

PURISSIMA HILLS WATER DISTRICT Water Rate Study

January 12, 2022



PURISSIMA HILLS WATER DISTRICT

26375 Fremont Road
Los Altos Hills, CA. 94022

WATER RATE STUDY

January 12, 2022

HF&H CONSULTANTS, LLC

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Walnut Creek, CA 94596



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January 12, 2022

Mr. Phil Witt, General Manager
Purissima Hills Water District
26375 Fremont Road
Los Altos Hills, CA. 94022

Subject: **Water Rate Study**

Dear Mr. Witt:

HF&H is pleased to submit this cost-of-service rate study to the Purissima Hills Water District. This study documents our methodology and recommendations. Our major recommendations are briefly summarized as follows.

- **Water revenue increases.** Annualized revenue from water rates should be increased by the following amounts:

April 1, 2022:	9%
January 1, 2023:	9%
January 1, 2024:	9%
January 1, 2025:	9%
January 1, 2026:	9%

- **Readiness-to-serve charge modifications.** The costs allocated to the capacity portion of the monthly readiness-to-serve charge have been reapportioned to each account based on each account's metered capacity ratio.
 - **Residential consumption charge rate structure.** The number of tiers should be reduced from five to four tiers by combining the fifth tier with the fourth tier. The size of the first three tiers will be slightly smaller based on recent customer demand patterns.
 - **Water Shortage Rate Adjustments.** We recommend adopting Water Shortage Rate Adjustments that would be made to consumption charge rates only during declared
-

Mr. Phil Witt
January 12, 2022
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water shortages. These adjustments will offset revenue shortfalls due to water rationing with revenue neutral increases in consumption charge rates.

- **Pass-Through Rate Adjustments.** We recommend that the District modify its previously adopted Pass-Through Rate Adjustments, which currently cover only unplanned *increases* in the SFPUC's wholesale rates. We recommend that the Pass-Through Rate Adjustment cover any variance between the SFPUC's projected wholesale rate (which was used in setting the proposed PHWD rates in this study) and the wholesale rate that is eventually adopted by the SFPUC.

Very truly yours,

HF&H CONSULTANTS, LLC

John Farnkopf, P.E., Senior Vice President
Richard Simonson, C.M.C., Senior Vice President
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APPENDIX

Water Rate Model

GLOSSARY

AWWA – American Water Works Association.

Breakpoint – The volume of water per billing period separating tiers in tiered rate structures.

CCF – Hundred cubic feet (see HCF below).

Capacity - Capacity is the maximum demand that a customer can place on the infrastructure. It is contrasted with demand (see below). Capacity is determined by the physical properties of the service connection.

Charge - A charge is how much a customer is billed and is the product of a rate multiplied times a unit of service (e.g., accounts, HCF).

CIP - Capital Improvement Program.

COS - Cost-of-service.

Demand - Demand is the metered or estimated flow that a customer places on the infrastructure. Demand is determined based on metered or estimated water use, which can vary and is limited by the capacity (see above) of the service connection.

EMU – Equivalent Meter Unit.

FY - Fiscal Year.

Flat rates - Fixed charges per account that do not vary based on metered water use. Flat rates are found in unmetered water systems and in wastewater rates. Flat rates are not uniform rates (see below).

GPD - Gallons Per Day.

HCF - Hundred cubic feet of metered water; 748 gallons; a cube of water 4.6 feet on edge. One HCF per month is about 25 gallons per day.

O&M - Operating and Maintenance, in reference to the costs of running facilities.

PAYGo - Pay-As-You-Go, in reference to funding capital improvements from cash rather than from borrowed sources such as bonds or loans.

Rate - A rate is the unit cost-of-service per account or volume of flow, which, when multiplied times the units of service (i.e., accounts, HCF) yields a charge that customers are billed.

Readiness-to-Serve Charges - Fixed charges paid per account regardless of the amount of water used. The charge is proportionate to the capacity of the customer's service, which is the capacity of the pipe connecting from the main to the meter, or the meter itself, whichever is smaller. Readiness-to-Serve Charges are not meter charges, which are one-time charges paid for the cost of a meter.

RTS - Readiness-To-Serve (see above), one of the two charges customers pay for the District's water service.

SFR - Single Family Residential.

SFPUC - San Francisco Public Utilities Commission.

Uniform rates - A constant rate per unit of metered water use or wastewater discharge that does not change depending on the volume of flow. Uniform rates are not flat rates (see above).

ACKNOWLEDGEMENTS

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Board of Directors

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LIMITATIONS

This document was prepared solely for the Purissima Hills Water District in accordance with the contract between the District and HF&H and is not intended for use by any other party for any other purpose. In preparing this study, we relied on information from the District, which we consider accurate and reliable. This study contains reasonable assumptions and forecasts regarding future conditions, which cannot be predicted with certainty. If actual conditions vary from these assumptions, there may be a significant difference with the forecasts in this report.

Rounding differences caused by stored values in electronic models may exist.

This document represents our understanding of relevant laws, regulations, and court decisions but should not be relied upon as legal advice. Questions concerning the interpretation of legal authorities referenced in this document should be referred to a qualified attorney.

WATER RATE STUDY



I. EXECUTIVE SUMMARY

This study documents the process by which the District’s water rates were updated for adoption for the next five years, FY 2021-22 through FY 2025-26. The following discussion summarizes our findings and recommendations.

PROJECTED REVENUE REQUIREMENTS AND REVENUE INCREASES

The water revenue requirements were updated by preparing a ten-year projection of operating and capital expenses. The projected increases needed in rate revenue were determined by comparing the revenue requirement projections with the revenue projected from rates. The required annual revenue increases are summarized in **Table I-1**, which includes other key financial indicators.

Table I-1 Projected Revenue Increases and Key Financial Parameters

	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25	FY 2025-26	FY 2026-27	FY 2027-28	FY 2028-29	FY 2029-30	FY 2030-31	FY 2031-32
	a	b	c	d	e	f	g	h	i	j	k
1 Revenue Increases	9.0%	9.0%	9.0%	9.0%	9.0%	5.0%	4.0%	4.0%	4.0%	3.0%	3.0%
2											
3 Revenue Requirement	\$8,433,332	\$8,812,832	\$9,605,986	\$10,470,525	\$11,412,872	\$12,201,944	\$12,749,544	\$13,259,525	\$13,789,906	\$14,271,201	\$14,485,269
4 EOY Fund Balance	\$4,031,649	\$5,906,551	\$5,079,011	\$4,568,271	\$4,222,320	\$4,217,239	\$4,303,119	\$4,564,640	\$4,949,843	\$5,465,293	\$6,046,558
5 Debt Coverage Ratio	3.63	4.36	5.01	4.12	4.62	3.79	4.02	4.22	4.42	4.57	4.50
6 Day of Cash	174	245	193	159	135	126	123	126	131	140	152

The projections show increases in revenue requirements needed to fund expenses and to maintain adequate reserves. The revenue increases also provide debt coverage that exceeds the minimum 1.20 requirement. Reserves grow to maintain the proposed target balance; the decline ~~in~~ days of cash is driven by the growth in the revenue requirement. Although the proposed reserve target balance is maintained, we regard it as a minimal requirement. Nonetheless, the proposed target balance represents an increase in the District’s current target balance. Overall, we regard the proposed revenue increases as sufficient but minimal.

WATER RATE STRUCTURE MODIFICATIONS

The District’s current water rate structure comprises two components: readiness-to-serve charge rates and consumption charge rates. Readiness-to-serve charges are charged monthly and are the same for the District’s two customer classes. Residential customers are charged monthly based on a five-tier consumption charge structure, which increases based on ranges of demand. Institutional customers pay a uniform consumption charge rate that is the same for all levels of demand. These classes and rate structures have been in place for several years with periodic rate increases.

The following modifications are proposed to the rate structures. No modification to the customer classes is proposed. Note that the planned effective date for the FY 2021-22 rate modifications is April 1, 2022 followed by future annual increases effective January 1 of each year.

Readiness-To-Serve Charge Rates

The current readiness-to-serve (RTS) charge rates have been set low to improve affordability and encourage conservation. Low RTS charge rates shift more revenue generation to the consumption charges, thereby making customer bills more responsive to customer demands. Increases or decreases in demand are more noticeable on bills with low RTS charges, which encourages customers to conserve and discourages wastefulness. It is critical that the RTS charges generate sufficient revenue so that they are consistent with the cost-of-service. In addition, higher RTS charges will improve revenue stability, which will allow the District to carry slightly lower reserves. In addition, the RTS charge rates have been updated to reflect the rated capacities of each meter size. The proposed RTS charge rates for the next five years are summarized in **Table I-2**.

Table I-2. Proposed Readiness-to-Serve Charge Rates

Monthly Readiness-to-Serve Charges							
Meter Size		FY 2021-22 Current Rates	FY 2021-22 4/1/2022	FY 2022-23 1/1/2023	FY 2023-24 1/1/2024	FY 2024-25 1/1/2025	FY 2025-26 1/1/2026
		a	c		d	e	f
1	3/4"	\$22.55	\$32.18	\$35.08	\$38.23	\$41.67	\$45.42
2	1"	\$36.80	\$41.98	\$45.76	\$49.88	\$54.37	\$59.26
3	1.5"	\$51.00	\$66.50	\$72.48	\$79.00	\$86.11	\$93.86
4	2"	\$73.50	\$95.91	\$104.54	\$113.95	\$124.20	\$135.38
5	3"	\$90.80	\$164.54	\$179.35	\$195.49	\$213.09	\$232.26
6	4"	\$168.00	\$262.59	\$286.22	\$311.98	\$340.06	\$370.66

Consumption Charge Rates

The District's single family rate payers have been charged increasing block rates for their metered water use for many years. Recent water rate litigation¹ provides guidance on designing tiered rates that limits the amount of discretion that was previously common in designing conservation-oriented rates. First, the size of each tier should be based on actual customer demands that corresponds with the cost of supplying those demands. This design guideline differs from prior common practices in which deemed amounts (e.g., essential use at the low end or excessive use at the high end) or budgets for indoor and outdoor needs were used as the basis for determining the size of tiers. The proposed consumption charge rates are based on recent customer demands taken from the District's billing data.

¹ *Howard Jarvis Taxpayers Association v. City of San Juan Capistrano*.

Second, the rate for each tier should reflect the cost of providing the service associated with each tier. This design guideline also differs from prior practices in which the rates for each tier were adjusted to reward low water use and discourage high water use. The proposed consumption charge rates are based on the cost of providing for levels of service corresponding to each of the tiers ranging from low peaking to high peaking.

With these modifications, the resulting consumption charge rates are summarized in **Table I-3**. Note that the proposed residential structure contains four tiers, rather than five tiers and that the sizes of the tiers differ slightly, both of which are the result of basing each tier on the level of actual customer demand and the cost of providing service for each level of demand. We regard these modifications as critical to avoiding similar litigation to what occurred in San Juan Capistrano.

Table I-3. Proposed Consumption Charges Rates

Water Consumption Charges							
	FY 2021-22		FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25	FY 2025-26
Monthly Use	Current Rates	Monthly Use	4/1/2022	1/1/2023	1/1/2024	1/1/2025	1/1/2026
	a	b	c	d	e	f	g
1 Residential							
2 1-10 hcf	\$5.64	1 - 10 hcf	\$5.70	\$6.21	\$6.77	\$7.38	\$8.04
3 11-30 hcf	\$7.33	11 - 29 hcf	\$7.67	\$8.36	\$9.11	\$9.94	\$10.83
4 31-60 hcf	\$9.52	30 - 58 hcf	\$10.89	\$11.87	\$12.94	\$14.11	\$15.38
5 61-100 hcf	\$11.69	59+ hcf	\$14.14	\$15.42	\$16.80	\$18.32	\$19.97
6 100+ hcf	\$13.86						
7							
8 Institutional							
9 All Use	\$8.50	All Use	\$12.63	\$13.76	\$15.00	\$16.35	\$17.82

We note that the proposed rates in **Table I-3** may be adjusted over the next five years based on Pass-Through Adjustments as described in **Section V** of this report. These adjustments account for variances between the projected cost of the SFPUC’s water and the rate that is adopted by the SFPUC.

We also note that the proposed rates in **Table I-3** are appropriate for years of normal water supply. During droughts, it is recommended that the District implement the Water Shortage Rate Adjustments described in **Section V** of this report. These adjustments would be applied only when the SFPUC implements regional water supply reductions during droughts or for prolonged emergency outages. Applying those factors to the normal-year rates will minimize the revenue shortfall caused by significant, possibly prolonged conservation, which otherwise could jeopardize the District’s reserves.

Both the Pass-Through and Water Shortage Rate Adjustments provide an important measure of revenue stability that is highly regarded by credit rating agencies, which should favorably reduce the District's cost of borrowing.

CUSTOMER BILL IMPACTS

The impact on customer bills due to these modifications in FY 2021-22 will vary depending on the size of customers' meters and their monthly water use. Hence, the overall revenue increase of 9.0% proposed for April 1, 2022 will vary with each bill. **Table I-4** summarizes monthly costs for representative customers.

Table I-4. Impact on Average Monthly Water Bills

	<u>Residential</u>				<u>Institutional</u>
	<u>Low Use</u>	<u>Medium Use</u>	<u>High Use</u>	<u>Very High Use</u>	<u>Average Use</u>
	a	b	c	d	e
1 Assumptions					
2 Flow per Month (hcf)	5	29	58	116	55
3 Flow per Day (gpd)	125	723	1446	2892	1371
4 Meter Size	3/4"	3/4"	1"	1"	1.5"
5					
6 Monthly Bill					
7 Bills with Current Rates					
8 Readiness-to-Serve	\$22.55	\$22.55	\$36.80	\$36.80	\$51.00
9 Consumption	\$28.20	\$195.67	\$469.56	\$1,143.24	\$467.50
10 Current FY 2021-22	\$50.75	\$218.22	\$506.36	\$1,180.04	\$518.50
11					
12 Bills with Proposed Rates					
13 Readiness-to-Serve	\$32.18	\$32.18	\$41.98	\$41.98	\$66.50
14 Consumption	\$28.48	\$202.73	\$518.62	\$1,338.96	\$694.47
15 Proposed FY 2021-22	\$60.66	\$234.91	\$560.60	\$1,380.94	\$760.97
16					
17 Proposed minus Current	\$9.91	\$16.69	\$54.24	\$200.90	\$242.47
18 Percent Change	19.5%	7.6%	10.7%	17.0%	46.8%

For residential customers, bills for low-use increase primarily due to the increase in the RTS charges, which is necessary to ensure that low-use customers are paying their share of the fixed costs. High-use customer bills increase because the cost-of-service analysis has aligned the cost of providing for the highest level of peak service with the consumption charge rates in the highest tier. For residential water use between low and high users, the percentage increase in bills are lower because the cost-of-service analysis has shifted revenue to the RTS charges and to the institutional customer class.

For Institutional customers, the percentage increase in bills is higher because they typically have larger meters, the RTS charges for which are proposed to increase. Furthermore, the consumption charge rates for institutional customers are going up because of the cost-of-service allocations.

II. INTRODUCTION

STUDY PURPOSE

The purpose of this study is to conduct a cost-of-service analysis that will determine rates that proportionally recover the cost of providing the District's water service. Toward that end, the cost-of-service analysis determined how much revenue should be generated by each component of the rate structures so that rate payers are charged for their proportionate shares of the cost of providing service. The cost-of-service analysis is tailored specifically to the District's customer classes and the rate structures.

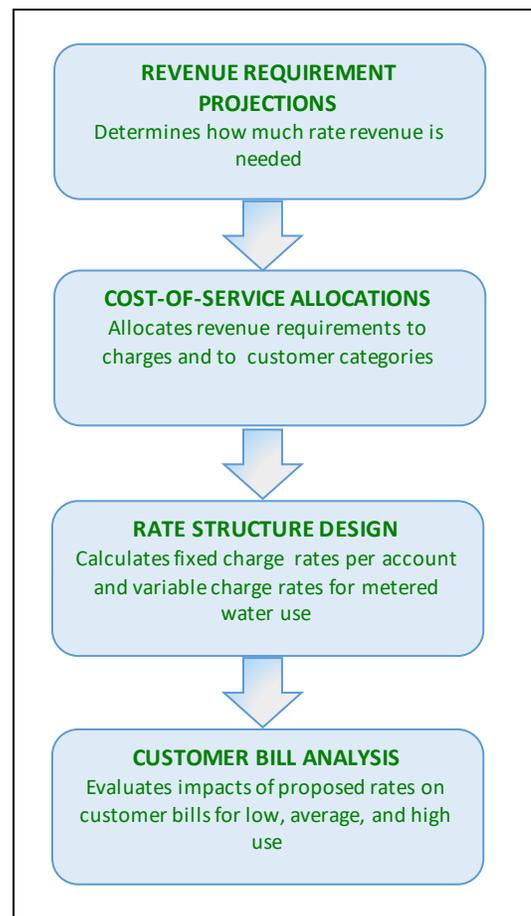
STUDY PROCESS

The rate study was conducted following industry standards and practices promulgated by the American Water Works Association.² A comprehensive rate study involves the four steps shown in the adjacent diagram.

Revenue requirements were projected for a ten-year planning period based on operations, maintenance, capital expenses, and contributions to reserves. The cost-of-service analysis allocates the projected expenses among the customer classes in proportion to their use of the systems. Rates are then designed so that rate payers are charged equitably. The impact on customers is then determined by comparing bills under the proposed rates with bills under the current rates.

During the course of the study, interim work products were presented to District staff and the Board of Directors:

- May 12, 2021 – Board Meeting: project introduction and Board direction.
- August 11, 2021 – Board Meeting: review preliminary analysis.
- October 13, 2021 – Board Meeting: review preliminary draft report.



² *Principles of Water Rates, Fees, and Charges*. American Water Works Association Manual M1. 2017.

- October 20, 2021 - Board Meeting: further discussion.
- November 10, 2021 - Board Meeting: further discussion.
- December 8, 2021 - Board Meeting: further discussion.
- December 21, 2021 - Board Rate Committee: further discussion
- January 4, 2022 - Board Rate Committee: further discussion

The input received from the Board is reflected in the recommended rates documented in this report.

REPORT ORGANIZATION

This report documents the analysis for each of the four rate-making steps. A glossary of technical terms and acronyms is provided following the Table of Contents. An appendix contains a copy of portions of the rate model that are not included in the body of the report text as tables and figures.

III. REVENUE REQUIREMENTS

The revenue requirement analysis began with the FY 2021-22 budgeted O&M and capital expenditures. Revenue requirements for each fiscal year were then projected over a ten-year planning period. Revenue increases needed to cover the projected revenue requirements were then determined. Over a ten-year period it is possible to derive a relatively smooth series of annual revenue increases that minimize annual fluctuations.

ASSUMPTIONS AND PROJECTIONS

Expense projections combined with contributions to reserves constitute the revenue requirements. The assumptions shown in Table III-1 were used to project expenses through FY 2031-32.

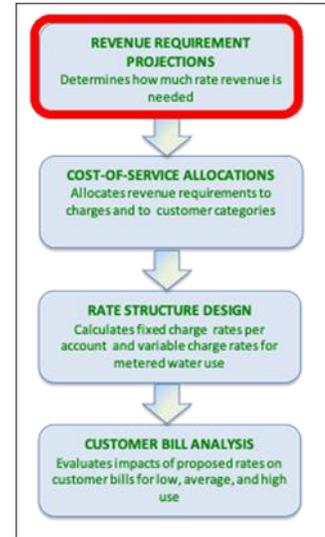


Table III-1. Projection Assumptions

	Budget	Projected									
	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25	FY 2025-26	FY 2026-27	FY 2027-28	FY 2028-29	FY 2029-30	FY 2030-31	FY 2031-32
Annual Account Growth Rate		0.25%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%
Annual Water Demand Increases		1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%
General Inflation	Budgeted	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Salaries & Wages	Budgeted	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Benefits	Budgeted	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%
Utilities	Budgeted	4.03%	4.03%	4.03%	4.03%	4.03%	4.03%	4.03%	4.03%	4.03%	4.03%
Construction Cost Inflation		3.29%	3.29%	3.29%	3.29%	3.29%	3.29%	3.29%	3.29%	3.29%	3.29%
Interest on Fund Balance	0.40%	0.40%	0.40%	0.40%	0.40%	0.40%	0.40%	0.40%	0.40%	0.40%	0.40%
Annual SFR conservation reduction	Budgeted	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SFPUC Quantity Charge per hcf	\$4.10	\$4.32	\$4.65	\$4.92	\$5.37	\$5.53	\$5.70	\$5.87	\$6.04	\$6.23	\$6.41
SFPUC Estimated Annual Increase		5.4%	7.6%	5.8%	9.1%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
BAWSCA Debt Service Surcharges	\$321,720	\$321,720	\$321,720	\$321,720	\$321,720	\$321,720	\$321,720	\$321,720	\$321,720	\$321,720	\$321,720
SFPUC Water Service Charge	\$78,624	\$78,624	\$78,624	\$78,624	\$78,624	\$78,624	\$78,624	\$78,624	\$78,624	\$78,624	\$78,624
Water Sales (hcf)	791,732	799,650	807,646	815,723	823,880	832,119	840,440	848,844	857,333	865,906	874,565

Source: Model Tab 1B. Assumptions

The resulting revenue requirement projections are shown in Figure III-1 as stacked bars. In addition, the revenue from current rates is shown as a dashed black line and the revenue with revenue increases as a solid black line.

Expense Projections

The detail for the line items in each expense category is shown in the model in the Appendix.

Water Supply Expenses

The projected water supply expenses are the cost of purchased water from the SFPUC. This cost is increasing during the projection period as a result of increases in the SFPUC's

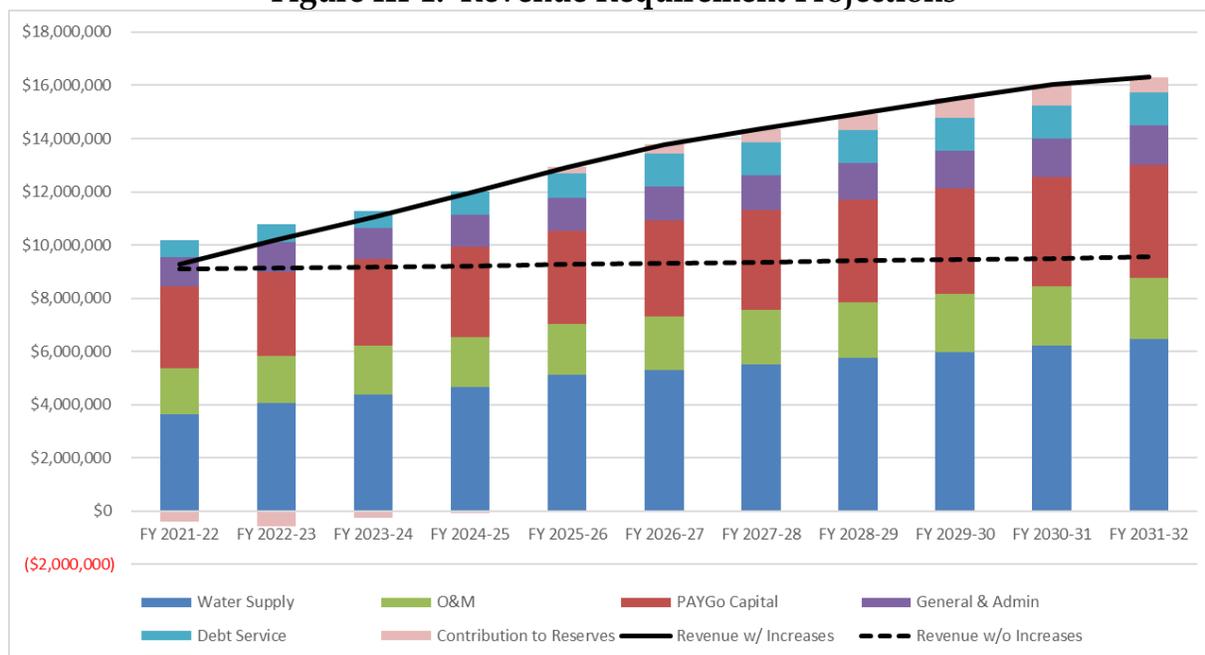
wholesale rates; it is not expected that the District’s purchased volumes from the SFPUC will increase significantly in the near future.

We note that the cost of SFPUC water that is used to set the proposed rates in this study is based on the SFPUC’s projections. The SFPUC may adopt different rates as conditions evolve. We recommend making Pass-Through Adjustments to account for the variance between the cost of SFPUC water shown in **Table III-1** and the wholesale rates that are eventually adopted by the SFPUC (see **Section V**).

Operating & Maintenance Expenses

The projected O&M expenses are projected to increase slightly based on the escalation factors in **Table III-1**.

