

FINAL REPORT



**Tahoe City Public Utility District
Comprehensive Water
Rate Study
November 2024**





November 20, 2024

Mr. Sean Barclay
General Manager
Tahoe City Public Utility District
221 Fairway Drive
Tahoe City, CA 96145

Subject: 2024 Water Rate Study Draft Report

Dear Mr. Barclay:

HDR Engineering, Inc. (HDR) is pleased to present to the Tahoe City Public Utility District (District) the draft report for the 2024 Water Rate Study (Study). The Study objectives were to provide an independent review of the five-year financial plan, and develop cost-based and proportional water rates for Board consideration. The results of the Study will provide the District with a five-year maximum rate schedule to fund the Study identified water utility operating and capital needs. This report outlines the approach, methodology, findings, and conclusions of the comprehensive rate study process.

The costs associated with providing water services to the District's customers was developed based on the District's specific information and is included within the development of the proposed rates. The Study was developed utilizing industry recognized generally accepted rate setting principles and methodologies as outlined in the American Water Works Association M1 Manual. This report provides the basis for developing and implementing water rates which are cost-based, proportional, and defensible to the District's customers.

We appreciate the assistance provided by the District's management and staff in the development of this study. More importantly, HDR appreciates the opportunity to provide these technical and professional services to the District.

Sincerely yours,
HDR Engineering, Inc.

A handwritten signature in black ink, appearing to read 'Shawn Koorn', enclosed in a thin black rectangular border.

Shawn Koorn
Associate Vice President

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Table of Contents

Table of Contents	i
1 Executive Summary	1
Introduction.....	1
Overview of the Rate Study Process.....	1
Key Water Rate Study Results.....	2
Summary of the Water Revenue Requirement Analysis.....	3
Summary of the Water Cost of Service Analysis	5
Summary of the Water Rate Design.....	6
Board Review	8
1 Introduction and Overview	9
1.1 Introduction.....	9
1.2 Goals and Objectives	9
1.3 Overview of the Rate Study Process.....	9
1.4 Organization of the Study	10
1.5 Summary	10
2 Overview of the Rate Setting Process	11
2.1 Introduction.....	11
2.2 Generally Accepted Rate Setting Principles	11
2.3 Determining the Revenue Requirement.....	11
2.4 Analyzing Cost of Service	12
2.5 Designing Utility Rates.....	13
2.6 Economic Theory and Rate Setting	13
2.7 Summary	13
3 Revenue Requirement Analysis	14
3.1 Water Revenue Requirement.....	14
3.2 Determining the Water Revenue Requirement	14
3.3 Establishing a Time Frame and Approach.....	14
3.4 Projecting Rate and Other Miscellaneous Revenues	15
3.5 Projecting Operation and Maintenance Expenses	16
3.6 Projecting Capital Funding Needs.....	17
3.7 Projection of Debt Service	19



3.8	Reserve Funding	19
3.9	Summary of the Revenue Requirement	20
3.10	Reserve Fund Levels	21
3.11	Revenue Requirement Summary	22
4	Cost of Service Analysis	23
4.1	Water Cost of Service	23
4.2	Objectives of a Cost of Service Study	23
4.3	Determining the Customer Classes of Service	24
4.4	General Cost of Service Procedures	24
4.4.1	Functionalization of Costs	24
4.4.2	Allocation of Costs	25
4.4.3	Development of Distribution Factors	26
4.5	Functionalization and Allocation of Plant in Service	27
4.6	Functionalization and Allocation of Operating Expenses	29
4.7	Major Assumptions of the Cost of Service Analysis	30
4.8	Summary Results of the Cost of Service Analysis	30
4.9	Consultant’s Conclusions and Recommendations	32
4.10	Summary of the Cost of Service Analysis	32
5	Rate Design Analysis	33
5.1	Water Rate Design	33
5.2	Rate Design Criteria and Considerations	33
5.3	Development of Cost-Based Water Rates	33
5.4	Determination of Sizing and Number of Tiers	35
5.5	Establishing the Cost-Basis for Pricing Tiers	36
5.6	Development of the Unit Costs for Rate Designs	36
5.6.1	Commodity Distribution Factor	37
5.6.2	Capacity Distribution Factor	39
5.6.3	Summary of the Consumption Based Unit Costs	41
5.6.4	Summary of the Customer (Fixed) Costs	42
5.7	Summary of the Present and Proposed Water Rates	43
5.8	Summary of the Water Rate Study	46
5.9	Board Review	46
	Technical Appendix – Water Analysis	48

1 Executive Summary

Introduction

HDR Engineering, Inc. (HDR) was retained by Tahoe City Public Utility District (District) to conduct a comprehensive water rate study (Study). The main objectives of the Study are:

- Develop a projection of water revenues to support the District’s operating and capital costs
- Proportionally distribute the costs of providing water services to the customers receiving service
- Propose cost-based and proportional water rates for a multi-year time period

Since the completion of the 2019 rate study, there have been changes to the District’s customers, operating costs, and capital plan that resulted in the need to update the Study. It is important to note that the results shown in this report are based on information available at ‘a point in time’. That is to say that if the information available at a later date has changed then the results of the analysis would likely also change or differ from those presented in this report.

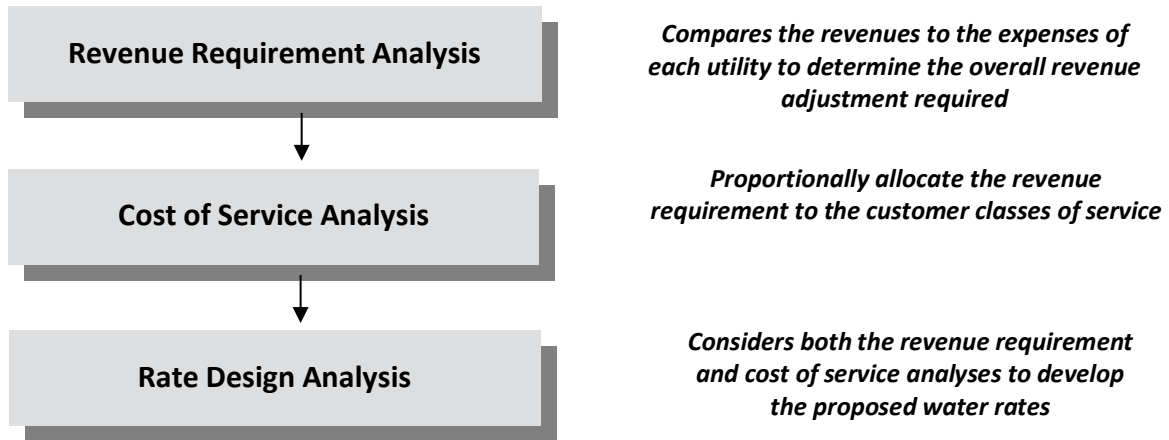
The District owns, operates, and maintains the water system which provides services to its customers. The costs associated with providing water services to District’s customers has been developed based on the District provided information and is included within the development of the proposed rates.

