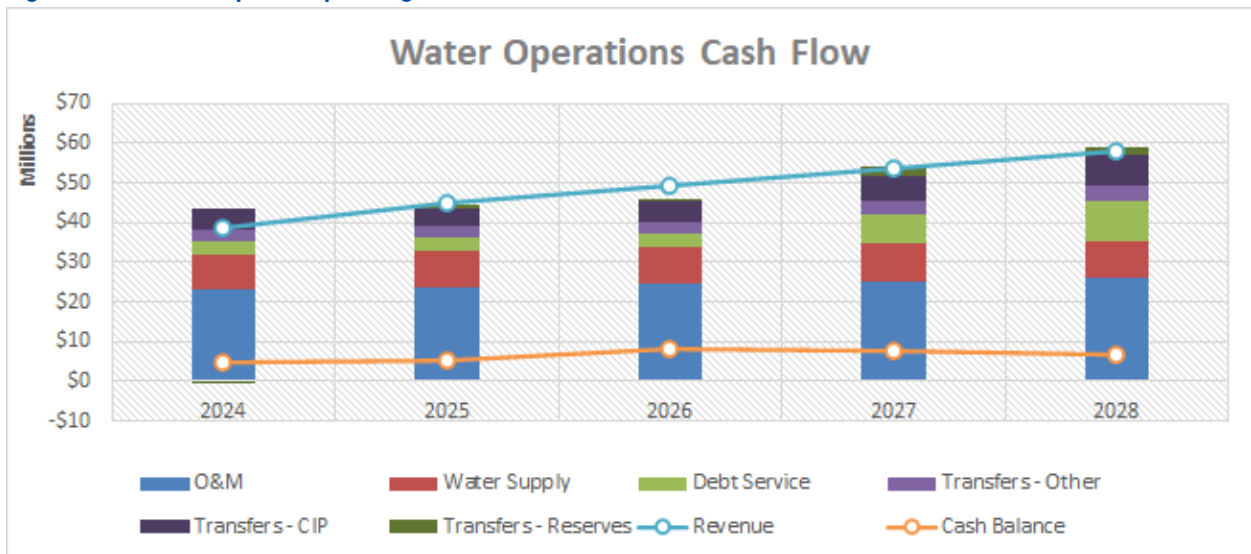
Figure 1-1 Status Quo Operating Cash Flow



### 1.4 Revenue Required to Achieve Financial Plan

To meet the projected revenue requirements, including the desired operating and debt service coverage levels, the Water Division proposed revenue adjustments which would allow the Water Division to operate the enterprise on a revenue-neutral basis as shown in Figure 1-2.

Figure 1-2 Proposed Operating Cash Flow



### 1.5 Cost of Service Analysis

The cost-of-service analysis is the process of allocating the costs to the various customer classes of service in a fair and equitable manner. The cost-of-service allocations performed in this Study are based on the base-extra capacity method endorsed by the American Water Works Association (AWWA) *Principles of Water Rates, Fees and Charges*, M1 (M1) manual. We allocate costs to the different customer classes in proportion to their use of the water system. As recommended by AWWA, Black &

Veatch distributed functional costs to base (average load conditions), extra capacity (peaking) and customer-related parameters such as whether service to the customer requires a pump station to reach higher elevations. This allocation methodology produces unit costs for allocation to individual customer classes based on the projected customer service requirements.

## 1.6 Rate Design

The final step of a cost-of-service analysis involves the design of rates. This step balances rate design with allocated cost-of-service, state regulations and local policy considerations. Policy makers must also evaluate the extent to which the existing rate structure recovers revenues from customer classes in accordance with cost-of-service allocations.

The existing rates consist of a fixed bi-monthly service charge, a consumption charge, pumped zone charge and a fixed service charge for private fire service connections. The single family residential have three tiers of quantity charges and the multi-family residential, commercial, irrigation, and contract customers have a uniform quantity charge. All customer classes vary whether they are located Inside City or Outside City.

### 1.6.1 Fixed Service Charge

The fixed service charge is to recover the numerous costs incurred by the water system whether water is consumed each billing cycle or not. The water system must be pressurized, monitored, and analyzed for water quality to ensure it is always clean and safe. It is composed of major infrastructure that must be maintained and cannot be reduced in size or neglected due to lower consumption. Customers expect 24-hour reliable service that is provided to them and therefore appropriate staffing levels are required to provide that level of service. The recent drought has emphasized that the water system incurs numerous costs regardless of the volume of water consumption. There is a reduction in the volume of chemicals required in the treatment process, but cost elements such as staffing required to operate the treatment plants 24/7 and monitor water quality 24 hours per day are not impacted by a reduction in consumption.

Costs associated with infrastructure do not reduce during a period of reduced production (i.e., pipes and tanks don't temporarily reduce in size.) Engineers size the system to meet the peak demand that flows through the system and this parameter does not vary during periods of reduced production. Debt service payments on capital improvements including the recently upgraded Barwick Jamieson Treatment Plant do not change if the City produces less water. The need to invest in capital improvements and maintain the massive infrastructure does not go down if customers use less water. In fact, even if the City sells no water in a given billing period, the City still continues to incur many costs. For example, staff must monitor and keep the system pressurized, maintain infrastructure, ensure fire-flow is available to protect structures and properties that are served City water, make emergency repairs of leaking pipes, read meters, monitor water quality in the system and ensure it is safe, and the City must maintain licensed, credentialed staff to ensure the water is clean, safe, and reliable at all times.

In the past, customer water demands were consistently higher and lower fixed cost elements were recovered through higher demand periods. In years of consistently lower consumption a shift in the way the service provided is charged to customers is warranted to ensure cost recovery. The fixed service charge was derived by allocating traditional cost components that do not vary with consumption.

### 1.6.2 Quantity Charge

The consumption charge for the single-family residential class has tier breakpoints that align with usage patterns and the relative costs to deliver service. Tier 1 rate is charged for consumption of 1 through 14 units which represents typical winter consumption. Based on fiscal year 2023 customer billing data, the Tier 1 breakpoint accounts for 73% of billed consumption of Inside City single family residential (ISFR) users. Tier 2 rate is charged for consumption of 15 through 27 units and represents typical summer consumption. Based on the customer billing data, the Tier 2 breakpoint accounts for 90% of billed consumption of ISFR users. Tier 3 rate is charged for consumption of 28 or more units and represents the remaining 10% of users' summer consumption. The high summer demands drive the size of the system infrastructure (pipes, tanks, treatment capacity) and volume of water supply that must be available to meet customer needs. Section 1.6 presents the full rate schedule.

### 1.6.3 Pumped Zone Charge

The pumped zone charge includes costs for electricity and pumping costs. The City service area is separated into five pressure zone. The first three zones are served from water directly pumped from all the water sources into the water system. Zones 4 and 5 required additional pumping stations to elevate water to service the customers at higher elevations. Therefore, there are additional costs incurred which are specific to these customers which are recovered through the surcharge.

### 1.6.4 Treat & Wheel Charge

The consumption charge for contract customers includes operating and capital costs associated with treatment at the Barwick Jamieson treatment plant and transmission pipeline that transports water from Barwick Jamieson to the cities of Calistoga and American Canyon. In 1998, the City entered into agreement with the cities of Calistoga and American Canyon to treat the cities of Calistoga and American Canyon's SWP entitlements at Barwick Jamieson. Once treated, the water is transported (wheeled) via a transmission pipeline to the respective cities.

### 1.6.5 Treat Only Charge

The consumption charge for the contract customer includes costs associated with treatment at Barwick Jamieson treatment facility. The City of American Canyon has a treatment facility adjacent to Barwick Jamieson which treats a portion of their SWP entitlements. Unfortunately, American Canyon cannot process the full amount and therefore relies on the City for treatment. American Canyon is in the planning stages of expanding their treated water clear well to allow the City to transfer treated water directly into their clear well and thus eliminated the transporting costs to American Canyon.

### 1.6.6 Fire Service Charge

The fire service charge includes costs of issuing bills, maintenance and capacity costs associated with private fire protection costs. These customers have a dedicated water line connection to the water system that is specifically for fire protection. To meet fire protection demands, the water system must be designed, operated, and maintained so that it can meet peak fire demand requirements. The fire service charges for private accounts are based on the diameter of the line that connects their fire

protection system to the water system. These charges are solely for services specifically benefiting those properties and not a service available to the public.

## 1.7 Study Recommendations

Through the cost-of-service analysis, the allocation of costs to customer classes must follow Proposition 218, the regulatory guidelines to ensure cost recovery proportionate to cost of serving those customer classes. Over the recent rate period, customer habits have changed, largely because of the State of California's drought mandates. Section 2.1 provides detailed information on the Regulations and Napa customer response to the drought mandates. As described above, the City's operating costs did not exhibit a commensurate percentage reduction during this period of reduced consumption.

To retain simplicity in structure, ensure reasonable stability of revenue, Black & Veatch recommends the following rate structure components:

- **Fixed Service Charge:** The Water Division should retain the fixed service charge based on meter sizes for all customer classes. The fixed service charge helps recover portions of fixed cost elements such as operating and capital components associated with SWP, meter maintenance and services, meter reading, issuing bills, and maintenance and capacity costs associated with available fire protection.
- **Quantity Charge:** The Water Division should retain the quantity charges for all customer classes. For the single-family residential the three-tier quantity charges and for multi-family residential, commercial and irrigation the quantity charges will remain at a uniform rate. The quantity charge helps recover costs associated with base, extra capacity, and conservation.
- **Pumped Zone Charge:** The Water Division should retain the quantity charge for customers in zones 4 and 5 which rely on pump stations to receive water service. The pumped zone charge will help recover costs from electricity and pumping costs specific to these customers.
- **Treat & Wheel Charge:** The Water Division should retain the quantity charge for contract customers that the City provides treat & wheel water service. The treat & wheel charge will help recover costs associated with treatment and transporting the water the contract customers.
- **Treat Only Charge:** The Water Division should retain the quantity charge for the contract customer that the City provides treat only water service. The treat only charge will help recover the costs associated with treatment if the water for the contract customer.
- **Fire Service Charge:** The Water Division should retain the fire service charge based on meter size for private fire service connections. The fire service charge will help recover costs of issuing bills and maintenance and capacity costs associated with private fire protection availability.

Table 1-1 summarizes the recommended 5-year rate schedules for all four components.

# EXHIBIT A TO ATTACHMENT 1

**Table 1-1 Proposed Five-Year Rate Schedules**

Fixed Service Charge					
Size of Meter	2024	2025	2026	2027	2028
(inches)	\$/bi-monthly	\$/bi-monthly	\$/bi-monthly	\$/bi-monthly	\$/bi-monthly
3/4"	52.04	58.28	63.53	69.25	74.79
1"	52.04	58.28	63.53	69.25	74.79
1-1/2"	99.53	111.47	121.51	132.44	143.04
2"	156.51	175.29	191.07	208.26	224.92
3"	308.45	345.46	376.56	410.45	443.28
4"	479.39	536.92	585.24	637.91	688.94
6"	954.22	1,068.73	1,164.91	1,269.75	1,371.33
8"	1,713.95	1,919.62	2,092.39	2,280.71	2,463.16

Quantity Charge - Inside City					
Customer	2024	2025	2026	2027	2028
	\$/kgal	\$/kgal	\$/kgal	\$/kgal	\$/kgal
Single Family Residential					
Tier 1 (0-14)	5.46	6.12	6.67	7.27	7.85
Tier 2 (15-27)	8.05	9.01	9.82	10.71	11.56
Tier 3 (>27)	9.77	10.94	11.92	13.00	14.04
Multi Family Residential	7.59	8.51	9.27	10.11	10.91
Commercial	7.58	8.49	9.25	10.08	10.89
Irrigation	7.65	8.57	9.34	10.19	11.00

Quantity Charge - Outside City					
Customer	2024	2025	2026	2027	2028
	\$/kgal	\$/kgal	\$/kgal	\$/kgal	\$/kgal
Single Family Residential					
Tier 1 (0-14)	8.07	9.03	9.85	10.73	11.59
Tier 2 (15-27)	11.53	12.91	14.08	15.34	16.57
Tier 3 (>27)	12.72	14.25	15.53	16.92	18.28
Multi Family Residential	11.17	12.52	13.64	14.87	16.06
Commercial	11.10	12.44	13.55	14.77	15.96
Irrigation	11.27	12.62	13.76	15.00	16.20

Quantity Charge - Pumped Zone					
Customer	2024	2025	2026	2027	2028
	\$/kgal	\$/kgal	\$/kgal	\$/kgal	\$/kgal
Pump Charge					
Zone 4 and 5	2.46	2.75	3.00	3.27	3.53

Quantity Charge - Contract					
Customer	2024	2025	2026	2027	2028
	\$/kgal	\$/kgal	\$/kgal	\$/kgal	\$/kgal
Contract					
Treat & Wheel	5.53	6.19	6.75	7.36	7.95
Treat Only	2.94	3.29	3.59	3.91	4.23

# EXHIBIT A TO ATTACHMENT 1

Size of Meter (inches)	Fire Service Charge				
	2024	2025	2026	2027	2028
	\$/bi-monthly	\$/bi-monthly	\$/bi-monthly	\$/bi-monthly	\$/bi-monthly
1-1/2"	33.99	38.07	41.49	45.23	48.85
2"	51.64	57.84	63.04	68.72	74.21
2-1/2"	75.21	84.24	91.82	100.08	108.09
3"	98.73	110.58	120.53	131.38	141.89
4"	151.70	169.90	185.20	201.86	218.01
6"	298.83	334.69	364.81	397.64	429.46
8"	534.25	598.36	652.21	710.91	767.78
10"	710.81	796.11	867.76	945.85	1,021.52
12"	997.72	1,117.45	1,218.02	1,327.64	1,433.85

## 2.0 Revenue and Revenue Requirements

To meet the costs associated with providing water services to its customers, the Water Division derives revenue from a variety of sources including water user charges, capacity fees, interest earned from the investment of available funds, meter installation fees, late penalties, and a few minor miscellaneous revenues including leases for cell towers at elevated tank sites. Black & Veatch has projected the level of future revenue generated in the Study through a combination of an analysis of historical and future system growth in terms of number of accounts and water consumption. This section also projects the expenses, or revenue requirements, necessary to operate and maintain the system, invest in capital improvements, make debt service payments, and cover other expenses of the system.

### 2.1 Customer and Water Consumption Projections

The Water Division provides water services to various customer classes. The following provides a brief description of the customer classes per the definitions of the respective dwelling units in Napa Municipal Code Section 17.06.030:

- The Retail Class consists of single-family residential, multi-family residential, commercial and irrigation customers. The following are descriptions of the classes.
  - **Single-family residential** is each parcel on which a dwelling unit is served by an individual water meter. For this Study, a dwelling unit is a structure with one or more rooms used as a residence for one household with facilities for living, sleeping, cooking, dining, and sanitation. For this Study, a dwelling unit may include either: (a) one single-family dwelling, or (b) one single-family dwelling and one accessory dwelling on the same parcel.
  - **Multi-family residential** is each structure in which two or more separate dwelling units are served by one water meter. This definition includes, but is not limited to, duplexes and triplexes, apartments, and townhomes under a common ownership.
  - **Commercial** are properties that serve business, industrial, or institutional uses, and are designated as commercial, office districts, residential office districts, industrial districts, public and quasi-public in the Zoning Ordinance.
  - **Irrigation** are properties with a dedicated water meter used for irrigation purposes. Interruptible Agricultural are now considered irrigation, yet the Water Division maintains the right to interrupt water service to these customers at any time because of water supply restrictions.
  - **Fire Services** are commercial or multi-family residential properties with dedicated services for a private fire system and typically include fire sprinklers.

In addition, the retail customers are differentiated as properties that are Inside both the Sphere of Influence (SOI) and Rural Urban Limit (RUL) (Inside City) or Outside either the SOI or the RUL (Outside City). The SOI is a line defined by the City and approved by Local Agency Formation Commission (LAFCO) to define the geographical boundaries within which the City is required to plan for public infrastructure. The RUL is a line defined by the voters that limits the City's authority outside the line.

- The Contract Class of customers consists of the cities of American Canyon, Calistoga, St Helena, and Yountville. This Class receives water from the City based on the services provided and terms pursuant to individual agreements. American Canyon and Calistoga, for example, receive only treat and wheel services because they own their own water supplies such as SWP entitlements, and the



City provides treatment and conveyance of their water through the City’s system to a metered connection with their respective systems. Service to the City of St Helena is subject to terms of an individual agreement that ties to the Outside City residential rate subject to phased implementation of price changes (up or down) to accommodate budget cycles. Town of Yountville is also subject to the terms of the individual contract agreement and tied to Outside City commercial rate.

- Congress Valley Water District (CVWD) and Carneros Mutual Water Company (CMWC) are also contract customers with individual wholesale water service agreements with the City, however they are billed under the Retail Class based on the type of service provided. CVWD is primarily single family residential and a few irrigation accounts and CMWC is commercial.
- Pumped Zones are properties in the water system pressure zone 4 and pressure zone 5 located at elevations that require the City to operate and maintain pump stations to boost water pressure to reach these properties.