Figure III-1. Revenue Requirement Projections



Source: Model Table 2. Revenue Requirement; data from District’s FY 2021-22 Budget.

PAYGo Capital Projects

A significant portion of the District’s revenue requirements comprises annual expenditures on capital improvements from rate revenue and capital reserves. These expenditures fund the on-going renewal and replacement of aging infrastructure. A list of the projects is shown in **Table III-2**. The annual average expenditures for pay-as-you-go (PAYGo) projects averages \$3,071,250 in current year dollars over an eight-year period. **Table III-3** converts this average to an inflation-adjusted amount for each year.

Because PAYGo projects fluctuate from year to year, they are funded from capital reserves, which buffers the annual fluctuations so that revenue requirements are relatively

stable. To modulate these fluctuations, contributions from the revenue requirements are made to the capital reserve based on the inflation adjusted average of annual PAYGo capital expenses for each year. The amount of these contributions is based on meeting target balances, which are discussed further below.

Table III-2. Capital Improvement Program - PAYGo Projects

PAYGo Project Description		Project Costs FY 2021-22 Dollars
1	Maintenance Building Improvements	\$330,000
2	Fremont Road Phase 2 Water Main Improvements	\$1,030,000
3	Buena Vista Drive Cross Country Water Main Improvements	\$445,000
4	West Fremont Road Water Main Improvements	\$3,610,000
5	1-280 & Liddicoat Drive Resiliency Project	\$2,070,000
6	Palo Alto / Gerth Lane Interconnection Project	\$1,140,000
7	Page Mill Road Water Main Improvements	\$1,040,000
8	Sherlock Road Water Main Improvements	\$720,000
9	Julietta Lane & Deer Springs Way Water Main Improvements	\$1,090,000
10	Elena Pump Station Improvements	\$1,650,000
11	Stonebrook Drive Water Main Improvements	\$1,400,000
12	Altamont Road Zone 4 Water Main Improvements	\$960,000
13	Quarry Lake Emergency Water Supply	\$1,000,000
14	Elena Tank Foundation Improvements	\$1,000,000
15	Deer Creek Pump Station Fire Suppression	\$445,000
16	La Crests Tank Cross Country Water Main Improvements	\$1,000,000
17	Hungry Horse Tank Improvements	\$2,340,000
18	1-280 (South) Water Main Abandonment	\$3,300,000
19	Total PAYGo CIP	\$24,570,000
20	Period (yrs)	8.00
21	Annual PAYGo CIP	\$3,071,250

Table III-3. Capital Improvement Program - Inflation Adjusted Costs

Project Description	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25	FY 2025-26	FY 2026-27	FY 2027-28	FY 2028-29	FY 2029-30	FY 2030-31	FY 2031-32	Total Project Cost
PAYGo Funded Projects	\$3,071,250	\$3,071,250	\$3,071,250	\$3,071,250	\$3,071,250	\$3,071,250	\$3,071,250	\$3,071,250	\$3,071,250	\$3,071,250	\$3,071,250	\$33,783,750
ENR Multiplier	1.000	1.033	1.067	1.102	1.138	1.176	1.214	1.254	1.295	1.338	1.382	
Project Costs Escalated	\$3,071,250	\$3,172,243	\$3,276,556	\$3,384,300	\$3,495,587	\$3,610,533	\$3,729,259	\$3,851,890	\$3,978,552	\$4,109,380	\$4,244,510	\$39,924,061

General & Administrative Expenses

Like O&M expenses, General & Administrative expenses increase slightly over the projection period based on the escalation factors in **Table III-1**.

Debt Service

The District currently pays debt service on previously issued bonds and plans to issue two bonds in FY 2024-25 and FY 2026-27 to fund a maintenance building and improvements at the Altamont Tanks.

Contributions to Reserves

The revenue requirements include contributions to operating and capital reserves in addition to what is needed to fund the PAYGo projects. The operating reserve provides working capital to meet month-to-month cash flow for O&M expenses. The capital reserve provides working capital for PAYGo capital projects. In the initial years, operating reserves are used to fund expenses that exceed revenues.

The contributions to reserves also include \$500,000 per year to be used for the development of additional water supplies. This contribution will provide additional funding for the District as it studies its available options and eventually acquires a source.

Revenue Increases

In addition to showing the major components of the revenue requirements, **Figure III-1** also shows the revenue from current rates and from rates after rate increases are added. The revenue increases are summarized in **Table III-4** along with other key financial indicators. Note that the effective date for the FY 2021-22 increase is April 1, 2022. Subsequent revenue increases become effective on January 1.

Table III-4. Projected Water Revenue Increases and Key Financial Parameters

	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25	FY 2025-26	FY 2026-27	FY 2027-28	FY 2028-29	FY 2029-30	FY 2030-31	FY 2031-32
	a	b	c	d	e	f	g	h	i	j	k
1 Revenue Increases	9.0%	9.0%	9.0%	9.0%	9.0%	5.0%	4.0%	4.0%	4.0%	3.0%	3.0%
2											
3 Revenue Requirement	\$8,433,332	\$8,812,832	\$9,605,986	\$10,470,525	\$11,412,872	\$12,201,944	\$12,749,544	\$13,259,525	\$13,789,906	\$14,271,201	\$14,485,269
4 EOY Fund Balance	\$4,031,649	\$5,906,551	\$5,079,011	\$4,568,271	\$4,222,320	\$4,217,239	\$4,303,119	\$4,564,640	\$4,949,843	\$5,465,293	\$6,046,558
5 Debt Coverage Ratio	3.63	4.36	5.01	4.12	4.62	3.79	4.02	4.22	4.42	4.57	4.50
6 Day of Cash	174	245	193	159	135	126	123	126	131	140	152

As further discussed below, the revenue increases fund the O&M and capital expenses and maintain adequate reserves. With the recommended revenue increases, debt coverage will continue to be adequate based on the current capital improvement program. However, the fund balance is drawn down to near the minimum target before climbing up. These revenue increases are therefore regarded as the minimum that are needed at this time.

RESERVE FUND BALANCE

Rates are set to generate sufficient revenue to cover annual expenses and to maintain adequate reserves. The difference between annual revenue requirements and revenue from rates and other sources results in an annual surplus or deficit that either adds to or subtracts from the unrestricted fund balance.

Revenue increases were determined in this report that would maintain reserves that meet certain conditions. One component of unrestricted reserves is needed to provide adequate working capital to meet monthly cash flow needs during the year related to O&M

and capital expenses. The Operating Reserve target is set based on the lag time between when the District incurs operating expenses and when the District receives payments from rate payers. Hence the billing frequency is a key consideration in setting the Operating Reserve target balance. In the District’s case, it bills monthly. A target of 25% of O&M expenses is recommended because of the lag time between when the District incurs costs and is paid by rate payers.

The Capital Reserve target is based on the working capital that is needed to fund PAYGo project costs. In this case, the annual average of the \$3,685,281 (which includes inflation) is used as the target balance for the Capital Reserve.

A comparison is made in **Table III-5** of the District’s current target balances with the proposed target balances. This shows a slight increase is recommended for the Operating Reserve target and a larger increase for the Capital Reserve target. We note that whereas the District’s targets are fixed amounts, the proposed targets will be adjusted based on increases in O&M and PAYGo expenditures that are projected to gradually increase over time, which provides a hedge against inflation. Even so, we regard these targets as minimums. The fund balance may exceed the targets but should not be allowed to continue to grow in excess of foreseeable needs.

Table III-5. Current and Proposed Reserve Target Balances

Reserves	Target	FY 2021-22
Current Reserves		
Operating Reserve	\$1.4 million	\$1,400,000
Capital Reserve	\$1.5 million	\$1,500,000
Total		\$2,900,000
HF&H Recommendation		
Operating Reserve	25% of O&M	\$1,743,672
Capital Reserve	1-year average CIP	\$3,685,281
Total		\$5,428,953

The projected fund balance over the planning period is graphed in **Figure III-2**. The solid green line represents the fund balance with the proposed annual revenue increases. The dashed green line shows the fund balance without revenue increases. The fund balance increases from FY 2020-21 to FY 2021-22 because no expenditures were made on PAYGo capital improvements. Without revenue increases, the fund balance would drop beginning in FY 2021-22 because current revenues are unable to support the planned capital improvement program.

Figure III-2. Projected Unrestricted Fund Balance

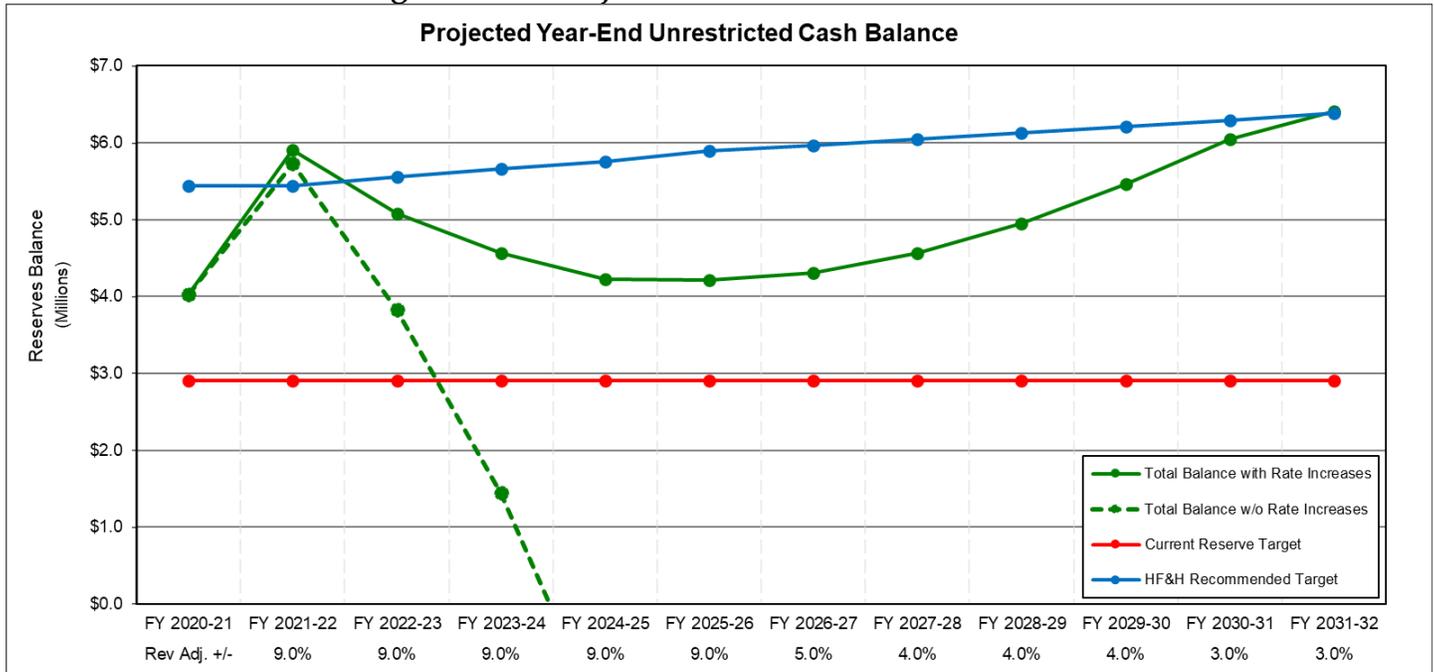


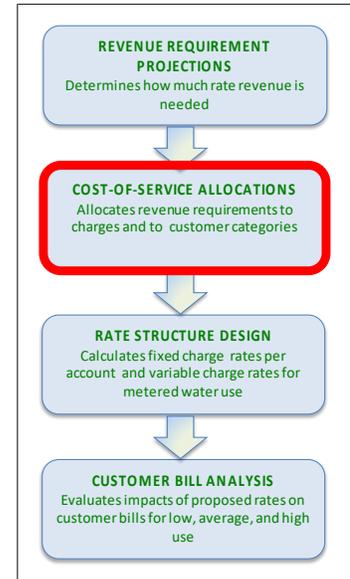
Figure III-2 also shows the current target balance for the District in blue and the proposed target balance in yellow. Each line is the sum of the individual targets for the Operating and Capital Reserves shown in Table III-5. It can be seen that the current fund balance is slightly greater than the proposed fund balance and well above the current target. The projected fund balance drops toward the District’s current target balance (red line) before gradually climbing to the recommended target balance, which is eventually reached at the end of the projection period. Higher revenue increases could reach the recommended target balance earlier. We regard the revenue increases as minimal because of the duration it takes to achieve the recommended target balance.

IV. COST-OF-SERVICE ANALYSIS

The revenue requirement analysis establishes how much revenue is required from rates to cover the cost-of-service. The next step in the analysis is determining the cost of the services provided by the District to its customers, which will be charged through its rates. Cost-of-service analysis is used to derive rates that proportionally allocate the cost-of-service between the RTS charge and the consumption charge and further allocated the consumption charge costs between the customer classes and among customers in each class.

ANALYTICAL APPROACH

The District provides demand services and customer services to water customers. Demand services include the costs related to meeting various levels of demand. Customer services include the costs related to customer accounts and the capacity that customers require.



The cost-of-service analysis performed in this study follows a procedure that has been long established by the American Water Works Association (AWWA),³ which is referred to as the “base/extra capacity method.” The analytical procedure contains the following steps:

1. **Cost classification** - Costs in the FY 2021-22 revenue requirement are classified into the service categories related to providing for customer demands and for customer service. FY 2021-22 costs are used for the cost-of-service analysis because they are the most recent budget year.
2. **Cost allocation** - The classified costs are allocated to the functions associated with each service. For demand services, the functions are levels of service that range from base, non-seasonal demands to the peak hour demands that represent the highest level of service. For customer services, the functions are customer accounts and customer capacity.

The criteria for classifying major costs are summarized as follows; examples of costs in each category are also shown:

Demand services - the basis for the consumption charge rates.

³ *Principles of Water Rates, Fees, and Charges*. Manual M1. American Water Works Association.

- Base day - non-seasonal demand (SFPUC purchased water cost).
- Average day – average daily demand: facilities that do not provide for peak day or hour demands (additional water supplies).
- Maximum day – peak demand on the maximum day (transmission mains from the source of supply to distribution storage reservoirs; booster pumps).
- Maximum hour – peak hour demand on the maximum day (a portion of distribution storage reservoirs and distribution mains to customers; hydrants, conservation programs).

Customer services - the basis for the RTS charge rates.

- Accounts: meter reading, billing, accounting, customer service, certain non-operating revenues.
- Capacity: a portion of distribution storage reservoirs and distribution mains to customers.

Composite services - these costs are recovered from both consumption and RTS charge rates.

- Indirect allocations for costs that are not directly related to either the demand or customer service functions (personnel, overhead, certain non-operating revenue).

The Rate Committee of the Board provided direction for how individual line items in the revenue requirements were to be classified into either the demand, customer, or composite service categories. Composite costs are allocated based on a composite of the direct allocations to the demand and customer service categories.

ALLOCATION FACTORS

Within the demand service function, allocations are made to varying levels of service. With these allocations, rates can be designed to proportionately charge customers based on their demands at each level of service.

Demand Services

Base Day Demand

Base day demand represents non-seasonal demand when irrigation is minimal and very little extra capacity is required for peaking. The base day demand was derived for each customer class from the District's customer billing data for the most recent three years. The base day demand period corresponded to the lowest month in each year.

Average Day Demand

Average day demand represents demand that includes only an average level of peaking. The average day demand was derived for each customer class from the District's customer billing data also for the most recent three years.

Maximum Day Demand

Maximum day demand includes average day demand plus peak day demand in the irrigation season. The District does not directly meter maximum day demand, which is typically the case for most water systems. Hence, estimates were required based on industry guidelines⁴ and customer billing data. The system-wide maximum day demand was estimated by multiplying the average day demand by 2.00. This factor is slightly higher than Manual M31's rule of thumb due to the District's arid climate, which accentuates seasonal peaks.

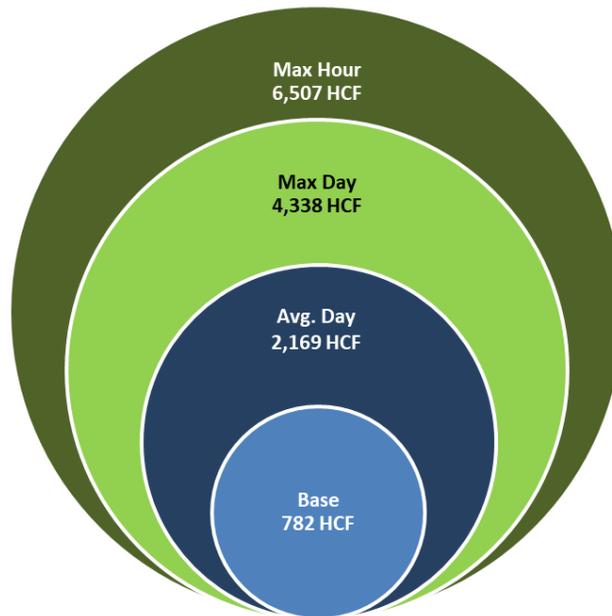
Maximum Hour Demand

Maximum hour demand represents the maximum hour demand on the maximum day. The District does not maintain data on its maximum hour demand, which is also not unusual. An estimate was made by which the maximum hour demand was assumed to be 1.50 times the maximum day demand; this value is consistent with industry guidelines. It is noted that sizing maximum hour facilities often serves to simultaneously provide capacity for both peak hour demands by customers and for fire flows. In effect, maximum hour demands determine how much capacity should be built into facilities needed for maximum hour peaks, which also accommodates fire flow capacity.

Figure IV-1 is a graphical depiction of the capacities of pipelines that correspond to each demand service level. This depiction is intended to exemplify the impact that peak levels of demand have on the design of facilities. The concentric circles are pipeline diameters proportionate to the levels of demand beginning with base demand, which is average winter demand when peaking is minimal. Average peaking during average day demands increases the capacity of the pipeline by 2.8 times base day demand. Maximum day demand requires a pipeline that is 5.5 times the capacity of base, non-peaking demand. Finally, to meet the highest level of service required by maximum hour demand, the pipeline capacity must be 8.3 times greater than the base demand. The larger capacities that are required to meet the higher levels of service require expenditures that cost-of-service analysis allocates proportionately to those who require the service.

⁴ "Where specific data on past consumption are not available, a good rule of thumb is that maximum daily demand is 1.5 times the average daily demand, while the peak hourly rate may vary from two to four times the average daily rate. In small water systems peaking factors may vary significantly higher than this." *Distribution System Requirements for Fire Protection*. American Water Works Association Manual M31. 1989. P. 16.

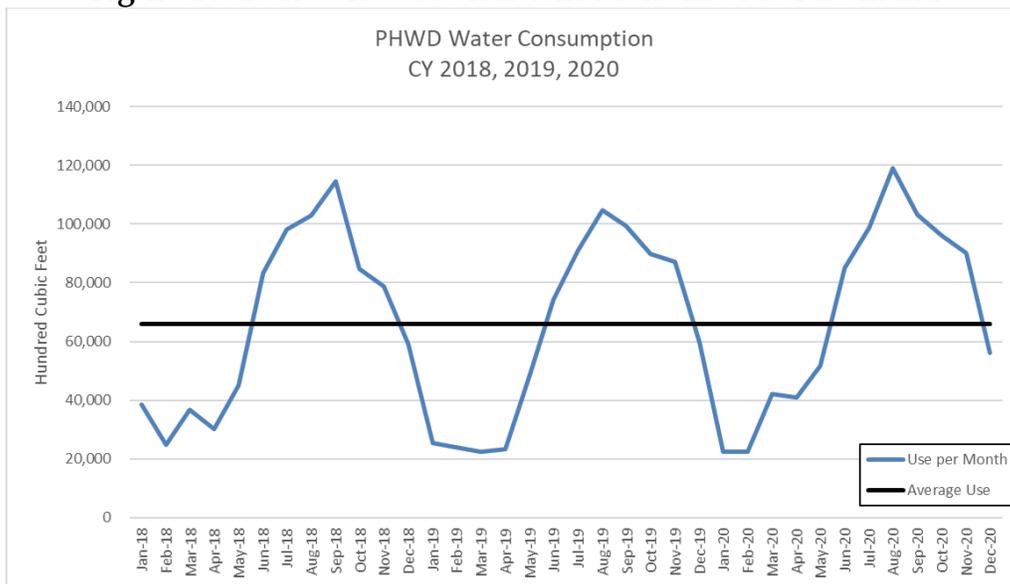
Figure IV-1. Pipeline Capacity Needed For Demand Service Levels



Note: Pipeline diameters drawn to scale

Figure IV-2 was prepared to further underscore the nature of peaking in the District from winter to summer.

Figure IV-2. Recent Seasonal Variations in Water Demand



The seasonality of the District’s demand is an important consideration in evaluating the balance of revenue between the fixed RTS charges and the consumption charges, which are subject to variations caused by climate (discussed below).

Allocation Factors

The flows associated with the demand service levels for each customer class and for the system as a whole are shown in **Table IV-1**. We note that the flows for the customer classes are coincident flows. Coincident flows represent the combined, total flow for which capacity is required at a given level of demand. It may be that one class’ peak may not be highest during the system-wide peak. That is inconsequential because facilities are not designed for noncoincident peaks. Hence, it would be illogical to use noncoincident flows to allocate costs that correspond to facilities that are sized for coincident peaks.

Table IV-1. Service Level Demands and Load Factors

	Levels of Demand			
	Base Day	Average Day	Maximum Day	Maximum Hour
	a	b	c	d
1 Demand by Customer Category				
2 Residential	703	2,027	4,055	6,082
3 Institutional	79	142	284	426
4 Total	782	2,169	4,338	6,507
5 Ratio of Flows to Average Day				
6 Residential	0.35	1.00	2.00	3.00
7 Institutional	0.56	1.00	2.00	3.00
8 Total	0.36	1.00	2.00	3.00
9				
10 Level of Service	782	2,169	4,338	6,507
11 Base Day Demand	2,169	2,169	2,169	2,169
12 Ratio of Level of Service to Avg Day	0.36	1.00	2.00	3.00

Source: Data source as described in text.

Table IV-2 shows the system-wide allocation percentages corresponding to the flows and load factors in **Table IV-1**. Note that costs that are classified, for example, as average day are allocated to both base day and average day and not to average day only. This is done because the capacity provided by average day facilities also provides capacity to meet base day demands. Similarly, maximum day and maximum hour costs are allocated across the lower levels of demand.

Table IV-2. Service Level Allocation Factors

Allocation Basis	Load Factors	Demand Service Levels				Totals
		Base Day	Average Day	Maximum Day	Maximum Hour	
1 Base Day	0.36	b	c	d	e	f
2 <i>Allocation %</i>		0.36				0.36
3		100%				100%
4 Average Day	1.00	0.36	0.64			1.00
5 <i>Allocation %</i>		36%	64%			100%
6						
7 Maximum Day	2.00	0.36	0.64	1.00		2.00
8 <i>Allocation %</i>		18%	32%	50%		100%
9						
10 Maximum Hour	3.00	0.36	0.64	1.00	1.00	3.00
11 <i>Allocation %</i>		12%	21%	33%	33%	100%

The allocation factors for costs classified as Customer Service are not related to levels of demand and, instead, are allocated either as 100% customer accounts or 100% customer capacity.

Table IV-3 summarizes the allocation factors for the demand and customer service costs. In addition, it shows the composite allocations. The O&M, Capital, and Expense composite allocations factors are based on subtotals of the O&M, Capital, and total costs that were directly allocated to either the demand or customer service categories. (These sub-totals for the composite allocations are shown in Tables IV-4, IV-5, and IV-6.)

Table IV-3. Summary of Allocation Factors

System-Wide Cost Allocation Factors	Demand Services				Customer Services		Total
	Base Day	Average Day	Maximum Day	Maximum Hour	Accounts	Service Charge	
a	b	c	d	e	f	g	h
1 <u>Demand Services</u>							
2 Base	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
3 Average Day	36.1%	63.9%	0.0%	0.0%	0.0%	0.0%	100.0%
4 Max Day	18.0%	32.0%	50.0%	0.0%	0.0%	0.0%	100.0%
5 Max Hour	12.0%	21.3%	33.3%	33.3%	0.0%	0.0%	100.0%
6 Peaking - CIP	12.0%	21.3%	33.3%	8.3%	0.0%	25.0%	100.0%
7 <u>Customer Services</u>							
8 Capacity	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%
9 Accounts	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%
10 <u>Composite Allocations</u>							
11 O&M Composite	60.0%	10.1%	8.6%	6.3%	12.9%	2.2%	100.0%
12 PAYGo Composite	37.3%	19.3%	21.1%	5.3%	0.0%	17.1%	100.0%
13 Exp Composite	53.4%	12.8%	12.2%	6.0%	9.1%	6.5%	100.0%
14 Debt Composite	12.0%	21.3%	33.3%	8.3%	0.0%	25.0%	100.0%

Source: Data source as described in the text

COST-OF-SERVICE ALLOCATIONS

O&M, Capital, and Composite Allocations

Tables IV-4, IV-5, and IV-6 show the FY 2021-22 revenue requirement allocated into the demand and customer services categories. Each line item was classified per the direction of the Rate Committee of the Board. The allocation factors that are summarized in Table IV-3 allocate the costs across the services based on the cost classification in column b.