In 2024, the District entered into an agreement to acquire the assets of the Tahoe Swiss Village Utility, Inc. (TSVU), with the acquisition set to take effect on January 1, 2025. This water system acquisition is part of the District's long-standing practice of acquiring existing, private water systems within its service area. The District’s Water System Acquisition Policy guides these acquisitions and consolidations and sets forth the rationale and benefits to the District, which include, operational efficiencies, reduced duplication and improvements to public health and safety for all property owners within TCPUD boundaries. The Study has incorporated TSVU’s operational and capital costs and accounts for the revenue increase from the approximately 445 new water customers to the District’s system.

Overview of the Rate Study Process

A comprehensive rate study uses three interrelated analyses to address the adequacy and proportionality of a utility’s rates. These three analyses are a revenue requirement analysis, a cost of service analysis, and a rate design analysis. These three analyses are illustrated below in Figure ES - 1.

Figure ES – 1 Overview of the Comprehensive Rate Analyses



The basic framework outlined above was utilized in the development of the Study for reviewing and evaluating the District’s water rates. A key aspect of the approach is utilizing generally accepted approaches and tailoring it to the District’s specific customer and system characteristics. The result of each task of the water rate study were used as the basis for establishing cost-based and proportional rates for the District’s water customers.

Key Water Rate Study Results

The water rate study’s technical analyses were developed based on the operating and capital costs necessary to provide service to District’s customers. The analyses performed resulted in the following findings, conclusions, and recommendations.

- A revenue requirement analysis was developed for the water utility for the projected time period of 2025 through 2029
- The District’s adopted 2024 budget for the water utility was used as the starting point of the analyses
- Operation and maintenance expenses are projected to increase at inflationary levels with no assumed changes to levels of service
- The District’s current capital improvement plan for the water utility, was used to develop a capital funding plan
- A five-year rate transition plan was developed to adequately fund the operating and capital needs
- For the water utility, annual revenue adjustments are necessary to fund the operating and capital needs

- A cost of service analysis was developed to determine the appropriate level of revenue to collect from each customer class of service and the fixed and consumption charge
- Proposed rates were developed, for the water utility, for 2025 through 2029 that reflect the proportionality as developed in the cost of service analysis while collecting the target level of revenues from the revenue requirement analyses

Summary of the Water Revenue Requirement Analysis

A revenue requirement analysis is the first analytical step in the development of the water rate study. This analysis determines the adequacy of the level of current water revenues for the District. From this analysis, a determination can be made as to the overall level of water revenue adjustments needed to provide adequate funding for both operating and capital needs.

For the revenue requirement analysis, a “cash basis” approach was utilized. The cash basis approach is the most commonly used methodology by municipal utilities to establish the revenue requirement and is the approach used in the District’s previous rate studies. The cash basis approach includes operation and maintenance (O&M) expenses, transfers, annual debt service, and rate funded capital. The primary financial inputs in the development of the revenue requirement analysis were the District’s 2024 adopted water budget, historical billed customer accounts and consumption data, and the water system capital improvement plan.

The water revenue requirement was developed from the adopted 2024 water utility budget for a projected time period. For the Study, a revenue requirement analysis was developed for the projected time period of 2025 through 2034 with a focus on the next five-year period of 2025 through 2029 to establish the maximum proposed rates. A multi-year time frame is recommended in order to better anticipate future financial requirements and allow the District to begin planning for these changes sooner, thereby minimizing short-term rate impacts and overall long-term rates. A good example of this is the planned debt issuance to fund the West Lake Tahoe Regional Water Treatment Plant (WTP) which is set to begin repayment in 2025.

Once the operating and maintenance expenses were developed for the projected time period, based on budgeted expenses and historical and projected inflationary factors, the next step was to develop the capital funding plan. The proper and adequate funding of capital projects is important in helping to minimize impacts to rates over time. A general financial guideline states that, at a minimum, a utility should fund an amount equal to or greater than annual depreciation expense through rates. For the Study, the District’s current capital improvement plan identified the projects necessary to maintain the water system, as well as projects necessary to upgrade recently acquired water systems to bring them up to the District’s levels of service. The capital funding plan developed for the District’s water utility has placed the rate funded capital level at \$3.7 million in 2025 and \$3.8 million annually in 2026 through 2029. This level of funding was established based on the long-term need to prudently fund replacement and repair of the existing water system and is greater than annual depreciation expense of approximately \$1.4 million in 2023. The difference between annual capital needs and rate funded capital, is funded through other funding sources such as reserves and long-term borrowing. The District prioritizes

“cash financing” capital projects as evident through the level of annual rate funded capital. This level of “pay-as-you-go” funding creates a more stable level of funding over time for capital projects, more predictable rates for customers, and can also provide the District with increased financial flexibility into the future. The other funding sources include reserve funds and long-term debt issuance. Given the nature and extent of the necessary capital projects, additional long-term debt is projected during the next five-year time period and is addressed during the District’s long term financial planning process. In developing the water capital funding plan, HDR is not acting in a municipal advisory role to the District.

The revenue requirement analysis for the District’s water utility was developed to determine the necessary revenues to meet the costs of providing water service to the customers based on the specific O&M and capital costs of the District’s water utility. Provided below, in Table ES – 1, is a summary of the water revenue requirement analysis. A more detailed analysis of the water revenue requirement can be found in Section 3 of this report.

Table ES - 1 Summary of the Water Revenue Requirement Analysis (\$000s)						
	2024	2025	2026	2027	2028	2029
Revenues						
Rate Revenues	\$9,387	\$9,411	\$9,434	\$9,458	\$9,482	\$9,505
Other Revenues	<u>961</u>	<u>1,498</u>	<u>1,511</u>	<u>1,568</u>	<u>1,651</u>	<u>1,742</u>
Total Revenues	\$10,348	\$10,909	\$10,945	\$11,026	\$11,133	\$11,247
Expenses						
Total O & M	\$6,596	\$7,589	\$8,038	\$8,513	\$9,015	\$9,546
Rate Funded Capital	3,700	3,700	3,825	3,825	3,825	3,825
Net Debt Service	51	718	1,111	1,754	2,356	2,848
Reserve Funding	<u>1</u>	<u>78</u>	<u>159</u>	<u>234</u>	<u>460</u>	<u>896</u>
Total Revenue Requirement	\$10,348	\$12,085	\$13,133	\$14,326	\$15,656	\$17,115
Total Bal. / (Def.) of Funds	\$0	(\$1,176)	(\$2,188)	(\$3,300)	(\$4,523)	(\$5,868)

As illustrated above, the water revenue requirement has summed the annual O&M expenses, rate funded capital, net debt service, and reserve funding. The total revenue requirement is then compared to the total sources of funds which are the rate revenues, at present rate levels, and other miscellaneous revenues. From this comparison a balance or deficiency of funds in each year can be determined. It is important to note the “Bal. / (Def.) of Funds” row is cumulative. That is, any adjustment to rate revenues in the initial years will reduce the deficiency in the later years, assuming expenses remain the same. Over the five-year projected period, the level of water rate revenues will need to be adjusted to fund the District’s projected operating and capital needs for the water utility.