Based on a review of historical patterns within the City, the projected total number of customer accounts are expected to remain flat for the remainder of the Study Period. Development in Napa is predominantly infill development. Although Napa has been and continues to undergo significant redevelopment, particularly in the downtown area, this type of development does not result in a significant increase in the number of water customer accounts but shifts current retail uses to hotels, restaurants, and mixed-use customers. In addition, due to local and state policies, specifically City Charter Section 180, and LAFCO Government Code 56133, the Outside City accounts are restricted from growth. Table 2-1 summarizes the projected customer accounts for the system.

**Table 2-1 Number of Customer Connections**

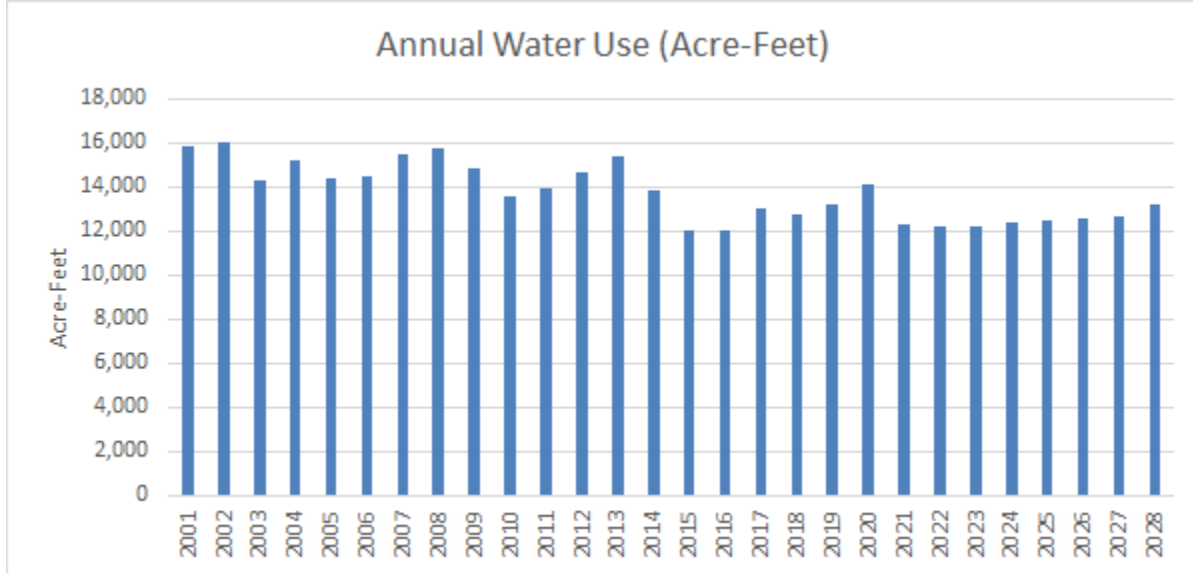
Line No.	Description	Fiscal Year Ending June 30,				
		2024	2025	2026	2027	2028
		(bills)	(bills)	(bills)	(bills)	(bills)
<b>Inside City &amp; Outside City</b>						
1	Single Family Residential	125,880	125,880	125,880	125,880	125,880
2	Multi-Family Residential	7,284	7,284	7,284	7,284	7,284
3	Commercial [1]	8,054	8,054	8,054	8,054	8,054
4	Irrigation [2]	2,659	2,659	2,659	2,659	2,659
5	Subtotal	143,877	143,877	143,877	143,877	143,877
	Est. Accounts	23,980	23,980	23,980	23,980	23,980
<b>Fire Service</b>						
6	Fire Service - Inside City	3,882	3,882	3,882	3,882	3,882
7	Fire Service - Outside City	126	126	126	126	126
	Subtotal	4,008	4,008	4,008	4,008	4,008
	Est. Accounts	668	668	668	668	668
	[1] Includes State Hospital and CA Veterans					
	[2] Includes Agricultural					

Table 2-2 shows the projected water sales volumes for the Study Period. In determining the projected water sales volume, Black & Veatch analyzed historical patterns of water consumption in conjunction with the Urban Water Management Plan and future water conservation requirements set forth by the State of California under SB 606/AB 1668. The City has a robust conservation program and has been consistently educating customers, offering rebate programs, toilet retrofits and free low flow



fixtures since the early 2000s. As a result, the City has experienced steady decline in consumption and increased efficiency in water use by its customers. As shown in Figure 2-1 below, annual water consumption, measured in acre-feet (AF) has decreased over time.

Figure 2-1 Water Demand per Year



The period between 2014 and 2016 and again in 2021 and 2022, the City experienced drought conditions and state mandated cutbacks which significantly reduced consumption as shown in Figure 2-1. The City had to develop short-term and long-term conservation measures to encourage customers to conserve to meet the mandates. These conservation measures worked and now the City has experienced lower patterns of consumption.

Recognizing that the City will not experience an elastic rebound in consumption over the Study Period due to educated, conservation-minded customers, changed customer habits influenced in part by extensive media coverage, and expected cooler than usual winters, Black & Veatch and the Water Division incorporated an objective realistic trend of a slow, steady increase in water use projections. For this analysis, it is assumed that the overall increase in consumption will average 1.1% for the remainder of the Study Period.

Table 2-2 Billed Water Consumption

Line No.	Description	Fiscal Year Ending June 30,				
		2024	2025	2026	2027	2028
		kgal	kgal	kgal	kgal	kgal
<b>Inside City &amp; Outside City</b>						
1	Single Family Residential	1,826,678	1,873,331	1,888,318	1,903,425	1,918,652
2	Multi Family Residential	548,705	562,719	567,220	571,758	576,332
3	Commercial	723,044	741,510	747,442	753,422	759,449
4	Irrigation	321,436	328,624	330,933	333,261	335,607
5	Subtotal	3,419,863	3,506,184	3,533,913	3,561,866	3,590,040
<b>Contract</b>						
6	City of American Canyon	32,000	32,000	32,000	32,000	32,000
7	City of Calistoga	157,000	157,000	157,000	157,000	157,000
8	City of St. Helena	211,803	211,803	211,803	211,803	211,803
9	Town of Yountville	978	978	978	978	978
10	Subtotal	401,781	401,781	401,781	401,781	401,781
11	Total Water Usage (1,000 gal)	3,821,644	3,907,965	3,935,694	3,963,647	3,991,821
12	Total Water Usage (AF)	11,728	11,993	12,078	12,164	12,250

## 2.2 Revenue under Existing Rates

Water user rates serve as the primary source of revenue for the Water Division. Other revenue sources include capacity fees, interest earned from the investment of available funds, meter installation fees, late penalties, and other miscellaneous revenues. The level of future revenue incorporates the projected system growth in terms of number of accounts and billed water consumption. The City bills water consumption in units of 1,000 gallons (or kgal).

Projections of future water sales revenue are based on the number of customers and volume of water sold multiplied by the applicable rates to determine water sales revenue. The City bills customers on a bi-monthly basis. The difference in water demand as shown in Figure 2-1 and total water usage in Table 2-2 is recognized and quantified in certified annual water loss audits and includes water loss due to meters out of calibration, flushing, and main repair activities. Table 2-3 presents the Water Division’s current schedule of water charges. The charges are composed of the following elements:

- **Fixed Service Charge:** A fixed service charge based on meter sizes for all customer classes. The fixed service charge helps recover portions of fixed cost elements such as operating and capital components associated with SWP, meter maintenance and services, meter reading, issuing bills, and maintenance and capacity costs associated with available fire protection.
- **Quantity Charge:** A quantity charges for all customer classes. For the single-family residential the three-tier quantity charges and for multi-family residential, commercial and irrigation the quantity charges will remain at a uniform rate. The quantity charge helps recover costs associated with base, extra capacity, and conservation.
- **Pumped Zone Charge:** A quantity charge for customers in zones 4 and 5 which rely on pump stations to receive water service. The pumped zone charge will help recover costs from electricity and pumping costs specific to these customers.

- **Treat & Wheel Charge:** A quantity charge for contract customers that the City provides treat & wheel water service. The treat & wheel charge will help recover costs associated with treatment and transporting the water the contract customers.
- **Treat Only Charge:** A quantity charge for the contract customer that the City provides treat only water service. The treat only charge will help recover the costs associated with treatment if the water for the contract customer.
- **Fire Service Charge:** A fire service charge based on meter size for private fire service connections. The fire service charge will help recover costs of issuing bills and maintenance and capacity costs associated with private fire protection availability.

Table 2-3 Existing Water Rates

Description	Existing	Description	Existing		
	2023		2023	2023	2023
	(\$/bi-monthly)		(\$/kgal) Inside City	(\$/kgal) Outside City	(\$/kgal) Contract
<b>Fixed Service Charge</b>		<b>Quantity Charge</b>			
<b>Inside City &amp; Outside City</b>	<b>All Customers</b>	<b>Single Family Residential</b>			
3/4"	\$48.58	Tier 1: (0-14 kgal)	\$4.57	\$6.53	
1"	\$48.58	Tier 2: (15-27 kgal)	\$6.58	\$9.59	
1-1/2"	\$93.43	Tier 3: (>27 kgal)	\$8.70	\$12.39	
2"	\$147.24	Multi-Family Residential	\$6.53	\$10.26	
3"	\$290.75	Commercial (Schools,City)	\$6.64	\$10.40	
4"	\$452.19	Irrigation	\$6.84	\$10.70	
6"	\$900.65				
8"	\$1,438.79				
<b>Fire Service</b>		<b>Agricultural</b>			
1-1/2"	\$33.75	On-Season (May-Oct)	\$8.56		
2"	\$51.76	Off-Season (Nov-Apr)	\$10.70		
2-1/2"	\$75.80				
3"	\$99.79	<b>Pump Charge</b>			
4"	\$153.81	Zone 4 & 5 Elevation Surcharge	\$2.09		
6"	\$303.89				
8"	\$483.99	<b>Contract</b>			
10"	\$694.10	City of American Canyon			\$5.48
12"	\$1,294.42	City of Calistoga			\$5.48
		City of St. Helena			\$8.24
		Town of Yountville			\$10.40

Table 2-4 represents a summary of projected water sales revenue under existing rates and charges. As shown, the revenue generated is anticipated to increase in conjunction with the increase in number of accounts and water consumption because of the anticipated minor and gradual rebound from the mandatory water conservation measures imposed by the State. The projected water revenue increases from \$34.8M in FY 2024 to \$36.2M in FY 2028.

Table 2-4 Projected Revenue under Existing Water Rates

Line No.	Description	Fiscal Year Ending June 30,				
		2024	2025	2026	2027	2028
		(\$)	(\$)	(\$)	(\$)	(\$)
<b>Inside City &amp; Outside City</b>						
1	Single Family Residential	16,840,000	17,113,500	17,201,400	17,289,900	17,379,200
2	Multi Family Residential	4,437,500	4,530,800	4,560,700	4,590,900	4,621,300
3	Commercial	6,042,100	6,172,800	6,214,700	6,257,000	6,299,600
4	Irrigation	2,762,200	2,815,900	2,833,200	2,850,600	2,868,100
5	<b>Total</b>	<b>\$30,081,800</b>	<b>\$30,633,000</b>	<b>\$30,810,000</b>	<b>\$30,988,400</b>	<b>\$31,168,200</b>
6	<b>Pumped Zone</b>	<b>\$760,800</b>	<b>\$780,300</b>	<b>\$786,600</b>	<b>\$792,800</b>	<b>\$799,200</b>
<b>Contract</b>						
7	City of American Canyon	175,400	175,400	175,400	175,400	175,400
8	City of Calistoga	860,400	860,400	860,400	860,400	860,400
9	City of St. Helena	1,859,600	1,982,500	2,041,800	2,103,200	2,166,700
10	Town of Yountville	10,200	10,200	10,200	10,200	10,200
11	<b>Total</b>	<b>\$2,905,600</b>	<b>\$3,028,500</b>	<b>\$3,087,800</b>	<b>\$3,149,200</b>	<b>\$3,212,700</b>
12	Fire Service	\$1,058,900	\$1,058,900	\$1,058,900	\$1,058,900	\$1,058,900
13	<b>Total Water System</b>	<b>\$34,807,100</b>	<b>\$35,500,700</b>	<b>\$35,743,300</b>	<b>\$35,989,300</b>	<b>\$36,239,000</b>

2.3 Other Revenue

There are other operating sources which include charges for hydrants, water installation, penalties, interest on investments, rents and royalties, and other miscellaneous revenues. In total other operating revenues represent about 4% of the Water Division’s total revenue. The City anticipates that these revenues will remain relatively constant but rents and royalties by agreement will increase at 3% per year for the duration of the Study Period.

2.4 Operating and Maintenance Expenses

Table 2-5 summarizes the Water Division’s projected O&M expense for the Study Period. These expenses include costs related to salaries and wages, materials and supplies, contract services, purchased water, routine capital outlay, and transfers. The City anticipates that all O&M expenditures will increase on average between 3% to 7% annually from the Water Division’s FY 2024 budget. Black & Veatch has forecasted expenditures based upon historical cost increases, industry indices, and the Water Division staff’s knowledge of future expenses for the water system.

The following tables provides the escalations factors for FY 2024.

Cost Category	Escalation Factor
Personnel (Salaries)	3.0%
Benefits	4.0%
Contract Services	3.1%
Materials and Supplies	4.6%
Water Purchase	3.5%
Utilities	7.1%

Cost Category	Escalation Factor
Chemicals	5.2%
Administrative	3.5%

Table 2-5 O&M Expenses

Line No.	Description	Fiscal Year Ending June 30,					
		2023	2024	2025	2026	2027	2028
		(\$)	(\$)	(\$)	(\$)	(\$)	(\$)
<b>O&amp;M Expenses</b>							
1	Water Administration	3,344,450	6,269,699	6,725,410	6,954,100	7,190,600	7,435,000
2	Water Billing	516,600	588,830	594,890	615,300	635,600	656,800
3	Water Distribution	4,430,430	4,625,470	4,694,890	4,854,200	5,005,300	5,161,100
4	Water Engineering	3,159,970	3,413,590	3,476,950	3,592,600	3,704,900	3,820,500
5	Water Supply	9,578,300	9,820,370	9,922,070	10,095,100	10,178,800	10,212,100
6	Water Transmission	2,012,250	1,940,880	2,008,320	2,066,300	2,120,500	2,176,100
7	Water Treatment	7,960,390	7,606,630	7,798,350	8,041,200	8,276,600	8,519,400
8	Water Laboratory	298,000	328,000	328,000	337,800	347,900	358,300
9	Water Conservation	551,400	590,120	599,540	620,500	640,800	661,500
10	Total	\$31,851,790	\$35,183,589	\$36,148,420	\$37,177,100	\$38,101,000	\$39,000,800

The expenses shown in Table 2-5 represent adopted budget in FY 2024 and projected expenses, based on previously described escalation percentages, for FY 2025 – FY 2028. The adopted budget in FY 2024 is the base for considering O&M expenses that need to be covered by future rates. Total O&M expenses are projected to increase an average 2.6% per year over the Study period.

As exhibited in Table 2-5, the budgeted expenditures increased approximately \$3.3M (10%) in FY 2024 when compared to year-end projected expenditures from FY 2023. The budget for FY 2024 is the result of a detailed process to determine all reasonably expected expenses. Rates must be set based on these projections. The difference between year-end projected expenses in FY 2023 and the budgeted expenses in FY 2024 predominately occur in Water Administration and are summarized as follows:

- Transfers to General Fund (\$1.2M) – The City recently updated its cost allocation plan which identifies services provided by the General Fund to the Water Fund and identifies the percentages to be recovered by each receiving department.
- Insurance and Liability (\$700k) – Cost of insurance, workers compensation, and general liability.
- Staff Expenses (\$1.4M) – Overall the City is experiencing a high level of staff vacancies and a backlog of recruitments, leading to FY 2023 expenses in the Water Fund being lower than expected. These one-time savings do not carry on into FY 2024 since vacancies are planned to be filled.

## 2.5 Debt Service Requirements

Table 2-6 represents the Water Division’s existing debt service obligations. This table shows both principal and interest requirements on the existing debt over the Study Period. It is common practice for utilities to utilize debt to finance multi-year capital improvement projects, but financing options will depend on the utility’s financial conditions. By financing the cost of the projects, the Water Division can fund major projects immediately and spread the payment over a specified time frame. Debt service represents roughly 11% of total expenditures. Based on the revenue bond requirements, the debt service coverage ratio is a minimum of 1.20x net revenues (revenue less operating expenses and not including capital) for the Water Division.

The Water Division issued Water Revenue Bonds 2016 to successfully refinance existing Water Revenue Bonds and State Loans. By refinancing the existing debt, the City saved a projected \$4.8M to the Water Division over the course of the repayment. Identified in Table 2-6 is a new revenue bond issuance in 2027. The City anticipates significant CIP that has already been identified and from the updated 30-Year Master Plan that will be completed by 2024. The debt service amounts are estimates based on an \$100.0M revenue bond issuance.