Table IV-4. Direct Allocations - O&M Expenses

	FY 2021-22 Revenue Requirement	Allocation Factor	Consumption Charge				Service Charge	
			Base Day	Average Day	Maximum Day	Maximum Hour	Accounts	Capacity
	a	b	c	d	e	f	g	h
1 Operations & Maintenance - Direct Allocation								
2 Sources of Supply								
3 SFPUC Water Purchased	\$3,291,000	Base	\$3,291,000	\$0	\$0	\$0	\$0	\$0
4 BAWSCA Bond Surcharge	\$321,720	Base	\$321,720	\$0	\$0	\$0	\$0	\$0
5 Other Water	\$0	Base	\$0	\$0	\$0	\$0	\$0	\$0
6 BAWSCA Assessments	\$40,000	Base	\$40,000	\$0	\$0	\$0	\$0	\$0
7 Additional Water Supply O&M	\$500,000	Average Day	\$180,278	\$319,722	\$0	\$0	\$0	\$0
8 Conservation Programs								
9 Conservation Expense	\$15,000	Max Hour	\$1,803	\$3,197	\$5,000	\$5,000	\$0	\$0
10 Salaries - Conservation	\$0	Max Hour	\$0	\$0	\$0	\$0	\$0	\$0
11 Conservation Programs - Other	\$0	Max Hour	\$0	\$0	\$0	\$0	\$0	\$0
12 Benefit Expenses	\$0	Max Hour	\$0	\$0	\$0	\$0	\$0	\$0
13 Pumping Expense								
14 PG&E Power	\$341,000	Base	\$341,000	\$0	\$0	\$0	\$0	\$0
15 Water Treatment Expense								
16 Water Testing	\$15,000	Average Day	\$5,408	\$9,592	\$0	\$0	\$0	\$0
17 Treatment Chemicals & Expense	\$3,000	Average Day	\$1,082	\$1,918	\$0	\$0	\$0	\$0
18 Pumping Plant Maintenance								
19 Maintenance Pumping Structures	\$0	Max Day	\$0	\$0	\$0	\$0	\$0	\$0
20 Maintenance Pump Equipment	\$7,500	Max Day	\$1,352	\$2,398	\$3,750	\$0	\$0	\$0
21 Reservoir Maintenance	\$15,000	Max Hour	\$1,803	\$3,197	\$5,000	\$5,000	\$0	\$0
22 Grounds Maintenance	\$7,500	Average Day	\$2,704	\$4,796	\$0	\$0	\$0	\$0
23 Telemetry/Control/Elect Maint	\$15,000	Max Day	\$2,704	\$4,796	\$7,500	\$0	\$0	\$0
24 Distribution Maintenance								
25 Distribution Mains Maint	\$275,000	Max Hour	\$33,051	\$58,616	\$91,667	\$91,667	\$0	\$0
26 Service Maintenance	\$0	Max Hour	\$0	\$0	\$0	\$0	\$0	\$0
27 Backflow Maintenance	\$5,000	Max Hour	\$601	\$1,066	\$1,667	\$1,667	\$0	\$0
28 Meter Maintenance	\$30,000	Max Hour	\$3,606	\$6,394	\$10,000	\$10,000	\$0	\$0
29 Maintenance of Hydrants	\$0	Max Hour	\$0	\$0	\$0	\$0	\$0	\$0
30 Salaries - O&M	\$517,267	Max Hour	\$62,168	\$110,254	\$172,422	\$172,422	\$0	\$0
31 Page Mill Tank	(\$75,000)	Max Hour	(\$9,014)	(\$15,986)	(\$25,000)	(\$25,000)	\$0	\$0
32 Vacation - O&M	\$0	Max Hour	\$0	\$0	\$0	\$0	\$0	\$0
33 Overtime - O&M	\$75,000	Max Hour	\$9,014	\$15,986	\$25,000	\$25,000	\$0	\$0
34 OT to Comp Time-O&M	\$0	Max Hour	\$0	\$0	\$0	\$0	\$0	\$0
35 Allocated OT - O&M	(\$37,500)	Max Hour	(\$4,507)	(\$7,993)	(\$12,500)	(\$12,500)	\$0	\$0
36 Workers Compensation - O&M	\$20,000	Max Hour	\$2,404	\$4,263	\$6,667	\$6,667	\$0	\$0
37 Ins Benefits - O&M	\$0	Max Hour	\$0	\$0	\$0	\$0	\$0	\$0
38 Pensions - O&M	\$130,000	Max Hour	\$15,624	\$27,709	\$43,333	\$43,333	\$0	\$0
39 Allocated Pens & Ben - O&M	\$0	Max Hour	\$0	\$0	\$0	\$0	\$0	\$0
40 Pension Expense - O&M	\$0	Max Hour	\$0	\$0	\$0	\$0	\$0	\$0
41 Field Communications	\$12,000	Max Hour	\$1,442	\$2,558	\$4,000	\$4,000	\$0	\$0
42 Personnel Supplies	\$20,000	Max Hour	\$2,404	\$4,263	\$6,667	\$6,667	\$0	\$0
43 Engineering - Mapping	\$15,000	Max Hour	\$1,803	\$3,197	\$5,000	\$5,000	\$0	\$0
44 Engineering - Special Projects	\$40,000	Max Hour	\$4,807	\$8,526	\$13,333	\$13,333	\$0	\$0
45 Engineering - Dist Analysis	\$20,000	Max Hour	\$2,404	\$4,263	\$6,667	\$6,667	\$0	\$0
46 Permitting Activities	\$20,000	Max Hour	\$2,404	\$4,263	\$6,667	\$6,667	\$0	\$0
47 Benefit Expenses	\$125,000	Max Hour	\$15,023	\$26,643	\$41,667	\$41,667	\$0	\$0

Table IV-4. Direct Allocations - O&M Expenses (cont.)

	FY 2021-22 Revenue Requirement	Allocation Factor	Consumption Charge				Service Charge	
			Base Day	Average Day	Maximum Day	Maximum Hour	Accounts	Capacity
			a	b	c	d	e	f
1 Customer Account Expense								
2 Salaries - C/A	\$110,000	Accounts	\$0	\$0	\$0	\$0	\$110,000	\$0
3 Vacation - C/A	\$0	Accounts	\$0	\$0	\$0	\$0	\$0	\$0
4 Ins Benefits - C/A	\$0	Accounts	\$0	\$0	\$0	\$0	\$0	\$0
5 Pensions - C/A	\$15,000	Accounts	\$0	\$0	\$0	\$0	\$15,000	\$0
6 Pension Expense - C/A	\$0	Accounts	\$0	\$0	\$0	\$0	\$0	\$0
7 Software/Billing Expense	\$25,000	Accounts	\$0	\$0	\$0	\$0	\$25,000	\$0
8 Postage	\$10,000	Accounts	\$0	\$0	\$0	\$0	\$10,000	\$0
9 Uncollectible Accounts	\$0	Accounts	\$0	\$0	\$0	\$0	\$0	\$0
10 Benefit Expenses	\$25,000	Accounts	\$0	\$0	\$0	\$0	\$25,000	\$0
11 Administrative & General								
12 Salaries - G&A	\$314,700	Accounts	\$0	\$0	\$0	\$0	\$314,700	\$0
13 Vacation - G&A	\$0	Accounts	\$0	\$0	\$0	\$0	\$0	\$0
14 Altamont Genset 150KW (2273201)	\$0	Accounts	\$0	\$0	\$0	\$0	\$0	\$0
15 Ins Benefits - G&A	\$0	Accounts	\$0	\$0	\$0	\$0	\$0	\$0
16 Employee Benefits - Claims	\$0	Accounts	\$0	\$0	\$0	\$0	\$0	\$0
17 Pensions - G&A	\$30,000	Accounts	\$0	\$0	\$0	\$0	\$30,000	\$0
18 Pension Expense - G&A	\$0	Accounts	\$0	\$0	\$0	\$0	\$0	\$0
19 Workers Compensation - G&A	\$3,000	Accounts	\$0	\$0	\$0	\$0	\$3,000	\$0
20 Office Supplies & Expense	\$20,000	Accounts	\$0	\$0	\$0	\$0	\$20,000	\$0
21 Office Utilities	\$22,500	Accounts	\$0	\$0	\$0	\$0	\$22,500	\$0
22 Rate Study	\$70,000	Accounts	\$0	\$0	\$0	\$0	\$70,000	\$0
23 Payroll Taxes - FICA	\$75,000	Accounts	\$0	\$0	\$0	\$0	\$75,000	\$0
24 Legal-General	\$75,000	Accounts	\$0	\$0	\$0	\$0	\$75,000	\$0
25 Legal-Claims	\$7,500	Accounts	\$0	\$0	\$0	\$0	\$7,500	\$0
26 Organizational Study	\$0	Accounts	\$0	\$0	\$0	\$0	\$0	\$0
27 Audit & Accounting	\$60,000	Accounts	\$0	\$0	\$0	\$0	\$60,000	\$0
28 Misc. General Expenses	\$10,000	Accounts	\$0	\$0	\$0	\$0	\$10,000	\$0
29 Timekeeping Software	\$1,500	Accounts	\$0	\$0	\$0	\$0	\$1,500	\$0
30 Benefit Expenses	\$75,000	Accounts	\$0	\$0	\$0	\$0	\$75,000	\$0
31 Total Allocable O&M	\$6,712,687		\$4,334,087	\$603,639	\$418,506	\$407,256	\$949,200	\$0
32								
33 Debt Service	\$636,832	Peaking - CIP	\$76,538	\$135,739	\$212,277	\$53,069	\$0	\$159,208
34								
35 Total Direct O&M and Debt Service	\$7,349,519		\$4,410,625	\$739,378	\$630,783	\$460,325	\$949,200	\$159,208
36 O&M Composite			60.0%	10.1%	8.6%	6.3%	12.9%	2.2%

Table IV-5 shows the allocation of the capital expenses (PAYGo plus five debt funded projects). The allocation of debt service is based on a composite of the projects funded by debt. Table IV-5 also includes the calculation of the capital composite allocation percentages that are used in Table IV-6 for the CIP PAYGo expense. Per the direction of the Rate Committee of the Board, 75% of maximum hour CIP costs were allocated to capacity. This allocation was referred to as Peaking - CIP in Table IV-3.

Table IV-5. Direct Allocations - Capital Expenses

	Project Costs		Allocation Factor	Base Day	Average Day	Maximum Day	Maximum Hour	Accounts	Customer Capacity
	FY 2021-22 Dollars								
a	b	c	d	e	f	g	h	i	
1 Debt Funded Projects									
2 2020 Bond Funded Projects	\$5,178,000	Peaking - CIP	\$622,320	\$1,103,680	\$1,726,000	\$431,500	\$0	\$1,294,500	
3 Seton Water Main Improvements	\$845,000	Peaking - CIP	\$101,557	\$180,110	\$281,667	\$70,417	\$0	\$211,250	
4 Duval Way Water Main Improvements	\$1,075,000	Peaking - CIP	\$129,199	\$229,134	\$358,333	\$89,583	\$0	\$268,750	
5 Elena Road (South) Water Main Improvements	\$630,000	Peaking - CIP	\$75,717	\$134,283	\$210,000	\$52,500	\$0	\$157,500	
6 Padre Court Water Main Improvements	\$375,000	Peaking - CIP	\$45,070	\$79,930	\$125,000	\$31,250	\$0	\$93,750	
7	\$8,103,000		\$973,862	\$1,727,138	\$2,701,000	\$675,250	\$0	\$2,025,750	
8 Debt Composite	100.0%		12.0%	21.3%	33.3%	8.3%	0.0%	25.0%	
9									
10 PAYGo Funded Projects									
11 Maintenance Building Improvements	\$330,000	Base	\$330,000	\$0	\$0	\$0	\$0	\$0	
12 Fremont Road Phase 2 Water Main Improvements	\$1,030,000	Peaking - CIP	\$123,791	\$219,542	\$343,333	\$85,833	\$0	\$257,500	
13 Buena Vista Drive Cross Country Water Main Improvements	\$445,000	Peaking - CIP	\$53,483	\$94,851	\$148,333	\$37,083	\$0	\$111,250	
14 West Fremont Road Water Main Improvements	\$3,610,000	Peaking - CIP	\$433,869	\$769,464	\$1,203,333	\$300,833	\$0	\$902,500	
15 1-280 & Liddicoat Drive Resiliency Project	\$2,070,000	Average Day	\$746,351	\$1,323,649	\$0	\$0	\$0	\$0	
16 Palo Alto / Gerth Lane Interconnection Project	\$1,140,000	Average Day	\$411,034	\$728,966	\$0	\$0	\$0	\$0	
17 Page Mill Road Water Main Improvements	\$1,040,000	Peaking - CIP	\$124,993	\$221,674	\$346,667	\$86,667	\$0	\$260,000	
18 Sherlock Road Water Main Improvements	\$720,000	Peaking - CIP	\$86,533	\$153,467	\$240,000	\$60,000	\$0	\$180,000	
19 Julietta Lane & Deer Springs Way Water Main Improvements	\$1,090,000	Peaking - CIP	\$131,002	\$232,331	\$363,333	\$90,833	\$0	\$272,500	
20 Elena Pump Station Improvements	\$1,650,000	Peaking - CIP	\$198,306	\$351,694	\$550,000	\$137,500	\$0	\$412,500	
21 Stonebrook Drive Water Main Improvements	\$1,400,000	Peaking - CIP	\$168,260	\$298,407	\$466,667	\$116,667	\$0	\$350,000	
22 Altamont Road Zone 4 Water Main Improvements	\$960,000	Peaking - CIP	\$115,378	\$204,622	\$320,000	\$80,000	\$0	\$240,000	
23 Quarry Lake Emergency Water Supply	\$1,000,000	Base	\$1,000,000	\$0	\$0	\$0	\$0	\$0	
24 Elena Tank Foundation Improvements	\$1,000,000	Peaking - CIP	\$120,185	\$213,148	\$333,333	\$83,333	\$0	\$250,000	
25 Deer Creek Pump Station Fire Suppression	\$445,000	Capacity	\$0	\$0	\$0	\$0	\$0	\$445,000	
26 La Crests Tank Cross Country Water Main Improvements	\$1,000,000	Peaking - CIP	\$120,185	\$213,148	\$333,333	\$83,333	\$0	\$250,000	
27 Hungry Horse Tank Improvements	\$2,340,000	Peaking - CIP	\$281,234	\$498,766	\$780,000	\$195,000	\$0	\$585,000	
28 1-280 (South) Water Main Abandonment	\$3,300,000	Base	\$3,300,000	\$0	\$0	\$0	\$0	\$0	
29 Maintenance Building Improvements	\$4,600,000	Base	\$4,600,000	\$0	\$0	\$0	\$0	\$0	
30 Altamont Tanks Improvements	\$5,845,000	Peaking - CIP	\$702,484	\$1,245,850	\$1,948,333	\$487,083	\$0	\$1,461,250	
31	\$35,015,000		\$13,047,088	\$6,769,578	\$7,376,667	\$1,844,167	\$0	\$5,977,500	
32 PAYGo Composite	100.0%		37.3%	19.3%	21.1%	5.3%	0.0%	17.1%	

Table IV-6 shows the allocation of the O&M composite expenses, the CIP composite expense⁵, and non-operating revenues. Table IV-6 also shows the distribution of the revenue requirement between the demand services and customer service categories. The demand service costs are recovered through the consumption charges and the customer accounts and capacity costs are combined for determining the RTS charge rates.

We note that the resulting allocations divide the revenue requirement between the demand services and customer services. Revenue from customer services is billed through the fixed charges (readiness-to-serve or RTS), which are fixed based on the size of the service connection; they do not vary with demand. The analysis indicates that 12.1% of the revenue requirement is attributed to the RTS charges. As an industry standard, fixed charges that generate 12.1% of the rate revenue are regarded as low given the fact that a utility's fixed costs are much higher (70% to 80% or more of the total costs).

⁵ The CIP composite expense is the five-year annual average of PAYGo projects (2021\$).

Table IV-6. Composite and Non-Operating Revenue Allocations

	FY 2021-22 Revenue Requirement	Allocation Factor	Consumption Charge				Service Charge	
			Base Day	Average Day	Maximum Day	Maximum Hour	Accounts	Capacity
	a	b	c	d	e	f	g	h
1 Operations & Maintenance - Composite Allocation								
2 General Maintenance								
3 Fuel - Gasoline	\$0	O&M Composite	\$0	\$0	\$0	\$0	\$0	\$0
4 Fuel - Diesel / UST	\$30,000	O&M Composite	\$18,004	\$3,018	\$2,575	\$1,879	\$3,875	\$650
5 Transportation Equip. Maint. - Other	\$15,000	O&M Composite	\$9,002	\$1,509	\$1,287	\$940	\$1,937	\$325
6 Heavy Equipment Maint	\$20,000	O&M Composite	\$12,002	\$2,012	\$1,717	\$1,253	\$2,583	\$433
7 Portable/Misc. Equip & Maint	\$3,000	O&M Composite	\$1,800	\$302	\$257	\$188	\$387	\$65
8 General Plant & Maintenance	\$17,500	O&M Composite	\$10,502	\$1,761	\$1,502	\$1,096	\$2,260	\$379
9 Misc. Tools & Supplies	\$20,000	O&M Composite	\$12,002	\$2,012	\$1,717	\$1,253	\$2,583	\$433
10 Safety Supplies and Expense	\$2,500	O&M Composite	\$1,500	\$252	\$215	\$157	\$323	\$54
11 Total Unallocated O&M	\$108,000		\$64,813	\$10,865	\$9,269	\$6,764	\$13,948	\$2,340
12								
13 Capital Expenses (PayGo)	\$3,071,250	PAYGo Composite	\$1,144,392	\$593,776	\$647,025	\$161,756	\$0	\$524,301
14								
15 Subtotal O&M, Capital, Non-Operating	\$10,528,769		\$5,619,830	\$1,344,019	\$1,287,078	\$628,846	\$963,148	\$685,849
16 <i>Expense Allocation</i>			<i>53.4%</i>	<i>12.8%</i>	<i>12.2%</i>	<i>6.0%</i>	<i>9.1%</i>	<i>6.5%</i>
17								
18 Administrative & General								
19 Computer Network Expense	\$30,000	Exp Composite	\$16,013	\$3,830	\$3,667	\$1,792	\$2,744	\$1,954
20 Engineering - Retainer	\$6,000	Exp Composite	\$3,203	\$766	\$733	\$358	\$549	\$391
21 Insurance	\$60,000	Exp Composite	\$32,026	\$7,659	\$7,335	\$3,584	\$5,489	\$3,908
22 Board of Directors	\$8,000	Exp Composite	\$4,270	\$1,021	\$978	\$478	\$732	\$521
23 Education	\$4,000	Exp Composite	\$2,135	\$511	\$489	\$239	\$366	\$261
24 Rents	\$36,000	Exp Composite	\$19,215	\$4,595	\$4,401	\$2,150	\$3,293	\$2,345
25 Dues & Fees	\$10,000	Exp Composite	\$5,338	\$1,277	\$1,222	\$597	\$915	\$651
26	\$154,000		\$82,199	\$19,658	\$18,826	\$9,198	\$14,088	\$10,032
27								
28 Non-Operating Revenue								
29 Antenna Rentals	(\$250,000)	Accounts	\$0	\$0	\$0	\$0	(\$250,000)	\$0
30 Property Taxes	(\$1,000,000)	Exp Composite	(\$533,759)	(\$127,652)	(\$122,244)	(\$59,726)	(\$91,478)	(\$65,140)
31 Gain (loss) on Asset Disposal	\$0	Accounts	\$0	\$0	\$0	\$0	\$0	\$0
32 Investment - FMV	\$0	Accounts	\$0	\$0	\$0	\$0	\$0	\$0
33 Water A/R Late Fees & Interest	(\$500)	Accounts	\$0	\$0	\$0	\$0	(\$500)	\$0
34 Service Installation & Repair	(\$20,000)	Accounts	\$0	\$0	\$0	\$0	(\$20,000)	\$0
35 Backflow Installation & Repair	(\$15,000)	Accounts	\$0	\$0	\$0	\$0	(\$15,000)	\$0
36 Meter Installation & Repair	(\$50,000)	Accounts	\$0	\$0	\$0	\$0	(\$50,000)	\$0
37 Fire Hydrant Installation	(\$10,000)	Accounts	\$0	\$0	\$0	\$0	(\$10,000)	\$0
38 Miscellaneous	(\$10,000)	Accounts	\$0	\$0	\$0	\$0	(\$10,000)	\$0
39 Total Non-Operating	(\$1,355,500)		(\$533,759)	(\$127,652)	(\$122,244)	(\$59,726)	(\$446,978)	(\$65,140)
40								
41 Transfers to/(from) Reserves	(\$893,938)	Exp Composite	(\$477,148)	(\$114,113)	(\$109,278)	(\$53,392)	(\$81,775)	(\$58,231)
42								
43 Total Revenue Requirement	\$8,433,332		\$4,691,122	\$1,121,912	\$1,074,381	\$524,925	\$448,483	\$572,508
44						\$7,412,341	\$448,483	\$572,508
45						% of total revenue requirement 87.9%		12.1%
46						<i>Consumption Charge COS</i>		<i>Service Charge COS</i>

Allocation Comparison

Table IV-7 compares the revenue from current rates *without* the proposed 9% revenue increase with the cost-of-service allocations *with* the revenue increase. Table IV-7 also shows that, if the District did not change its current rates, the revenue from consumption charges would fall short of **(\$413,900)** the revenue needed from consumption charges after the reallocation of costs from the cost-of-service analysis and the 9% increase in revenue. This table also shows that the current RTS charge revenue would be **\$282,430** below what is indicated by the cost-of-service analysis.

Table IV-7. Comparison of Current Revenue With COS Allocations (FY 2021-22)

	Current Rate Revenue FY 2021-22		COS (w/ Rate Increase) FY 2021-22		Difference COS Minus Current	
	a	b	c	d	e=c-a	f=e/a
1 Consumption Charge Revenue	\$6,998,441	90.5%	\$7,412,341	87.9%	\$413,900	5.9%
2 Readiness-to-Serve Revenue	\$738,561	9.5%	\$1,020,991	12.1%	\$282,430	38.2%
3	\$7,737,002	100.0%	\$8,433,332	100.0%	\$696,330	9.0%

Summary of Allocations By Customer Class

The allocations by customer class are summarized in **Table IV-8**. The revenue from residential consumption charges shifts to RTS charges and to the institutional consumption charges. Overall, residential charges will generate \$439,622 more revenue on an annual basis than they would pay if the current rates stayed in place; institutional charges will generate \$256,708.

Table IV-8. Comparison of Customer Class Allocations

Components of Rate Structure	Revenue at Current Rates FY 2021-22		Cost-of-Service FY 2021-22		Difference COS Minus Current	
	a	b	c	d	e=c-a	f=e/a
1 Residential						
2 Consumption Charge Revenue	\$6,565,781	90%	\$6,758,528	88%	\$192,748	2.9%
3 Readiness-to-Serve Revenue	\$707,759	10%	\$954,634	12%	\$246,875	34.9%
4 Subtotal - Residential	\$7,273,540	100%	\$7,713,162	100%	\$439,622	6.0%
5 Institutional						
6 Consumption Charge Revenue	\$432,660	93%	\$653,812	91%	\$221,152	51.1%
7 Readiness-to-Serve Revenue	\$30,802	7%	\$66,357	9%	\$35,555	115.4%
8 Subtotal - Institutional	\$463,462	100%	\$720,170	100%	\$256,708	55.4%
9 Total						
10 Consumption Charge Revenue	\$6,998,441	90%	\$7,412,341	88%	\$413,900	5.9%
11 Readiness-to-Serve Revenue	\$738,561	10%	\$1,020,991	12%	\$282,430	38.2%
12 Total	\$7,737,002	100%	\$8,433,332	100%	\$696,330	9.00%

Source: Model Tab 8. Allocations.

CONSUMPTION CHARGE COST ALLOCATIONS

As previously mentioned, the customer service function is independent of the customer classes. The demand service function requires further allocations to customer classes in deriving rates. **Table IV-9** derives the cost-of-service for each of the District's customer classes. The allocation reflects each class' proportionate shares of the four demand service levels (i.e., base day, average day, maximum day, and maximum hour) because they share common facilities. Moreover, the allocation of costs to the residential customers needs to be tracked by demand service level for purposes of calculating the residential tiered rates in **Section V** below.