Based on the water revenue requirement analysis developed herein, HDR has concluded that the District will need to adjust the level of water revenues received over the next five years (2025 – 2029). HDR has reached this conclusion for the following reasons:

- Rate revenue adjustments are necessary to fund annual water utility operating expenses
- Rate revenue adjustments are necessary to maintain prudent funding of annual renewal and replacement of the water system
- Rate revenue adjustments are necessary to fund annual debt service payments which have, and will, fund system improvements and betterments
- The rate revenue adjustments maintain the strong financial health of the District’s water utility (e.g., reserve levels, debt service coverage ratios) and provide long-term, sustainable funding levels

In reaching this conclusion, HDR recommends that the District increase annual rate revenues annually in 2025 through 2029. Based on the Study assumptions, increasing the rate revenues to fund the identified revenue deficiencies in this Study will provide sufficient funding for annual O&M and capital improvement needs over this Study time period. A detailed discussion of the development of the revenue requirement is provided in Section 3 of this report and the technical analysis is provided in Exhibit 1 through Exhibit 6 of the Technical Appendix.

Summary of the Water Cost of Service Analysis

A cost of service analysis determines the proportional distribution of the revenue requirement to the water customer classes of service. Whereas the revenue requirement analysis determines the utility’s overall revenue needs, the cost of service analysis determines the proportional manner in which to distribute the cost of service and collect that revenue requirement for the proposed time period. The cost of service analysis is based on generally accepted methodologies as outlined in the American Water Works Association M1 Manual, Principles of Water Rates, Fees, and Charges and the water system and customer characteristics. For the District’s Study, the revenue requirement for 2025 was used as the ‘test year’ for the water utility in order to develop the cost of service analysis.

In summary form, the cost of service analysis began by functionalizing the revenue requirement. As explained in more detail later in this report, the functionalized revenue requirement was then allocated to the various cost components. The individual allocation totals were then proportionally distributed to the customer class of service based on each customer class’s use of, or demand, placed on the water system (via the distribution factors). The distributed expenses for each customer class were then aggregated (summed) to determine each customer class’s overall revenue responsibility. Table ES - 2 provides the summary of the cost of service analysis based on the water system specific costs and each of the District’s water customer class of service characteristics.

Table ES - 2
Summary of the Water 2025 Cost of Service Analysis (\$000s)

Class of Service	Present Revenues	Distributed Costs	\$ Difference
Residential	\$7,980	\$8,877	(\$897)
Commercial	1,045	1,291	(\$246)
Fireline	<u>386</u>	<u>419</u>	<u>(\$33)</u>
Total System	\$9,411	\$10,587	(\$1,176)

The results of the cost of service analysis show differences between the customer classes of service. This is not uncommon given the nature of how customer water consumption patterns change over time, changes in how the District incurs costs, the level of costs incurred, and system demographics.

Given the requirement of California Constitution Article XIII D, Section 6 (commonly referred to as Proposition 218) the results of the water cost of service analysis are used to establish the proposed rates. As noted in the cost of service section of this report, the implementation of cost of service adjustments will impact the overall customer bill and revenue generation. A detailed discussion of the development of the cost of service analysis is provided in Section 4 of this report and in Exhibit 7 through Exhibit 18 of the Technical Appendix.

Summary of the Water Rate Design

The third and final step of the comprehensive rate study process is the design of the water rates to collect the targeted levels of revenue, based on the results of the revenue requirement and cost of service analyses. The revenue requirement analysis provided a set of recommendations related to annual revenue adjustments, while the cost of service results in the need to make interclass (cost of service) adjustments.

The District currently has three customer classes of service: Residential, Commercial, and Fireline. Residential and Commercial customer classes are currently charged a fixed base charge schedule which varies based on the service meter size. For the consumption charge, Residential is currently charged on a four-tiered consumption structure on a per thousand gallon (1,000 gal) basis. Commercial customers are charged a uniform consumption charge on a per 1,000 gallon basis. Lastly, Fireline customers are charged on a fixed charge basis that varies by Fireline size.

After reviewing the current rate structure with the District staff, it was determined that the current base (or fixed meter) charge structure would be maintained. The base charge structure will still vary by service meter size with the equivalencies based on AWWA safe operating capacity ratios which is an industry standard approach. The Fireline base charge will be calculated on a stand-alone basis.

After a review of the customer consumption patterns, and discussion with the District, the tiered rate structure will be maintained for Residential customers and the uniform consumption charge be maintained for Commercial customers. Given this, and the result of the prior analyses – the revenue requirement and cost of service – the proposed rates were developed for the five-year period of 2025 through 2029. The proposed rates were designed to reflect the proportional distribution of the costs of providing service to each customer class, both fixed and consumption, and overall revenue needs of the water utility over the projected time period. Provided in Table ES – 3 is a summary of the present and proposed residential rates for the District’s water utility.

Table ES - 3
Summary of the Monthly Present and Proposed Residential Water Rates

	<i>Present Rates</i>	2025	2026	2027	2028	2029
Base Charge	\$ / Mo.					
3/4"	\$94.57	\$106.57	\$116.69	\$127.78	\$139.92	\$153.21
1"	157.93	177.96	194.87	213.38	233.65	255.85
1 1/4"	236.42	266.41	291.72	319.43	349.78	383.01
1 1/2"	314.92	354.86	388.57	425.48	465.90	510.16
2"	504.06	567.99	621.95	681.04	745.74	816.59
3"	945.70	1,776.44	1,945.20	2,129.99	2,332.34	2,553.91
4"	1,576.48	3,551.82	3,889.24	4,258.72	4,663.30	5,106.31
6"	3,152.02	5,683.13	6,223.03	6,814.22	7,461.57	8,170.42
8"	5,043.42	8,170.37	8,946.56	9,796.48	10,727.15	11,746.23
Consumption Charge	\$ / 1,000 gal					
0 - 8,000 gal	\$3.55	\$3.74	\$4.10	\$4.49	\$4.92	\$5.39
8,000 - 20,000 gal	4.64	4.89	5.35	5.86	6.42	7.03
20,000 - 40,000 gal	6.68	6.70	7.34	8.04	8.80	9.64
40,000 + gal	13.21	12.91	14.14	15.48	16.95	18.56

Table ES – 3 shows, for residential customers, the present rate structure has been revised slightly and the level of rates have been adjusted in order to meet target revenue levels and the unit costs as developed in the cost of service analysis. The 2025 rates are based on the unit cost from the cost of service analysis. The proposed rates are projected to be effective January 1 of each year starting January 1, 2025.

Table ES – 4 provides a summary of the present and proposed commercial rates. As noted, Commercial customers have the same proposed base charge as residential customers. Additionally, the present uniform consumption charge structure will remain and only the pricing of the uniform rate has been revised to reflect the unit costs as developed in the cost of service analysis.