**Table 2-6 Debt Service**

Line No.	Description	Fiscal Year Ending June 30,				
		2024	2025	2026	2027	2028
		(\$)	(\$)	(\$)	(\$)	(\$)
<b>Long-Term Debt</b>						
1	Existing Revenue Bonds 2016	3,232,800	3,148,550	3,057,800	3,236,800	2,973,800
2	Proposed Revenue Bond 2027	0	0	4,164,100	7,138,400	7,138,400
3	<b>Total</b>	<b>\$3,232,800</b>	<b>\$3,148,550</b>	<b>\$7,221,900</b>	<b>\$10,375,200</b>	<b>\$10,112,200</b>

**2.6 Capital Improvement Program**

The Water Division last developed a 20-year Master Plan in 2010 to identify system needs including routine testing, inspections, maintenance, and renewal and replacement requirements. In 2023, the City embarked on a new 30-year Master Plan that will provide necessary capital investments for treatment, watershed, transmission, distribution, and information technology (IT)/Finance.

The City funds the Capital Improvement Program (CIP) through a combination of debt service, capacity fees or rate generated revenue, which is often referred to as pay as you go or pay-go. For large complex projects, the City uses debt financing. Pay-go funding through rates is appropriate for the base CIP to replace aging infrastructure and upgrade facilities. Capacity fees typically generate approximately \$900,000 annually for the CIP. Current rates will contribute an average of \$5.8M annually in pay-go funding towards CIP which falls well short of funding the average \$16.9M annual need. Recognizing the shortfall, the City plans to phase-in additional rate generated funding for the CIP; the current proposal includes increasing the annual funds available from pay-go from \$5.2M in 2024 to \$8.0M in 2028.

These are necessary investments in the system to keep up with recommended AWWA standards. Staff prioritizes investments each year according to the greatest need and does its best within these means to maintain high quality, reliable water, and contain costs. Deferring capital for long periods of time is not an industry-recognized best management practice. Long-term deferral results in overall higher operating costs due to emergency responses needed to address minor and major failures within the aging system.

Table 2-7 summarizes the Water Division’s CIP for FY 2024 through FY 2028. The Water Division is projecting a \$84.3M capital improvement program over the Study Period, which includes both capital and replacement projects. The staff identified short and long-term capital facilities needs for the system and developed a schedule and costs for the projects. The City anticipates that over the Study Period, the Water Division will implement tank improvements to address disinfection byproduct formation, continue annual infrastructure replacement of water mains and meters, transmission system valve installation to decrease repair time and water volumes required to drain, flush and refill the large pipes, and pipe replacement to increase reliability and reduce customer outages, and construct important dam, spillway, and watershed improvements.



Key projects identified in the CIP of the current FY 2024 and FY 2025 budget cycle are: Milliken Water Treatment Plant Upgrades, Barwick Jamieson Chain and Flight Renovation, Hennessey Treatment Plant Rehabilitation, and Hennessey Spillway Flow Expansion.

**Table 2-7 Capital Improvement Projects**

Line No.	Description	Fiscal Year Ending June 30,				
		2024	2025	2026	2027	2028
		(\$)	(\$)	(\$)	(\$)	(\$)
<b>Capital Improvement Program</b>						
1	Water Administration	0	100,000	0	0	0
2	Water Distribution	5,113,000	1,752,600	2,400,000	2,400,000	2,400,000
3	Water Quality (Treatment)	1,350,000	5,000,000	15,250,000	8,250,000	20,250,000
4	Watershed (Supply Source)	200,000	100,000	100,000	10,000,000	150,000
5	Water Transmission	5,650,000	650,000	650,000	650,000	650,000
6	Water Recovery/Disaster	1,200,000	0	0	0	0
7	<b>Total</b>	<b>\$13,513,000</b>	<b>\$7,602,600</b>	<b>\$18,400,000</b>	<b>\$21,300,000</b>	<b>\$23,450,000</b>

**2.6.1 Capital Improvement Financing Plan**

The City funds annual expenditures for the CIP from a combination of available funds on hand, capacity fees, long-term debt, interest earnings, and revenues derived from user rates. As shown in Table 2-8 the annual CIP expenditure averages \$16.9M throughout the Study Period. Capacity fees, which can only be used for capital improvements, are typically \$900,000 per fiscal year. Contribution from Other Agencies in 2024 accounts for reimbursements from FEMA for disaster related projects. The current annual CIP contribution from the operating fund or pay-go averages \$5.8M per year over the Study Period and peaks at \$8.0M in 2028.

The Water Division follows the practice of using bond funds for major projects ready for immediate construction and then having customers that benefit from the improvements paying for these projects over decades. The City of Napa last sold bonds for major treatment plant and other capital improvements in 2007 and consolidated and refinanced all debt in 2016 resulting in debt service payments of \$3.2M per year. Given the size and age of the City’s system, it is more fiscally responsible for ratepayers to fund major capital investments through a combination of funds on hand, capacity fees, user rate revenues and long-term debt.

In 2027, the City will seek a substantial bond sale in the magnitude of \$100.0M to execute the identified CIP, primarily improvements to the Hennessey Water Treatment Plant in 2028 – 2030. The City anticipates completing its 30-year Master Plan by mid-2024 which will identify and prioritize a broad range of necessary capital investments. These investments are expected to be significant, therefore, the bond sale amount may differ upon completion of the Water Master Plan.

Table 2-8 CIP Financing Plan

Line No.	Description	Fiscal Year Ending June 30,				
		2024	2025	2026	2027	2028
		(\$)	(\$)	(\$)	(\$)	(\$)
1	Beginning Balance	\$ 32,429,300	\$ 19,123,170	\$ 17,600,570	\$ 5,100,570	\$ 82,705,970
<b>Sources of Funds</b>						
2	Revenue Bond Funds	0	0	0	100,000,000	0
3	Capacity Fees	900,000	1,700,000	900,000	900,000	900,000
4	Transfer from Operating Fund	5,200,000	4,300,000	5,000,000	6,500,000	8,000,000
5	Contributions from Other Agencies	7,440,683	80,000	0	0	0
6	Intrfd Tsfr Out / (In) - Reserve	0	0	0	0	0
7	Interest Income	0	0	0	0	0
8	Total Sources of Funds	\$ 13,540,683	\$ 6,080,000	\$ 5,900,000	\$ 107,400,000	\$ 8,900,000
<b>Uses of Funds</b>						
9	Capital Improvements	13,513,000	7,602,600	18,400,000	21,300,000	23,450,000
10	Carryover Expense	13,333,813	0	0	0	0
11	Bond Issuance Expense	0	0	0	1,356,200	0
12	Bond Reserve Requirement*	0	0	0	7,138,400	0
13	Total Uses of Funds	\$ 26,846,813	\$ 7,602,600	\$ 18,400,000	\$ 29,794,600	\$ 23,450,000
14	Ending Balance	\$ 19,123,170	\$ 17,600,570	\$ 5,100,570	\$ 82,705,970	\$ 68,155,970
* Represents amount dedicated to reserves based on issuance at any specific year. Thereafter the amount is not shown in Line 12 unless there is another issuance.						

## 2.7 Transfers

The Water Division performs various transfers throughout the course of the year to and from the operating fund and other funds. Since such transfers do not represent direct operating expenses for the Water Division, Black & Veatch includes these costs as “below-the-line” (i.e., after the payment of debt service) cash flow items and not included as O&M expenses in the calculation of projected debt service coverage. General Fund transfers are the equivalent costs charged for services provided to the water operation that would otherwise be paid for directly such as legal services and human resources. These costs are considered operating costs and are factored into the debt service calculation but are shown as a transfer for accounting purposes. Table 2-10 represents these transfers on an annual basis throughout the Study Period. The following are a brief description of the transfers.

- Rate Funded CIP Contribution Fund transfers represent funds to an internal Water Division fund to cover planned CIP project expenditures.
- Non-Recurring Fund transfers represent funds to an internal Water Division fund for periodic, studies and plans that are required on 5- and 10-year intervals such as the Urban Water Master Plan (UWMP) as required by the State Department of Water Resources, or the Sanitary Survey as required by the State Water Resources Board Division of Drinking Water.

## 2.8 Reserves

Like transfers, the Water Division performs various transfers throughout the course of the year to and from reserves. The Water Enterprise Fund’s fiscal policy reserve requirements have been most recently reviewed by Water Division staff and Black & Veatch to ensure that there are sufficient funds on hand for unforeseen costs. Reserves are important in helping maintain good bond ratings, especially for a



water system comprised of hundreds of millions of dollars of infrastructure to have the ability to secure funding for long-term projects that exceed the capacity of ratepayers to support on a pay-go basis. It is recommended that the Water Division have four reserves designated for various activities. The recommended reserves consist of the following:

- Operating Reserve represents working capital maintained by the operating fund to cover day-to-day expenses and maintain sufficient funds to cover accounts payable if there are supplier issues, periods of low water sales, or unforeseen cost increases. The recommendation is to maintain a level between 12% to 25% (45 – 90 days) of annual operating expenses excluding transfers to CIP.
- Emergency Reserve represents funds used to fund operating or capital expenditures required because of unbudgeted financial liability. The recommendation is to maintain a level of 10% of annual operating expenses excluding transfers to CIP.
- Long Term Water Supply Reserve represents funds set aside to invest in future water supplies or to purchase supplemental supplies during a drought. The recommendation is to initially fund this reserve with a starting balance of \$1.7M in FY2024 and then transfer \$200,000 annually from the operating fund.
- Rate Stabilization Reserve represents funds used to absorb revenue shortfall due to short-term decreases in water sales. The recommendation is to maintain a level of 10% of annual operating expenses excluding transfers to CIP.

Regardless of the type of reserve, appropriate reserve levels help the Water Division maintain a stable financial position and attain better bond ratings, which in turn, leads to lower borrowing costs. Reserve levels are recommended to be funded at or near the fully funded level over the rate study period and therefore transfers to reserves are accounted for as operating expenses increase. As shown in Table 2-9, total reserve levels over the 5-year study period will be maintained between \$19.0M and \$26.9M.

**Table 2-9 Reserve Balances**

Line No.	Description	Fiscal Year Ending June 30,				
		2024	2025	2026	2027	2028
		(\$)	(\$)	(\$)	(\$)	(\$)
<b>Reserves</b>						
1	Working Capital Reserve	9,605,100	9,710,400	9,943,300	11,175,500	13,044,900
2	Emergency Reserve	3,842,000	3,938,100	4,032,600	4,532,300	5,290,400
3	Water Supply Reserve	1,700,000	1,900,000	2,100,000	2,300,000	3,300,000
4	Rate Stabilization Reserve	3,602,000	3,938,100	4,032,600	4,532,300	5,290,400
5	<b>Total</b>	<b>\$ 18,749,100</b>	<b>\$ 19,486,600</b>	<b>\$ 20,108,500</b>	<b>\$ 22,540,100</b>	<b>\$ 26,925,700</b>

**2.9 Projected Operating Results**

The revenue requirements of the Water Division consist of system O&M expenses, routine capital expenditures for equipment and improvements, the CIP, debt service requirements on existing debt, transfers, and reserve requirements.

In the analysis, staff sought to examine the state of the Water Division if no revenue increases were to occur. Under the status quo scenario, the Water Division would not impose any revenue increases over the Study Period and continue to execute the planned CIP. As shown in Figure 2-2 the status quo conditions mean that the Water Division will operate at an annual deficit position thus tapping into its reserves. By FY 2025, both the operating fund and reserves run out of funds. In addition, since the Water Division has debt service commitments, the debt service coverage will be in violation of debt covenants

starting FY 2024 as shown in Figure 2-3. The debt service coverage will fluctuate year-over-year based on operating results.

Figure 2-2 Status Quo Operating Cash Flow

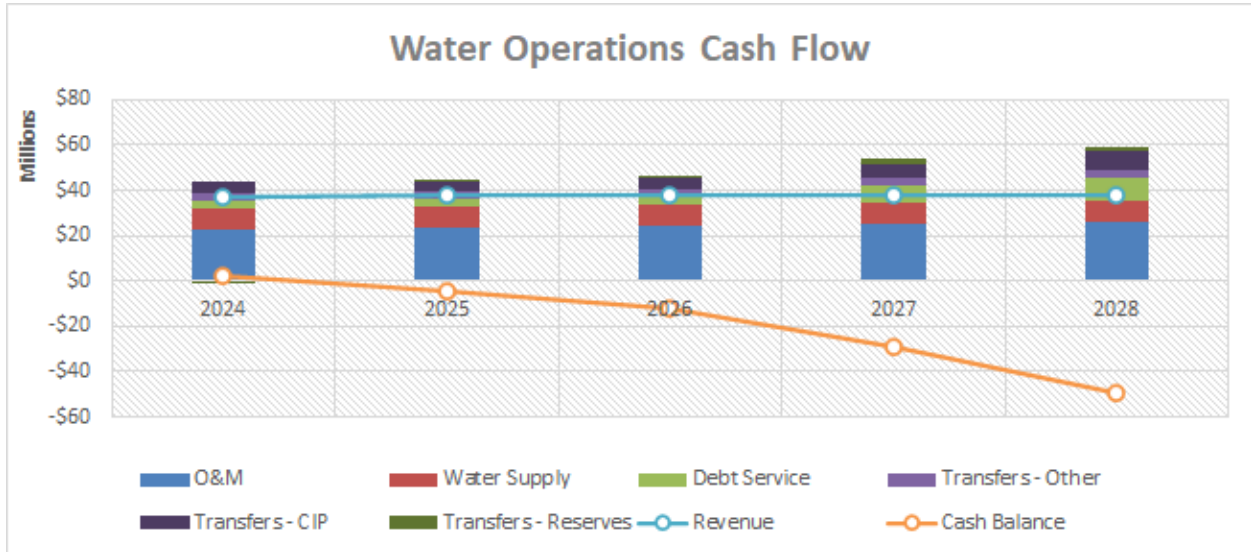
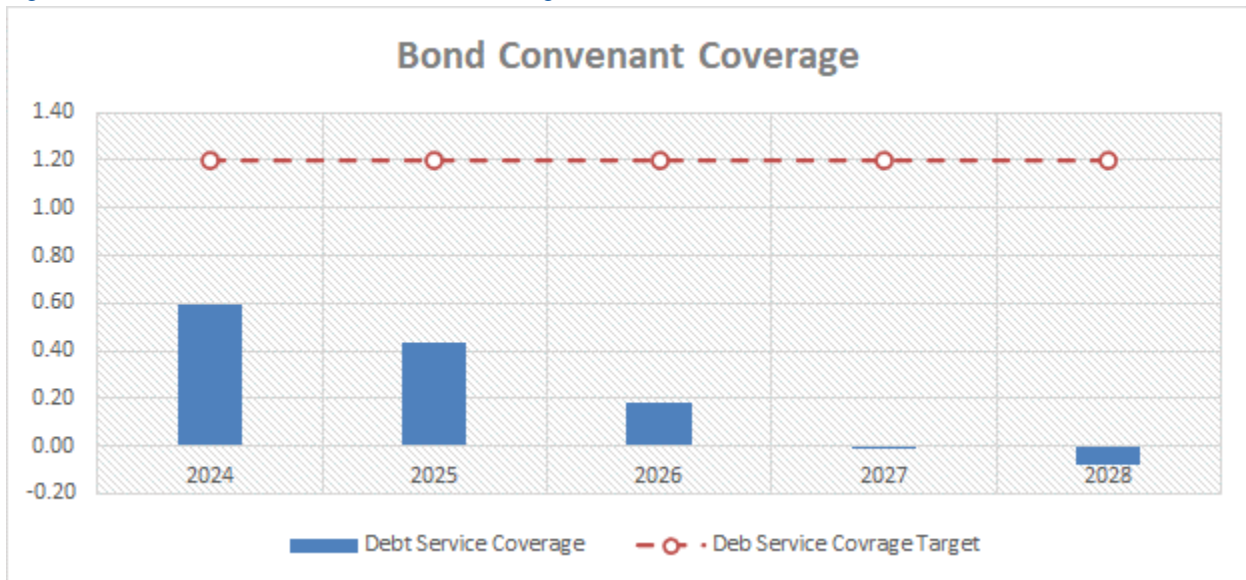


Figure 2-3 Status Quo Debt Service Coverage



To avoid deficit positions, revenue increases as shown in Table 2-10 are required. The revenue increases represent the overall total revenue adjustment needed to meet revenue requirements. The revenue adjustment does not represent adjustments to the individual rates but reflects the overall level of revenue needed to meet the Water Division’s obligations.

The suggested revenue increases help the Water Division to meet the following goals:

- Meets budgeted and projected obligations through FY2028 for investments in operations and maintenance.

- Meets the need to increase annual level of pay-as-you-go investments in Capital Improvements by increasing the annual transfer to CIP from \$5M in FY2024 to \$8M in FY2028.
- Meets the need to issue debt financing for \$100M in FY2027 to invest in Hennessey Water Treatment Plant improvements in FY2028-FY2030.
- Meets the Bond debt coverage ratio of 1.20x for existing debt and 1.25x for proposed debt
- Maintains total reserves described in Section 2.8.

Shown in Table 2-10 is a summary of the proposed operating fund for the Study Period. The operating fund consists of two parts: revenue and revenue requirements. Line 1 is the revenue under existing rates while Lines 2 through 7 is the additional revenue generated from the required annual revenue increases. Lines 9 through 11 represent other operating revenues which include revenue from St. Helena. Line 13 shows the total revenues generated from existing rates, revenue from increases and other operating revenue.