Table IV-9. Consumption Charge Cost Allocations By Customer Class

Consumption Charge Cost of Service	Base Day	Average Day	Maximum Day	Maximum Hour	Total
	a	b	c	d	e
1 Operations & Maintenance	\$4,481,099	\$634,162	\$446,600	\$423,218	\$5,985,080
2 Debt Service	\$76,538	\$135,739	\$212,277	\$53,069	\$477,624
3 Capital Expenses (PayGo)	\$1,144,392	\$593,776	\$647,025	\$161,756	\$2,546,949
4 Non-Operating Revenue	(\$533,759)	(\$127,652)	(\$122,244)	(\$59,726)	(\$843,382)
5 Transfers to/(from) Reserves	(\$477,148)	(\$114,113)	(\$109,278)	(\$53,392)	(\$753,931)
6 Total Consumption Charge COS	\$4,691,122	\$1,121,912	\$1,074,381	\$524,925	\$7,412,341
7					
8 Units of Service (hcf)					
9 Residential	703	2,027	4,055	6,082	
10 Institutional	79	142	284	426	
11	782	2,169	4,338	6,507	
12 Proportional Allocation Factors					
13 Residential	89.86%	93.46%	93.46%	93.46%	
14 Institutional	10.14%	6.54%	6.54%	6.54%	
15	100.00%	100.00%	100.00%	100.00%	
16					
17 Total COS - Residential	\$4,215,279	\$1,048,539	\$1,004,116	\$490,595	\$6,758,528
18 Total COS - Institutional	\$475,843	\$73,374	\$70,265	\$34,330	\$653,812
19 Grand Total Consumption Charge COS	\$4,691,122	\$1,121,912	\$1,074,381	\$524,925	\$7,412,341

V. RATE DESIGN

This section explains the derivation of the updated rates associated with the two charges paid by customers in the District’s two customer classes. These rates are based on the results of the cost-of-service analysis in the preceding section.

CURRENT RATE STRUCTURE

Tables V-1 and V-2 summarize the District’s current rates for its two charges. This rate structure, including the customer classes, has been in place for many years. Customers are billed the sum of the readiness-to-serve (RTS) and water consumption charges monthly.

Table V-1. Current Readiness-to-Serve Charge Rates

FY 2021-22		
	Meter Size	Current Rates
1	3/4"	\$22.55
2	1"	\$36.80
3	1.5"	\$51.00
4	2"	\$73.50
5	3"	\$90.80
6	4"	\$168.00

Table V-2. Current Consumption Charge Rates

FY 2021-22		
	Monthly Use	Current Rates
1	Residential	
2	1-10 hcf	\$5.64
3	11-30 hcf	\$7.33
4	31-60 hcf	\$9.52
5	61-100 hcf	\$11.69
6	100+ hcf	\$13.86
7		
8	Institutional	
9	All Use	\$8.50

READINESS-TO-SERVE CHARGE RATES

RTS charge rates are fixed rates charged per account that recover the cost of the customer service function. RTS charge rates are graduated in proportion to the capacity of the service (i.e., size of the water meter) serving a property. RTS charge rates are also independent of customer classes because the capacity of a service is the same no matter what customer is connected to the meter. In other words, a one-inch meter provides the same capacity to any customer that is connected to it.

The RTS charge is set to generate the revenue required to cover the costs allocated to the customer service function, which was determined in the cost-of-service analysis. The customer service function has two components – customer accounts and customer capacity – each of which is itemized in the cost-of-service analysis. Costs attributable to customer accounts are allocated to customers in proportion to the number of accounts. Costs attributable to customer capacity are allocated to customers in proportion to the capacity of their services. The sum of the two components equals the RTS charge rate per connection.

Capacity costs associated with the distribution system are apportioned among the connections in proportion to the capacity associated with each connection. Accounts are converted to Equivalent Meter Units (EMUs) to apportion the customer capacity cost component. An EMU represents the number of $\frac{3}{4}$ -inch meters to which a larger meter is equivalent. The capacity multipliers are based on AWWA nominal rated capacities.

The inventory of these meters is shown in **Table V-3**, which also shows the rated capacity in gallons per minute (GPM) for each meter size. Using the rated capacities, it is possible to calculate the EMUs for each size meter. For example, a 1-inch meter provides 1.67 times as much capacity as a $\frac{3}{4}$ -inch meter. The 631 1-inch meters equal 1,052 EMUs (i.e., $\frac{3}{4}$ " meters). The number of EMUs was calculated for each meter type and summed up to determine the total EMUs.

Table V-3 derives the unit costs for the customer accounts and customer capacity cost components. Each account is allocated \$17.47 for the customer account cost component. That amount represents the costs the District incurs to maintain an account regardless of the capacity of the service. Each account is also allocated \$14.71 per EMU. That amount represents a portion of the cost of providing distribution system capacity for each account, and increases in proportion to the capacity of the meter.

Table V-3. Proposed RTS Charge Unit Costs

Service Size	# of Accounts	Meter Ratings (gpm)	Capacity Multiplier	EMUs
	a	b	$c = b \div 30$	$a * c$
3/4" meters	1,347	30	1.00	1,347
1" meters	631	50	1.67	1,052
1 1/2" meters	102	100	3.33	340
2" meters	51	160	5.33	272
3" meters	0	300	10.00	0
4" meters	2	500	16.67	33
6" meters	6	1000	33.33	200
Total Accounts	2,139		Total EMUs	3,244
Units Costs	\$448,483			\$572,508
Monthly Cost				
per Account	\$17.47			
per EMU				\$14.71

Table V-4 combines the customer service and capacity components into a RTS charge for each size service. These amounts are monthly values for FY 2021-22. They are compared with the current monthly equivalents. All of the current RTS charges increase in order to generate the additional cost that is allocated to the customer service function in the cost-of-service analysis in **Section IV**.

Table V-4. Proposed Monthly RTS Charge Rates

Service Size	% of Meters	Account Component (\$/mo.)	Capacity Component			Proposed Service Charges (\$/mo.)	Total	
			\$/EMU	Capacity Multiplier	Capacity Total		Current Charge	\$ Difference
		a	b	c	d = b * c	e = a + d	f	g = e - f
3/4" meters	63.0%	\$17.47	\$14.71	1.00	\$14.71	\$32.18	\$22.50	\$9.68
1" meters	29.5%	\$17.47	\$14.71	1.67	\$24.51	\$41.98	\$36.80	\$5.18
1 1/2" meters	4.8%	\$17.47	\$14.71	3.33	\$49.02	\$66.50	\$51.00	\$15.50
2" meters	2.4%	\$17.47	\$14.71	5.33	\$78.44	\$95.91	\$73.50	\$22.41
3" meters	0.0%	\$17.47	\$14.71	10.00	\$147.07	\$164.54	\$90.80	\$73.74
4" meters	0.1%	\$17.47	\$14.71	16.67	\$245.11	\$262.59	\$168.00	\$94.59
6" meters	0.3%	\$17.47	\$14.71	33.33	\$490.23	\$507.70	\$0.00	\$507.70

CONSUMPTION CHARGE RATES

The District’s residential customers pay consumption charge rates that are tiered, increasing block rates. The institutional customer class pays a separate uniform consumption charge rate. Their respective rates are based on their share of the demand service costs allocated to them in the cost-of-service analysis in **Section IV**.

Tiered Consumption Charge Rates

The District's residential customers are currently charged a five-tier increasing block rate structure.⁶ The structure is a series of "blocks" of water whose unit costs increase with each block. The structure is "progressive" in the sense that water is billed sequentially by block up to the highest block. It is not the case that all of the water is billed at only the rate for the highest block. All metered water use is at least billed the Tier 1 rate. Water use beyond Tier 1 is only billed the Tier 2 rate for the volume of water within Tier 2, and water use beyond the volume of water within Tier 2 is billed at the Tier 3 rate, etc..

Increasing block rates have become more common as the need has grown to set rates that more precisely recover the cost-of-service. Increasing block rates continue to be well suited for the District's residential customer class.

When increasing block rates are implemented, the number of tiers must be determined. There is no absolute industry standard or law that prescribes how many tiers must be used. Judgment that is supported by facts is allowed. However, the rates for each tier cannot exceed the proportional cost-of-service for each tier. In the District's case, a four-tier structure aligns well with the four demand service levels where Tier 1, Tier 2, Tier 3, and Tier 4 correspond with base day, average day, maximum day, and maximum demands. Given a four-tier structure, the following describes how the size of the tiers and rate per tier were derived.

Breakpoints Between Tiers

The base/extra capacity cost-of-service analysis leads to four distinct levels of demand that are defined by the functions performed by facilities that are designed to provide each service level. Each service level has an average flow that can be used as the divider (i.e., "breakpoint") between each service level. Based on residential billing data and estimates of peak demands, the breakpoints were calculated as shown in **Table V-5**.

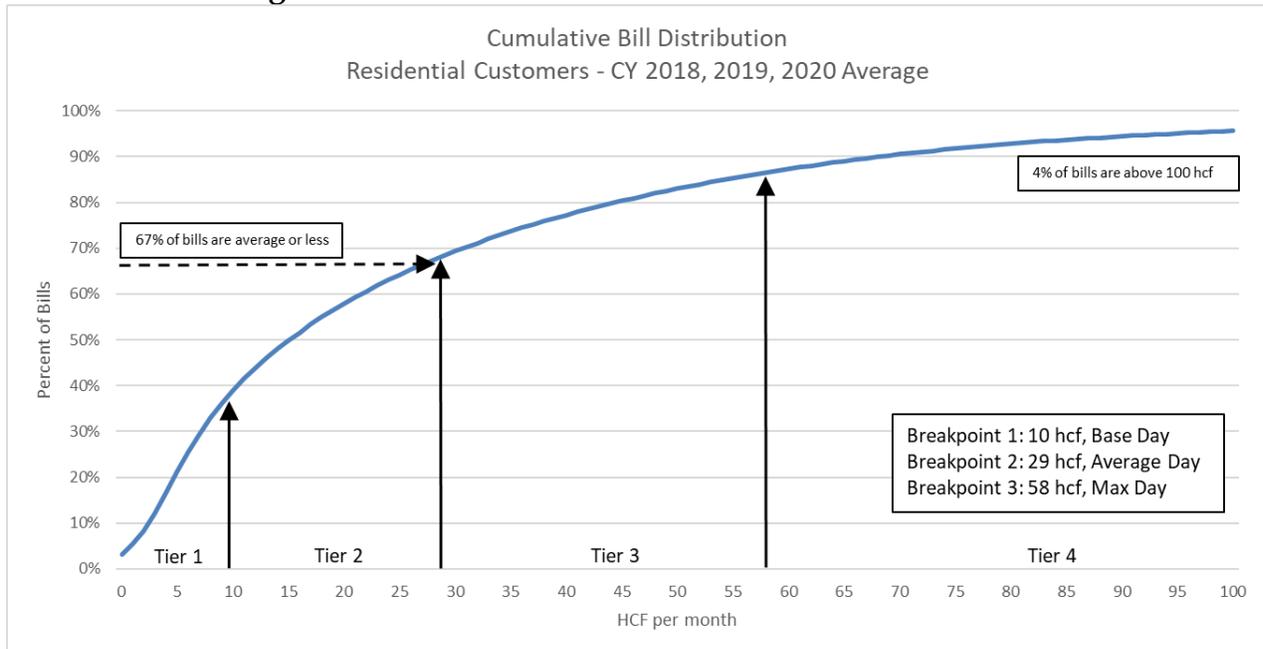
Table V-5. Proposed Breakpoint Locations - Single Family Tiers

	Tier 1	Tier 2	Tier 3	Tier 4
Flow per Customer (hcf per month)	Base Day	Average Day	Maximum Day	Maximum Hour
Residential				
hcf per day	703	2,027	4,055	6,082
hcf per month	21,083	60,818	121,636	
# of Accounts	2,100	2,100	2,100	
Average flow per Acct (hcf/mo)	10.0	29.0	58.0	58+

⁶ For simplicity, we use the term "tiered rates" synonymously with "increasing block rates." "Inclining block rates" is sometimes used for "increasing block rates." However, because an incline can slope either up or down, it is ambiguous in this context and therefore is not used in this study.

The current breakpoints are close to the updated breakpoints. **Figure V-1** is a graph of the cumulative bill distribution from smallest to largest residential bills. The proposed breakpoints are plotted as vertical arrows. This graph indicates, for example, that 67% of the bills are 29 HCF (which is average day consumption) or less, which also indicates that 33% of bills are above average. The median bill is approximately 15 HCF. In other words 50% of the bills are 15 HCF or less and 50% of the bills are greater than 15 HCF. 10 HCF is the Tier 1 breakpoint; 39% of the bills are 10 HCF or less. Approximately 14% of the bills are over 58 HCF in Tier 4. Only 4% of the bills are beyond 100 HCF in the current Tier 5.

Figure V-1. Cumulative Residential Bill Distribution



Source: Model tab Bill Distribution.

Rates Per Tier

With breakpoints that correspond to the service levels in the cost-of-service analysis, it is possible to calculate the rate per tier by dividing the cost-of-service per tier by the water demand in each tier. The resulting rates represent the *unit cost-of-service* for each tier.⁷

Table V-6 shows the calculations of the incremental cost per tier.

⁷ In this report, “rates” and “unit costs” are synonymous.

Table V-6. Proposed Residential Consumption Charge Rates (FY 2021-22)

Residential COS per Unit	Tier 1	Tier 2	Tier 3	Tier 4	Total or Average
	Base Day	Average Day	Maximum Day	Maximum Hour	
	a	b	c	d	
1 Residential COS - Consumption	\$4,215,279	\$1,048,539	\$1,004,116	\$490,595	\$6,758,528
2	62.4%	15.5%	14.9%	7.3%	
3					
4 Demand Per Tier					
5 Tier 1 - 0 - 10 hcf	209,044				
6 Tier 2 - 11 - 29 hcf	219,178	219,178			
7 Tier 3 - 30 - 58 hcf	160,825	160,825	160,825		
8 Tier 4 - 59+ hcf	150,906	150,906	150,906	150,906	
9 Total hcf per Tier	739,953	530,909	311,731	150,906	739,953
10					
11 Cost-of-Service per Unit (hcf)	\$5.70	\$1.97	\$3.22	\$3.25	
12					
13 Tier 1 - 0 - 10 hcf	\$5.70	\$5.70	\$5.70	\$5.70	
14 Tier 2 - 11 - 29 hcf		\$1.97	\$1.97	\$1.97	
15 Tier 3 - 30 - 58 hcf			\$3.22	\$3.22	
16 Tier 4 - 59+ hcf				\$3.25	
17 Unit Cost per hcf (by Tier)	\$5.70	\$7.67	\$10.89	\$14.14	\$9.13

Base day costs apply to all tiers. Usage up to the 10 HCF Tier 1 breakpoint is charged the base day rate only. Demand that does not exceed Tier 1 is not responsible for the additional costs of peaking that were allocated to the higher service levels. These additional peaking costs are both the initial capital cost, the subsequent rehabilitation and renewal costs, and the operations and maintenance costs for larger pipelines, additional pumps, and larger reservoirs. Bills that exceed Tier 1 pay additional rate increments corresponding to the higher levels of service.

Average day costs apply to all water use greater than Tier 1, namely, to Tier 2, Tier 3, and Tier 4. Usage between 11 and 29 HCF is charged the Tier 2 rate, which is the sum of the base day and average day incremental costs. Usage greater than 29 HCF pays the Tier 3 rate, which is the sum of the base day, average day, and maximum day incremental costs. Clearly, as demand progresses through the tiers, the additional costs of higher levels of service associated with peaking are allocated to the higher tiers to recover the costs from those who require the higher levels of service. Tier 4 pays the final cost increment for maximum hour service, which is the highest burden placed on the system.

Figure V-2 plots the cost increments per tier. The dashed black line represents the average cost of water. It can be seen that the Tier 1 and Tier 2 rates are less than the average cost and the Tier 3 and Tier 4 rates are greater than the average cost. **Figure V-2** also shows that The Tier 2 cost increment is relatively small compared with the other tiers. On the other hand, the Tier 3 and Tier 4 cost increments are large increments, which is in keeping with the high level of service that is required to provide for the District’s very pronounced peak demands caused by seasonal irrigation.

Figure V-2. Cost-of-Service Increments Per Tier For Consumption Charge Rates



Source: Incremental cost components by Tier are calculated on Model Table. 8 Allocations.

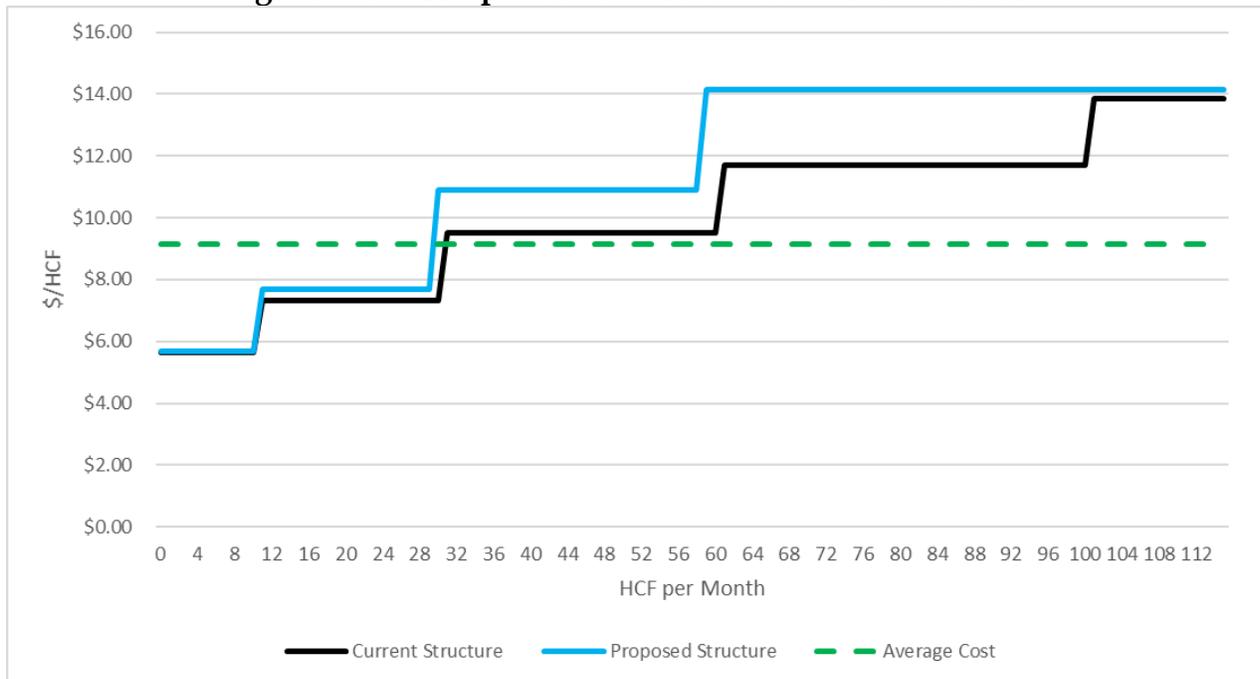
In effect, the average cost represents the non-tiered, uniform rate, which makes no distinction between different levels of service. The average cost is the most general form of the cost-of-service. It treats the cost of water service as though it is linear. A more exacting cost-of-service analysis derives the average cost for each level of service. In effect, tiered rates are a sequence of the average costs corresponding to discrete levels of service.

Each Service Level Pays Its Share

Even though facilities are designed for the maximum demand, their cost is allocated to all customers, not just to the highest peaking customers. The combination of all use determines the size of facilities. Low-use customers also contribute to the peak. Hence, all customers share in the cost in proportion to how much they peak.

Figure V-3 graphically compares the tier structures for the current structure (without 9% increase) with the proposed structure and with the average unit cost (with 9% increase). Note that approximately two-thirds of the bills are within the first two tiers for the proposed rate structure, which is lower than the average cost. Note also that the proposed rates reflect the cost-of-service adjustments, which lowered the revenue generated by residential consumption rates even when the 9% revenue increase is added (see **Table IV-9**); the proposed residential consumption rates generate 8.2% less revenue than the current residential rates.

Figure V-3. Comparison of Residential Tier Structures



Uniform Consumption Charge Rate

The consumption charge rate for institutional customers is a uniform, un-tiered rate. The uniform rate is derived by dividing the costs allocated to the institutional class by the corresponding demand as shown in **Table V-7**.

Table V-7. Proposed Institutional Consumption Charge Rate (FY 2021-22)

Consumption Charge Cost of Service	Base Day	Average Day	Maximum Day	Maximum Hour	Total
	a	b	c	d	e
1 Total COS - Institutional	\$475,843	\$73,374	\$70,265	\$34,330	\$653,812
2			Annual water use (hcf)		51,780
3				\$ per hcf	\$12.63

Source: Revenue requirement from **Figure IV-9**;
 Projected demand from **Figure IV-10**.

RATE SUMMARY

The proposed rates for RTS charges and consumption charges are summarized for FY 2021-22 through FY 2025-26 in **Table V-8** and **Table V-9**.

Table V-8. Proposed RTS Rates

Monthly Readiness-to-Serve Charges							
Meter Size	FY 2021-22 Current Rates	FY 2021-22 4/1/2022	FY 2022-23 1/1/2023	FY 2023-24 1/1/2024	FY 2024-25 1/1/2025	FY 2025-26 1/1/2026	
	a		c	d	e	f	
1 3/4"	\$22.55	\$32.18	\$35.08	\$38.23	\$41.67	\$45.42	
2 1"	\$36.80	\$41.98	\$45.76	\$49.88	\$54.37	\$59.26	
3 1.5"	\$51.00	\$66.50	\$72.48	\$79.00	\$86.11	\$93.86	
4 2"	\$73.50	\$95.91	\$104.54	\$113.95	\$124.20	\$135.38	
5 3"	\$90.80	\$164.54	\$179.35	\$195.49	\$213.09	\$232.26	
6 4"	\$168.00	\$262.59	\$286.22	\$311.98	\$340.06	\$370.66	
7 6"	\$0.00	\$507.70	\$553.39	\$603.20	\$657.49	\$716.66	

Table V-9. Proposed Consumption Charge Rates (Normal Water Supply)

Water Consumption Charges							
Monthly Use	FY 2021-22 Current Rates	Monthly Use	FY 2021-22 4/1/2022	FY 2022-23 1/1/2023	FY 2023-24 1/1/2024	FY 2024-25 1/1/2025	FY 2025-26 1/1/2026
	a	b	c	d	e	f	g
1 Residential							
2 1-10 hcf	\$5.64	1 - 10 hcf	\$5.70	\$6.21	\$6.77	\$7.38	\$8.04
3 11-30 hcf	\$7.33	11 - 29 hcf	\$7.67	\$8.36	\$9.11	\$9.94	\$10.83
4 31-60 hcf	\$9.52	30 - 58 hcf	\$10.89	\$11.87	\$12.94	\$14.11	\$15.38
5 61-100 hcf	\$11.69	59+ hcf	\$14.14	\$15.42	\$16.80	\$18.32	\$19.97
6 100+ hcf	\$13.86						
7							
8 Institutional							
9 All Use	\$8.50	All Use	\$12.63	\$13.76	\$15.00	\$16.35	\$17.82

Water Shortage Rate Adjustments

We note that the proposed rates should be considered adequate in years of normal water supply. During shortages that require customers to curtail water use, revenue shortfalls will occur. These shortfalls may be fiscally tolerable for a brief shortage. However, during a severe or prolonged drought or other emergency shortage (e.g., a natural disaster that damages the SFPUC’s regional water supply facilities), the District’s reserves may be unable to offset the revenue shortfall because costs will not decrease by the same amount.

As a means of stabilizing revenue during declared emergency shortages, water agencies are integrating adjustment factors that are implemented *only* during water shortages. During a water shortage, the District will implement a range of actions to reduce water use and help ensure that demand for water does not exceed supply. Such actions may include public outreach campaigns, water efficiency customer assistance and rebate programs, operational changes, and prohibitions and restrictions on some water uses. In the

more severe stages of shortage and when the SFPUC implements its regional water supply reductions during droughts, the District's Board of Directors would declare a water shortage emergency and have discretion to require mandatory water reductions and implement the Water Shortage Rate Adjustments to increase the existing rates to recoup lost revenue from reduced consumption. These adjustments would be temporary and would return to the regular schedule when the District's Board determines that the water shortage emergency is over. Rate payers must be notified in advance on their monthly bills; the need for the full ratepayer protest process under Proposition 218, which is costly and time consuming is avoided by simply providing advance notification on bills at least 30 days prior to when the adjustment is made.

The adjustment factors increase the consumption charges to cover fixed costs without generating a surplus. This revenue-neutral adjustment is correlated with the level of mandated reduction and is reduced and eliminated as the shortage is alleviated and ends.