Table ES - 4
Summary of the Monthly Present and Proposed Commercial Water Rates

	<i>Present Rates</i>	2025	2026	2027	2028	2029
<u>Base Charge</u>	<u>\$ / Acct. / Mo.</u>					
3/4"	\$94.57	\$106.57	\$116.69	\$127.78	\$139.92	\$153.21
1"	157.93	177.96	194.87	213.38	233.65	255.85
1 1/4"	236.42	266.41	291.72	319.43	349.78	383.01
1 1/2"	314.92	354.86	388.57	425.48	465.90	510.16
2"	504.06	567.99	621.95	681.04	745.74	816.59
3"	945.70	1,776.44	1,945.20	2,129.99	2,332.34	2,553.91
4"	1,576.48	3,551.82	3,889.24	4,258.72	4,663.30	5,106.31
6"	3,152.02	5,683.13	6,223.03	6,814.22	7,461.57	8,170.42
8"	5,043.42	8,170.37	8,946.56	9,796.48	10,727.15	11,746.23
<u>Consumption Charge</u>	<u>\$ / 1,000 gal</u>					
All Usage	\$5.01	\$5.08	\$5.56	\$6.09	\$6.67	\$7.30

A more detailed discussion of the development of the proposed water rates is provided in Section 5 of this Study.

Board Review

Proposition 218 outlines the process to adopt and implement the proposed water rates. This includes the establishment of the cost basis and proportionality of the water rates which is the purpose of the study and summarized in this report. As part of the public review process, the study results and recommendations were presented to the District Board at the August 16, 2024 and September 20, 2024 public meetings. At the conclusion of the September Board meeting, District staff was directed to mail the Proposition 218 notices to the District’s customers which outlined the proposed changes in rates along with the time, date, and location of the public hearing. The District held a public hearing on November 15, 2024, to discuss the publicly noticed proposed water rates. At the completion of the public hearing, the Board accepted the water rate study and adopted the proposed water rates as outlined in this report for 2025 through 2029.



1 Introduction and Overview

1.1 Introduction

HDR was retained by the Tahoe City Public Utility District to conduct a comprehensive water rate study. The objective of the rate study was to review the District’s operating and capital costs in order to develop a projection of revenue needs and cost-based rates for the water system customers. This study determined the adequacy of the existing rates and provides the framework and cost basis for any needed future adjustments.

The District owns and operates the water system, which provides service to over 5,700 customer accounts within Tahoe City. With the planned acquisition of Tahoe Swiss Village Utility, Inc. in January 2025, the total number of customers will exceed 6,145. The water system consists of supply, transmission, and distribution services. The District receives source water from local ground water resources via wells and a surface water plant. The costs associated with providing water supply, plus the costs of distributing water to customers, has been developed based on District provided information and included within the development of the proposed rates.

1.2 Goals and Objectives

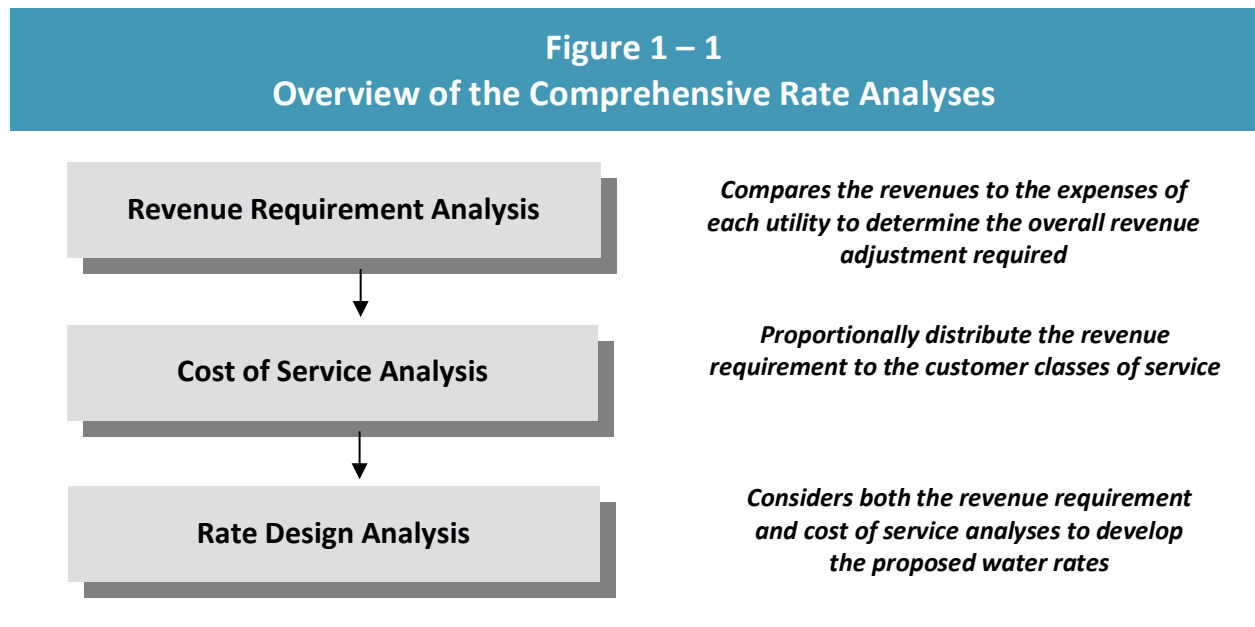
The District had a number of key objectives in developing the water rate study. These key objectives provided a framework for policy decisions in the analysis that follows. These key objectives were as follows:

- Develop the water study in a manner that is consistent with the principles and methodologies established by the American Water Works Association (AWWA), M1 Manual, Principles of Water Rates, Fees, and Charges.
- In financial planning and establishing the District’s rates, review and utilize best industry practices, while recognizing and acknowledging the specific and unique characteristics of the District’s systems.
- Review the District’s rates utilizing generally accepted rate making methodologies to determine adequacy and proportionality of the water rates.
- Meet the long-term financial planning criteria and goals of the District. For example, debt service coverage ratios, adequate funding of capital infrastructure, and maintenance of adequate and prudent reserve levels.
- Develop a final proposed financial plan which adequately supports the utility’s funding requirements, while attempting to minimize overall impacts to rates.
- Develop a proportional distribution of costs to the District’s water customers.
- Provide proposed rates designed to meet the legal requirements of Article XIII D.

1.3 Overview of the Rate Study Process

User rates must be set at a level where a utility’s operating and capital expenses are met with the revenues received from customers. This is an important point, as failure to achieve this objective may lead to insufficient funds to maintain system integrity. To evaluate the adequacy

of the water rates, on a standalone basis, a comprehensive rate study is often performed. A comprehensive rate study consists of three interrelated analyses. Figure 1 – 1 provides an overview of these analyses.



The above framework for reviewing and evaluating rates was utilized for the District’s water rate study.

1.4 Organization of the Study

This report is organized in a sequential manner that first provides an overview of utility rate setting principles, followed by sections that detail the specific steps used to review the District’s water rates. The following sections comprise the District’s water rate study report:

- **Section 2** – Overview of Rate Setting Principles
- **Section 3** – Revenue Requirement Analysis
- **Section 4** – Cost of Service Analysis
- **Section 5** – Rate Design Analysis

A Technical Appendix is attached at the end of this report, which details the various technical analyses that were undertaken in the preparation of the Study.