As discussed earlier, O&M, water purchase, debt service, and transfers make up the revenue requirements section. Line 25 represents the total revenue requirement. Line 28 presents the net cumulative working capital residual balance.

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# EXHIBIT A TO ATTACHMENT 1

**Table 2-10 Operating Fund**

Line No.	Description	Fiscal Year Ending June 30,				
		2024	2025	2026	2027	2028
		(\$)	(\$)	(\$)	(\$)	(\$)
<b>Revenue</b>						
1	Revenue from Existing Rates	32,947,500	33,518,200	33,701,500	33,886,100	34,072,300
Months						
	Fiscal Year	Effective				
2	2024	6	1,976,900	4,022,200	4,044,200	4,066,300
3	2025	9		3,378,600	4,529,500	4,554,300
4	2026	9			2,853,600	3,825,600
5	2027	9				3,127,400
6	2028	9				3,046,800
7	Increased Revenue Due to Adjustments	1,976,900	7,400,800	11,427,300	15,573,600	19,754,200
8	Subtotal	\$ 34,924,400	\$ 40,919,000	\$ 45,128,800	\$ 49,459,700	\$ 53,826,500
9	St Helena Contract	1,859,600	1,982,500	2,041,800	2,103,200	2,166,700
10	Other Operating Revenue	1,848,700	1,839,400	1,779,400	1,779,400	1,779,400
11	Interest Income	222,000	222,000	222,000	222,000	222,000
12	Subtotal	\$ 3,930,300	\$ 4,043,900	\$ 4,043,200	\$ 4,104,600	\$ 4,168,100
13	<b>Total Revenue</b>	<b>\$ 38,854,700</b>	<b>\$ 44,962,900</b>	<b>\$ 49,172,000</b>	<b>\$ 53,564,300</b>	<b>\$ 57,994,600</b>
<b>Revenue Requirements</b>						
Operation and Maintenance						
14	O&M Expenses	22,971,300	23,711,600	24,455,900	25,248,800	26,032,600
15	NBA Water Supply	9,100,000	9,200,000	9,384,100	9,411,600	9,420,900
	Subtotal	\$ 32,071,300	\$ 32,911,600	\$ 33,840,000	\$ 34,660,400	\$ 35,453,500
Debt Service						
16	Existing Senior Debt	3,236,800	3,232,800	3,148,600	3,057,800	2,976,000
17	Proposed Senior Debt	0	0	0	4,164,100	7,138,400
18	Subtotal	\$ 3,236,800	\$ 3,232,800	\$ 3,148,600	\$ 7,221,900	\$ 10,114,400
Transfers						
19	Tsfr to/from General Fund Services	3,112,300	3,236,800	3,337,100	3,440,600	3,547,300
20	Tsfr to/from Water CIP (531)	5,200,000	4,300,000	5,000,000	6,500,000	8,000,000
21	Tsfr to/from NR Water (539)	0	0	0	0	0
22	Subtotal	\$ 8,312,300	\$ 7,536,800	\$ 8,337,100	\$ 9,940,600	\$ 11,547,300
Reserves						
23	Tsfr to/from Reserves	(240,000)	737,500	621,900	2,431,600	1,893,500
24	Subtotal	\$ (240,000)	\$ 737,500	\$ 621,900	\$ 2,431,600	\$ 1,893,500
25	<b>Total Revenue Requirements</b>	<b>\$ 43,380,400</b>	<b>\$ 44,418,700</b>	<b>\$ 45,947,600</b>	<b>\$ 54,254,500</b>	<b>\$ 59,008,700</b>
26	Net Cash Balance	(4,525,700)	544,200	3,224,400	(690,200)	(1,014,100)
27	Beginning Fund Balance	9,117,230	4,591,530	5,135,730	8,360,130	7,669,930
28	Net Working Capital Balance	\$ 4,591,530	\$ 5,135,730	\$ 8,360,130	\$ 7,669,930	\$ 6,655,830
29	Debt Coverage Ratio	1.21	2.73	3.81	2.14	1.88

Figure 2-4 presents the proposed operating cash flow and Figure 2-5 presents the proposed debt service coverage ratio.

Figure 2-4 Proposed Operating Cash Flow

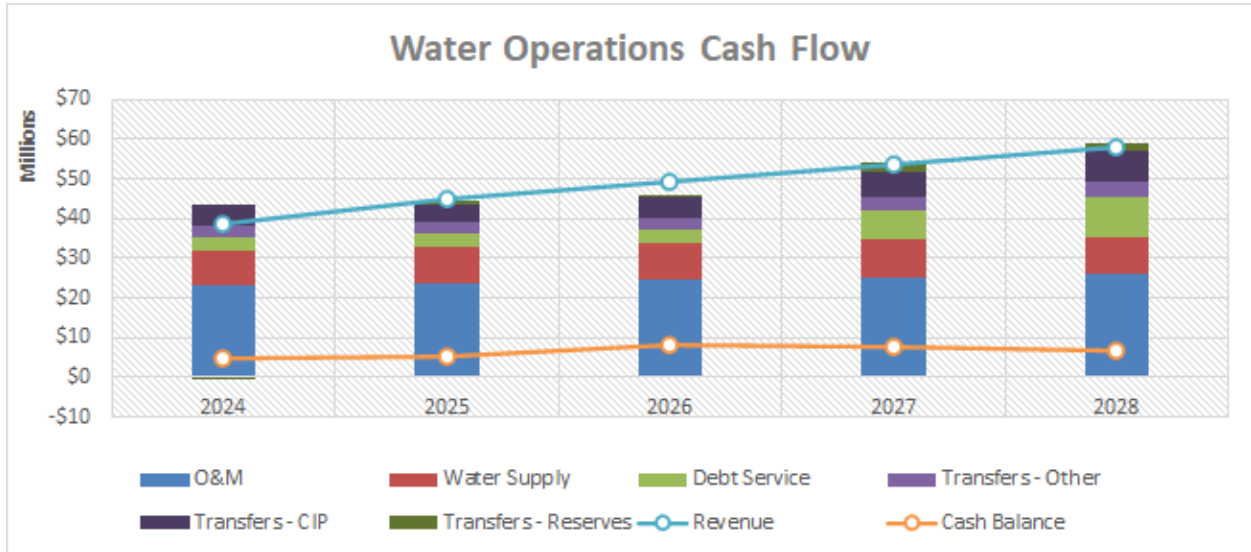
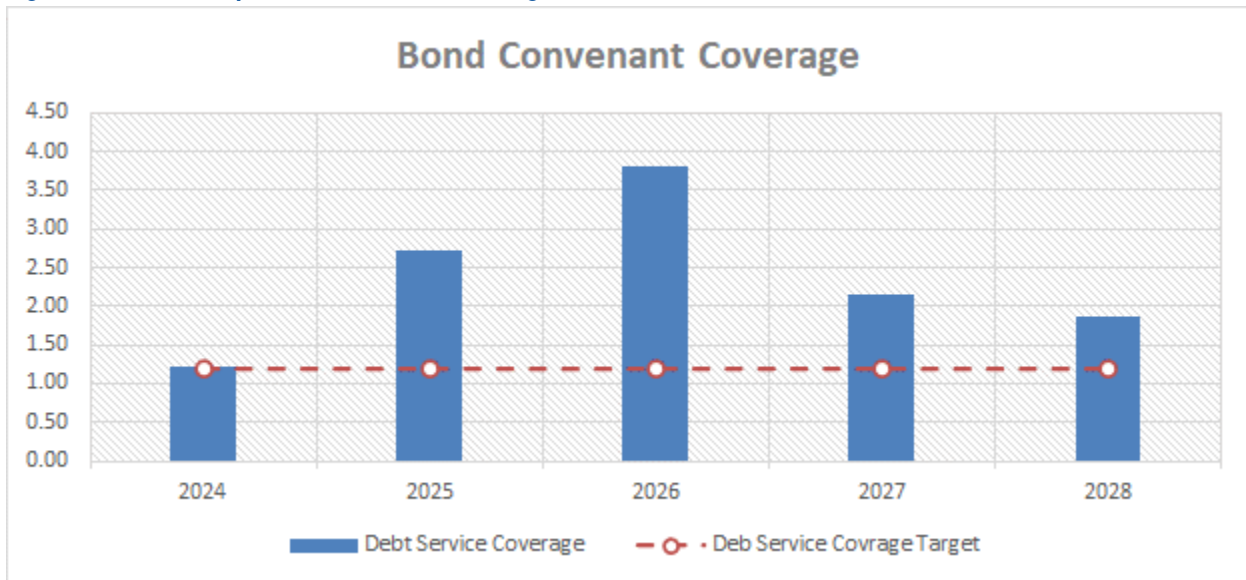


Figure 2-5 Proposed Debt Service Coverage



### 3.0 Cost of Service Allocation

The revenue requirements recovered from rates for water service are synonymous with the definition of the Cost-of-Service. In developing equitable rate structures, revenue requirements are allocable to the various customer classifications according to the service rendered. Proper allocation of these requirements to customer classes should consider the quantity of water consumed, peak flows, number of customer connections, and other relevant factors.

In analyzing the Water Division’s cost of service for allocation to its customer classes, Black & Veatch selected the annual revenue requirements for FY 2024 as the Test Year (TY) requirements to demonstrate the development of cost-of-service water rates. Table 3-1 summarizes the total costs of service recovered from water user rates for the TY 2024.

**Table 3-1 Cost of Service Revenue from Rates**

Line No.	Description	Operating Expense (\$)	Capital Cost (\$)	Total Cost (\$)
<b>Revenue Requirements</b>				
1	O&M Expense	22,971,300	0	22,971,300
2	Water Purchase	9,100,000	0	9,100,000
<b>Transfers</b>				
3	Transfers - Operating	3,112,300	0	3,112,300
4	Transfers - Specific	0	5,200,000	5,200,000
5	Transfers - Reserves	(240,000)	0	(240,000)
6	Debt Service Requirements	0	3,236,800	3,236,800
7	<b>Subtotal</b>	<b>\$34,943,600</b>	<b>\$8,436,800</b>	<b>\$43,380,400</b>
<b>Less Revenue Requirements met from Other Sources</b>				
8	Other Service Charges	1,859,600	0	1,859,600
9	Other Operating Revenue	1,848,700	0	1,848,700
10	Interest Income	222,000	0	222,000
11	<b>Subtotal</b>	<b>\$3,930,300</b>	<b>\$0</b>	<b>\$3,930,300</b>
<b>Adjustments</b>				
12	Adjustment for Annual Cash Balance	3,645,500	880,200	4,525,700
13	Adjustment to Annualize Rate Increase	(1,592,300)	(384,500)	(1,976,800)
14	<b>Subtotal</b>	<b>\$2,053,200</b>	<b>\$495,700</b>	<b>\$2,548,900</b>
15	<b>Cost of Service to be Recovered from Rates</b>	<b>\$28,960,100</b>	<b>\$7,941,100</b>	<b>\$36,901,200</b>

Shown in Line 7 is the total revenue requirement that corresponds with Table 2-10, Line 25. To derive the revenue requirement recovered via rates, it is necessary to deduct revenues from other sources as shown in Lines 11 and 14. Line 12 represents the net annual cash balance for the Water Division during the TY. In this case, the \$3.6M figure indicates that the Water Division is projecting a negative cash balance for the year. Since the City expects to implement the revenue adjustment across six months starting in January, the final cost of service recovered from rates requires an adjustment. Line 13 represents the additional revenues generated if the revenue increase was effective for a full year, versus

only 6 months. Line 15 represents the total amount of funds needed in revenue from rates that will offset the total revenue requirement.

### 3.1 Functional Cost Components

The first step in conducting a cost-of-service analysis involves analyzing the cost of providing water service by system function to properly allocate the costs to the various customer classes and then subsequently designing rates. As a basis for allocating costs of service among customer classes, we separate costs into the following four basic functional cost components: (1) “Base”; (2) “Extra Capacity”; (3) “Customer”; and (4) “Direct Assignment,” described as follows:

- Base costs represent operating and capital costs of the system associated with service to customers to the extent required under constant or average annual load conditions without the elements necessary to meet water use variations or peak demands.
- Extra Capacity costs represent those operating costs incurred in meeting demands in excess of average and capital-related costs for additional plant and system capacity beyond that required for the average rate of use.
- Customer costs are those expenditures that tend to vary in proportion to the number of customers connected to the system. These include meter reading, billing, collecting, and accounting, and maintenance and capital costs associated with meters and services.
- Directly assigned costs are costs specifically identified as those incurred to serve a specific customer group(s). These costs include fire protection for customers served City water, water supply, pumped zones, treat & wheel, and treatment only. Similarly, there are costs specifically for Inside City and Outside City customers. These dedicated costs consist of base, extra capacity, and conservation cost components. Customers that are Outside City are beyond the core function of the water system and service area. Local reservoirs of Lake Hennessey and Milliken Creek water supplies were developed in 1948 and 1922 respectively and are under the jurisdiction of the City of Napa, who maintains these assets to serve its residents. Through the years, the City has grown and has developed imported water supplies through a connection to SWP. To have the ability to accommodate service to Outside City customers in unincorporated county areas and to meet peak demands, the City maintains all three types of water supplies. The SWP supplies are the highest cost supplies that would decrease if the City did not serve Outside City customers. Geographically, the Outside City customer class encompasses a widespread service area ranging from Rutherford to the north, Silverado and Monticello Park to the east, and Congress Valley to the west. Therefore, vehicle and labor costs are higher to provide the same level of service to the collective Outside City customer class.

### 3.2 Allocation to Cost Components

The next step of the cost-of-service process involves allocating each element of cost to functional cost components based on the parameter or parameters having the most significant influence on the magnitude of that element of cost. We allocate O&M expense items directly to appropriate cost components. We use a detailed allocation of related capital investment as a proxy for allocating capital and replacement costs. The separation of costs into functional components provides a means for



distributing such costs to the various classes of customers based on their respective responsibilities for each particular type of service.

### 3.2.1 System Base, Max Day, and Max Hour Allocations

The water system is comprised of various facilities; each designed and operated to fulfill a given function. For the system to provide adequate service to its customers always, it must be capable of meeting not only the annual volume requirements, but also the maximum demand rates placed on the system. Because not all customers and types of customers exert maximum demand at the same time, the capacities of the various facilities must meet the maximum coincidental demand of all classes of customers. Each water service facility within the system has an underlying average demand, exerted by the customers for whom the base cost component applies. For those facilities designed solely to meet average day demand, 100% of the costs go to the base cost component. Extra capacity requirements associated with coincidental demands in excess of average use consist of maximum daily and maximum hourly demand subcomponents.

For volume-related cost allocations, the first step in determining the allocation percentages is to assign system peaking factors. The base element is equal to the average daily demand (ADD) and assigned a value of 1.0. Based on consumption figures from the 2017 to 2022, the Water Division's maximum day (max day) demand is 1.63 times the ADD. Thus, we assign the max day factor a value of 1.63. The maximum hourly (max hour) consumption approximates the maximum instantaneous consumption and is 3.6 times the ADD. Thus, we assign the max hour factor a value of 3.6. These peaking factors are based on the Water Division's daily treated water production logs.

The costs associated with facilities required to meet maximum day demand are allocable to base and maximum day extra capacity as follows:

- Base =  $(1.0/1.63) \times 100 = 61.3\%$
- Max Day =  $(1.63 - 1.0)/1.9 \times 100 = 38.7\%$

These calculations indicate that the average or base use requires 61.3 percent of the capacity of facilities designed and generated to meet maximum day demand and the remaining 38.7 percent meets maximum day extra capacity requirements.

The costs associated with facilities required to meet maximum hour demand are allocable to base, maximum day extra capacity, and maximum hour extra capacity as follows:

- Base =  $(1.0/3.6) \times 100 = 27.8\%$
- Max Day =  $(1.63 - 1.0)/3.6 \times 100 = 17.5\%$
- Max Hour =  $(3.6 - 1.63)/3.6 \times 100 = 54.7\%$

### 3.2.2 Allocation of Operating and Maintenance Expenses

In the allocation of O&M expenses, we allocate costs directly to cost components to the extent possible. The Water Division accounts for operating costs by functional categories. Therefore, Black & Veatch used the factors noted in Section 3.1 to allocate the operating expenses to the cost components. We allocate Administrative and Engineering cost elements based on the allocation of all other costs. Table 3-2 represents the allocation of O&M to the cost components. To determine the net O&M costs, we subtract revenues from other sources as shown in Table 3-1, Lines 11 and 14 from the allocated costs.



The direct assignment represents Inside City, Outside City, fire protection, pumped zones, treat & wheel, and treatment only.

### **3.2.3 Allocation of Capital Investments**

Like O&M expenses, we allocate existing fixed assets (which serve as a proxy for the current capital investments) directly to cost components to the extent possible. The allocation of costs into the costs components provides a basis for annual investment in water system facilities. Table 3-3 shows the allocation of system investment serving water customers for the Test Year. The total net system investment of \$116,457,700 shown on Lines 10 and 20 represents the Test Year original cost less accumulated depreciation of the system in service. The total net system investment reflects the Water Division's fixed asset listing ending June 30, 2022 grouped with planned CIP. This value represents book value of the assets. The system valuation under replacement cost (\$940,700,000) would represent the water system's estimate worth. Using the distribution of total net system investment across the functional cost components, we can then allocate the planned capital costs.