During the preparation of this report, the SFPUC indicated its plans to declare a 15% regional water supply reduction. A regional shortage of this magnitude requires each of the SFPUC's wholesale customers to reduce their demands based on a complex formula, which results in a 40.0% reduction for the District. Using this level of reduction as an example, the District would need to increase its consumption charge rates in **Table V-9** by 1.35, as summarized in **Table V-10**.

Table V-10. Proposed Consumption Charge Rates (Shortage Water Supply Only)

Water Consumption Charges with 40% Drought Cutback			
Monthly Use	Normal Rate	Factor	Shortage Rate
	a	b	c
1 Residential			
2 0 - 10 hcf	\$7.68	1.35	\$10.35
3 11 - 29 hcf	\$10.34	1.35	\$13.94
4 30 - 58 hcf	\$14.68	1.35	\$19.80
5 59+ hcf	\$19.07	1.35	\$25.70
6			
7			
8 Institutional			
9 All Use	\$17.02	1.35	\$22.95

The Water Shortage Rate Adjustment for a 15% regional cutback in the SFPUC water supply is derived as follows:

$$\text{Water Shortage Rate Adjustment Factor} = \frac{\text{Conservation Component}}{1-a} * \frac{\text{Variable Cost Component}}{b - (c * a)}$$

a = Required conservation reduction = 40.0%.

b = Portion of total rate revenue produced by proposed consumption charges = 87.9%.

c = Portion of total expenses that is variable (i.e., SFPUC water purchases) = 42%.

Substituting the values into the formula yields the 1.35 Water Shortage Rate Adjustment Factor corresponding to a 40.0% reduction in water use. Note that this formula takes into account the fact that the cost of SFPUC water purchases decreases during a shortage.

$$\begin{aligned} \text{Water Shortage Rate Adjustment Factor} &= \frac{1}{1-0.40} * \frac{0.879-(0.42 * 0.40)}{0.879} \\ &= 1.667 * 0.809 = 1.35 \end{aligned}$$

This formula can be used for other shortages. For a 10% regional SFPUC shortage, the District’s required reduction is 25.95% with a corresponding 1.183 Water Shortage Rate Adjustment Factor. For a 20% regional shortage, the District’s required reduction is 45.00%, with a 1.43 Water Shortage Rate Adjustment Factor.

We note that the application of Water Shortage Rate Adjustment Factors improves revenue stability but is still an approximation. The exact revenue shortfall due to shortage reductions is complicated by the tiered structure of rates, which places greater revenue generation on the higher tiers. Hence, the loss of revenue across the tiers from a reduction is non-linear. Although the proposed Water Shortage Rate Adjustment Factors greatly improve revenue stability, the adjustment is not perfect and may fall short of full revenue neutrality. A formula that would correct for this imperfection would be too complex to implement. In a prolonged shortage, it is critical that reserves be monitored so that further action can be taken if needed, including re-opening rates for an update that follows the full procedural requirements of Proposition 218.

Pass-Through Adjustments

Water Shortage Rate Adjustments are intended for use *only* during *declared* water shortages. Another revenue stabilization measure adjusts consumption charge rates for unplanned increases in the cost of SFPUC purchased water, which can occur at any time, not just during declared water shortages. These adjustments are referred to as “pass-through adjustments” because the cost is passed through directly to District rate payers. The District does not determine the SFPUC’s wholesale water rates and has no choice but to pass through the cost to avoid depleting the District’s reserves to cover the unplanned rate increase.

The District currently has a provision that allows it to make these pass-through adjustments after providing at least 30 days notice to rate payers. We recommend that the District continue this practice. However, the current policy refers to making adjustments for unplanned *increases* in the SFPUC’s wholesale rates. We recommend that pass-through adjustments cover any variance between the projected SFPUC wholesale rates (as shown in **Table V-11**) and the wholesale rates that are eventually adopted year by year by the SFPUC. In other words, the pass-through adjustment could either *increase* or *decrease* PHWD’s Water Consumption Charge rates.

Table V-12 shows the wholesale rates projected by the SFPUC, which served as the basis for deriving the proposed rates for PHWD in this report. These projected SFPUC wholesale rates serve as the baseline for determining if a pass-through adjustment should be considered. The pass-through adjustment would equal the difference between the projections in **Table V-11** and the wholesale rate that is eventually adopted by the SFPUC. That difference would be added or subtracted from the rates adopted by PHWD.

Table V-11. Projected SFPUC Wholesale Rates (\$/HCF)

	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25	FY 2025-26	FY 2026-27
SFPUC Wholesale Rate	\$4.10	\$4.32	\$4.65	\$4.92	\$5.37	\$5.53

VI. CUSTOMER BILL IMPACTS

A further understanding of the differences between the current and proposed rate structures is gained by comparing bills based on both rate structures. The monthly cost comparison is based on “typical” customers or customers that are most representative of a group of customers. The typical customer is based on the most common meter sizes for the class and the average water use for customers of that type.

In addition to comparisons of bills with the current and proposed rates, comparisons are also made of the District’s proposed bills with neighboring agencies.

CUSTOMER BILL COMPARISON

The monthly bills for the current and proposed rates for FY 2021-22 are compared in **Table VI-1**, which also shows the assumed water use and meter size. Clearly, the impact on customers is sensitive to the meter size and monthly water use for each bill.

Four sample bills are shown for residential bills ranging from low use, which is representative of a small household with little or no irrigation, to very high use in Tier 4. The medium use represents average use at the end of Tier 2, the high use represents two times average use at the end of Tier 3, and very high use is two times high use in Tier 4. Note that the bills for low and medium use are based on a ¾-inch meter and for high and very high use on a 1-inch meter.

Table VI-1 also shows a bill comparison for an average institutional bill, which will see an increase because of both the increased RTS charge rates and uniform consumption charge rate.

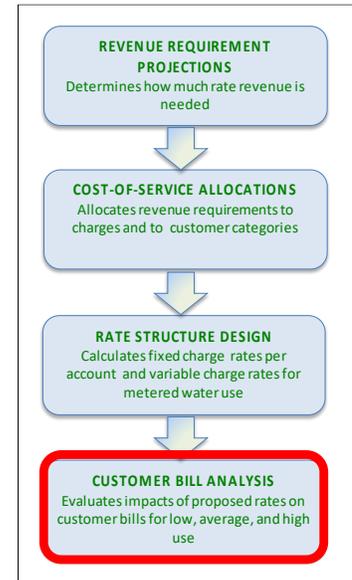


Table VI-1. Sample Water Bill Impacts (FY 2021-22)

	<u>Residential</u>				<u>Institutional</u>
	Low Use	Medium Use	High Use	Very High Use	Average Use
	a	b	c	d	e
1 Assumptions					
2 Flow per Month (hcf)	5	29	58	116	55
3 Flow per Day (gpd)	125	723	1446	2892	1371
4 Meter Size	3/4"	3/4"	1"	1"	1.5"
5					
6 Monthly Bill					
7 Bills with Current Rates					
8 Readiness-to-Serve	\$22.55	\$22.55	\$36.80	\$36.80	\$51.00
9 Consumption	\$28.20	\$195.67	\$469.56	\$1,143.24	\$467.50
10 Current FY 2021-22	\$50.75	\$218.22	\$506.36	\$1,180.04	\$518.50
11					
12 Bills with Proposed Rates					
13 Readiness-to-Serve	\$32.18	\$32.18	\$41.98	\$41.98	\$66.50
14 Consumption	\$28.48	\$202.73	\$518.62	\$1,338.96	\$694.47
15 Proposed FY 2021-22	\$60.66	\$234.91	\$560.60	\$1,380.94	\$760.97
16					
17 Proposed minus Current	\$9.91	\$16.69	\$54.24	\$200.90	\$242.47
18 Percent Change	19.5%	7.6%	10.7%	17.0%	46.8%

Figure VI-1 plots monthly bills for residential customers with a 3/4-inch meter for a range of consumption from 0 to 100 HCF, which includes 98% of the bills for 3/4-inch meters. **Table VI-2** is the tabular basis for **Figure VI-1**.

Figure VI-1. Current and Proposed Residential Bill Comparison (3/4" Meter)

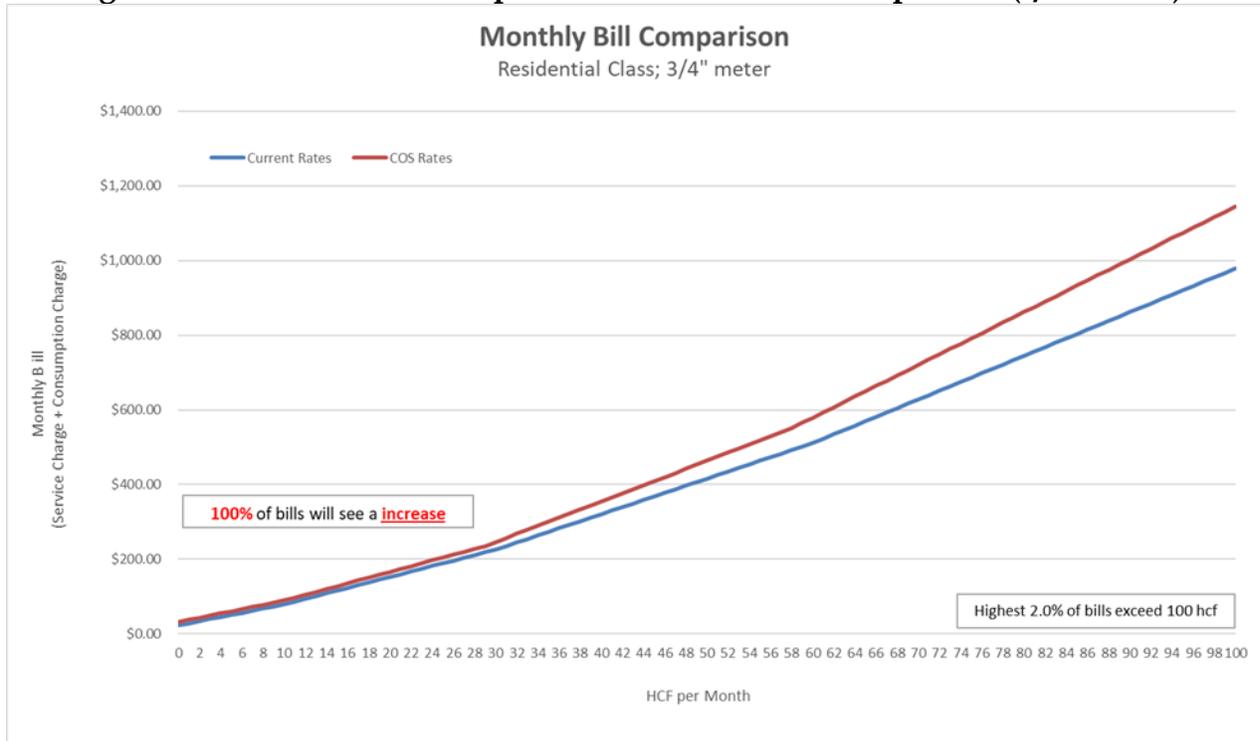
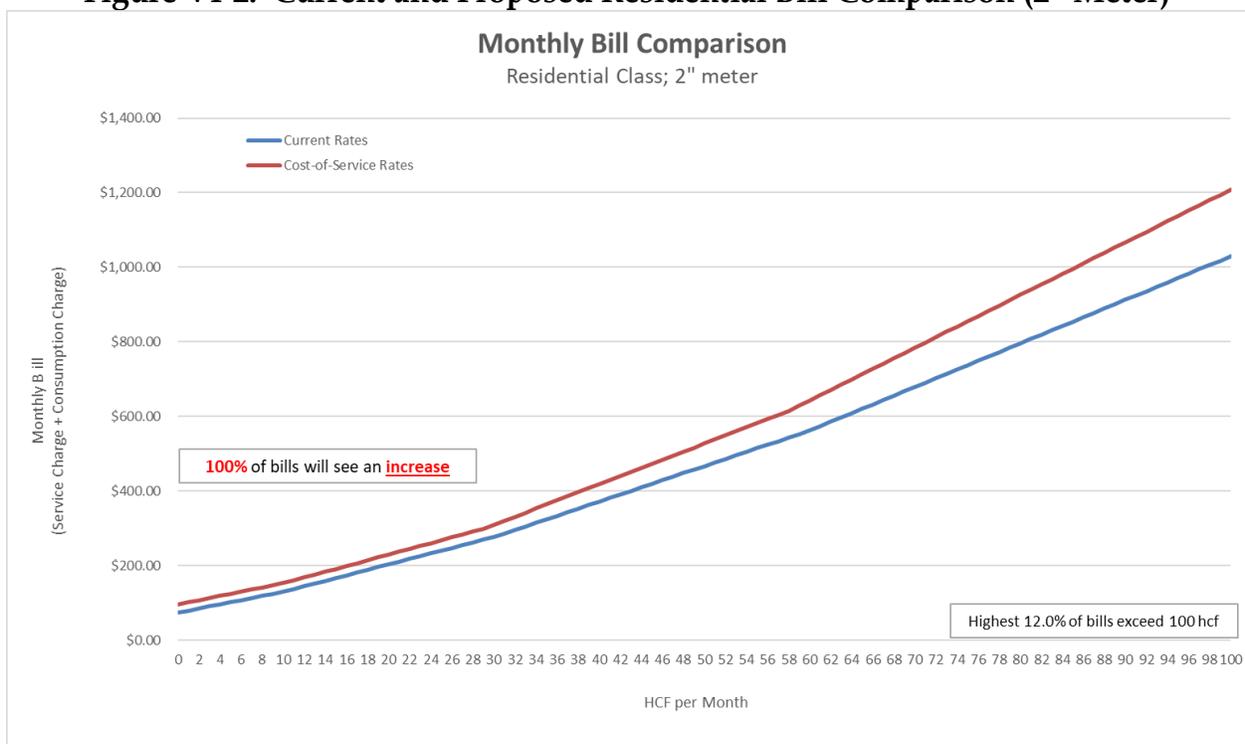


Table VI-2. Residential Bill Impacts - FY 2021-22 (3/4" Meter)

Water Use HCF/Mo	Gal/Day	Total Bill		\$ Difference	% of Bills	Cumulative
		Current Rates	Proposed Rates			
		a	b	c	d	e
0	0	\$22.50	\$32.18	\$9.68	3.17%	3.17%
1	25	\$28.14	\$37.88	\$9.74	2.63%	5.80%
2	50	\$33.78	\$43.57	\$9.79	3.22%	9.02%
3	75	\$39.42	\$49.27	\$9.85	4.29%	13.31%
4	100	\$45.06	\$54.97	\$9.91	4.84%	18.15%
5	125	\$50.70	\$60.66	\$9.96	5.06%	23.21%
6	150	\$56.34	\$66.36	\$10.02	4.52%	27.73%
7	175	\$61.98	\$72.06	\$10.08	4.22%	31.94%
8	199	\$67.62	\$77.75	\$10.13	3.92%	35.87%
9	224	\$73.26	\$83.45	\$10.19	3.41%	39.27%
10	249	\$78.90	\$89.15	\$10.25	2.99%	42.27%
11	274	\$86.23	\$96.82	\$10.59	2.75%	45.02%
12	299	\$93.56	\$104.49	\$10.93	2.52%	47.54%
13	324	\$100.89	\$112.16	\$11.27	2.27%	49.82%
14	349	\$108.22	\$119.83	\$11.61	2.05%	51.87%
15	374	\$115.55	\$127.50	\$11.95	1.92%	53.78%
16	399	\$122.88	\$135.18	\$12.30	1.79%	55.57%
17	424	\$130.21	\$142.85	\$12.64	1.83%	57.40%
18	449	\$137.54	\$150.52	\$12.98	1.74%	59.13%
19	474	\$144.87	\$158.19	\$13.32	1.56%	60.69%
20	499	\$152.20	\$165.86	\$13.66	1.56%	62.25%
21	524	\$159.53	\$173.53	\$14.00	1.38%	63.63%
22	549	\$166.86	\$181.21	\$14.35	1.37%	65.00%
23	573	\$174.19	\$188.88	\$14.69	1.44%	66.44%
24	598	\$181.52	\$196.55	\$15.03	1.29%	67.74%
25	623	\$188.85	\$204.22	\$15.37	1.19%	68.93%
26	648	\$196.18	\$211.89	\$15.71	1.25%	70.18%
27	673	\$203.51	\$219.56	\$16.05	1.08%	71.25%
28	698	\$210.84	\$227.24	\$16.40	1.05%	72.30%
29	723	\$218.17	\$234.91	\$16.74	0.98%	73.28%
30	748	\$225.50	\$245.80	\$20.30	0.96%	74.24%
31	773	\$235.02	\$256.69	\$21.67	0.91%	75.16%
32	798	\$244.54	\$267.59	\$23.05	0.87%	76.03%
33	823	\$254.06	\$278.48	\$24.42	0.90%	76.92%
34	848	\$263.58	\$289.37	\$25.79	0.86%	77.79%
35	873	\$273.10	\$300.26	\$27.16	0.76%	78.55%
36	898	\$282.62	\$311.16	\$28.54	0.76%	79.31%
37	923	\$292.14	\$322.05	\$29.91	0.75%	80.06%
38	947	\$301.66	\$332.94	\$31.28	0.70%	80.77%
39	972	\$311.18	\$343.84	\$32.66	0.67%	81.44%
40	997	\$320.70	\$354.73	\$34.03	0.61%	82.05%
41	1022	\$330.22	\$365.62	\$35.40	0.62%	82.67%
42	1047	\$339.74	\$376.51	\$36.77	0.55%	83.22%
43	1072	\$349.26	\$387.41	\$38.15	0.59%	83.81%
44	1097	\$358.78	\$398.30	\$39.52	0.57%	84.38%
45	1122	\$368.30	\$409.19	\$40.89	0.52%	84.90%
46	1147	\$377.82	\$420.09	\$42.27	0.49%	85.39%
47	1172	\$387.34	\$430.98	\$43.64	0.58%	85.98%
48	1197	\$396.86	\$441.87	\$45.01	0.49%	86.47%
49	1222	\$406.38	\$452.76	\$46.38	0.46%	86.93%
50	1247	\$415.90	\$463.66	\$47.76	0.49%	87.42%
51	1272	\$425.42	\$474.55	\$49.13	0.47%	87.89%
52	1297	\$434.94	\$485.44	\$50.50	0.42%	88.31%
53	1321	\$444.46	\$496.33	\$51.87	0.43%	88.74%
54	1346	\$453.98	\$507.23	\$53.25	0.41%	89.15%
55	1371	\$463.50	\$518.12	\$54.62	0.36%	89.51%
56	1396	\$473.02	\$529.01	\$55.99	0.36%	89.87%
57	1421	\$482.54	\$539.91	\$57.37	0.35%	90.22%
58	1446	\$492.06	\$550.80	\$58.74	0.36%	90.58%
59	1471	\$501.58	\$564.94	\$63.36	0.30%	90.88%
60	1496	\$511.10	\$579.09	\$67.99	0.34%	91.22%
61	1521	\$522.79	\$593.23	\$70.44	0.31%	91.53%
62	1546	\$534.48	\$607.37	\$72.89	0.30%	91.83%
63	1571	\$546.17	\$621.52	\$75.35	0.29%	92.12%
64	1596	\$557.86	\$635.66	\$77.80	0.24%	92.36%
65	1621	\$569.55	\$649.80	\$80.25	0.27%	92.62%
66	1646	\$581.24	\$663.95	\$82.71	0.28%	92.90%
67	1671	\$592.93	\$678.09	\$85.16	0.28%	93.18%
68	1695	\$604.62	\$692.24	\$87.62	0.25%	93.43%
69	1720	\$616.31	\$706.38	\$90.07	0.24%	93.67%
70	1745	\$628.00	\$720.52	\$92.52	0.23%	93.90%
71	1770	\$639.69	\$734.67	\$94.98	0.24%	94.14%
72	1795	\$651.38	\$748.81	\$97.43	0.21%	94.35%
73	1820	\$663.07	\$762.95	\$99.88	0.19%	94.54%
74	1845	\$674.76	\$777.10	\$102.34	0.23%	94.77%
75	1870	\$686.45	\$791.24	\$104.79	0.19%	94.96%

It is important to realize that **Figure VI-1** exemplifies only ¾-inch meters, which are the most common meter size at the District. However, one-third of the meters are larger than ¾-inch meters. The impact on residential customer bills with 2-inch meters is shown in **Figure VI-2**. Customers with 2-inch meters will see increases at every level of consumption.

Figure VI-2. Current and Proposed Residential Bill Comparison (2" Meter)



To further understand the impact of the proposed rates on residential customers, a group of five customers with ¾" meters was compared for twelve months, ranging from annual demand approximating the 10th percentile⁸ (i.e., 10% of cumulative annual demand was this amount or less) to demand at approximately the 90th percentile (i.e., 90% of the cumulative annual demand was this amount or less). The comparison is shown in **Figure VI-3** along with the breakpoints for the four tiers. The variation shows seasonal fluctuations indicating that the median (50th percentile) customer stayed within Tiers 1 and 2 for the whole year. 75th percentile and 90th percentile customers are predominantly in Tiers 3 and 4.

⁸ Note: the percentiles are approximations used for ease of discussion. In effect, sample residential customers in five categories ranging from very low to very high use are used for illustrative purposes.

Figure VI-3. Comparison of Monthly Residential Demands

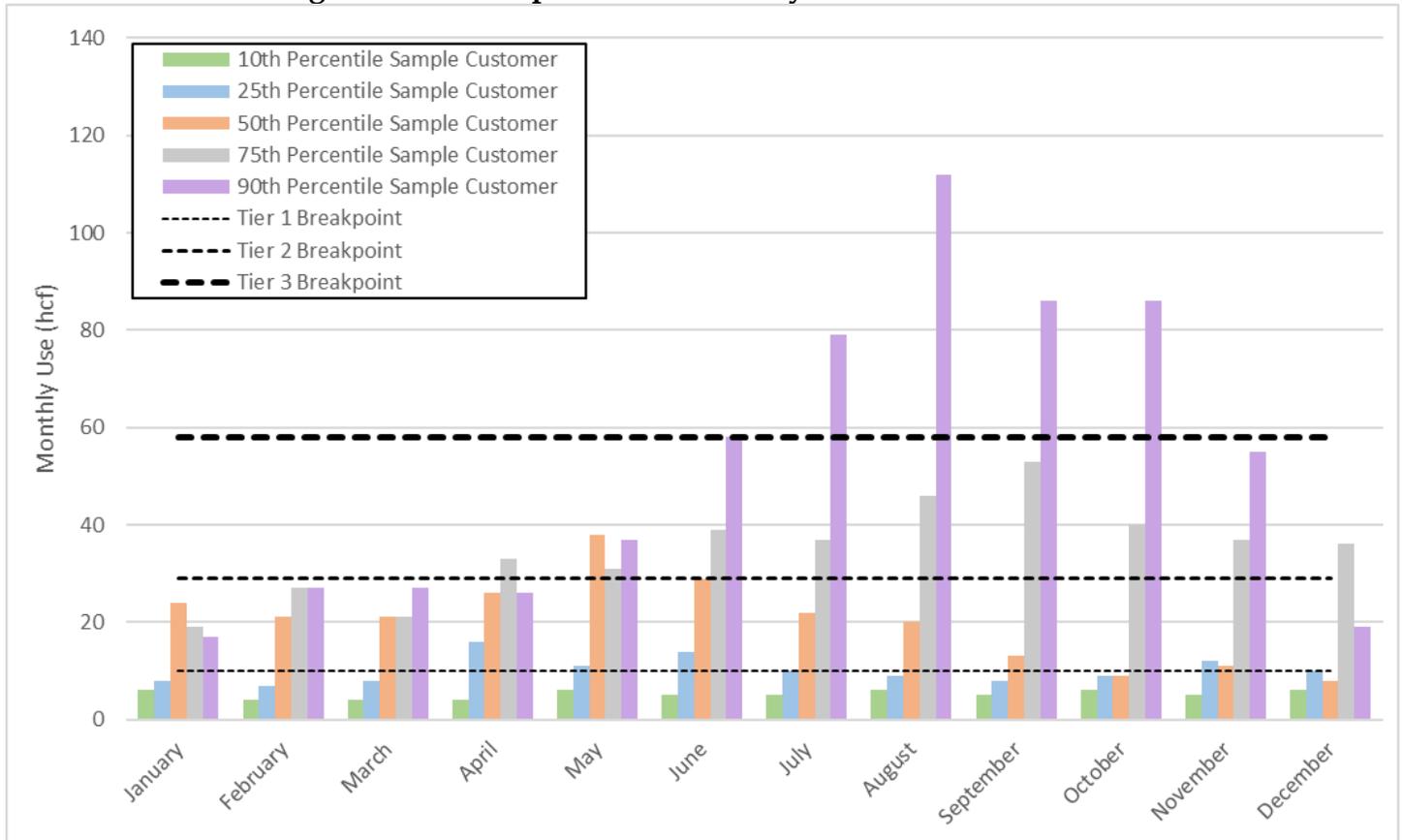


Table VI-3 tabulates the monthly bills for each of the five customers in **Figure VI-3** under the current rates (without the revenue increase) and the proposed FY 2021-22 rates. The annual cumulative total amount shows the net impact.