1.5 Summary

This report will review the comprehensive water rate study prepared for Tahoe City Public Utility District. This report has been prepared utilizing generally accepted and industry standard water rate setting techniques as outlined in the AWWA M1 Manual.



2 Overview of the Rate Setting Process

2.1 Introduction

This section of the report provides background information about the rate setting process, including descriptions of generally accepted principles, types of utilities, methods of determining a revenue requirement, the cost of service, and rate design analyses. This information is useful for gaining a better understanding of the details presented in further sections of this report.

2.2 Generally Accepted Rate Setting Principles

As a practical matter, all utilities should consider setting their rates around some generally accepted or global principles and guidelines. Utility rates should be:

- Cost-based, proportional, and set at a level that meets the utility’s full revenue requirement
- Easy to understand and administer
- Designed to conform to “generally accepted” rate setting techniques
- Stable in their ability to provide adequate revenues for meeting the utility’s financial, operating, and regulatory requirements
- Established at a level that is stable from year-to-year from a customer’s perspective

2.3 Determining the Revenue Requirement

Most public utilities use the cash basis approach for establishing their revenue requirement and setting rates. This approach conforms to most public utility budgetary requirements and the calculation is easy to understand. A public utility totals its cash expenditures for a period of time to determine required revenues. The revenue requirement for a public utility is usually comprised of the following costs or expenses:

- **Total Operating Expenses:** This includes a utility’s operation and maintenance (O&M) expenses, plus any applicable taxes or transfer payments. Operation and maintenance expenses include the materials, electricity, labor, supplies, etc., needed to keep the utility functioning.
- **Total Capital Expenses:** Capital expenses are calculated by adding debt service payments (principal and interest) to capital improvements financed with rate revenues. In lieu of including capital improvements financed with rate revenues, a utility sometimes includes depreciation expense to stabilize the annual revenue requirement.

Under the cash basis approach, the sum of the total O&M expenses plus the total capital expenses equals the utility’s revenue requirement during any selected period of time (historical or projected).

Note that the two portions of the capital expense component (debt service and rate funded capital) are necessary under the cash basis approach because utilities generally cannot finance

all their capital facilities with long-term debt. At the same time, it is often difficult to pay for capital expenditures on a “pay-as-you-go” basis given that some major capital projects may have significant rate impacts upon a utility and its customers, even when financed with long-term debt. Many utilities have found that some combination of pay-as-you-go funding and long-term financing will often lead to minimization of rate increases over time.

Public utilities typically use the cash basis¹ approach to establish their revenue requirement. An exception occurs if a public utility provides service to a large wholesale or contract customer. In this situation, a public utility could use the “utility basis” approach (see Table 2 - 1) regarding earning a fair return on its investment.

Table 2 – 1 Cash versus Utility Basis Comparison	
Cash Basis	Utility Basis (Accrual)
+ O&M Expenses	+ O&M Expenses
+ Taxes/Transfer Payments	+ Taxes/Transfer Payments
+ Capital Improv. Funded From Rates (≥ Depreciation Expense)	+ Depreciation Expense
+ Debt Service (Principal + Interest)	+ Return on Investment
= Total Revenue Requirement	= Total Revenue Requirement

2.4 Analyzing Cost of Service

After the total revenue requirement is determined, it is allocated and proportionally distributed to the users (i.e., customer classes) of the service. The allocation and distribution, analyzed through a cost of service analysis, reflects the cost relationships for providing water services. A cost of service analysis requires three analytical steps:

1. Costs are **functionalized** or grouped into the industry standard cost categories related to providing service. For a water utility this typically includes supply, treatment, distribution, pumping, etc. This step is typically accomplished through the utility’s accounting system.
2. The functionalized costs are then **allocated** to specific cost components. Allocation refers to the arrangement of the functionalized data to the appropriate cost component(s). For example, a utility’s water costs are typically allocated as average day, peak day, or customer related.

¹ “Cash basis” as used in the context of rate setting is not the same as the terminology used for accounting purposes and recognition of revenues and expenses. As used for rate setting, “cash basis” simply refers to the specific cost components to be included within the revenue requirement analysis.

3. Once the costs are allocated to the appropriate cost component(s), they are proportionally ***distributed*** to the customer classes of service (e.g., Residential, Commercial). The distribution is based on each customer class’s relative contribution to the cost component (i.e., benefits received from and burdens placed on the system and its resources). For example, customer-related costs are distributed to each class of service based on the total number of customers in that class of service. Once costs are distributed, the revenues from each customer class of service required to achieve cost-based rates can be determined.

2.5 Designing Utility Rates

Rates that meet the utility’s objectives are designed based on both the revenue requirement and the cost of service analysis. This approach results in rates that are strictly cost-based and does not consider other non-cost based goals and objectives (conservation, economic development, ability to pay, revenue stability, etc.). In designing the final proposed rates, factors such as ability to pay, continuity of past rate philosophy, economic development, ease of administration, and customer understanding may be taken into consideration. However, the proposed rates must take into consideration each customer class’s proportional share of costs allocated through the cost of service analysis to meet the requirements of California Constitution Article XIII D, commonly referred to as Proposition 218.

2.6 Economic Theory and Rate Setting

One of the major justifications for a comprehensive rate study is founded in economic theory. Economic theory suggests that the price of a commodity must roughly equal its cost if parity among customers is to be maintained. This statement’s implications on utility rate designs are significant. For example, a water utility usually incurs capacity-related costs to meet summer lawn watering needs. It follows that the customers who create excessive peak demands on the system and create the need for upsizing of the distribution system should pay for those over-sized facilities in proportion to their contribution to total peaking requirements. When costing and pricing techniques are refined, consumers have a more accurate understanding of what the commodity costs to produce and deliver. This price-equals-cost concept provides the basis for the subsequent analysis and comments.

“Economic theory suggests that the price of a commodity must roughly equal its cost if equity among customers is to be maintained.”

2.7 Summary

This section of the report has provided a brief introduction to the general principles, techniques, and economic theory used to set water rates. These principles and techniques will become the basis for the District’s comprehensive rate studies.



3 Revenue Requirement Analysis

3.1 Water Revenue Requirement

This section describes the development of the revenue requirement analysis for the District’s water utility. The District has provided detailed revenue, expenses, and customer billing data for the water system that allowed for the development of the revenue requirement. The revenue requirement analysis is the first analytical step in the comprehensive water rate study process. This analysis determines the adequacy of the District’s overall water revenues at current rate levels. From this analysis, a determination can be made as to the overall level of rate revenue needed to provide adequate and prudent funding for both operating and capital needs. HDR developed an independent analysis based on information provided by the District as part of the review of proposed rate revenue adjustments.