Table 3-2 Allocation of O&M Expenditures

Line No.	Description	Total Costs	Common to All Customers				Fire Protection	Water Supply (NBA)	Pumped Zones	
			Base	Extra Capacity	Customer					
		(\$)	(\$)	(\$)	(\$)	(\$)	(\$)	(\$)		
<b>Operating Expenses</b>										
<b>Water Admin</b>										
1	Salaries & Wages	1,421,800	267,600	8,900	0	36,500	33,800	127,300	210,600	43,800
2	Materials and Supplies	13,000	2,400	100	0	300	300	1,200	1,900	400
3	Services - External & Internal	1,722,600	324,400	10,800	0	44,100	41,000	154,200	255,200	53,000
4	Transfers Out	3,069,500	577,900	19,100	0	78,700	73,100	274,900	454,700	94,500
<b>Water Billing</b>										
5	Salaries and Wages	146,700	0	0	0	0	146,700	0	0	0
6	Materials and Supplies	36,500	0	0	0	0	36,500	0	0	0
7	Services - External & Internal	405,700	0	0	0	0	405,700	0	0	0
<b>Water Distribution</b>										
8	Salaries and Wages	2,976,900	0	0	0	297,700	0	297,700	0	0
9	Materials and Supplies	541,700	0	0	0	54,200	0	54,200	0	0
10	Services - External & Internal	973,900	0	0	0	97,400	0	97,400	0	0
11	Capital Outlay	133,000	0	0	0	13,300	0	13,300	0	0
<b>Water Engineering</b>										
12	Salaries and Wages	2,813,700	529,800	17,500	0	72,200	67,000	251,900	416,800	86,600
13	Materials and Supplies	46,900	8,900	300	0	1,200	1,100	4,200	6,900	1,400
14	Services - External & Internal	553,000	104,000	3,500	0	14,200	13,200	49,500	81,900	17,000
<b>Water Supply</b>										
15	Salaries and Wages	278,600	250,700	0	0	0	0	27,900	0	0
16	Materials and Supplies	82,700	74,400	0	0	0	0	8,300	0	0
17	Water Purchase	9,100,000	4,550,000	0	0	0	0	910,000	3,640,000	0
18	Services - External & Internal	344,100	309,700	0	0	0	0	34,400	0	0
19	Capital Outlay	15,000	13,500	0	0	0	0	1,500	0	0
<b>Water Transmission</b>										
20	Salaries and Wages	1,428,300	203,300	128,100	0	142,800	0	142,800	0	448,500
21	Materials and Supplies	47,700	6,700	4,300	0	4,800	0	4,800	0	15,000
22	Electricity	220,000	0	0	0	0	0	0	0	220,000
23	Services - External & Internal	244,900	34,800	22,000	0	24,500	0	24,500	0	76,900
<b>Water Treatment</b>										
24	Salaries and Wages	4,119,800	0	0	0	0	0	412,000	0	0
25	Materials and Supplies	715,900	0	0	0	0	0	71,600	0	0
26	Chemicals	1,610,000	0	0	0	0	0	0	0	0
27	Services - External & Internal	1,060,900	0	0	0	0	0	106,100	0	0
28	Capital Outlay	100,000	0	0	0	0	0	10,000	0	0
<b>Water Laboratory</b>										
29	Materials and Supplies	137,000	0	0	0	0	0	0	0	0
30	Services - External & Internal	191,000	0	0	0	0	0	0	0	0
<b>Water Conservation</b>										
31	Salaries and Wages	313,500	0	0	0	0	0	0	0	0
32	Materials and Supplies	23,300	0	0	0	0	0	0	0	0
33	Services - External & Internal	253,300	0	0	0	0	0	0	0	0
34	<b>Total Operating Expenses</b>	<b>\$34,943,700</b>	<b>\$7,191,500</b>	<b>\$213,300</b>	<b>\$0</b>	<b>\$876,800</b>	<b>\$813,800</b>	<b>\$3,061,200</b>	<b>\$5,064,500</b>	<b>\$1,052,300</b>
35	Less Other Sources & Adjustments	5,983,500	1,231,500	36,500	0	150,100	139,300	524,200	867,200	180,200
36	<b>Net Operating Expenses</b>	<b>\$28,960,200</b>	<b>\$5,960,000</b>	<b>\$176,800</b>	<b>\$0</b>	<b>\$726,700</b>	<b>\$674,500</b>	<b>\$2,537,000</b>	<b>\$4,197,300</b>	<b>\$872,100</b>

Line No.	Description	Total Costs	Inside SOI				RUL				Treat & Wheel	Treat Only
			Base	Extra Capacity		Conservation	Base	Extra Capacity		Conservation		
			Base	Max. Day	Max. Hour	Conservation	Base	Max. Day	Max. Hour	Conservation		
<b>Operating Expenses</b>		(\$)	(\$)	(\$)	(\$)	(\$)	(\$)	(\$)	(\$)	(\$)	(\$)	(\$)
<b>Water Admin</b>												
37	Salaries & Wages	1,421,800	299,300	138,300	98,200	13,600	41,600	20,800	18,200	20,300	38,900	4,100
38	Materials and Supplies	13,000	2,700	1,300	900	100	400	200	200	200	400	0
39	Services - External & Internal	1,722,600	362,600	167,500	119,000	16,400	50,400	25,200	22,000	24,700	47,100	5,000
40	Transfers Out	3,069,500	646,200	298,500	211,900	29,300	89,700	44,900	39,300	43,900	84,000	8,900
<b>Water Billing</b>												
41	Salaries and Wages	146,700	0	0	0	0	0	0	0	0	0	0
42	Materials and Supplies	36,500	0	0	0	0	0	0	0	0	0	0
43	Services - External & Internal	405,700	0	0	0	0	0	0	0	0	0	0
<b>Water Distribution</b>												
44	Salaries and Wages	2,976,900	558,200	351,600	1,099,600	0	103,400	65,100	203,600	0	0	0
45	Materials and Supplies	541,700	101,500	64,000	200,100	0	18,800	11,800	37,100	0	0	0
46	Services - External & Internal	973,900	182,500	115,000	359,700	0	33,900	21,400	66,600	0	0	0
47	Capital Outlay	133,000	25,000	15,700	49,100	0	4,600	2,900	9,100	0	0	0
<b>Water Engineering</b>												
48	Salaries and Wages	2,813,700	592,300	273,700	194,300	26,900	82,200	41,100	36,000	40,300	77,000	8,100
49	Materials and Supplies	46,900	9,900	4,600	3,200	400	1,400	700	600	700	1,300	100
50	Services - External & Internal	553,000	116,400	53,800	38,200	5,300	16,200	8,100	7,100	7,900	15,100	1,600
<b>Water Supply</b>												
51	Salaries and Wages	278,600	0	0	0	0	0	0	0	0	0	0
52	Materials and Supplies	82,700	0	0	0	0	0	0	0	0	0	0
53	Water Purchase	9,100,000	0	0	0	0	0	0	0	0	0	0
54	Services - External & Internal	344,100	0	0	0	0	0	0	0	0	0	0
55	Capital Outlay	15,000	0	0	0	0	0	0	0	0	0	0
<b>Water Transmission</b>												
56	Salaries and Wages	1,428,300	0	0	0	0	47,300	29,800	0	0	285,700	0
57	Materials and Supplies	47,700	0	0	0	0	1,600	1,000	0	0	9,500	0
58	Electricity	220,000	0	0	0	0	0	0	0	0	0	0
59	Services - External & Internal	244,900	0	0	0	0	8,100	5,100	0	0	49,000	0
<b>Water Treatment</b>												
60	Salaries and Wages	4,119,800	1,913,300	1,205,400	0	0	232,500	146,500	0	0	173,000	37,100
61	Materials and Supplies	715,900	332,400	209,500	0	0	40,400	25,500	0	0	30,100	6,400
62	Chemicals	1,610,000	1,379,800	0	0	0	148,100	0	0	0	67,600	14,500
63	Services - External & Internal	1,060,900	492,600	310,400	0	0	59,900	37,800	0	0	44,500	9,600
64	Capital Outlay	100,000	46,400	29,300	0	0	5,600	3,600	0	0	4,200	900
<b>Water Laboratory</b>												
65	Materials and Supplies	137,000	72,000	45,400	0	0	7,700	4,900	0	0	5,800	1,200
66	Services - External & Internal	191,000	100,400	63,300	0	0	10,800	6,800	0	0	8,000	1,700
<b>Water Conservation</b>												
67	Salaries and Wages	313,500	0	0	0	125,400	0	0	0	188,100	0	0
68	Materials and Supplies	23,300	0	0	0	9,300	0	0	0	14,000	0	0
69	Services - External & Internal	253,300	0	0	0	101,400	0	0	0	151,900	0	0
70	<b>Total Operating Expenses</b>	<b>\$34,943,700</b>	<b>\$7,197,400</b>	<b>\$3,325,400</b>	<b>\$2,360,900</b>	<b>\$326,300</b>	<b>\$999,400</b>	<b>\$500,000</b>	<b>\$437,300</b>	<b>\$489,300</b>	<b>\$935,700</b>	<b>\$98,600</b>
71	<b>Less Other Sources &amp; Adjustments</b>	<b>5,983,500</b>	<b>1,232,400</b>	<b>569,400</b>	<b>404,300</b>	<b>55,900</b>	<b>171,100</b>	<b>85,600</b>	<b>74,900</b>	<b>83,800</b>	<b>160,200</b>	<b>16,900</b>
72	<b>Net Operating Expenses</b>	<b>\$28,960,200</b>	<b>\$5,965,000</b>	<b>\$2,756,000</b>	<b>\$1,956,600</b>	<b>\$270,400</b>	<b>\$828,300</b>	<b>\$414,400</b>	<b>\$362,400</b>	<b>\$405,500</b>	<b>\$775,500</b>	<b>\$81,700</b>

Table 3-3 Allocation of Capital Costs

Line No.	Description	Total Costs (\$)	Common to All Customers					Fire Protection (\$)	Water Supply (NBA) (\$)	Pumped Zones (\$)
			Base	Extra Capacity		Customer				
			Base (\$)	Max. Day (\$)	Max. Hour (\$)	Meters (\$)	Cust./Bill. (\$)			
<b>Plant Assets</b>										
1	Source of Supply	35,495,300	31,945,800	0	0	0	0	3,549,500	0	0
2	Treatment	32,713,100	0	0	0	0	0	3,271,300	0	0
3	Transmission	20,165,600	8,845,500	5,572,800	0	2,016,600	0	1,290,600	0	524,300
4	Distribution	16,781,500	0	0	0	1,678,200	0	1,074,000	0	0
5	Meters & Services	3,363,700	0	0	0	3,363,700	0	0	0	0
6	Hydrants	2,354,000	0	0	0	0	0	2,354,000	0	0
7	General Plant	5,154,600	1,923,400	256,900	0	325,400	0	532,000	0	24,200
8	<b>Total Plant Assets</b>	<b>\$116,027,800</b>	<b>\$42,714,700</b>	<b>\$5,829,700</b>	<b>\$0</b>	<b>\$7,383,900</b>	<b>\$0</b>	<b>\$12,071,400</b>	<b>\$0</b>	<b>\$548,500</b>
9	Less Other Sources & Adjustments	495,700	184,900	24,700	0	31,300	0	51,200	0	2,300
10	<b>Net Capital Expenses</b>	<b>\$116,457,700</b>	<b>\$42,529,800</b>	<b>\$5,805,000</b>	<b>\$0</b>	<b>\$7,352,600</b>	<b>\$0</b>	<b>\$12,020,200</b>	<b>\$0</b>	<b>\$546,200</b>

Line No.	Description	Total Costs (\$)	Inside SOI				RUL				Treat & Wheel (\$)	Treat Only (\$)
			Base	Extra Capacity		Conservation (\$)	Base	Extra Capacity		Conservation (\$)		
			Base (\$)	Max. Day (\$)	Max. Hour (\$)		Base (\$)	Max. Day (\$)	Max. Hour (\$)			
<b>Plant Assets</b>												
11	Source of Supply	35,495,300	0	0	0	0	0	0	0	0	0	0
12	Treatment	32,713,100	15,192,500	9,571,300	0	0	1,846,400	1,163,200	0	0	1,374,000	294,400
13	Transmission	20,165,600	0	0	0	0	668,100	420,900	0	0	826,800	0
14	Distribution	16,781,500	3,314,300	2,088,000	6,529,300	0	582,700	367,100	1,147,900	0	0	0
15	Meters & Services	3,363,700	0	0	0	0	0	0	0	0	0	0
16	Hydrants	2,354,000	0	0	0	0	0	0	0	0	0	0
17	General Plant	5,154,600	853,300	537,600	301,000	0	142,800	90,000	52,900	0	101,500	13,600
18	<b>Total Plant Assets</b>	<b>\$116,027,800</b>	<b>\$19,360,100</b>	<b>\$12,196,900</b>	<b>\$6,830,300</b>	<b>\$0</b>	<b>\$3,240,000</b>	<b>\$2,041,200</b>	<b>\$1,200,800</b>	<b>\$0</b>	<b>\$2,302,300</b>	<b>\$308,000</b>
19	Less Other Sources & Adjustments	495,700	82,100	51,700	28,900	0	13,700	8,700	5,100	0	9,800	1,300
20	<b>Net Capital Expenses</b>	<b>\$116,457,700</b>	<b>\$19,278,000</b>	<b>\$12,145,200</b>	<b>\$6,801,400</b>	<b>\$0</b>	<b>\$3,226,300</b>	<b>\$2,032,500</b>	<b>\$1,195,700</b>	<b>\$0</b>	<b>\$2,292,500</b>	<b>\$306,700</b>

### 3.3 Units of Service

Following the allocation of costs, the total cost responsibility for each customer class results by developing unit costs of service for each cost function and subsequently assigning those costs to the customer classes based on the respective service requirements of each. To properly recognize the cost of service, each customer class receives its share of base, maximum day, and peak hour costs. The number of units of service required by each customer class provides a means for the proportionate distribution of costs previously allocated to respective cost categories.

Table 3-4 summarizes the estimated test year units of service for the various customer classes. Base costs vary with the volume of water used and distributed to customer classes on that basis. Extra Capacity costs are those associated with meeting peak rates of water use and distributed to customer classes based on the respective class capacity requirements in excess of average rates of use. Peak consumption information for each individual customer class is not available; therefore, the bi-monthly consumption records in the City's Customer Information System (CIS) provides the basis for estimating maximum day and peak hour ratios for each customer class. The number of bills for each customer class serves as the basis for distributing customer billing requirements. Customer meter requirements are allocated based on the number of equivalent meters serving each customer class. The estimated number of equivalent meters for each customer class is based on the total number of various sizes of meters serving respective classes and the ratio of the cost of meters for the various sizes to the cost of 5/8-inch meters. The equivalent meter ratios adopted in this analysis are consistent with those established in AWWA M6 Manual, "Water Meters - Selection, Installation, Testing and Maintenance". Private fire protection costs allocations use equivalent fire hydrants.

### 3.4 Cost of Service Allocations

To determine the cost of service for each customer class, we apply the unit costs of service to each customer classes' respective service requirements. The total unit costs of service applied to the respective requirements for each customer class results in the total cost of service for each customer class.

#### 3.4.1 Units Costs of Service

The test year unit cost of service for each functional cost component is based on the total cost divided by the applicable units of service as shown in Table 3-5. On Lines 1 to 3, the total costs represent the cost that rates need to recover shown in Table 3-1 Line 15. The total O&M cost includes O&M, water purchase, transfers less revenue from other sources and adjustments. The total capital cost includes transfers to the capital fund, CIP reserves, and the total debt service, including debt owed to financial institutions. Line 7 represents the unit costs used in allocating the costs to the specific customer classes.

#### 3.4.2 Distribution of Costs of Service to Customer Classes

Applying the unit costs of service to the number of units for which the customer class is responsible produces the customer class responsibility. This process is illustrated in Table 3-6, in which the unit costs of service are applied to the customer class units of service. The costs attributable to each customer class are based on the functional cost components described in Section 3.1. Each customer

class places a burden on the system in different ways and thus the allocation of the units is representative of this burden.

For example, the unit cost for the customers/bills functional cost component is \$4.56 per bill as shown in Table 3-5. The number of bills associated with the class serves as the basis for distributing billing costs. So, for commercial customers within Inside City, Table 3-6 shows that Inside City issues 7,704 bills annually. Therefore, the cost of issuing bills for this customer class is  $7,704 \times \$4.56$ , which rounds to about \$35,100.