Table VI-3. Monthly Residential Bill and Annual Cumulative Bill Impacts

	January	February	March	April	May	June	July	August	September	October	November	December	Total
10th Percentile Sample Customer													
Consumption (hcf)	6	4	4	4	6	5	5	6	5	6	5	6	62
Current Bill													
RTS Charge	\$22.55	\$22.55	\$22.55	\$22.55	\$22.55	\$22.55	\$22.55	\$22.55	\$22.55	\$22.55	\$22.55	\$22.55	\$22.55
Water Use Charge	\$33.84	\$22.56	\$22.56	\$22.56	\$33.84	\$28.20	\$28.20	\$33.84	\$28.20	\$33.84	\$28.20	\$33.84	\$33.84
Total Bill	\$56.39	\$45.11	\$45.11	\$45.11	\$56.39	\$50.75	\$50.75	\$56.39	\$50.75	\$56.39	\$50.75	\$56.39	\$620.28
Proposed Bill													
RTS Charge	\$32.18	\$32.18	\$32.18	\$32.18	\$32.18	\$32.18	\$32.18	\$32.18	\$32.18	\$32.18	\$32.18	\$32.18	\$32.18
Water Use Charge	\$34.18	\$22.79	\$22.79	\$22.79	\$34.18	\$28.48	\$28.48	\$34.18	\$28.48	\$34.18	\$28.48	\$34.18	\$34.18
Total Bill	\$66.36	\$54.97	\$54.97	\$54.97	\$66.36	\$60.66	\$60.66	\$66.36	\$60.66	\$66.36	\$60.66	\$66.36	\$739.35
Difference	\$9.97	\$9.86	\$9.86	\$9.86	\$9.97	\$9.91	\$9.91	\$9.97	\$9.91	\$9.97	\$9.91	\$9.97	\$119.07
25th Percentile Sample Customer													
Consumption (hcf)	8	7	8	16	11	14	10	9	8	9	12	10	122
Current Bill													
RTS Charge	\$22.55	\$22.55	\$22.55	\$22.55	\$22.55	\$22.55	\$22.55	\$22.55	\$22.55	\$22.55	\$22.55	\$22.55	\$22.55
Water Use Charge	\$45.12	\$39.48	\$45.12	\$100.38	\$63.73	\$85.72	\$56.40	\$50.76	\$45.12	\$50.76	\$71.06	\$56.40	\$56.40
Total Bill	\$67.67	\$62.03	\$67.67	\$122.93	\$86.28	\$108.27	\$78.95	\$73.31	\$67.67	\$73.31	\$93.61	\$78.95	\$980.65
Proposed Bill													
RTS Charge	\$32.18	\$32.18	\$32.18	\$32.18	\$32.18	\$32.18	\$32.18	\$32.18	\$32.18	\$32.18	\$32.18	\$32.18	\$32.18
Water Use Charge	\$45.57	\$39.88	\$45.57	\$103.00	\$64.64	\$87.65	\$56.97	\$51.27	\$45.57	\$51.27	\$72.31	\$56.97	\$56.97
Total Bill	\$77.75	\$72.06	\$77.75	\$135.18	\$96.82	\$119.83	\$89.15	\$83.45	\$77.75	\$83.45	\$104.49	\$89.15	\$1,106.82
Difference	\$10.08	\$10.03	\$10.08	\$12.25	\$10.54	\$11.56	\$10.20	\$10.14	\$10.08	\$10.14	\$10.88	\$10.20	\$126.17
50th Percentile Sample Customer													
Consumption (hcf)	24	21	21	26	38	29	22	20	13	9	11	8	242
Current Bill													
RTS Charge	\$22.55	\$22.55	\$22.55	\$22.55	\$22.55	\$22.55	\$22.55	\$22.55	\$22.55	\$22.55	\$22.55	\$22.55	\$22.55
Water Use Charge	\$159.02	\$137.03	\$137.03	\$173.68	\$279.16	\$195.67	\$144.36	\$129.70	\$78.39	\$50.76	\$63.73	\$45.12	\$45.12
Total Bill	\$181.57	\$159.58	\$159.58	\$196.23	\$301.71	\$218.22	\$166.91	\$152.25	\$100.94	\$73.31	\$86.28	\$67.67	\$1,864.25
Proposed Bill													
RTS Charge	\$32.18	\$32.18	\$32.18	\$32.18	\$32.18	\$32.18	\$32.18	\$32.18	\$32.18	\$32.18	\$32.18	\$32.18	\$32.18
Water Use Charge	\$164.37	\$141.36	\$141.36	\$179.71	\$300.76	\$202.73	\$149.03	\$133.68	\$79.98	\$51.27	\$64.64	\$45.57	\$45.57
Total Bill	\$196.55	\$173.53	\$173.53	\$211.89	\$332.94	\$234.91	\$181.21	\$165.86	\$112.16	\$83.45	\$96.82	\$77.75	\$2,040.61
Difference	\$14.98	\$13.95	\$13.95	\$15.66	\$31.23	\$16.69	\$14.30	\$13.61	\$11.22	\$10.14	\$10.54	\$10.08	\$176.36
75th Percentile Sample Customer													
Consumption (hcf)	19	27	21	33	31	39	37	46	53	40	37	36	419
Current Bill													
RTS Charge	\$22.55	\$22.55	\$22.55	\$22.55	\$22.55	\$22.55	\$22.55	\$22.55	\$22.55	\$22.55	\$22.55	\$22.55	\$22.55
Water Use Charge	\$122.37	\$181.01	\$137.03	\$231.56	\$212.52	\$288.68	\$269.64	\$355.32	\$421.96	\$298.20	\$269.64	\$260.12	\$260.12
Total Bill	\$144.92	\$203.56	\$159.58	\$254.11	\$235.07	\$311.23	\$292.19	\$377.87	\$444.51	\$320.75	\$292.19	\$282.67	\$3,318.65
Proposed Bill													
RTS Charge	\$32.18	\$32.18	\$32.18	\$32.18	\$32.18	\$32.18	\$32.18	\$32.18	\$32.18	\$32.18	\$32.18	\$32.18	\$32.18
Water Use Charge	\$126.01	\$187.39	\$141.36	\$246.30	\$224.51	\$311.66	\$289.87	\$387.91	\$464.16	\$322.55	\$289.87	\$278.98	\$278.98
Total Bill	\$158.19	\$219.56	\$173.53	\$278.48	\$256.69	\$343.84	\$322.05	\$420.09	\$496.33	\$354.73	\$322.05	\$311.16	\$3,656.70
Difference	\$13.27	\$16.00	\$13.95	\$24.37	\$21.62	\$32.61	\$29.86	\$42.22	\$51.82	\$33.98	\$29.86	\$28.49	\$338.05
90th Percentile Sample Customer													
Consumption (hcf)	17	27	27	26	37	58	79	112	86	86	55	19	629
Current Bill													
RTS Charge	\$22.55	\$22.55	\$22.55	\$22.55	\$22.55	\$22.55	\$22.55	\$22.55	\$22.55	\$22.55	\$22.55	\$22.55	\$22.55
Water Use Charge	\$107.71	\$181.01	\$181.01	\$173.68	\$269.64	\$469.56	\$710.71	\$1,122.52	\$792.54	\$792.54	\$441.00	\$122.37	\$122.37
Total Bill	\$130.26	\$203.56	\$203.56	\$196.23	\$292.19	\$492.11	\$733.26	\$1,145.07	\$815.09	\$815.09	\$463.55	\$144.92	\$5,634.89
Proposed Bill													
RTS Charge	\$32.18	\$32.18	\$32.18	\$32.18	\$32.18	\$32.18	\$32.18	\$32.18	\$32.18	\$32.18	\$32.18	\$32.18	\$32.18
Water Use Charge	\$110.67	\$187.39	\$187.39	\$179.71	\$289.87	\$518.62	\$815.64	\$1,282.38	\$914.64	\$914.64	\$485.94	\$126.01	\$126.01
Total Bill	\$142.85	\$219.56	\$219.56	\$211.89	\$322.05	\$550.80	\$847.82	\$1,314.56	\$946.82	\$946.82	\$518.12	\$158.19	\$6,399.06
Difference	\$12.59	\$16.00	\$16.00	\$15.66	\$29.86	\$58.69	\$114.56	\$169.49	\$131.73	\$131.73	\$54.57	\$13.27	\$764.17

Additional customer bill impacts are shown for ¾-inch, 1-inch, 1 1/2 -inch, and 2-inch meter residential customers in the following figures. Each figure contains two histograms. The Y-axis on the first histogram indicates the annual dollar impact on customers comparing bills under the proposed rate structure with bills under the current rate structure (with no revenue increase). The Y-axis on the second histogram indicates the percentage differences. Note that the same scale for the Y-axes is maintained for all of the meter sizes. The X-axis on all of the histograms indicates the ranking of the customers from lowest annual demand to highest annual demand. Note also that the customers included in this figures had twelve months of consumption; customers with less than a continuous full year of twelve bills were excluded.

Figure VI-4. Annual Dollar and Percentage Change In Residential Cost - 3/4" Meters

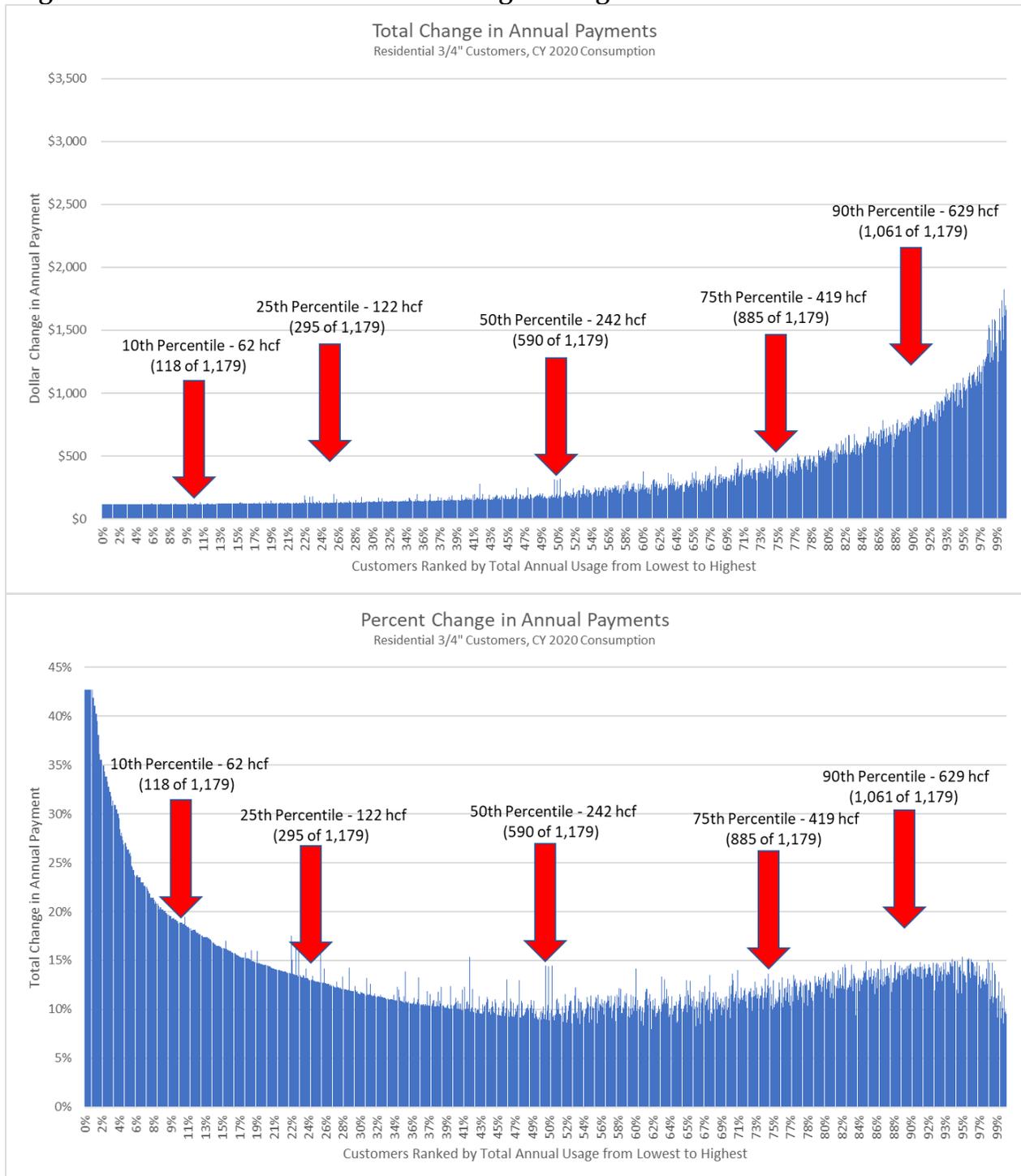


Figure VI-5. Annual Dollar and Percentage Change In Residential Cost - 1" Meters

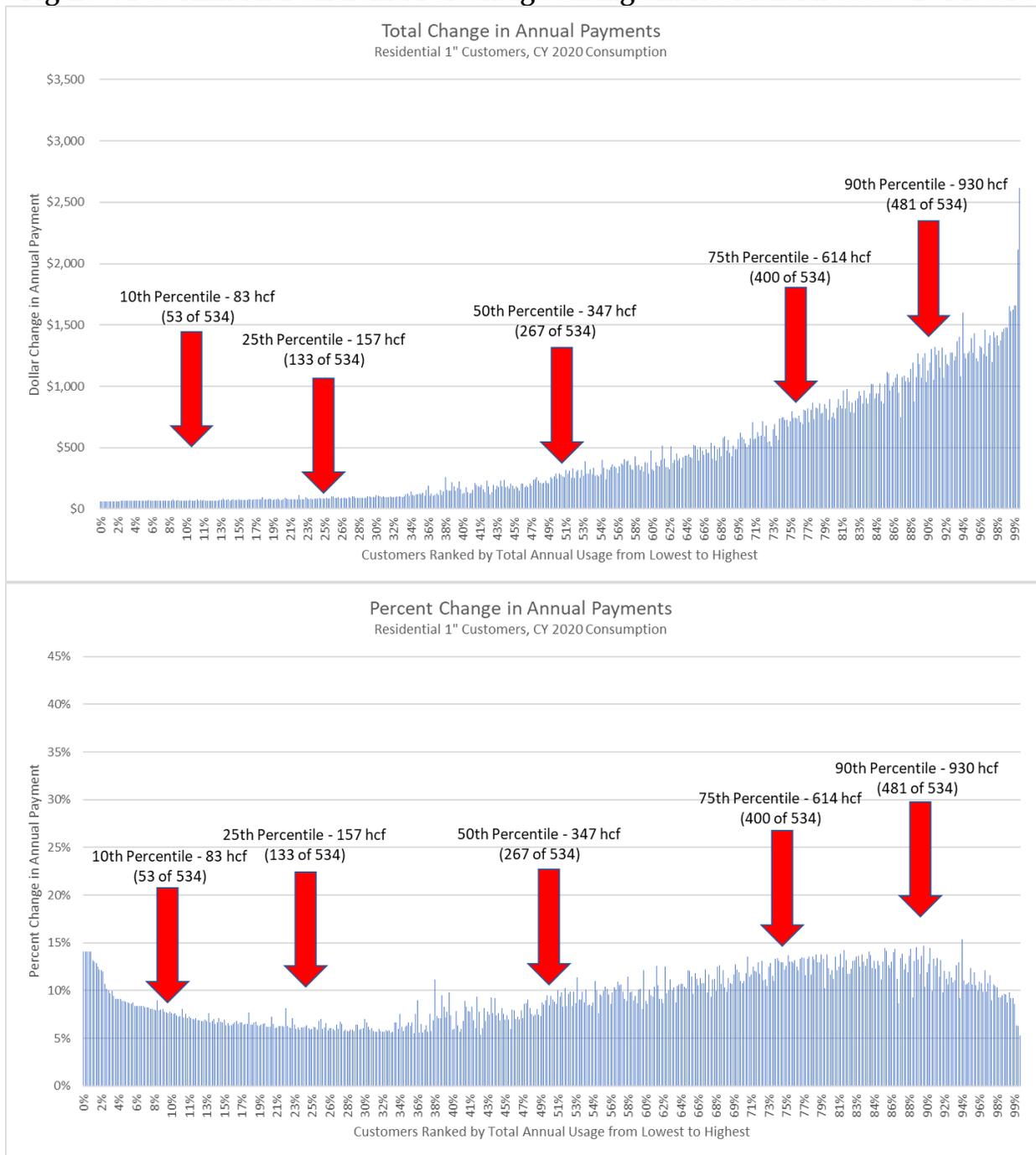


Figure VI-6. Annual Dollar and Percentage Change In Residential Cost - 1.5" Meters

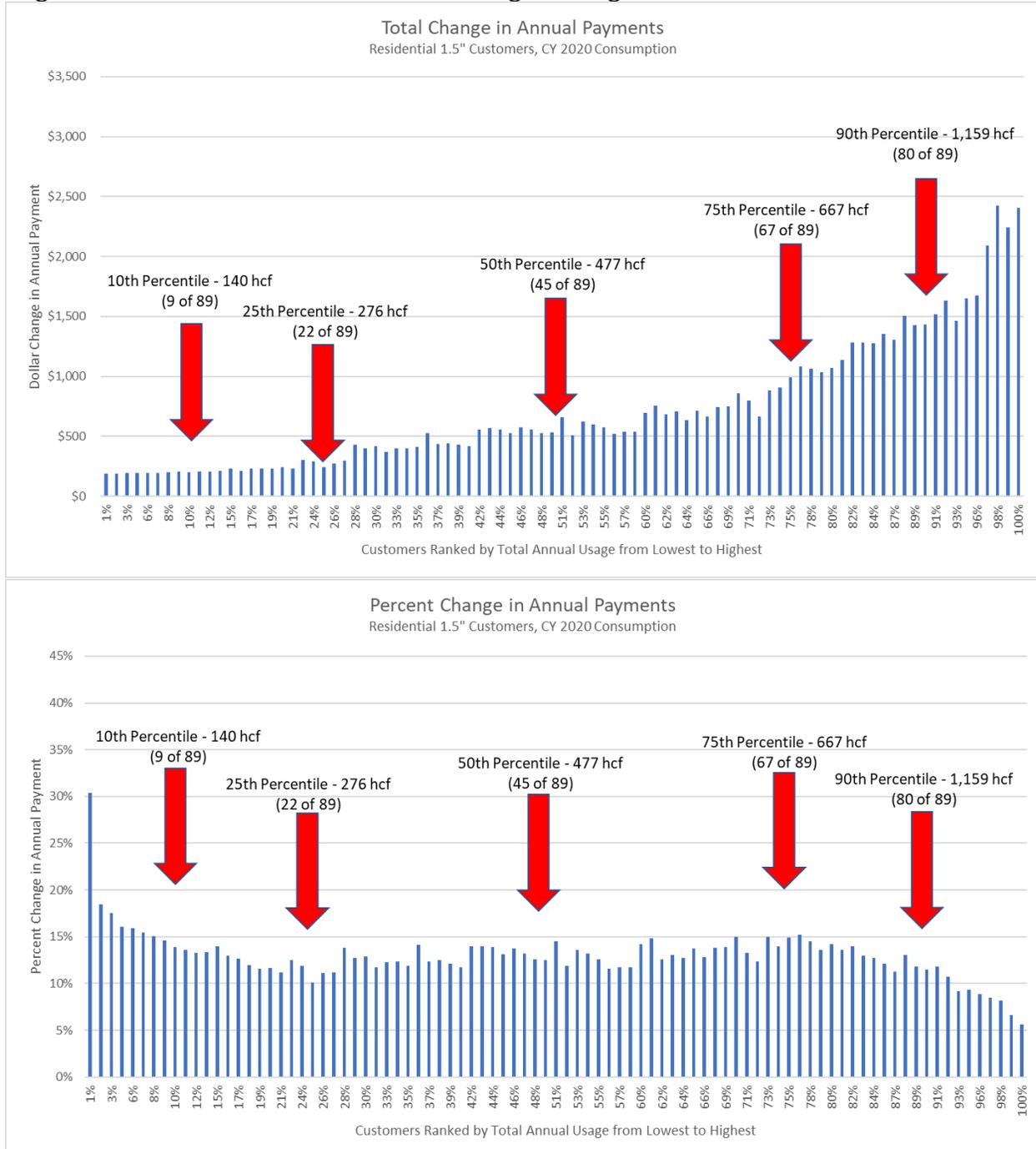
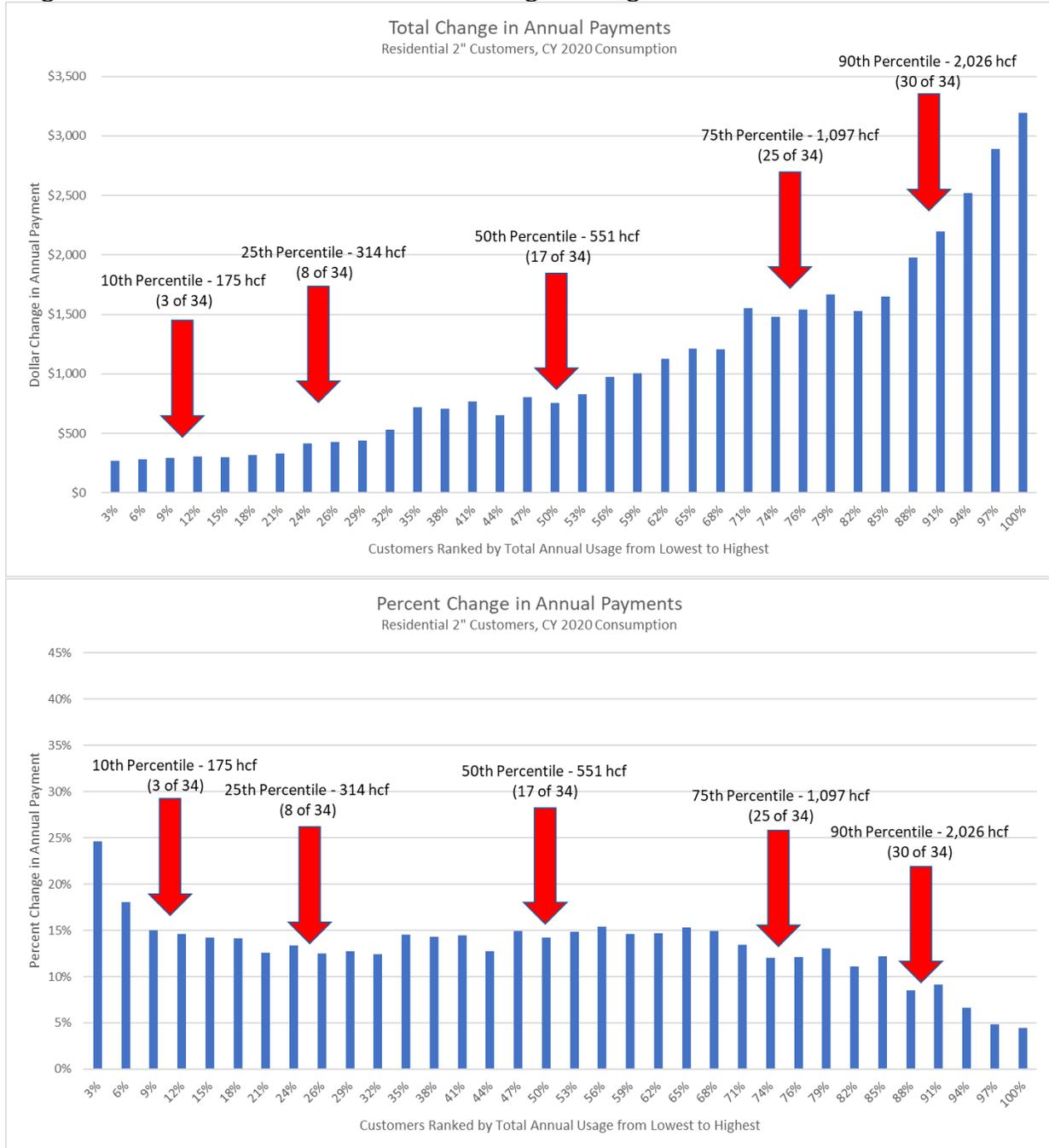


Figure VI-7. Annual Dollar and Percentage Change In Residential Cost - 2" Meters



COMPARISON WITH OTHER AGENCIES

Figure VI-8 compares the District’s residential monthly bills with a variety of water agencies in San Mateo County. The comparison is for a customer with a ¾- inch connection using 10 HCF in each agency. Figure VI-8 shows the fixed and consumption charges for each agency. The District’s proposed bill shows how the proposed increase in the RTS compares with other agencies. Basing this comparison on 10 HCF for each agency is one

form of comparison. However, we note that the consumption charges do not account for the average use at each agency, which bears significantly on what the consumption charges need to be to cover each agency’s cost. For example, Coastside County Water District (Half Moon Bay area) has high consumption charge rates because its water use is comparatively low; average water use per month per residence is 6 HCF compared with 29 HCF at the District.