3.2 Determining the Water Revenue Requirement

In developing the District’s water revenue requirement, the water utility, as an enterprise fund, must financially “stand on its own” and be properly funded. That is, no transfers from other District funds occur to support the District’s water utility. As a result, the revenue requirement analysis, as developed herein, assumes the full and proper funding needed to operate and maintain the water system on a financially sound and prudent basis.

3.3 Establishing a Time Frame and Approach

The first step in calculating the revenue requirement for the District’s water utility was to establish a time frame for the revenue requirement analysis. For the Study, the revenue requirement was developed for a 10-year time period (2025 through 2034). Reviewing a multi-year time period is recommended as it attempts to identify major expenses that may be on the horizon. By anticipating future financial requirements, the District can begin planning for these changes sooner, thereby minimizing short-term rate impacts and overall long-term rates. For purposes of setting rates, the Study focuses on the next five years as the rate setting period of 2025 through 2029.

The second step in determining the revenue requirement was to decide on the basis of accumulating costs. For the Study, the revenue requirement analysis was established using a “cash basis” approach. The cash basis approach is the most common methodology used by municipal utilities to set their revenue requirement. This is also the methodology that the District has historically used to establish its water revenue requirement. Table 3 - 1 provides a summary of the cash basis approach and cost components used to develop the District’s water revenue requirement.

Table 3 – 1 Overview of the Water Utility’s “Cash Basis” Revenue Requirements

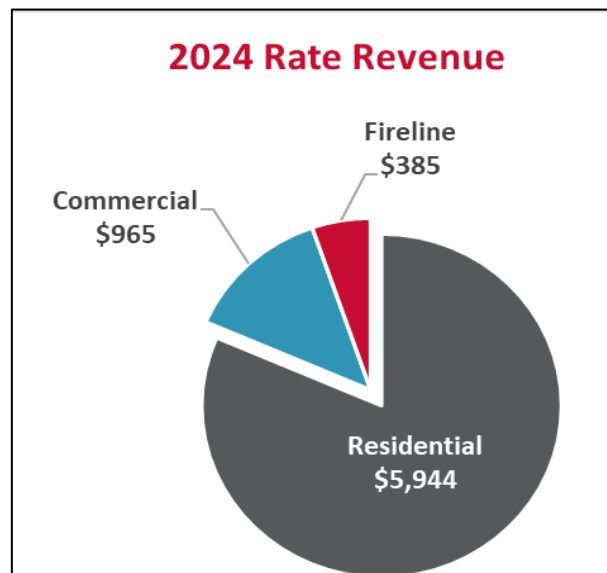
+	Water Operation and Maintenance Expenses
+	Rate Funded Capital
+	Net Debt Service (Principal + Interest)
<u>±</u>	<u>Reserve Funding</u>
=	Total Water Revenue Requirement
-	<u>Miscellaneous Revenues</u>
=	Net Revenue Requirement (Bal. Req’d from Rates)

Given a time period around which to develop the revenue requirement and a method to accumulate the costs, the focus shifts to the development and projection of the revenues and expenses of the District’s Study.

The primary financial inputs in the development of the revenue requirement are the District’s adopted water budget, district long-term financial plan, recent and historical billed customer and consumption data, and the water capital improvement plan. Presented below is a detailed discussion of the steps and key assumptions contained in the development of the projections of the District’s water revenue requirement analysis.

3.4 Projecting Rate and Other Miscellaneous Revenues

The starting point of the revenue requirement analysis is to develop a projection of the water rate revenues, at present rate levels. In general, this process involved developing projected billing units for each customer group (e.g., Residential, Commercial, Fireline). For the water utility, the billing units were the number and size of meters for the fixed charge and the monthly metered consumption for each customer for the consumption charge. The billing units for each customer group were then multiplied by the applicable current water rates. This method of independently



calculating revenues links the projected revenues used within the analysis to the projected billing units. It also helps to confirm that the billing units used within the study are reasonable for purposes of projecting future revenues, distributing costs, and ultimately, establishing proposed rates.

The District currently has a rate structure for each customer class, Residential, Commercial, and Fireline. As noted above, the projection of revenues - and subsequent cost distribution - is based on each specific customer class of service. Given this, a revenue projection was developed for each of the customer classes of service. The

majority of the District’s rate revenues are derived from the Residential customer class. The District also has customer classes for Commercial and Fireline customers. In total, and at current rate levels, the District is projected to receive approximately \$9.4 million in rate revenue in 2024, based on the projection of customers and metered consumption. Over time, the Study has assumed a conservative level of customer growth of 0.25% per year. This results in rate revenues increasing to approximately \$9.5 million, at present rate levels, in 2029 as a result of the estimated growth on the system.

In addition to rate revenues, the District receives other revenues from operations. These are revenues related to penalties, interest earnings, rental income, and revenues from the acquisition of water systems along with other operating revenues. In total, the District is projected to receive approximately \$960,000 in other revenues in 2024. This amount is anticipated to increase to \$1.74 million by 2029 when including the revenues from the recently acquired systems.

On a combined basis, taking into account rate revenues and other revenues, the District’s water utility has total projected revenues of approximately \$10.3 million in 2024, increasing to approximately \$11.2 million by 2029. Again, this does not include any proposed revenue adjustments, only increases in revenues due to customer growth and annual changes in miscellaneous revenues.

3.5 Projecting Operation and Maintenance Expenses

Operation and maintenance (O&M) expenses are incurred by the District to provide water service (supply, treatment, transmission, and distribution) as well as to operate and maintain the existing infrastructure. As mentioned, the District provided detailed O&M expenses based on the 2024 adopted budget. The budgeted O&M expenses were projected over the time period based on historical and projected inflationary factors experienced by the District and the general economy. Provided in Table 3 - 2 is a summary of the primary escalation factors used to develop the projection of O&M expenses.

Table 3 – 2 Summary of the O&M Escalation Factors						
	2025	2026	2027	2028	2029	
Salaries	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%
Benefits	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%
Professional Services	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%
Materials & Supplies	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%
Equipment	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%
Miscellaneous	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%
Utilities	5.5%	5.5%	5.5%	5.5%	5.5%	5.5%
CIP	5.0%	4.0%	3.0%	3.0%	3.0%	3.0%
Flat	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Each of the budgeted O&M expenses were reviewed and the applicable escalation factor applied to develop the O&M for the projected time period. Exhibit 2 of the Technical Appendix provides a summary of the assumptions used to develop the projection of revenues and escalation of the O&M expenses.

Based on the 2024 adopted budget, the total O&M expenses for the District are \$6.6 million. Over the planning horizon, total O&M expenses for the District are projected to increase to approximately \$9.5 million by 2029 based on the noted escalation factors. This reflects an average inflationary increase of approximately 6.0% per year over the projected time period, excluding additional O&M starting in 2025. These additions, above 2024 budgeted levels are O&M expenses for the water treatment plant, additional staffing needs identified by the District, and additional O&M for recently acquired water systems.

3.6 Projecting Capital Funding Needs

A key component in the development of the water revenue requirement was properly and adequately funding capital improvement needs. One of the major issues facing utilities across the U.S. is the amount of deferred capital projects and the funding pressure from growth/expansion-related improvements. The proper and adequate funding of capital projects is an important issue for all water utilities and is not just a local issue or concern of the District.