Table 3-4 Units of Service

Line No.	Description	Consumption		Maximum Day			Maximum Day			Meters (9) (EMs)	Cust/Bills (10) (bills)	Fire Protection (11) (EFMs)	Fire Protection (12) (EHs)
		Annual (1) (kgal)	Avg. Day (2) (kgal/day)	Factor (3)	Total (4) (kgal/day)	Extra (5) (kgal/day)	Factor (6)	Total (7) (kgal/day)	Extra (8) (kgal/day)				
<b>Inside City</b>													
1	Single Family Residential	1,683,005	4,611	216%	9,947	5,336	341%	15,733	5,787	33,174	119,256	0	0
2	Multi Family Residential	532,143	1,458	263%	3,839	2,381	460%	6,700	2,862	4,439	7,056	0	0
3	Commerical and Institutional	640,741	1,755	277%	4,854	3,099	431%	7,565	2,711	4,930	7,704	0	0
4	Irrigation	235,534	645	308%	1,987	1,342	399%	2,578	591	1,219	2,065	0	0
5	Subtotal	3,091,424	8,470		20,627	12,157		32,577	11,950	43,763	136,081	0	0
<b>Outside City</b>													
6	Single Family Residential	143,673	394	318%	1,252	858	527%	2,074	822	1,886	6,624	0	0
7	Multi Family Residential	16,562	45	543%	247	201	966%	438	192	284	228	0	0
8	Commerical and Institutional	83,281	228	566%	1,292	1,064	937%	2,139	847	690	368	0	0
9	Irrigation	85,902	235	608%	1,432	1,196	957%	2,253	821	500	594	0	0
10	Subtotal	329,417	903		4,222	3,320		6,904	2,682	3,360	7,814	0	0
<b>Contract</b>													
11	American Canyon	32,000	88	622%	545	458					6		
12	Calistoga	157,000	430	120%	516	86					6		
13	Subtotal	189,000	518		1,061	544					12		
<b>Fire</b>													
14	Public				593	593		4,743	4,151	0	0	46,567	2,794
15	Private				121	121		965	844	0	3,882	18,982	568
16	Subtotal	0	0		714	714		5,708	4,995	0	3,882	65,549	3,362
17	<b>Grand Total</b>	<b>3,609,841</b>	<b>9,890</b>		<b>26,624</b>	<b>16,734</b>		<b>45,189</b>	<b>19,627</b>	<b>47,123</b>	<b>147,789</b>	<b>65,549</b>	<b>3,362</b>

Table 3-5 Units Cost of Service

Line No.	Description	Total Costs	Common to All Customers					Fire Protection	Water Supply (NBA)	Pumped Zones
			Base	Extra Capacity		Customer				
			Base	Max. Day	Max. Hour	Meters	Cust./Bill.			
		(\$)	(\$)	(\$)	(\$)	(\$)	(\$)	(\$)	(\$)	
<b>Unit Cost of Service</b>										
1	Net Operating Expense	28,960,100	5,959,900	176,800	0	726,700	674,500	2,537,000	4,197,300	872,100
2	Capital Costs	4,704,300	1,755,400	234,500	0	297,000	0	485,600	0	22,100
3	Debt Service	3,236,800	2,999,100	237,700	0	0	0	0	0	0
4	<b>Total Cost of Service</b>	<b>\$36,901,200</b>	<b>\$10,714,400</b>	<b>\$649,000</b>	<b>\$0</b>	<b>\$1,023,700</b>	<b>\$674,500</b>	<b>\$3,022,600</b>	<b>\$4,197,300</b>	<b>\$894,200</b>
5	Units of Service - Inside City		3,091,424	12,157	11,950	43,763	136,081	0	43,763	0
6	Units of Service - Outside City		329,417	3,320	2,682	3,360	7,814	0	3,360	0
7	Units of Service - Contract		0	0	0	0	0	0	0	0
8	Units of Service - Fire		0	593	4,151	0	4,008	66,580	0	0
9	Units of Service - Lift Zones		0	0	0	0	0	0	0	364,038
10	Cost per Unit		\$ 3.13	\$ 40.39	\$ 0.00	\$ 21.72	\$ 4.56	\$ 45.40	\$ 89.07	\$ 2.46
11	per Unit		kgal	kgal/Day	kgal/Day	EM	Bill	EC	kgal	kgal

Line No.	Description	Total Costs	Inside City				Outside City				Treat & Wheel	Treat Only
			Base	Extra Capacity		Conservation	Base	Extra Capacity		Conservation		
			Base	Max. Day	Max. Hour		Base	Max. Day	Max. Hour			
		(\$)	(\$)	(\$)	(\$)	(\$)	(\$)	(\$)	(\$)	(\$)	(\$)	
<b>Unit Cost of Service</b>												
12	Net Operating Expense	28,960,100	5,965,000	2,756,000	1,956,600	270,400	828,300	414,400	362,400	405,500	775,500	81,700
13	Capital Costs	4,704,300	778,700	490,600	274,700	0	130,300	82,100	48,300	0	92,600	12,400
14	Debt Service	3,236,800	0	0	0	0	0	0	0	0	0	0
15	<b>Total Cost of Service</b>	<b>\$36,901,200</b>	<b>\$6,743,700</b>	<b>\$3,246,600</b>	<b>\$2,231,300</b>	<b>\$270,400</b>	<b>\$958,600</b>	<b>\$496,500</b>	<b>\$410,700</b>	<b>\$405,500</b>	<b>\$868,100</b>	<b>\$94,100</b>
16	Units of Service - Inside City		3,091,424	12,157	11,950	3,091,424	0	0	0	0	0	0
17	Units of Service - Outside City		0	0	0	0	329,417	3,320	2,682	329,417	0	0
18	Units of Service - Contract		0	0	0	0	0	0	0	0	157,000	32,000
19	Units of Service - Fire		0	714	4,995	0	0	8	59	0	0	0
20	Units of Service - Lift Zones		0	0	0	0	0	0	0	0	0	0
21	Cost per Unit		\$ 2.18	\$ 252.24	\$ 131.68	\$ 0.09	\$ 2.91	\$ 149.19	\$ 149.83	\$ 1.23	\$ 5.53	\$ 2.94
22	per Unit		kgal	kgal/Day	kgal/Day	kgal	kgal	kgal/Day	kgal/Day	kgal	kgal	kgal



Table 3-6 Distribution of Costs to Customer Classes

Line No.	Description	Total Costs	Common to All Customers					Fire Protection	Water Supply (NBA)	Pumped Zones
			Base	Extra Capacity		Customer				
			Base	Max. Day	Max. Hour	Meters	Cust/Bill.			
1	Per Cost per Unit		kgal \$ 3.13	kgal/Day \$ 40.39	kgal/Day \$ 0.00	EM \$ 21.72	Bill \$ 4.56	EC \$ 45.40	kgal \$ 89.07	kgal \$ 0.09
<b>Inside City</b>										
Single Family Residential										
2	Units		1,683,005	5,336	5,787	33,174	119,256	0	33,174	1,683,005
3	Allocation of costs of service	15,632,700	5,271,300	215,500	0	720,700	543,900	0	2,954,900	147,200
Multi Family Residential										
4	Units		532,143	2,381	2,862	4,439	7,056	0	4,439	532,143
5	Allocation of costs of service	4,471,600	1,666,700	96,200	0	96,400	32,200	0	395,400	46,500
Commercial										
6	Units		640,741	3,099	2,711	4,930	7,704	0	4,930	640,741
7	Allocation of costs of service	5,305,800	2,006,900	125,200	0	107,100	35,100	0	439,100	56,000
Irrigation										
8	Units		235,534	1,342	591	1,219	2,065	0	1,219	235,534
9	Allocation of costs of service	1,887,100	737,700	54,200	0	26,500	9,400	0	108,600	20,600
<b>Outside City</b>										
Single Family Residential										
10	Units		143,673	858	822	1,886	6,624	0	1,886	0
11	Allocation of costs of service	1,570,000	450,000	34,600	0	41,000	30,200	0	168,000	0
Multi Family Residential										
12	Units		16,562	201	192	284	228	0	284	0
13	Allocation of costs of service	219,800	51,900	8,100	0	6,200	1,000	0	25,300	0
Commercial										
14	Units		83,281	1,064	847	690	368	0	690	0
15	Allocation of costs of service	1,012,500	260,800	43,000	0	15,000	1,700	0	61,500	0
Irrigation										
16	Units		85,902	1,196	821	500	594	0	500	0
17	Allocation of costs of service	1,032,900	269,100	48,300	0	10,900	2,700	0	44,600	0

Line No.	Description	Total Costs	Common to All Customers					Fire Protection	Water Supply (NBA)	Pumped Zones
			Base	Extra Capacity		Customer				
			Base	Max. Day	Max. Hour	Meters	Cust/Bill.			
1	Per Cost per Unit		kgal \$ 3.13	kgal/Day \$ 40.39	kgal/Day \$ 0.00	EM \$ 21.72	Bill \$ 4.56	EC \$ 45.40	kgal \$ 89.07	kgal \$ 0.09
<b>Contract</b>										
City of American Canyon										
18	Units		0	0	0	0	0	0	0	0
19	Allocation of costs of service	94,100	0	0	0	0	0	0	0	0
City of Calistoga										
20	Units		0	0	0	0	0	0	0	0
21	Allocation of costs of service	868,100	0	0	0	0	0	0	0	0
<b>Fire</b>										
Public Fire										
22	Units		0	593	4,151	0	0	46,567	0	0
23	Allocation of costs of service	2,834,100	0	23,900	0	0	0	2,114,000	0	0
Private Fire										
24	Units		0	0	0	0	3,882	18,982	0	0
25	Allocation of costs of service	1,020,900	0	0	0	0	17,700	861,700	0	0
<b>Pumped Zone</b>										
26	Units		0	0	0	0	0	0	0	364,038
27	Allocation of costs of service	894,200	0	0	0	0	0	0	0	894,200
28	<b>TOTAL COSTS OF SERVICE</b>	<b>\$ 36,901,200</b>	<b>\$ 10,714,400</b>	<b>\$ 649,000</b>	<b>\$ 0</b>	<b>\$ 1,023,700</b>	<b>\$ 674,500</b>	<b>\$ 3,022,600</b>	<b>\$ 4,197,300</b>	<b>\$ 894,200</b>

Line No.	Description	Total Costs	Inside City				Outside City				Treat & Wheel	Treat Only
			Base	Extra Capacity		Conservation	Base	Extra Capacity		Conservation		
			Base	Max. Day	Max. Hour	Conservation	Base	Max. Day	Max. Hour	Conservation		
Per		kgal	kgal/Day	kgal/Day	kgal	kgal	kgal/Day	kgal/Day	kgal	kgal	kgal	
29	Cost per Unit		\$ 2.18	\$ 252.24	\$ 131.68	\$ 0.09	\$ 2.91	\$ 149.19	\$ 149.83	\$ 1.23	\$ 5.53	\$ 2.94
<b>Inside City</b>												
Single Family Residential												
30	Units		1,683,005	5,336	5,787	1,683,005	0	0	0	0	0	0
31	Allocation of costs of service	15,632,700	3,671,300	1,345,900	762,000	147,200	0	0	0	0	0	0
Multi Family Residential												
32	Units		532,143	2,381	2,862	532,143	0	0	0	0	0	0
33	Allocation of costs of service	4,471,600	1,160,800	600,600	376,800	46,500	0	0	0	0	0	0
Commercial												
34	Units		640,741	3,099	2,711	640,741	0	0	0	0	0	0
35	Allocation of costs of service	5,305,800	1,397,700	781,700	357,000	56,000	0	0	0	0	0	0
Irrigation												
36	Units		235,534	1,342	591	235,534	0	0	0	0	0	0
37	Allocation of costs of service	1,887,100	513,800	338,500	77,800	20,600	0	0	0	0	0	0
<b>Outside City</b>												
Single Family Residential												
38	Units		0	0	0	0	143,673	858	822	143,673	0	0
39	Allocation of costs of service	1,570,000	0	0	0	0	418,100	128,000	123,200	176,900	0	0
Multi Family Residential												
40	Units		0	0	0	0	16,562	201	192	16,562	0	0
41	Allocation of costs of service	219,800	0	0	0	0	48,200	30,000	28,700	20,400	0	0
Commercial												
42	Units		0	0	0	0	83,281	1,064	847	83,281	0	0
43	Allocation of costs of service	1,012,500	0	0	0	0	242,300	158,800	126,900	102,500	0	0
Irrigation												
44	Units		0	0	0	0	85,902	1,196	821	85,902	0	0
45	Allocation of costs of service	1,032,900	0	0	0	0	250,000	178,500	123,100	105,700	0	0

Line No.	Description	Total Costs	Inside City				Outside City				Treat & Wheel	Treat Only
			Base	Extra Capacity		Conservation	Base	Extra Capacity		Conservation		
			Base	Max. Day	Max. Hour	Conservation	Base	Max. Day	Max. Hour	Conservation		
			kgal	kgal/Day	kgal/Day	kgal	kgal	kgal/Day	kgal/Day	kgal	kgal	kgal
29	Per Cost per Unit		\$ 2.18	\$ 252.24	\$ 131.68	\$ 0.09	\$ 2.91	\$ 149.19	\$ 149.83	\$ 1.23	\$ 5.53	\$ 2.94
<b>Contract</b>												
City of American Canyon												
46	Units		0	0	0	0	0	0	0	0	0	32,000
47	Allocation of costs of service	94,100	0	0	0	0	0	0	0	0	0	94,100
City of Calistoga												
48	Units		0	0	0	0	0	0	0	0	157,000	0
49	Allocation of costs of service	868,100	0	0	0	0	0	0	0	0	868,100	0
<b>Fire</b>												
Public Fire												
50	Units		0	593	4,151	0	0	0	0	0	0	0
51	Allocation of costs of service	2,834,100	0	149,600	546,600	0	0	0	0	0	0	0
Private Fire												
52	Units		0	121	844	0	0	0	0	0	0	0
53	Allocation of costs of service	1,020,900	0	30,400	111,100	0	0	0	0	0	0	0
<b>Pumped Zone</b>												
54	Units		0	0	0	0	0	0	0	0	0	0
55	Allocation of costs of service	894,200	0	0	0	0	0	0	0	0	0	0
56	<b>TOTAL COSTS OF SERVICE</b>	<b>\$ 36,901,200</b>	<b>\$ 6,743,700</b>	<b>\$ 3,246,600</b>	<b>\$ 2,231,300</b>	<b>\$ 270,400</b>	<b>\$ 958,600</b>	<b>\$ 496,500</b>	<b>\$ 410,700</b>	<b>\$ 405,500</b>	<b>\$ 868,100</b>	<b>\$ 94,100</b>

## 4.0 Proposed Water Rate Adjustments

The initial consideration in the derivation of rate schedules for water service is the establishment of equitable charges to the customers commensurate with the cost of providing that service. While the cost-of-service allocations to customer classes should not be construed as literal or exact determinations, they offer a guide to the necessity for, and the extent of, rate adjustments. Practical considerations sometimes modify rate adjustments by considering additional factors such as the extent of bill impacts, existing contracts, and historical local policies and practices.

### 4.1 Existing Rates

The Water Division's existing rates for all customers consist of a fixed bi-monthly service charge. The single-family residential customers have a three-tier quantity charge based on units of consumption (1 unit = 1,000 gallons). The multi-family residential, commercial, irrigation, agricultural and contract customers have uniform quantity charge which varies by Inside City, Outside City, and customer class. In addition, there is a fixed service charge for fire service connections. Table 2-3 presented earlier in this report summarized the existing water rates.

### 4.2 Proposed Water Rates

The costs of service analyses described in preceding sections of this report provide a basis for the design of water rates.

The water rates for all Inside City and Outside City customers will remain the same in structure but change in value. The single-family residential rate will keep the fixed bi-monthly service charge based on meter size plus an inclining three-tiered rate structure for consumption. The inclining tiered rate structure consist of Tier 1 0-14 units, Tier 2 15-27 units and Tier 3 over 27 units. Under an inclining tier rate structure, users pay different commodity rates for different block usages.

The inclining tier rate structure applies solely to single family residential customers as this customer class represents the class with the highest variability between winter and summer demands based primarily on additional discretionary use in the summer. The promotion of efficient use of water has long term benefits to the water system and to the customer classes in avoidance of future capital costs such as additional in-system tank/reservoir storage and pipe size upgrades required by AWWA standards to meet peak daily requirements. During summer months the single-family residential water demand nearly doubles when compared to winter water demand. As a result, it costs more to operate the water system because the Water Division must maintain higher priced SWP water entitlements to ensure ample reliable water supply. If the City did not need to accommodate higher water demand users, the Water Division could sell these higher cost water entitlements and reduce operating costs. Water supply costs are the main driver of higher costs in Tiers 2 and 3.

In addition to water supply costs, peaking costs are allocated to the higher users because they determine the capacity required and therefore size of the infrastructure that must be available to always provide water throughout the year. Aside from the major capital requirements for the infrastructure this affects operating costs. The high water demands above wintertime averages require two and even all three treatment plants to run simultaneously, thereby requiring more maintenance costs, staffing and capital resources. Treatment plant assets including pumps, chemicals, laboratory and testing capabilities, and associated staffing are required to provide 24/7 operation of the treatment plants to meet maximum

day demand. These high water demands also drive the need for additional system assets including higher tank storage volumes and the maximum pipeline conveyance capacity. Grouped all together, these additional operating costs are allocated to the respective proposed three-tier system.