Figure VI-8. Bill Comparison With Neighboring Agencies (10 HCF)

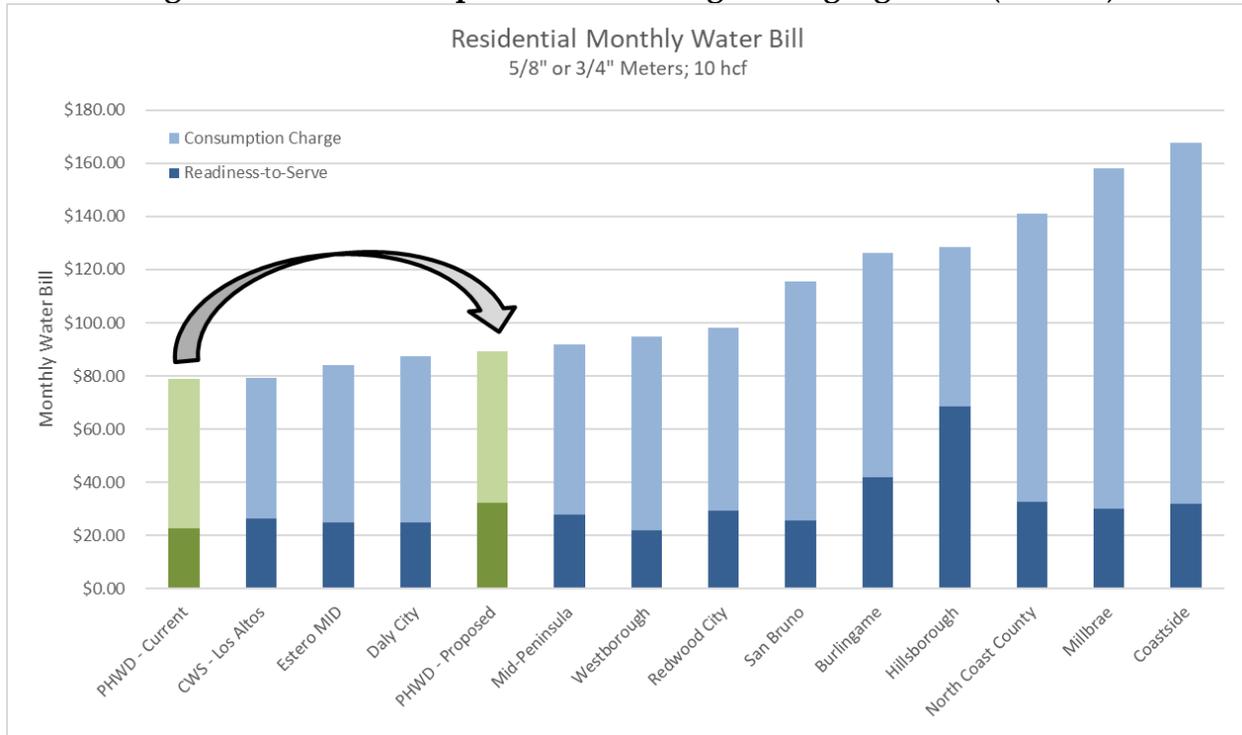


Figure VI-9 was prepared to compare the District’s residential monthly bills with the same water agencies using the *average* amount of water for customers in each agency (rather than a constant 10 HCF as in **Figure VI-3**). Monthly bills on the Y-axis are plotted against population served on the X-axis.

Figure VI-9. Average Residential Bill Comparison With Neighboring Agencies

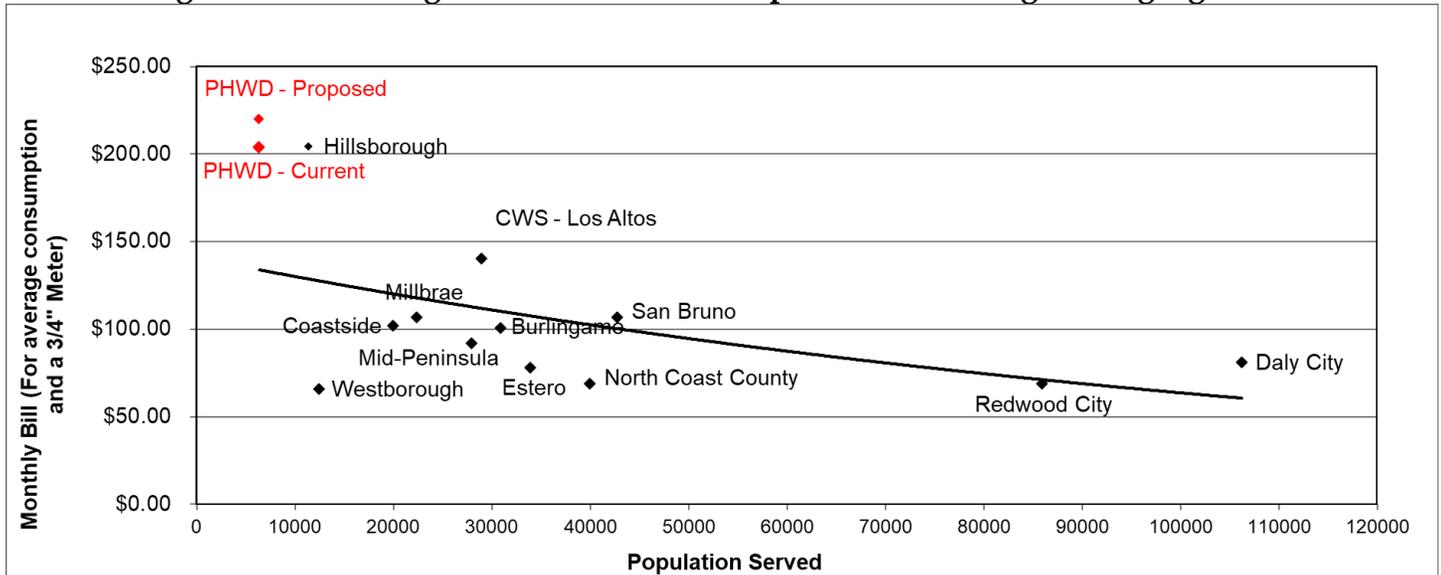


Figure VI-9 shows that an average bill for the District’s customers is most comparable to average bills in the Town of Hillsborough. Both bills are the highest of those surveyed for at least two reasons. First, both agencies are comparatively small and do not get the benefit of economies of scale that larger agencies get. More significant, however, is the fact that both the District and Hillsborough are comparatively less densely developed than other agencies surveyed. This means that there is more infrastructure required to serve each parcel in the District than, for example, in Daly City, the largest city in San Mateo County. Not only is Daly City much larger, its density is much greater than the District’s.

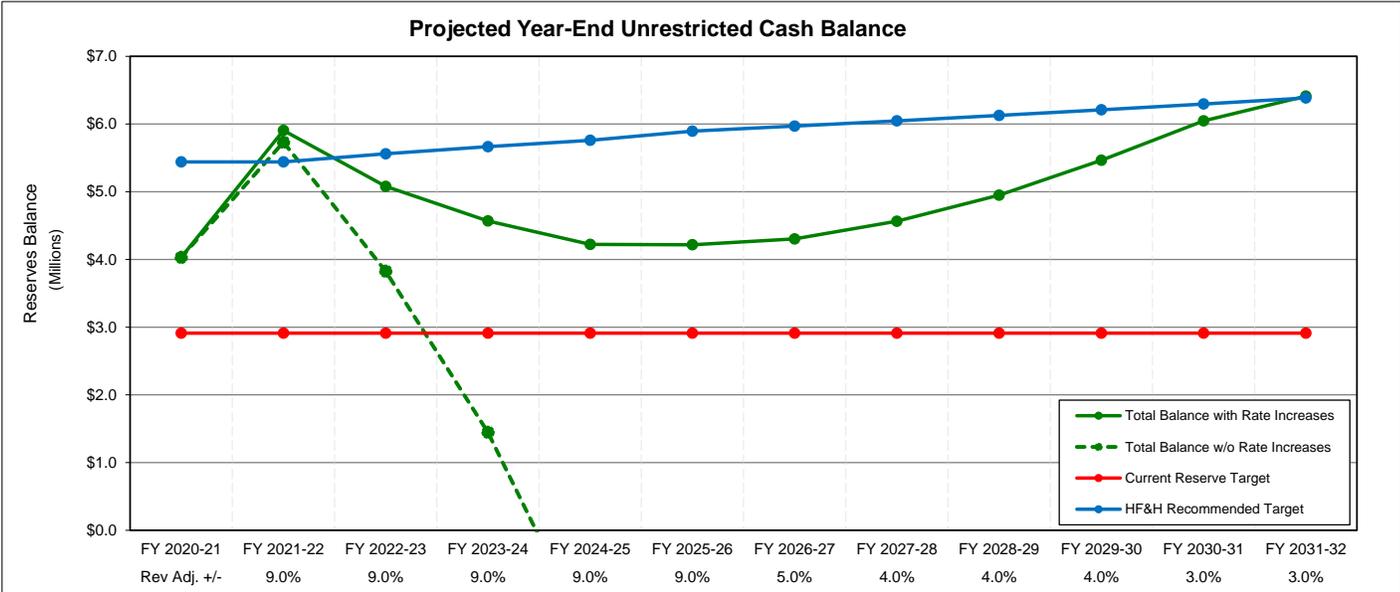
We note that cooler coastal communities served by Coastside, North Coast, Daly City and Westborough have comparatively low bills when their respective average consumption is used for the bill comparison. Agencies like the District and Hillsborough are not only smaller, less densely developed, but are also inland with hotter climates, which explains why they are clustered with the highest bills in **Figure VI-9**.

WATER RATE STUDY

APPENDIX

WATER RATE MODEL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Purissima Hills Water District													
2	Water Rate Model													
3	Table 1A - Summary													
4														
5		Fiscal year	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25	FY 2025-26	FY 2026-27	FY 2027-28	FY 2028-29	FY 2029-30	FY 2030-31	FY 2031-32	Notes
6		Eff. Date	4/1/2022	1/1/2023	1/1/2024	1/1/2025	1/1/2026	1/1/2027	1/1/2028	1/1/2029	1/1/2030	1/1/2031	1/1/2032	
7														
8		Annual Rate Revenue Increases	9.0%	9.0%	9.0%	9.0%	9.0%	5.0%	4.0%	4.0%	4.0%	3.0%	3.0%	To Tables 3, 4, 6
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	A	B	C	D	E	F	G	H	I	J	K	L	M
1		Purissima Hills Water District											
2		Water Rate Model											
3		Table 1B - Assumptions											
4													
5													
6		Budget				Projected							
7		FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25	FY 2025-26	FY 2026-27	FY 2027-28	FY 2028-29	FY 2029-30	FY 2030-31	FY 2031-32	
8	a	Annual Account Growth Rate	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%
9	b	Annual Water Demand Increases	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%
10	c	General Inflation	Budgeted 3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
11	d	Salaries & Wages	Budgeted 3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
12	e	Benefits	Budgeted 5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%
13	f	Utilities	Budgeted 4.03%	4.03%	4.03%	4.03%	4.03%	4.03%	4.03%	4.03%	4.03%	4.03%	4.03%
14	g	Construction Cost Inflation	3.29%	3.29%	3.29%	3.29%	3.29%	3.29%	3.29%	3.29%	3.29%	3.29%	3.29%
15	h	Interest on Fund Balance	0.40%	0.40%	0.40%	0.40%	0.40%	0.40%	0.40%	0.40%	0.40%	0.40%	0.40%
16	i	Annual SFR conservation reduction	Budgeted 0.0%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
17	j	SFPUC Quantity Charge per hcf	\$4.10	\$4.32	\$4.65	\$4.92	\$5.37	\$5.53	\$5.70	\$5.87	\$6.04	\$6.23	\$6.41
18	k	SFPUC Estimated Annual Increase	5.4%	7.6%	5.8%	9.1%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
19	l	BAWSCA Debt Service Surcharges	\$321,720	\$321,720	\$321,720	\$321,720	\$321,720	\$321,720	\$321,720	\$321,720	\$321,720	\$321,720	\$321,720
20	m	SFPUC Water Service Charge	\$78,624	\$78,624	\$78,624	\$78,624	\$78,624	\$78,624	\$78,624	\$78,624	\$78,624	\$78,624	\$78,624
21	n	Water Sales (hcf)	791,732	799,650	807,646	815,723	823,880	832,119	840,440	848,844	857,333	865,906	874,565

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	Purissima Hills Water District															
2	Water Rate Model															
3	Table 3A - Revenue Increases															
4																
5																
6		Months														
7		Increase														
8		In Effect														
9	Rate Revenue at Current Rates															
10	Water Rate Revenue		\$7,737,002	\$7,737,002	\$7,737,002	\$7,737,002	\$7,737,002	\$7,737,002	\$7,737,002	\$7,737,002	\$7,737,002	\$7,737,002	\$7,737,002	\$7,737,002	\$7,737,002	Average of FY 2021-22 Operating Budget and FY 2020-21 Actual
11	Total Revenue (before rate increases)		\$7,737,002	\$7,737,002	\$7,737,002	\$7,737,002	\$7,737,002	\$7,737,002	\$7,737,002	\$7,737,002	\$7,737,002	\$7,737,002	\$7,737,002	\$7,737,002	\$7,737,002	
12	Increase in Rate Revenue		9.0%	9.0%	9.0%	9.0%	9.0%	5.0%	4.0%	4.0%	4.0%	3.0%	3.0%		From Table 1B	
13		cumulative	9.0%	18.8%	29.5%	41.2%	53.9%	61.6%	68.0%	74.7%	81.7%	87.2%	92.8%			
14																
15	Revenue from Current Rates		\$7,737,002	\$7,737,002	\$7,737,002	\$7,737,002	\$7,737,002	\$7,737,002	\$7,737,002	\$7,737,002	\$7,737,002	\$7,737,002	\$7,737,002	\$7,737,002	\$7,737,002	
16																
17	Revenue from Rate Increases															
18	FY 2021-22 (eff. Apr 1, 2022)	3	\$174,083	\$696,330	\$696,330	\$696,330	\$696,330	\$696,330	\$696,330	\$696,330	\$696,330	\$696,330	\$696,330	\$696,330	\$696,330	
19	FY 2022-23 (eff. Jan 1, 2023)	6		\$379,500	\$759,000	\$759,000	\$759,000	\$759,000	\$759,000	\$759,000	\$759,000	\$759,000	\$759,000	\$759,000	\$759,000	
20	FY 2023-24 (eff. Jan 1, 2024)	6			\$413,655	\$827,310	\$827,310	\$827,310	\$827,310	\$827,310	\$827,310	\$827,310	\$827,310	\$827,310	\$827,310	
21	FY 2024-25 (eff. Jan 1, 2025)	6				\$450,884	\$901,768	\$901,768	\$901,768	\$901,768	\$901,768	\$901,768	\$901,768	\$901,768	\$901,768	
22	FY 2025-26 (eff. Jan 1, 2026)	6					\$491,463	\$982,927	\$982,927	\$982,927	\$982,927	\$982,927	\$982,927	\$982,927	\$982,927	
23	FY 2026-27 (eff. Jan 1, 2027)	6						\$297,608	\$595,217	\$595,217	\$595,217	\$595,217	\$595,217	\$595,217	\$595,217	
24	FY 2027-28 (eff. Jan 1, 2028)	6							\$249,991	\$499,982	\$499,982	\$499,982	\$499,982	\$499,982	\$499,982	
25	FY 2028-29 (eff. Jan 1, 2029)	6								\$259,991	\$519,981	\$519,981	\$519,981	\$519,981	\$519,981	
26	FY 2029-30 (eff. Jan 1, 2030)	6									\$270,390	\$540,781	\$540,781	\$540,781	\$540,781	
27	FY 2030-31 (eff. Jan 1, 2031)	6										\$210,904	\$210,904	\$210,904	\$210,904	
28	FY 2031-32 (eff. Jan 1, 2032)	6											\$214,068	\$214,068	\$214,068	
29	Total Revenue from Rate Increases		\$174,083	\$1,075,830	\$1,868,985	\$2,733,524	\$3,675,871	\$4,464,943	\$5,012,542	\$5,522,524	\$6,052,905	\$6,534,200	\$6,748,268	\$6,748,268	\$6,748,268	
30	Total Current Revenue		\$7,737,002	\$7,737,002	\$7,737,002	\$7,737,002	\$7,737,002	\$7,737,002	\$7,737,002	\$7,737,002	\$7,737,002	\$7,737,002	\$7,737,002	\$7,737,002	\$7,737,002	From above
31	Total Revenue with Rate Increases		\$7,911,084	\$8,812,832	\$9,605,986	\$10,470,525	\$11,412,872	\$12,201,944	\$12,749,544	\$13,259,525	\$13,789,906	\$14,271,201	\$14,485,269	\$14,485,269	\$14,485,269	To Table 6
32	Total Revenue Requirement		\$8,433,332	\$8,812,832	\$9,605,986	\$10,470,525	\$11,412,872	\$12,201,944	\$12,749,544	\$13,259,525	\$13,789,906	\$14,271,201	\$14,485,269	\$14,485,269	\$14,485,269	
33	Transfer to/(from) Reserves		(\$522,248)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	To Table 4
34																
35	Transfer to/(from) Reserves w/o rate increases		(\$696,330)	(\$1,075,830)	(\$1,868,985)	(\$2,733,524)	(\$3,675,871)	(\$4,464,943)	(\$5,012,542)	(\$5,522,524)	(\$6,052,905)	(\$6,534,200)	(\$6,748,268)	(\$6,748,268)	(\$6,748,268)	To Table 4
36																

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	
1	Purissima Hills Water District														
2	Water Rate Model														
3	Table 4 - Reserve Funds														
4		Reserves +/-	46.5%	-14.0%	-10.1%	-7.6%	-0.1%	2.0%	6.1%	8.4%	10.4%	10.6%	6.1%		
5		Rev Adj. +/-	9.0%	9.0%	9.0%	9.0%	9.0%	5.0%	4.0%	4.0%	4.0%	3.0%	3.0%		
6		Fiscal Year	FY 2020-21	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25	FY 2025-26	FY 2026-27	FY 2027-28	FY 2028-29	FY 2029-30	FY 2030-31	FY 2031-32	
7	Notes														
8	Operating Reserve														
9	Beginning Balance		\$2,519,949	\$1,111,011	\$57,877	(\$685,551)	(\$1,271,500)	(\$1,524,109)	(\$1,693,512)	(\$1,695,266)	(\$1,581,569)	(\$1,346,106)	(\$1,053,563)		
10	Transfers														
11	(to/from) Operations		(\$522,248)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	From Table 3	
12	(to/from) Rev. Requirements		(\$893,938)	(\$1,055,467)	(\$743,428)	(\$585,949)	(\$252,608)	(\$169,404)	(\$1,754)	\$113,698	\$235,463	\$292,543	\$68,238	To Table 2	
13	(to/from) Capital Reserve													To below	
14	(to/from) Unemployment Ins.		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
15	Fund Subtotal		\$1,103,764	\$55,544	(\$685,551)	(\$1,271,500)	(\$1,524,109)	(\$1,693,512)	(\$1,695,266)	(\$1,581,569)	(\$1,346,106)	(\$1,053,563)	(\$985,326)		
16	Estimated Interest Earnings		\$7,247	\$2,333	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	Avg. Bal. * Table 1A assumption f.	
17	Ending Balance with Rate Increase		\$2,519,949	\$1,111,011	\$57,877	(\$685,551)	(\$1,271,500)	(\$1,524,109)	(\$1,693,512)	(\$1,695,266)	(\$1,581,569)	(\$1,346,106)	(\$1,053,563)	\$4,031,649 per email from 12/19/2021	
18	Target Balance		\$1,400,000	\$1,400,000	\$1,400,000	\$1,400,000	\$1,400,000	\$1,400,000	\$1,400,000	\$1,400,000	\$1,400,000	\$1,400,000	\$1,400,000	\$1.4 million or 25% of O&M Budget	
19	Fund Balance Compared to Target		79%	4%	-49%	-91%	-109%	-121%	-121%	-113%	-96%	-75%	-70%		
20	Capital Reserve														
21	Beginning Balance		\$1,500,000	\$4,783,793	\$5,009,340	\$5,241,981	\$5,481,932	\$5,729,411	\$5,984,648	\$6,247,874	\$6,519,333	\$6,799,271	\$7,087,944		
22	Revenues														
23	(to/from) Rev. Requirements		\$3,071,250	\$3,172,243	\$3,276,556	\$3,384,300	\$3,495,587	\$3,610,533	\$3,729,259	\$3,851,890	\$3,978,552	\$4,109,380	\$4,244,510		
24	(to/from) Operating Fund		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
25	Storage Facility Charges		\$100,000	\$103,000	\$106,090	\$109,273	\$112,551	\$115,927	\$119,405	\$122,987	\$126,677	\$130,477	\$134,392		
26	Transmission Facility Charge		\$100,000	\$103,000	\$106,090	\$109,273	\$112,551	\$115,927	\$119,405	\$122,987	\$126,677	\$130,477	\$134,392		
27	Cash Funded CIP Expenditures		\$0	(\$3,172,243)	(\$3,276,556)	(\$3,384,300)	(\$3,495,587)	(\$3,610,533)	(\$3,729,259)	(\$3,851,890)	(\$3,978,552)	(\$4,109,380)	(\$4,244,510)	From Table 5	
28	Fund Subtotal		\$4,771,250	\$4,989,793	\$5,221,520	\$5,460,527	\$5,707,034	\$5,961,266	\$6,223,458	\$6,493,849	\$6,772,687	\$7,060,225	\$7,356,728		
29	Estimated Interest Earnings		\$12,543	\$19,547	\$20,462	\$21,405	\$22,378	\$23,381	\$24,416	\$25,483	\$26,584	\$27,719	\$28,889	Avg. Bal. * Table 1A assumption f.	
30	Ending Balance		\$1,500,000	\$4,783,793	\$5,009,340	\$5,241,981	\$5,481,932	\$5,729,411	\$5,984,648	\$6,247,874	\$6,519,333	\$6,799,271	\$7,087,944	\$7,385,617	
31	Target Balance		\$1,500,000	\$1,500,000	\$1,500,000	\$1,500,000	\$1,500,000	\$1,500,000	\$1,500,000	\$1,500,000	\$1,500,000	\$1,500,000	\$1,500,000	\$1.5 million	
32	Fund Balance Compared to Target			319%	334%	349%	365%	382%	399%	417%	435%	453%	473%	492%	
33	Unemployment Ins. Reserve														
34	Beginning Balance		\$11,700	\$11,747	\$11,794	\$11,841	\$11,888	\$11,936	\$11,984	\$12,032	\$12,080	\$12,128	\$12,177		
35	From Operating Fund		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
36	Expenditures		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	From Table 5	
37	Fund Subtotal		\$11,700	\$11,747	\$11,794	\$11,841	\$11,888	\$11,936	\$11,984	\$12,032	\$12,080	\$12,128	\$12,177		
38	Estimated Interest Earnings		\$47	\$47	\$47	\$47	\$48	\$48	\$48	\$48	\$48	\$48	\$49	Avg. Bal. * Table 1A assumption f.	
39	Ending Balance		\$11,700	\$11,747	\$11,794	\$11,841	\$11,888	\$11,936	\$11,984	\$12,032	\$12,080	\$12,128	\$12,177	Page 1 of FY 2021-22 Budget	
40	Target Balance		\$11,700	\$11,700	\$11,700	\$11,700	\$11,700	\$11,700	\$11,700	\$11,700	\$11,700	\$11,700	\$11,700	Target Level: \$11,700	
41	Fund Balance Compared to Target			100%	101%	101%	102%	102%	102%	103%	103%	104%	104%		
42	Operating Fund w/o Rate Increases														
43	Beginning Balance		\$2,519,949	\$936,581	(\$1,194,717)	(\$3,807,130)	(\$7,126,603)	(\$11,055,082)	(\$15,689,429)	(\$20,703,725)	(\$26,112,551)	(\$31,929,993)	(\$38,171,650)		
44	Transfers														
45	(to/from) Operations		(\$696,330)	(\$1,075,830)	(\$1,868,985)	(\$2,733,524)	(\$3,675,871)	(\$4,464,943)	(\$5,012,542)	(\$5,522,524)	(\$6,052,905)	(\$6,534,200)	(\$6,748,268)		
46	(to/from) Rev. Requirements		(\$893,938)	(\$1,055,467)	(\$743,428)	(\$585,949)	(\$252,608)	(\$169,404)	(\$1,754)	\$113,698	\$235,463	\$292,543	\$68,238		
47	(to/from) Capital Reserve		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
48	(to/from) Unemployment Ins.		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
49	Fund Subtotal		\$929,681	(\$1,194,717)	(\$3,807,130)	(\$7,126,603)	(\$11,055,082)	(\$15,689,429)	(\$20,703,725)	(\$26,112,551)	(\$31,929,993)	(\$38,171,650)	(\$44,851,680)		
50	Estimated Interest Earnings		\$6,899	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		
51	Ending Balance with Rate Increase		\$2,519,949	\$936,581	(\$1,194,717)	(\$3,807,130)	(\$7,126,603)	(\$11,055,082)	(\$15,689,429)	(\$20,703,725)	(\$26,112,551)	(\$31,929,993)	(\$38,171,650)	(\$44,851,680)	
52	Target Balance		\$1,400,000	\$1,400,000	\$1,400,000	\$1,400,000	\$1,400,000	\$1,400,000	\$1,400,000	\$1,400,000	\$1,400,000	\$1,400,000	\$1,400,000		
53	Fund Balance Compared to Target			67%	-85%	-272%	-509%	-790%	-1121%	-1479%	-1865%	-2281%	-2727%	-3204%	
54	Reserve Funds Summary														
55	Total Balance with Rate Increases		\$4,031,649	\$5,906,551	\$5,079,011	\$4,568,271	\$4,222,320	\$4,217,239	\$4,303,119	\$4,564,640	\$4,949,843	\$5,465,293	\$6,046,558	\$6,412,517	To Table 1B Graph
56	Total Balance w/o Rate Increases		\$4,031,649	\$5,732,120	\$3,826,417	\$1,446,692	(\$1,632,783)	(\$5,313,735)	(\$9,692,797)	(\$14,443,819)	(\$19,581,139)	(\$25,118,595)	(\$31,071,529)	(\$37,453,838)	
57	Operating Reserve Target		\$1,400,000	\$1,400,000	\$1,400,000	\$1,400,000	\$1,400,000	\$1,400,000	\$1,400,000	\$1,400,000	\$1,400,000	\$1,400,000	\$1,400,000	To Table 1B Graph	
58	Capital Reserve Target		\$1,500,000	\$1,500,000	\$1,500,000	\$1,500,000	\$1,500,000	\$1,500,000	\$1,500,000	\$1,500,000	\$1,500,000	\$1,500,000	\$1,500,000	From Table 5 - avg annual cash-funded CIP	
59	Unemployment Ins. Reserve Target		\$11,700	\$11,700	\$11,700	\$11,700	\$11,700	\$11,700	\$11,700	\$11,700	\$11,700	\$11,700	\$11,700		
60	Current Reserve Target		\$2,911,700	\$2,911,700	\$2,911,700	\$2,911,700	\$2,911,700	\$2,911,700	\$2,911,700	\$2,911,700	\$2,911,700	\$2,911,700	\$2,911,700	To Table 1B Graph	
61	HF&H Recommended Target		\$5,440,653	\$5,440,653	\$5,560,692	\$5,665,535	\$5,759,623	\$5,895,199	\$5,969,715	\$6,046,966	\$6,127,053	\$6,210,082	\$6,296,163	\$6,385,411	
62	Net Change in Reserves			\$1,874,902	(\$827,540)	(\$510,740)	(\$345,951)	(\$5,081)	\$85,880	\$261,521	\$385,204	\$515,449	\$581,265	\$365,959	