In general, there are three types of capital projects that a utility may need to fund. These include the following types:

- Renewal & replacement projects
- Growth / capacity expansion projects
- Regulatory-related projects

A renewal and replacement project is a project required for maintaining the existing system that is in place today. As the existing plant or pipelines become worn out, obsolete, etc., the utility should be making continuous investments to maintain the integrity of the facilities. In contrast to this, a utility may make capital investments to expand the capacity of facilities to accommodate future capacity needs (customers). Finally, certain projects may be a function of a regulatory requirement in which the Federal or State government mandates the need for an improvement to the system to meet a regulatory standard. Understanding these different types of capital projects is important because it may help to explain why costs are increasing and the cost drivers for any needed revenue adjustments. In addition, and more importantly, the way in which projects are funded may vary by the type of capital project. For example, renewal and replacement projects should be paid for via rates and funded on a “pay-as-you-go” basis. In contrast to this, growth or capacity expansion projects may be funded via the collection of development or connection fees (i.e., growth-related charges) in which new development pays a proportional share of the cost of facilities necessary to serve their development (impact). Finally, regulatory projects may be funded by a variety of different means, which may include rates, long-term debt, grants, etc.

While the above discussion appears to neatly divide capital projects into three clearly defined categories, the reality of working with specific capital projects may be more complex. For example, a pump may be replaced, but while being replaced, it is up-sized to accommodate greater capacity to serve increasing demands or new development. There are many projects that share these “joint” characteristics. At the same time, projects may not be “replacement” related, but rather “improvement” related.

For purposes of developing the capital funding plan the District provided its capital improvement plan (CIP) which has been summarized in Table 3 - 3 along with the expected funding sources developed as part of the rate study.

Table 3 – 3 Summary of the Water Capital Improvement Plan (\$000s)						
	2024	2025	2026	2027	2028	2029
Total Capital Projects	\$4,458	\$14,561	\$20,963	\$21,161	\$17,829	\$16,058
Other Funding Sources						
Property Tax Revenue	\$0	\$6,186	\$4,974	\$5,124	\$0	\$0
Reserves	758	0	1,971	1,714	0	0
Long Term Debt	0	4,200	10,192	10,498	10,813	11,137
West Shore Augment. Debt	0	0	0	0	3,191	1,096
Grant Funding	<u>0</u>	<u>475</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total Other Funding Sources	\$758	\$10,861	\$17,137	\$17,336	\$14,004	\$12,233
Rate Funded Capital	\$3,700	\$3,700	\$3,825	\$3,825	\$3,825	\$3,825

The capital improvements are a mix of renewal and replacement of aging water system infrastructure, equipment replacement, improvements to acquired water systems, storage improvements, and general system pipeline replacement. While the total amount required to fund projects may vary from year-to-year, the rate study capital funding plan has developed a plan to provide a consistent funding source for capital improvements.

The capital funding plan developed for the District’s water utility has placed the rate funded capital level at \$3.8 million in 2026 through 2029 based on discussion with District staff and Board. This level of funding was established based on the long-term need to prudently fund replacement and repair of the existing water system. This was balanced with the use of available reserves and the need for long-term borrowing to fund major system improvements over the next five-year period. The District prioritizes “cash financing” capital projects as evident through the level of annual rate funded capital. This level of pay-as-you-go funding can create a more stable level of funding over time for capital projects, more predictable rates for customers, and may also provide the District with increased financial flexibility into the future. The other funding sources include reserve funds and long-term debt issuance. While the District prefers to limit



debt when possible, given the nature, and level, of the capital projects, additional long-term debt is projected during the next five-year time period to fund major system improvements.

A desirable and recommended minimum funding target for rate funded capital is an amount equal to or greater than annual depreciation expense. For the District, in FY 2023 annual depreciation expense estimated at \$1.4 million for the water utility. As can be seen, this financial plan provides the District with funding an amount greater than annual depreciation expense. This is critical as the replacement cost of an asset may be many times the original costs reflected through annual depreciation expense. This funding level will remain important to fund as the District's water system continues to age and the demand for funding renewal and replacement projects increases. In developing this financial plan, HDR and the District have attempted to minimize rate impacts while funding the necessary capital improvement projects.

3.7 Projection of Debt Service

The District has one (1) outstanding debt issue for the water utility, the state revolving fund (SRF) loan for the WTP. The total annual debt service payment is approximately \$100,000 in 2024 and starting in 2025 \$1.1 million a year until 2044. However, as per the Board's policy, 50% is funded from property tax resulting in net annual debt service of approximately \$556,000. As noted in the capital funding section above, the district is assuming additional long term debt to fund system improvements. This is primarily for the Tahoe Cedars and Madden Creek system improvements. The debt service for Tahoe Cedars will be approximately \$240,000 in 2025 and it will increase each year to \$2.7M in 2029. Madden Creek improvements will be funded through a low interest loan with annual debt service of approximately \$357,000 in 2029. As directed by the Board, the funding for these two debt issuances are through rate revenues, infrastructure improvement charge, and property tax revenues. Finally, the District is anticipating debt funding for the West Shore storage project which results in an additional approximately \$247,000 in annual debt service in 2029. Given the total debt issued, annual debt service increases from approximately \$100,000 in 2024 to \$4.4 million in 2029. However, as noted, 50% of the WTP debt, and 33% of the Tahoe Cedars and Madden Creek debt, is funded through property tax revenues. This results in a net debt service of approximately \$2.8 million in 2029.

As part of the Study, HDR is not providing municipal advice to the District as it relates to long-term borrowing, terms of borrowing, or structures of long-term debt issuance. Rather, this study is simply identifying the existing annual debt service payments and District provided estimates of additional long-term debt for rate setting purposes.

3.8 Reserve Funding

The final component of the revenue requirement analysis is the transfer to, or from, reserves to either maintain prudent ending fund balances or for future funding of specific capital improvements. In future years, as rates are projected to reach sufficient levels, funds are being transferred to the operating reserves to replenish prior expenditures and to meet minimum target levels. A more detailed discussion of the District's water reserve funds is provided in Section 3.10.

3.9 Summary of the Revenue Requirement

Given the above projections of revenues and expenses, a summary of the District’s revenue requirement analysis can be developed. In developing the revenue requirement analysis, consideration was given to the financial planning considerations of the District. In particular, emphasis was placed on minimizing rates, while providing adequate funds to support the operational activities and capital improvement needs throughout the test period. Presented below in Table 3 – 4 is a summary of the District’s revenue requirement based on projected expenses and current rates. Detailed exhibits of this analysis can be found in the Water Technical Appendices Exhibit 3.