The rates for multi-family residential, commercial, and irrigation customers will remain the same with a fixed bi-monthly service charge plus uniform consumption rate. Tiered rates are not applied to these customer classes because, unlike single family residential customers, their consumption habits do not have strong ties to seasonal variations when the costs to provide service increases. For example, multi-family residential customers that have separate irrigation services demonstrate indoor use that is more consistent throughout the year. The City charges higher variability irrigation services at a higher rate. Commercial users pay a uniform rate because their demands are more dependent on the nature of their businesses and they generally do not fluctuate tremendously during the summer and winter months other than their separate irrigation accounts, which pay a higher rate accordingly.

In addition, the contract customers will keep their existing uniform consumption rate structure and the pumped zone surcharge which will remain in effect as a surcharge on top of the consumption rate for all customers in zones 4 and 5.

#### **4.2.1 Inside City and Outside City**

Within the customer classes, the Water Division separates Inside City and Outside City. The separation exists because there are different costs associated with providing services to customers residing Inside City or Outside City boundaries. The different costs vary by function throughout the water system. For example, the Water Division maintains additional SWP entitlements to meet Outside City obligations. Based on water demands in the Study period, Outside City customers use nearly 1,400 acre feet of water. SWP allocations vary annually as a function of water availability within the project. To meet demands of Outside City customers at 100% reliability, an additional SWP supply of 4,000 acre feet are maintained. The City incurs these added costs for the benefit to outside customers and therefore, these costs belong to this customer class.

Additionally, Black & Veatch notes that there are costs that are shared by both types of customers, but there are allocation factors unique to each. For example, the transmission and distribution costs for Outside City customers are greater because the locations are more widely spread out, requiring greater linear footage per service than Inside City customers who are located in relatively dense and closer geographic proximity; therefore, the costs are separated based on the miles of mains dedicated to serving Inside City and mains serving only Outside City and would not otherwise exist to serve Inside City customers.

#### **4.2.2 Fixed Service Charge**

The City incurs fixed cost elements, such as operating and capital components associated with connectivity to the SWP, meter maintenance and services, meter reading, bill issuance, and maintenance and capacity costs associated with fire protection to City water customers regardless of the level of water consumed. Therefore, the fixed bi-monthly service charge recovers portions of these fixed cost elements. SWP capital components are charged according to the amount of total water entitlements held by the City (21,900 acre feet.) The City maintains SWP entitlements at sufficient levels to insure reliability of supplies during years of low delivery allocations from the State Department of Water Resources. The

City incurs these costs to ensure reliability of the water system to the benefit of customers connected to the system, even if there is no water consumption.

The fixed service charge increases with increasing meter size. Black & Veatch used meter ratios based on maximum operating capacities by meter size as shown in AWWA M1, Table B-1, which recognizes that as meter size increases, so does the capacity. For example, customers with a 4" meter have an expectation of being able to use more water (at a higher flow capacity) than customers are with a ¾" meter. Consequently, the City's water system must maintain assets sized accordingly and capable of providing customers the level of service expected from their meter connection when the tap turns on. Table 4-1 demonstrates the cost elements incorporated into the fixed service charge for FY 2024. Table 4-2 shows the five-year fixed service charge rate schedule, based on unit costs in future years.

**Table 4-1 Costs within the Fixed Charge for FY 2024**

Meter Size	Water Supply, Meter & Services, Fire Capacity					Billing			Total Service Charge \$/bi-mo
	Water Supply Unit Costs	Meter & Svcs Unit Cost	Fire Capacity Unit Cost	Meter Ratio	Adjusted Unit Cost \$/bi-mo	Unit Cost	Bill Ratio	Adjusted Unit Cost \$/bi-mo	
¾"	\$14.85	\$3.62	\$10.02	1.67	\$47.48	\$4.56	1.00	\$4.56	\$52.04
1"	14.85	3.62	10.02	1.67	47.48	4.56	1.00	4.56	52.04
1-1/2"	14.85	3.62	10.02	3.33	94.97	4.56	1.00	4.56	99.53
2"	14.85	3.62	10.02	5.33	151.95	4.56	1.00	4.56	156.51
3"	14.85	3.62	10.02	10.67	303.89	4.56	1.00	4.56	308.45
4"	14.85	3.62	10.02	16.67	474.83	4.56	1.00	4.56	479.39
6"	14.85	3.62	10.02	33.33	949.66	4.56	1.00	4.56	954.22
8"	14.85	3.62	10.02	60.00	1,709.39	4.56	1.00	4.56	1,713.95

**Table 4-2 Proposed Fixed Service Charge**

Size of Meter (inches)	Fixed Service Charge				
	2024 \$/bi-monthly	2025 \$/bi-monthly	2026 \$/bi-monthly	2027 \$/bi-monthly	2028 \$/bi-monthly
¾"	52.04	58.28	63.53	69.25	74.79
1"	52.04	58.28	63.53	69.25	74.79
1-1/2"	99.53	111.47	121.51	132.44	143.04
2"	156.51	175.29	191.07	208.26	224.92
3"	308.45	345.46	376.56	410.45	443.28
4"	479.39	536.92	585.24	637.91	688.94
6"	954.22	1,068.73	1,164.91	1,269.75	1,371.33
8"	1,713.95	1,919.62	2,092.39	2,280.71	2,463.16

**4.2.3 Fire Service**

Like the meter service charge, the fire service charge includes costs of issuing bills, maintenance and capacity costs associated with private fire protection costs. The fire service charge increases with increasing pipeline diameter size. The Water Division provides fire service to about 660 private fire accounts. These customers have a water line connection to the water system that is specifically for fire protection. To meet fire protection demands, the Water Division must design, operate, and maintain a water system that can meet peak fire demand requirements. The Water Division charges private accounts a fire service charge based on the diameter of the line that connects their fire protection system to the water system. These charges are for services specifically benefiting those properties and not a service available to the public. Table 4-3 demonstrates the costs incorporated into the fire service charge and Table 4-4 shows the five-year meter charge rate schedule based on unit costs in future years.

Table 4-3 Costs within the Fire Service Charge for FY 2024

Meter Size	Billing			Fire Protection			Total Service Charge
	Unit Cost	Bill Ratio	Adjusted Unit Cost	Unit Cost	Meter Ratio	Adjusted Unit Cost	
			\$/bi-mo			\$/bi-mo	\$/bi-mo
1-1/2"	\$4.56	1.00	\$4.56	\$8.83	3.33	\$29.43	\$33.99
2"	4.56	1.00	4.56	8.83	5.33	47.08	51.64
2-1/2"	4.56	1.00	4.56	8.83	8.00	70.65	75.21
3"	4.56	1.00	4.56	8.83	10.67	94.17	98.73
4"	4.56	1.00	4.56	8.83	16.67	147.14	151.70
6"	4.56	1.00	4.56	8.83	33.33	294.27	298.83
8"	4.56	1.00	4.56	8.83	60.00	529.69	534.25
10"	4.56	1.00	4.56	8.83	80.00	706.25	710.81
12"	4.56	1.00	4.56	8.83	112.50	993.16	997.72

Table 4-4 Proposed Fire Service Charge

Size of Meter (inches)	Fire Service Charge				
	2024	2025	2026	2027	2028
	\$/bi-monthly	\$/bi-monthly	\$/bi-monthly	\$/bi-monthly	\$/bi-monthly
1-1/2"	33.99	38.07	41.49	45.23	48.85
2"	51.64	57.84	63.04	68.72	74.21
2-1/2"	75.21	84.24	91.82	100.08	108.09
3"	98.73	110.58	120.53	131.38	141.89
4"	151.70	169.90	185.20	201.86	218.01
6"	298.83	334.69	364.81	397.64	429.46
8"	534.25	598.36	652.21	710.91	767.78
10"	710.81	796.11	867.76	945.85	1,021.52
12"	997.72	1,117.45	1,218.02	1,327.64	1,433.85

4.2.4 Retail Quantity Charge

4.2.4.1 Base Costs

The base costs represent costs associated with water supply costs and delivery costs. Water supply costs are the costs associated with obtaining and treating water. The Water Division obtains water from the SWP via the North Bay Aqueduct and surface water at Lake Hennessey and Milliken Reservoir. The City treats the SWP water at the Barwick Jamieson treatment plant, while site-specific treatment plants handle the Hennessey and Milliken waters. Delivery costs are the operating and capital costs associated with delivering water through the transmission and distribution system to all customers at base use (average daily demand) conditions.

Water Supply Unit Costs

The determination of unit water supply costs associated with each customer class is a function of the cost and amount of water allocated from the three water sources. Black & Veatch used the following 4 -steps to derive the water supply unit costs:

- Step 1: Determine the weighted average unit costs for produced water. Produced water represents the amount of treated potable water produced by the Water Division. It incorporates both water sold and unaccounted water. Unaccounted water represents water used to systematically flush and clean the system, fight fires on structures located on properties that are served City water, and water loss



through the system that occurs as a part of routine operations such as main breaks and associated flushing of the lines for water quality purposes after each repair.

Table 4-5 identifies the amount of water produced by water supply source, the associated costs and the unit costs. The production allocation is based on the average of actual water produced at the three facilities between FY 2019 and FY 2021. The costs represent actual cost per gallon for each source of water provided to customers. The water supply and treatment costs vary as shown according to chemical usage and energy consumed to process water at each of our three treatment plants. For example, in FY2024, total costs for SWP water, chemicals and electricity are \$10,151,300 to produce 2,492,377 thousand gallons of water resulting in a unit cost of \$4.07. Due to SWP supply costs and energy consumption associated with ozone treatment, the cost of treated water from the Barwick Jamieson Treatment Plant is higher than the limited processes and water costs from our other two local sources.

**Table 4-5 Water Supply Unit Costs**

Description	Production Allocation	Produced Volume	Unit Cost
	%	kgal	\$/kgal
<b>Water Supply Sources</b>			
Barwick Jamieson	60%	2,492,377	\$ 4.07
Hennessy	38%	1,578,505	0.54
Milliken	2%	83,079	0.82
Subtotal	100%	4,153,961	
Weighted Average Costs			\$ 2.66

- Step 2: Determine the amount of water sold to each customer class. Table 4-6 identifies the amount of water sold by customer class based on customer information system records. Note that the difference between water sold and water produced is unaccounted water.

**Table 4-6 Water Sold by Customer Class**

Description	All				Total
	SFR	MFR	Commercial	Irrigation	
Total Usage	1,826,678	548,705	724,022	321,436	3,420,841
% of Usage	53.4%	16.0%	21.2%	9.4%	100.0%

- Step 3: Allocate the water supply sources to each customer class and determine the weighted average costs by customer class. Table 4-7 identifies the amount of water sold by water source and the associated unit costs. Each year, all three treatment plants treat water supplies, taking into consideration multiple factors including water supply availability, water quality, operational restrictions because of emergency repairs, or planned capital improvement projects. Based on the different costs associated with inside and outside city customers, the Water Division allocates water supply as follows:

- Hennessy water supply is allocated to inside city single family, multi-family, and commercial customers proportionate to their water demand.
- Milliken water supply is allocated to Inside City and Outside City single family, multi-family, and commercial customers proportionate to their water demand.
- Barwick Jamieson water supply makes up the remaining water demand for single family, multi-family, and commercial as well as all irrigation and agricultural. Irrigation and agricultural uses are deemed discretionary use under the State’s Water Action Plan and in state policies such as SB7x-7 that are shaping municipal water use in California; therefore, they are assigned to Barwick Jamieson.

Table 4-7 Water Supply Unit Costs by Customer Class

Description	Unit Cost	Inside City			
		SFR	MFR	Commercial	Irrigation
		kgal	kgal	kgal	kgal
<b>Water Supply Sources</b>					
Jamieson Canyon	\$ 4.07	879,812	278,221	334,898	235,534
Milliken	0.82	37,150	11,747	14,142	0
Hennessy	0.54	766,043	242,175	291,702	0
Subtotal		1,683,005	532,143	640,741	235,534
Weighted Average Costs	\$ 2.66	\$ 2.39	\$ 2.39	\$ 2.39	\$ 4.07

Description	Outside City				Total
	SFR	MFR	Commercial	Irrigation	
	kgal	kgal	kgal	kgal	kgal
<b>Water Supply Sources</b>					
Jamieson Canyon	140,499	16,199	81,440	85,902	2,052,505
Milliken	3,175	363	1,840	0	68,417
Hennessy	0	0	0	0	1,299,920
Subtotal	143,673	16,562	83,281	85,902	3,420,841
Weighted Average Costs	\$ 4.00	\$ 4.00	\$ 4.00	\$ 4.07	

- Step 4: For single-family residential, allocate the water supply sources to each tier and determine the weighted average unit costs by tier. Table 4-8 identify the amount of water sold by water source and the associated unit costs.

**Table 4-8 SFR Water Supply Unit Costs by Tier**

Description	Tier Breakpoint	Usage kgal	Hennessy kgal	Milliken kgal	Jamieson Canyon kgal	Total kgal	Avg Cost by Tier \$/kgal
Average Supply Costs by Water Source (\$/kgal)			\$ 0.54	\$ 0.82	\$ 4.07		
Total Water Available to Inside City SFR by Source			766,043	37,150	879,812		
Inside City							
Single Family Residential							
Tier 1: 0-14	14	1,137,010	766,043	37,150	333,817	1,137,010	\$ 1.59
Tier 2: 15-27	27	337,608	0	0	337,608	337,608	\$ 4.07
Tier 3: >27	>28	208,388	0	0	208,388	208,388	\$ 4.07
Subtotal		1,683,005	766,043	37,150	879,812	1,683,005	
Description	Tier Breakpoint	Usage kgal	Hennessy kgal	Milliken kgal	Jamieson Canyon kgal	Total kgal	Avg Cost by Tier \$/kgal
Average Supply Costs by Water Source (\$/kgal)			\$ 0.54	\$ 0.82	\$ 4.07		
Total Water Available to Outside City SFR by Source			0	3,175	140,499		
Outside City							
Single Family Residential							
Tier 1: 0-14	14	60,118	0	3,175	56,943	60,118	\$ 3.90
Tier 2: 15-27	27	29,423	0	0	29,423	29,423	\$ 4.07
Tier 3: >27	>28	54,132	0	0	54,132	54,132	\$ 4.07
Subtotal		143,673	0	3,175	140,499	143,673	

**Delivery Costs**

Next, to determine water delivery unit costs, Black & Veatch subtracted the water supply costs common to all base costs determined in Table 3-5. The base costs represent the combined supply and delivery costs under average daily demand conditions. In addition, Table 4-9 also identifies the delivery unit costs specific to Inside City.

**Table 4-9 Water Delivery Unit Costs**

Description	Delivery Rate
	\$
<b>Inside City &amp; Outside City</b>	
Base Costs	\$10,714,400 (Derived in Table 3-5, Line 4)
Less Water Supply Cost	(9,116,290) (Derived in Table 4-7)
Subtotal	\$1,598,110
Water Supply (kgal)	3,420,841 (Derived in Table 4-5)
Unit Costs	\$0.47
Inside City	\$ 2.18 (Derived in Table 3-5, Line 15)
Outside City	\$ 2.91 (Derived in Table 3-5, Line 15)

**4.2.4.2 Extra Capacity Costs**

The extra capacity represents costs associated with peak demands in excess of base demand. Total extra capacity costs are comprised of maximum day and maximum hour demands. Peaking factors derived from customer consumption data serves as the basis for distributing the peaking costs derived in Table 3-6 to each customer class. Table 4-10 identified the peaking unit costs common to all by tier and

customer class. Table 4-11 and Table 4-12 identify the peaking unit costs for Inside City and Outside City customers.

**Table 4-10 Common Water Peaking Unit Costs**

Description	Peaking Costs	Usage	Peaking Rate
	\$	kgal	\$/kgal
<b>Inside City &amp; Outside City</b>			
<b>Single Family Residential</b>			
Tier 1	132,400	1,197,128	\$ 0.11
Tier 2	50,900	367,031	0.14
Tier 3	66,800	262,519	0.25
Multi Family Residential	104,300	548,705	\$ 0.19
Commercial	168,200	724,022	0.23
Irrigation	102,500	321,436	0.32

**Table 4-11 Inside City Water Peaking Unit Costs**

Description	Peaking Costs	Usage	Peaking Rate
	\$	kgal	\$/kgal
<b>Inside City</b>			
<b>Single Family Residential</b>			
Tier 1	1,273,200	1,137,010	\$ 1.12
Tier 2	355,800	337,608	1.05
Tier 3	479,000	208,388	2.30
Multi Family Residential	977,400	532,143	\$ 1.84
Commercial	1,138,700	640,741	1.78
Irrigation	416,300	235,534	1.77

**Table 4-12 Outside City Water Peaking Unit Costs**

Description	Peaking Costs	Usage	Peaking Rate
	\$	kgal	\$/kgal
<b>Outside City</b>			
<b>Single Family Residential</b>			
Tier 1	40,700	60,118	\$ 0.68
Tier 2	68,900	29,423	2.34
Tier 3	141,600	54,132	2.62
Multi Family Residential	58,700	16,562	\$ 3.54
Commercial	285,700	83,281	3.43
Irrigation	301,600	85,902	3.51

**4.2.4.3 Conservation Costs**

The conservation costs represent costs incurred to promote, encourage, and enforce water conservation. These costs represent water use efficiency programs and efforts. The City offers these programs to both Inside City and Outside City residential and commercial customers, but efforts target

users with high discretionary use. Black & Veatch allocated conservation costs to tiers 2 and 3, where water consumption is primarily discretionary. The allocation of conservation costs to upper tiers provides a strong price signal for conservation, consistent with Article X Section 2 of the State of California Constitution, and proportionately allocates such costs to those customers whose greater demand create the need for conservation and efficiency programs and efforts. Table 4-13 identifies the conservation costs by tier and customer class.