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1		Purissima Hills Water District													
2		Water Rate Model													
3		Table 5 - Capital Improvement Program													
4															
5		Project Costs													
6		PAYGo Project Description	FY 2021-22 Dollars												
7															
8	1	Maintenance Building Imprc	\$330,000												
9	2	Fremont Road Phase 2 Wate	\$1,030,000												
10	3	Buena Vista Drive Cross Cou	\$445,000												
11	4	West Fremont Road Water I	\$3,610,000												
12	5	1-280 & Liddicoat Drive Res	\$2,070,000												
13	6	Palo Alto / Gerth Lane Interi	\$1,140,000												
14	7	Page Mill Road Water Main	\$1,040,000												
15	8	Sherlock Road Water Main I	\$720,000												
16	9	Julietta Lane & Deer Springs	\$1,090,000												
17	10	Elena Pump Station Improv	\$1,650,000												
18	11	Stonebrook Drive Water Ma	\$1,400,000												
19	12	Altamont Road Zone 4 Wate	\$960,000												
20	13	Quarry Lake Emergency Wa	\$1,000,000												
21	14	Elena Tank Foundation Impr	\$1,000,000												
22	15	Deer Creek Pump Station Fii	\$445,000												
23	16	La Crests Tank Cross Countr	\$1,000,000												
24	17	Hungry Horse Tank Improve	\$2,340,000												
25	18	1-280 (South) Water Main A	\$3,300,000												
26	19	Total PAYGo CIP	\$24,570,000												
27	20	Period (yrs)	8.00												
28	21	Annual PAYGo CIP	\$3,071,250												
29															
30															
31															

Project Description	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25	FY 2025-26	FY 2026-27	FY 2027-28	FY 2028-29	FY 2029-30	FY 2030-31	FY 2031-32	Total Project Cost	Notes
PAYGo Funded Projects	\$3,071,250	\$3,071,250	\$3,071,250	\$3,071,250	\$3,071,250	\$3,071,250	\$3,071,250	\$3,071,250	\$3,071,250	\$3,071,250	\$3,071,250	\$33,783,750	
ENR Multiplier	1.000	1.033	1.067	1.102	1.138	1.176	1.214	1.254	1.295	1.338	1.382		
Project Costs Escalated	\$3,071,250	\$3,172,243	\$3,276,556	\$3,384,300	\$3,495,587	\$3,610,533	\$3,729,259	\$3,851,890	\$3,978,552	\$4,109,380	\$4,244,510	\$39,924,061	
Average Annual Cash-Funded Projects (FY 2022-23 to FY 2026-27)												\$3,685,281	

Project Description	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25	FY 2025-26	FY 2026-27	FY 2027-28	FY 2028-29	FY 2029-30	FY 2030-31	FY 2031-32	Total Project Cost
Maintenance Building Improvements				\$4,600,000								\$4,600,000
Altamont Tanks Improvements						\$5,845,000						\$5,845,000
Total Project Costs	\$0	\$0	\$0	\$4,600,000	\$0	\$5,845,000	\$0	\$0	\$0	\$0	\$0	\$10,445,000

	Project Costs		Allocation Factor	Base Day	Average Day	Maximum Day	Maximum Hour	Accounts	Customer Capacity
	FY 2021-22 Dollars								
Debt Funded Projects									
2020 Bond Funded Projects	\$5,178,000	Peaking - CIP	\$622,320	\$1,103,680	\$1,726,000	\$431,500	\$0	\$1,294,500	
Seton Water Main Improver	\$845,000	Peaking - CIP	\$101,557	\$180,110	\$281,667	\$70,417	\$0	\$211,250	
Duval Way Water Main Imp	\$1,075,000	Peaking - CIP	\$129,199	\$229,134	\$358,333	\$89,583	\$0	\$268,750	
Elena Road (South) Water Iv	\$630,000	Peaking - CIP	\$75,717	\$134,283	\$210,000	\$52,500	\$0	\$157,500	
Padre Court Water Main Im	\$375,000	Peaking - CIP	\$45,070	\$79,930	\$125,000	\$31,250	\$0	\$93,750	
	\$8,103,000		\$973,862	\$1,727,138	\$2,701,000	\$675,250	\$0	\$2,025,750	
Debt Composite	100.0%		12.0%	21.3%	33.3%	8.3%	0.0%	25.0%	
PAYGo Funded Projects									
Maintenance Building Imprc	\$330,000	Base	\$330,000	\$0	\$0	\$0	\$0	\$0	
Fremont Road Phase 2 Wate	\$1,030,000	Peaking - CIP	\$123,791	\$219,542	\$343,333	\$85,833	\$0	\$257,500	
Buena Vista Drive Cross Cou	\$445,000	Peaking - CIP	\$53,483	\$94,851	\$148,333	\$37,083	\$0	\$111,250	
West Fremont Road Water I	\$3,610,000	Peaking - CIP	\$433,869	\$769,464	\$1,203,333	\$300,833	\$0	\$902,500	
1-280 & Liddicoat Drive Res	\$2,070,000	Average Day	\$746,351	\$1,323,649	\$0	\$0	\$0	\$0	
Palo Alto / Gerth Lane Interi	\$1,140,000	Average Day	\$411,034	\$728,966	\$0	\$0	\$0	\$0	
Page Mill Road Water Main	\$1,040,000	Peaking - CIP	\$124,993	\$221,674	\$346,667	\$86,667	\$0	\$260,000	
Sherlock Road Water Main I	\$720,000	Peaking - CIP	\$86,533	\$153,467	\$240,000	\$60,000	\$0	\$180,000	
Julietta Lane & Deer Springs	\$1,090,000	Peaking - CIP	\$131,002	\$232,331	\$363,333	\$90,833	\$0	\$272,500	
Elena Pump Station Improv	\$1,650,000	Peaking - CIP	\$198,306	\$351,694	\$550,000	\$137,500	\$0	\$412,500	
Stonebrook Drive Water Ma	\$1,400,000	Peaking - CIP	\$168,260	\$298,407	\$466,667	\$116,667	\$0	\$350,000	
Altamont Road Zone 4 Wate	\$960,000	Peaking - CIP	\$115,378	\$204,622	\$320,000	\$80,000	\$0	\$240,000	
Quarry Lake Emergency Wa	\$1,000,000	Base	\$1,000,000	\$0	\$0	\$0	\$0	\$0	
Elena Tank Foundation Impr	\$1,000,000	Peaking - CIP	\$120,185	\$213,148	\$333,333	\$83,333	\$0	\$250,000	
Deer Creek Pump Station Fii	\$445,000	Capacity	\$0	\$0	\$0	\$0	\$0	\$445,000	
La Crests Tank Cross Countr	\$1,000,000	Peaking - CIP	\$120,185	\$213,148	\$333,333	\$83,333	\$0	\$250,000	
Hungry Horse Tank Improve	\$2,340,000	Peaking - CIP	\$281,234	\$498,766	\$780,000	\$195,000	\$0	\$585,000	
1-280 (South) Water Main A	\$3,300,000	Base	\$3,300,000	\$0	\$0	\$0	\$0	\$0	
Maintenance Building Imprc	\$4,600,000	Base	\$4,600,000	\$0	\$0	\$0	\$0	\$0	
Altamont Tanks Improveme	\$5,845,000	Peaking - CIP	\$702,484	\$1,245,850	\$1,948,333	\$487,083	\$0	\$1,461,250	
	\$35,015,000		\$13,047,088	\$6,769,578	\$7,376,667	\$1,844,167	\$0	\$5,977,500	
PAYGo Composite	100.0%		37.3%	19.3%	21.1%	5.3%	0.0%	17.1%	

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Purissima Hills Water District													
2	Water Rate Model													
3	Table 6 - Debt Service & Coverage													
4														
5														
6														
7														
8														
9	Revenue Bonds													
10	Principal	\$480,000	\$491,000	\$501,000	\$512,000	\$523,000	\$535,000	\$546,000	\$558,000	\$570,000	\$583,000	\$595,000		
11	Interest	\$156,832	\$146,378	\$135,691	\$124,778	\$113,632	\$102,238	\$90,601	\$78,710	\$66,560	\$54,135	\$41,445		
12	Total	\$636,832	\$637,378	\$636,691	\$636,778	\$636,632	\$637,238	\$636,601	\$636,710	\$636,560	\$637,135	\$636,445		
13	Future Debt Service (\$4.6M FY 2025)	\$0	\$0	\$0	\$266,018	\$266,018	\$266,018	\$266,018	\$266,018	\$266,018	\$266,018	\$266,018	To Pay for \$4.6 million CIP in FY 2024-25	
14	Future Debt Service (\$5.8M FY 2027)	\$0	\$0	\$0	\$0	\$0	\$338,017	\$338,017	\$338,017	\$338,017	\$338,017	\$338,017	To Pay for \$5.845 million CIP in FY 2026-27	
15														
16	Total Debt Service	\$636,832	\$637,378	\$636,691	\$902,796	\$902,651	\$1,241,274	\$1,240,637	\$1,240,746	\$1,240,596	\$1,241,170	\$1,240,480		
17														
18	Debt Coverage Calculation													
19	Funds Available for Debt Service													
20	Rate revenue - Service Charge	\$7,911,084	\$8,812,832	\$9,605,986	\$10,470,525	\$11,412,872	\$12,201,944	\$12,749,544	\$13,259,525	\$13,789,906	\$14,271,201	\$14,485,269	From Table 3	
21	Non-Operating Income	\$1,355,500	\$1,396,165	\$1,438,050	\$1,481,191	\$1,525,627	\$1,571,396	\$1,618,538	\$1,667,094	\$1,717,107	\$1,768,620	\$1,821,679	From Table 2	
22	Interest income	\$19,837	\$21,927	\$20,509	\$21,452	\$22,425	\$23,429	\$24,464	\$25,532	\$26,632	\$27,768	\$28,938	From Table 4	
23	Total Funds Available	\$9,286,421	\$10,230,924	\$11,064,545	\$11,973,169	\$12,960,925	\$13,796,769	\$14,392,546	\$14,952,151	\$15,533,646	\$16,067,589	\$16,335,886	To below	
24														
25	Expenses													
26	O&M	\$6,974,687	\$7,454,843	\$7,874,217	\$8,250,569	\$8,792,870	\$9,090,937	\$9,399,940	\$9,720,287	\$10,052,403	\$10,396,728	\$10,753,720	From Table 2	
27	Total Expenses	\$6,974,687	\$7,454,843	\$7,874,217	\$8,250,569	\$8,792,870	\$9,090,937	\$9,399,940	\$9,720,287	\$10,052,403	\$10,396,728	\$10,753,720		
28														
29	Net Revenue	\$2,311,734	\$2,776,081	\$3,190,328	\$3,722,600	\$4,168,055	\$4,705,832	\$4,992,606	\$5,231,864	\$5,481,243	\$5,670,861	\$5,582,166	Funds Available less Expenses	
30														
31	Debt Service	\$636,832	\$637,378	\$636,691	\$902,796	\$902,651	\$1,241,274	\$1,240,637	\$1,240,746	\$1,240,596	\$1,241,170	\$1,240,480	From above	
32	Debt Coverage Ratio	3.63	4.36	5.01	4.12	4.62	3.79	4.02	4.22	4.42	4.57	4.50		

	A	B	C	D	E	F	G	H	I
1		Purissima Hills Water District							
2		Water Rate Model							
3		Tab 8 - Load Factors							
4									
5		Month	Residential	Institutional	Total				
6		July	7	90,266	5,712	95,978			
7		August	8	102,595	6,393	108,988			
8		September	9	99,061	6,690	105,750			
9		October	10	83,828	6,302	90,130			
10		November	11	80,171	5,177	85,348			
11		December	12	54,815	3,604	58,418			
12		January	1	26,296	2,528	28,824			
13		February	2	21,376	2,413	23,789			
14		March	3	31,235	2,479	33,714			
15		April	4	29,190	2,283	31,472			
16		May	5	44,956	3,519	48,474			
17		June	6	76,165	4,680	80,845			
18		Total		739,953	51,780	791,732			
19									
20									
21			Levels of Demand						
22			Base	Average	Maximum	Maximum			
23			Day	Day	Day	Hour			
24			a	b	c	d			
25		1 Demand by Customer Category							
26		2 Residential	703	2,027	4,055	6,082			
27		3 Institutional	79	142	284	426			
28		4 Total	782	2,169	4,338	6,507			
29		5 Ratio of Flows to Average Day							
30		6 Residential	0.35	1.00	2.00	3.00			
31		7 Institutional	0.56	1.00	2.00	3.00			
32		8 Total	0.36	1.00	2.00	3.00			
33		9							
34		10 Level of Service	782	2,169	4,338	6,507			
35		11 Base Day Demand	2,169	2,169	2,169	2,169			
36		12 Ratio of Level of Service to Avg Day	0.36	1.00	2.00	3.00			
37		Base Day: February Billed Usage Annualized							
38		Average Day: CY 2018, 2019, 2020 average							
39		Maximum Day: Average Day * 2.0							
40		Maximum Hour: Max Day * 1.5							
41									
42									
43			Demand Service Levels						
44			Base	Average	Maximum	Maximum			
45		Allocation Basis	Day	Day	Day	Hour	Totals		
46			a	b	c	d	e	f	
47		1 Base Day	0.36	0.36				0.36	
48		2 <i>Allocation %</i>		100%				100%	
49		3							
50		4 Average Day	1.00	0.36	0.64			1.00	
51		5 <i>Allocation %</i>		36%	64%			100%	
52		6							
53		7 Maximum Day	2.00	0.36	0.64	1.00		2.00	
54		8 <i>Allocation %</i>		18%	32%	50%		100%	
55		9							
56		10 Maximum Hour	3.00	0.36	0.64	1.00	1.00	3.00	
57		11 <i>Allocation %</i>		12%	21%	33%	33%	100%	
58									
59			Tier 1	Tier 2	Tier 3	Tier 4			
60			Base	Average	Maximum	Maximum			
61		Flow per Customer (hcf per month)	Day	Day	Day	Hour			
62		Residential							
63		hcf per day	703	2,027	4,055	6,082			
64		hcf per month	21,083	60,818	121,636			x 30 days	
65		# of Accounts	2,100	2,100	2,100				
66		Average flow per Acct (hcf/mo)	10.0	29.0	58.0	58+			hcf per month ÷ Monthly bills
67									
68		Institutional							
69		hcf per day	79	142	284	426			
70		hcf per month	2,380	4,256	8,512				
71		# of Accounts	39	39	39				
72		Average flow per Acct (hcf/mo)	61.0	109.0	218.0	218+			
73									
74		Combined							
75		hcf per day	782	2,169	4,338	6,507			
76		hcf per month	23,463	65,074	130,148				
77		# of Accounts	2,139	2,139	2,139				
78		Average flow per Acct (hcf/mo)	11.0	30.0	61.0	61+			
79									

	A	B	C	D	E	F	G	H	I
1	Purissima Hills Water District								
2	Water Rate Model								
3	Table 9 - Allocations								
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	Base Day	Average Day	Maximum Day	Maximum Hour	Total
19 Grand Total Consumption Charge COS	\$4,691,122	\$1,121,912	\$1,074,381	\$524,925	\$7,412,341
	TRUE	TRUE	TRUE	TRUE	TRUE

Components of Rate Structure	Revenue at Current Rates FY 2021-22		Cost-of-Service FY 2021-22		Difference COS Minus Current	
	a	b	c	d	e=c-a	f=e/a
1 Residential						
2 Consumption Charge Revenue	\$6,565,781	90%	\$6,758,528	88%	\$192,748	2.9%
3 Readiness-to-Serve Revenue	\$707,759	10%	\$954,634	12%	\$246,875	34.9%
4 Subtotal - Residential	\$7,273,540	100%	\$7,713,162	100%	\$439,622	6.0%
5 Institutional						
6 Consumption Charge Revenue	\$432,660	93%	\$653,812	91%	\$221,152	51.1%
7 Readiness-to-Serve Revenue	\$30,802	7%	\$66,357	9%	\$35,555	115.4%
8 Subtotal - Institutional	\$463,462	100%	\$720,170	100%	\$256,708	55.4%
9 Total						
10 Consumption Charge Revenue	\$6,998,441	90%	\$7,412,341	88%	\$413,900	5.9%
11 Readiness-to-Serve Revenue	\$738,561	10%	\$1,020,991	12%	\$282,430	38.2%
12 Total	\$7,737,002	100%	\$8,433,332	100%	\$696,330	9.00%

Residential ONLY					
Tiered Consumption Rates	Tier 1	Tier 2	Tier 3	Tier 4	Total
Demand Condition	Base Day	Average Day	Maximum Day	Maximum Hour	
Tier Structure					
Volume per tier (hcf)	0 - 10 hcf	11 - 29 hcf	30 - 58 hcf	59+ hcf	
hcf by Tier	209,044	219,178	160,825	150,906	739,953
Cost of Service by Tier	\$4,215,279	\$1,048,539	\$1,004,116	\$490,595	\$6,758,528

Residential COS per Unit	Tier 1	Tier 2	Tier 3	Tier 4	Total or Average
	Base Day	Average Day	Maximum Day	Maximum Hour	
1 Residential COS - Consumption	\$4,215,279	\$1,048,539	\$1,004,116	\$490,595	\$6,758,528
2	62.4%	15.5%	14.9%	7.3%	
3					
4 Demand Per Tier					
5 Tier 1 - 0 - 10 hcf	209,044				
6 Tier 2 - 11 - 29 hcf	219,178	219,178			
7 Tier 3 - 30 - 58 hcf	160,825	160,825	160,825		
8 Tier 4 - 59+ hcf	150,906	150,906	150,906	150,906	
9 Total hcf per Tier	739,953	530,909	311,731	150,906	739,953
10					
11 Cost-of-Service per Unit (hcf)	\$5.70	\$1.97	\$3.22	\$3.25	
12					
13 Tier 1 - 0 - 10 hcf	\$5.70	\$5.70	\$5.70	\$5.70	
14 Tier 2 - 11 - 29 hcf		\$1.97	\$1.97	\$1.97	
15 Tier 3 - 30 - 58 hcf			\$3.22	\$3.22	
16 Tier 4 - 59+ hcf				\$3.25	
17 Unit Cost per hcf (by Tier)	\$5.70	\$7.67	\$10.89	\$14.14	\$9.13

1	Purissima Hills Water District										
2	Water Rate Model										
3	Tab 10. Service Charge Cost-of-Service Calculation										
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Account and EMU Summary

Service Size	# of Accounts	Meter Ratings (gpm)	Capacity Multiplier	EMUs
	a	b	c = b ÷ 30	a * c
3/4" meters	1,347	30	1.00	1,347
1" meters	631	50	1.67	1,052
1 1/2" meters	102	100	3.33	340
2" meters	51	160	5.33	272
3" meters	0	300	10.00	0
4" meters	2	500	16.67	33
6" meters	6	1000	33.33	200
Total Accounts	2,139		Total EMUs	3,244
Units Costs	\$448,483			\$572,508
Monthly Cost				
per Account	\$17.47			
per EMU				\$14.71

Meter Charge Unit Cost Calculation

	Service Charge Components		Total Service Charge	
	Accounts	Capacity		
Operations & Maintenance	\$977,236	\$12,371	\$989,607	From Table 9
Debt Service	\$0	\$159,208	\$159,208	From Table 9
Capital Expenses (PayGo)	\$0	\$524,301	\$524,301	From Table 9
Non-Operating Revenue	(\$446,978)	(\$65,140)	(\$512,118)	From Table 9
Transfers to/(from) Reserves	(\$81,775)	(\$58,231)	(\$140,007)	From Table 9
Service Charge Expenses	\$448,483	\$572,508	\$1,020,991	\$0
<i>% of Component</i>	44%	56%	100%	
Units of Service	2,139	3,244		
	Accounts	EMUs		
Monthly Cost				
per Account	\$17.47			
per EMU		\$14.71		

Expenses from Tab 8. Allocations

Service Charge Component Calculation

Service Size	% of Meters	Account Component (\$/mo.)	Capacity Component			Proposed Service Charges (\$/mo.)	Total	
			\$/EMU	Capacity Multiplier	Capacity Total		Current Charge	\$ Difference
		a	b	c	d = b * c	e = a + d	f	g = e - f
3/4" meters	63.0%	\$17.47	\$14.71	1.00	\$14.71	\$32.18	\$22.50	\$9.68
1" meters	29.5%	\$17.47	\$14.71	1.67	\$24.51	\$41.98	\$36.80	\$5.18
1 1/2" meters	4.8%	\$17.47	\$14.71	3.33	\$49.02	\$66.50	\$51.00	\$15.50
2" meters	2.4%	\$17.47	\$14.71	5.33	\$78.44	\$95.91	\$73.50	\$22.41
3" meters	0.0%	\$17.47	\$14.71	10.00	\$147.07	\$164.54	\$90.80	\$73.74
4" meters	0.1%	\$17.47	\$14.71	16.67	\$245.11	\$262.59	\$168.00	\$94.59
6" meters	0.3%	\$17.47	\$14.71	33.33	\$490.23	\$507.70	\$0.00	\$507.70