**Table 4-13 Water Conservation Unit Costs**

Description	Conservation Costs	Annual Usage	Weighted Alloc Factor	Percent Resp Cons Costs	Alloc Cons Costs	Conservation Rate
	\$	kgal	kgal	%	\$	\$/kgal
<b>Inside City</b>						
Single Family Residential	147,200					
Tier 1		1,137,010	0	0.0%	0	\$ -
Tier 2		337,608	67,522	30.2%	44,409	0.13
Tier 3		208,388	156,291	69.8%	102,791	0.49
Multi Family Residential	46,500	532,143				\$0.09
Commercial	56,000	640,741				0.09
Irrigation	20,600	235,534				0.09
Description	Conservation Costs	Annual Usage	Weighted Alloc Factor	Percent Resp Cons Costs	Alloc Cons Costs	Conservation Rate
	\$	kgal	kgal	%	\$	\$/kgal
<b>Outside City</b>						
Single Family Residential	176,900					
Tier 1	0	60,118	0	0.0%	0	\$ -
Tier 2	0	29,423	14,712	26.6%	47,052	1.60
Tier 3	0	54,132	40,599	73.4%	129,848	2.40
Multi Family Residential	20,400	16,562				\$1.23
Commercial	102,500	83,281				1.23
Irrigation	105,700	85,902				1.23

**4.2.4.4 Summary of Base, Extra-Capacity, and Conservation Rates**

The quantity charge includes costs associated with base, extra capacity, and conservation and are shown in Table 4-14, Table 4-15, and Table 4-16 for each customer class.

Table 4-14 Common Water Unit Costs

Description	Common to Both			Total Common Costs
	Supply Costs	Delivery Costs	Peaking Costs	
	\$/kgal	\$/kgal	\$/kgal	\$/kgal
<b>Inside City &amp; Outside City</b>				
<b>Single Family Residential</b>				
Tier 1		\$0.47	\$ 0.11	\$ 0.58
Tier 2		0.47	0.14	0.61
Tier 3		0.47	0.25	0.72
Multi Family Residential	\$2.83	\$0.47	\$ 0.19	\$ 3.49
Commercial	2.83	0.47	0.23	3.53
Irrigation	2.83	0.47	0.32	3.62

Table 4-15 Inside City Water Unit Costs

Description	Inside City					Total Costs
	Common Costs	Supply Costs	Delivery Costs	Peaking Costs	Conservation Costs	
	\$/kgal	\$/kgal	\$/kgal	\$/kgal	\$/kgal	\$/kgal
<b>Inside City</b>						
<b>Single Family Residential</b>						
Tier 1	\$ 0.58	\$ 1.59	\$ 2.18	\$ 1.12	\$ -	\$ 5.46
Tier 2	0.61	4.07	2.18	1.05	0.13	8.05
Tier 3	0.72	4.07	2.18	2.30	0.49	9.77
Multi Family Residential	\$ 3.49		\$ 2.18	\$ 1.84	\$ 0.09	\$ 7.59
Commercial	3.53		2.18	1.78	0.09	7.58
Irrigation	3.62		2.18	1.77	0.09	7.65

Table 4-16 Outside City Water Unit Costs

Description	Outside City					Total Costs
	Common Costs	Supply Costs	Delivery Costs	Peaking Costs	Conservation Costs	
	\$/kgal	\$/kgal	\$/kgal	\$/kgal	\$/kgal	\$/kgal
<b>Outside City</b>						
<b>Single Family Residential</b>						
Tier 1	\$ 0.58	\$ 3.90	\$ 2.91	\$ 0.68	\$ -	\$ 8.07
Tier 2	0.61	4.07	2.91	2.34	1.60	11.53
Tier 3	0.72	4.07	2.91	2.62	2.40	12.72
Multi Family Residential	\$ 3.49		\$ 2.91	\$ 3.54	\$ 1.23	\$ 11.17
Commercial	3.53		2.91	3.43	1.23	11.10
Irrigation	3.62		2.91	3.51	1.23	11.27

4.2.4.5 Summary of Retail Consumption Rates

Table 4-17 shows the results in a five-year quantity charge rate schedule for Inside City and Outside City customers.

Table 4-17 Proposed Quantity Charge

Quantity Charge - Inside City					
Customer	2024	2025	2026	2027	2028
	\$/kgal	\$/kgal	\$/kgal	\$/kgal	\$/kgal
<b>Single Family Residential</b>					
Tier 1 (0-14)	5.46	6.12	6.67	7.27	7.85
Tier 2 (15-27)	8.05	9.01	9.82	10.71	11.56
Tier 3 (>27)	9.77	10.94	11.92	13.00	14.04
Multi Family Residential	7.59	8.51	9.27	10.11	10.91
Commercial	7.58	8.49	9.25	10.08	10.89
Irrigation	7.65	8.57	9.34	10.19	11.00

Quantity Charge - Outside City					
Customer	2024	2025	2026	2027	2028
	\$/kgal	\$/kgal	\$/kgal	\$/kgal	\$/kgal
<b>Single Family Residential</b>					
Tier 1 (0-14)	8.07	9.03	9.85	10.73	11.59
Tier 2 (15-27)	11.53	12.91	14.08	15.34	16.57
Tier 3 (>27)	12.72	14.25	15.53	16.92	18.28
Multi Family Residential	11.17	12.52	13.64	14.87	16.06
Commercial	11.10	12.44	13.55	14.77	15.96
Irrigation	11.27	12.62	13.76	15.00	16.20

4.2.5 Pump Zone Charge

The pump zone costs represent costs associated with electricity and pumping costs. The City service area is separated into five pressure zone. The first three zones are served from water directly pumped from all the water sources into the water system. Zones 4 and 5 required additional pumping stations to elevate water to service the customers at higher elevations. Due to the cost difference for providing service between zones 1- 3, and 4- 5, the Water Division enacted a pumped zone surcharge for customers within zones 4 and 5. These operational and facilities costs associated with zones 4 and 5 are standalone costs for which only those customers benefit. Therefore, the are additional costs incurred which are specific to these customers which are recovered through the surcharge.

Table 4-18 Pump Zone Unit Costs

Description	PZ Rate
	\$
<b>Pump Zone Costs</b>	
Operating	\$872,100 (Derived in Table 3-5, Line 1)
Capital	22,100 (Derived in Table 3-5, Line 2,3)
Subtotal	\$894,200
Water Supply (kgal)	364,038 (Derived in Table 3-5, Line 9)
Unit Costs	\$2.46



Table 4-19 Proposed Pump Zone Charges

Customer	Quantity Charge - Pumped Zone				
	2024	2025	2026	2027	2028
	\$/kgal	\$/kgal	\$/kgal	\$/kgal	\$/kgal
Pump Charge					
Zone 4 and 5	2.46	2.75	3.00	3.27	3.53

4.2.6 Contract Quantity Charge

4.2.6.1 Treat & Wheel Costs

The treat & wheel costs represent costs associated with treatment and delivery costs for water delivered to the cities of Calistoga and American Canyon. The cities of Calistoga and American Canyon obtain water from the SWP via the North Bay Aqueduct. Calistoga does not have treatment capabilities to treat SWP water, therefore entered into agreement in 1998 with the City for treatment and delivery of their water entitlements. American Canyon has the capability to treat a portion of the SWP water but entered into agreement in 1998 with the City to treat the remaining portion of their SWP entitlement.

4.2.6.2 Treat Only Costs

The treat only costs represent costs associated with treatment only costs for City of American Canyon. The City of American Canyon has a treatment facility adjacent to Barwick Jamieson which treats a portion of their SWP entitlements. Unfortunately, American Canyon cannot process the full amount and therefore relies on the City for treatment. American Canyon is in the planning stages of expanding their treated water clear well to allow the City to transfer treated water directly into their clear well and thus eliminated the transporting costs to American Canyon.

Table 4-20 Treat & Wheel and Treat Only Unit Costs

Description	T&W Rate	Treat Only Rate
	\$	\$
<b>Contract Costs</b>		
Operating	\$775,500	\$81,700 (Derived in Table 3-5, Line 12)
Capital	92,600	12,400 (Derived in Table 3-5, Line 13,14)
Subtotal	\$868,100	\$94,100
Water Supply (kgal)	157,000	32,000 (Derived in Table 3-5, Line 18)
Unit Costs	\$5.53	\$2.94

Table 4-21 Proposed Treat & Wheel and Treat Only Charges

Customer	Quantity Charge - Contract				
	2024	2025	2026	2027	2028
	\$/kgal	\$/kgal	\$/kgal	\$/kgal	\$/kgal
Contract					
Treat & Wheel	5.53	6.19	6.75	7.36	7.95
Treat Only	2.94	3.29	3.59	3.91	4.23

## 5.0 Summary of Proposed Rates and Typical Monthly Costs

### 5.1 Proposed Rate Schedule

Table 5-1 Proposed Rate Schedule

		Fixed Service Charge				
Size of Meter		2024	2025	2026	2027	2028
(inches)		\$/bi-monthly	\$/bi-monthly	\$/bi-monthly	\$/bi-monthly	\$/bi-monthly
3/4"		52.04	58.28	63.53	69.25	74.79
1"		52.04	58.28	63.53	69.25	74.79
1-1/2"		99.53	111.47	121.51	132.44	143.04
2"		156.51	175.29	191.07	208.26	224.92
3"		308.45	345.46	376.56	410.45	443.28
4"		479.39	536.92	585.24	637.91	688.94
6"		954.22	1,068.73	1,164.91	1,269.75	1,371.33
8"		1,713.95	1,919.62	2,092.39	2,280.71	2,463.16

		Quantity Charge - Inside City				
Customer		2024	2025	2026	2027	2028
		\$/kgal	\$/kgal	\$/kgal	\$/kgal	\$/kgal
Single Family Residential						
Tier 1 (0-14)		5.46	6.12	6.67	7.27	7.85
Tier 2 (15-27)		8.05	9.01	9.82	10.71	11.56
Tier 3 (>27)		9.77	10.94	11.92	13.00	14.04
Multi Family Residential		7.59	8.51	9.27	10.11	10.91
Commercial		7.58	8.49	9.25	10.08	10.89
Irrigation		7.65	8.57	9.34	10.19	11.00

		Quantity Charge - Outside City				
Customer		2024	2025	2026	2027	2028
		\$/kgal	\$/kgal	\$/kgal	\$/kgal	\$/kgal
Single Family Residential						
Tier 1 (0-14)		8.07	9.03	9.85	10.73	11.59
Tier 2 (15-27)		11.53	12.91	14.08	15.34	16.57
Tier 3 (>27)		12.72	14.25	15.53	16.92	18.28
Multi Family Residential		11.17	12.52	13.64	14.87	16.06
Commercial		11.10	12.44	13.55	14.77	15.96
Irrigation		11.27	12.62	13.76	15.00	16.20

		Quantity Charge - Pumped Zone				
Customer		2024	2025	2026	2027	2028
		\$/kgal	\$/kgal	\$/kgal	\$/kgal	\$/kgal
Pump Charge						
Zone 4 and 5		2.46	2.75	3.00	3.27	3.53

# EXHIBIT A TO ATTACHMENT 1

Customer	Quantity Charge - Contract				
	2024	2025	2026	2027	2028
	\$/kgal	\$/kgal	\$/kgal	\$/kgal	\$/kgal
Contract					
Treat & Wheel	5.53	6.19	6.75	7.36	7.95
Treat Only	2.94	3.29	3.59	3.91	4.23

Size of Meter (inches)	Fire Service Charge				
	2024	2025	2026	2027	2028
	\$/bi-monthly	\$/bi-monthly	\$/bi-monthly	\$/bi-monthly	\$/bi-monthly
1-1/2"	33.99	38.07	41.49	45.23	48.85
2"	51.64	57.84	63.04	68.72	74.21
2-1/2"	75.21	84.24	91.82	100.08	108.09
3"	98.73	110.58	120.53	131.38	141.89
4"	151.70	169.90	185.20	201.86	218.01
6"	298.83	334.69	364.81	397.64	429.46
8"	534.25	598.36	652.21	710.91	767.78
10"	710.81	796.11	867.76	945.85	1,021.52
12"	997.72	1,117.45	1,218.02	1,327.64	1,433.85

## 5.2 Typical Monthly Costs under Proposed Charges

Table 5-2 presents a comparison of typical monthly costs under existing rates and the proposed schedule of water user rates derived in this Study. The costs are shown monthly, although we recognize that customers receive bi-monthly bills (so double the costs in Table 5-2 to get the corresponding bi-monthly water bill amount), because most people think in terms of monthly expenses.

**Table 5-2 Typical Monthly Water Costs**

Customer Class	Meter Size	Typical Usage	Inside City		
			Existing Rates	Proposed Rates	Increase/Decrease
Single Family Residential	3/4"	3	\$62.29	\$68.43	\$6.14
	3/4"	10	\$94.28	\$106.69	\$12.41
	3/4"	30	\$217.62	\$254.40	\$36.78
Multi Family Residential	1"	25	\$211.83	\$241.91	\$30.08
	1"	100	\$701.58	\$811.53	\$109.95
	2"	50	\$473.74	\$536.26	\$62.52
	2"	150	\$1,126.74	\$1,295.75	\$169.01
Commercial	1"	25	\$214.58	\$241.48	\$26.90
	1"	100	\$712.58	\$809.80	\$97.22
	2"	50	\$479.24	\$535.39	\$56.15
	2"	150	\$1,143.24	\$1,293.15	\$149.91
Irrigation	1"	25	\$219.58	\$243.40	\$23.82
	1"	100	\$732.58	\$817.49	\$84.91
	2"	50	\$489.24	\$539.23	\$49.99
	2"	150	\$1,173.24	\$1,304.68	\$131.44

\* Although water bills are issued bimonthly, comparisons to other bills is shown on a typical monthly basis.

Customer Class	Meter Size	Typical Usage	Outside City		
			Existing Rates	Proposed Rates	Increase/Decrease
Single Family Residential	3/4"	3	\$68.17	\$76.24	\$8.07
	3/4"	10	\$113.88	\$132.70	\$18.82
	3/4"	30	\$292.25	\$341.48	\$49.23
Multi Family Residential	1"	25	\$305.08	\$331.40	\$26.32
	1"	100	\$1,074.58	\$1,169.50	\$94.92
	2"	50	\$660.24	\$715.24	\$55.00
	2"	150	\$1,686.24	\$1,832.69	\$146.45
Commercial	1"	25	\$308.58	\$329.62	\$21.04
	1"	100	\$1,088.58	\$1,162.35	\$73.77
	2"	50	\$667.24	\$711.66	\$44.42
	2"	150	\$1,707.24	\$1,821.97	\$114.73
Irrigation	1"	25	\$316.08	\$333.79	\$17.71
	1"	100	\$1,118.58	\$1,179.05	\$60.47
	2"	50	\$682.24	\$720.01	\$37.77
	2"	150	\$1,752.24	\$1,847.02	\$94.78

\* Although water bills are issued bimonthly, comparisons to other bills is shown on a typical monthly basis.

### 5.3 Summary of Cost-of-Service Study

This cost-of-service study proposes adjustments to the City of Napa’s water rates. A summary of actions and projections are as follows:

- Maintain the fixed service charge to reflect the nature of fixed costs associated with providing 24/7 water service and investments in infrastructure through the capital improvement program.
- Project water sales to increase slightly but continue to meet targets set forth by SB 606/AB 1668.
- Meet debt service ratio of 1.20 for existing debt and 1.25 for proposed debt.
- Fund budgeted and projected obligations through FY2028 for investments in operations and maintenance.
- Increase annual level of pay-as-you-go investments in Capital Improvements by increasing the annual transfer to CIP from \$5.3M in FY2024 to \$8.0M in FY2028.
- Issue debt financing for \$100M in FY2027 to invest in Hennessey Water Treatment Plant improvements in FY2028-FY2030.
- Operating Reserve. Maintain the maximum level of 90 days operating costs less transfers to CIP.
- Emergency Reserves. Maintain the minimum level of 10% of operating costs less transfers to CIP.
- Rate Stabilization Reserve. Drawdown \$240k of the existing \$3.8M Rate Stabilization Fund in FY2024 to address debt service coverage requirement. Maintain minimum level of 10% of operating costs less transfers to CIP over the remaining study period.
- Water Supply Reserve. Start with \$1.7M in Water Supply Reserve and continue to add \$200k per year over the 5-year study period.
- Maintain a below average cost of delivering potable drinking water amongst 20 San Francisco Bay Area urban water providers. Figure 5 shows a comparison of the cost of 8 units of water per month for single family residential customers in the Bay Area. This level of monthly water usage is typical for an average home in the summer. Based on billing data for City of Napa customers, 77% of all bills

sent to customers are for 8 units of water per month or less which means 77% of all bills will be \$72 or less in 2024 under the proposed rates.

Figure 5-1 Comparison of Costs for Customers in the Bay Area