Table 3 - 4						
Summary of the Water Revenue Requirement Analysis (\$000s)						
	2024	2025	2026	2027	2028	2029
Revenues						
Rate Revenues	\$9,387	\$9,411	\$9,434	\$9,458	\$9,482	\$9,505
Other Revenues	<u>961</u>	<u>1,498</u>	<u>1,511</u>	<u>1,568</u>	<u>1,651</u>	<u>1,742</u>
Total Revenues	\$10,348	\$10,909	\$10,945	\$11,026	\$11,133	\$11,247
Expenses						
Total O & M	\$6,596	\$7,589	\$8,038	\$8,513	\$9,015	\$9,546
Rate Funded Capital	3,700	3,700	3,825	3,825	3,825	3,825
Net Debt Service	51	718	1,111	1,754	2,356	2,848
Reserve Funding	<u>1</u>	<u>78</u>	<u>159</u>	<u>234</u>	<u>460</u>	<u>896</u>
Total Revenue Requirement	\$10,348	\$12,085	\$13,133	\$14,326	\$15,656	\$17,115
Total Bal. / (Def.) of Funds	\$0	(\$1,176)	(\$2,188)	(\$3,300)	(\$4,523)	(\$5,868)

As can be seen, the revenue requirement has summed the O&M, net debt service, rate funded capital, and reserve funding. The total revenue requirement is then compared to the total sources of funds which are the rate revenues, at present rate and consumption levels, and other revenues. From this comparison, a balance or deficiency of funds in each year can be determined. The “Bal. / (Def.) of Funds” row is cumulative. That is, any rate revenue adjustments in the initial years will reduce the deficiency in the later years, assuming no changes in projected expenses.

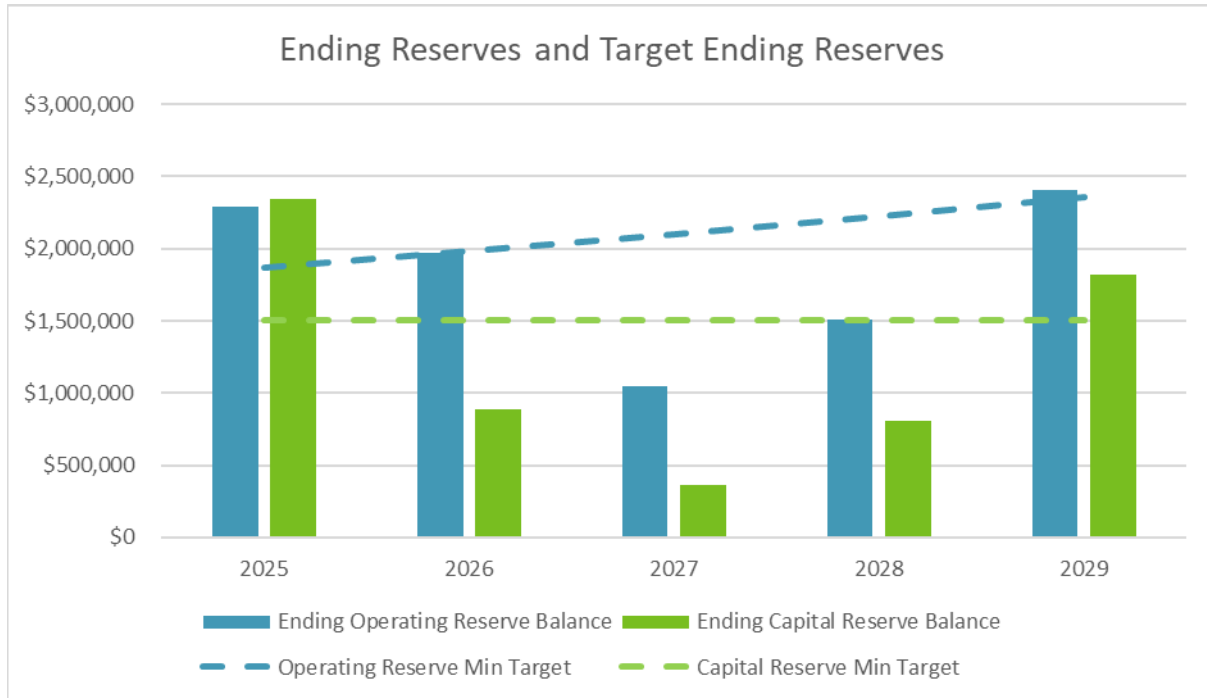
As shown in Table 3 – 4, the overall level of water rate revenue should be increased over the Study time period to meet the operating and capital needs of the water utility. Based on the analysis, the District will need to adjust the level of rate revenue starting in 2025 and continuing through 2029. Based on the proposed rates, as developed later in this report, the revenue adjustments will be effective January 1, of each year. Given the Study assumptions, the proposed rate revenue levels have been developed to meet the operating and capital needs of the District during the projected time period.

3.10 Reserve Fund Levels

Another key element of reviewing the financial health and sustainability of the District's water utility is to review the level of available reserve levels after the revenues have been increased to fund the deficiencies identified in this Study. Utilities can have several different reserves, each with a different purpose. The typical types of reserves utilities maintain are generally referenced as an operating reserve and a capital reserve. Each of these funds can have a minimum ending balance that, if reached or falls below, is a signal that the District should review the revenue sources associated with each reserve fund. The minimum ending balances will vary depending on the purpose of the fund and the expected revenue sources. For the District, two of the reserve funds have minimum target balances, the operating reserve and infrastructure capital replacement reserve. The combined minimum reserve balance for these two funds is approximately \$3.1 million, increasing over the Study time period to reflect increases in projected costs.

- **Operating Reserves** – The reserve is to be used in extraordinary circumstances to mitigate unforeseen significant fluctuations in operational expenses. The target minimum ending balance is 90 days of O&M expenses.
- **Infrastructure Capital Replacement Reserve** – The reserve may be used to fund capital expenditures that exceed the anticipated rate revenue available for capital. The minimum target ending balance is set at \$1.5 million.
- **Fleet & Equipment Replacement Reserve** – The reserve is for the planned replacement of current and future fleet and heavy equipment. Reserve target is an annualized value.
- **Water System Acquisition & Infrastructure Improvement Property Tax Reserve** – The reserve is in place for the future acquisitions and infrastructure improvements for those newly acquired systems. The reserve target is set at \$3.0 million and is fully funded.

Shown in the chart below is the District’s water utility projected ending fund balance over the rate setting period.



As can be seen in the reserve chart above, operating (rate stabilization) and capital reserves are utilized annually and are below target minimum balances during the Study time period. Target minimum balances are met by the end of the five-year rate transition period based on the implementation of the proposed rate adjustments and transfers of funds to the reserves.

3.11 Revenue Requirement Summary

Based on the revenue requirement analyses developed herein, HDR has concluded that the District will need to adjust the level of water revenues received over the next five years (2025 – 2029). HDR has reached this conclusion for the following reasons:

- Rate revenue adjustments are necessary to fund annual water utility operating expenses
- Rate revenue adjustments are necessary to maintain prudent funding of annual renewal and replacement of the water system
- Rate revenue adjustments are necessary to fund annual debt service payments which have, and will, fund system improvements and betterments
- The rate revenue adjustments maintain the strong financial health of the District’s water utility (e.g., reserve levels, debt service coverage ratios) and provide long-term, sustainable funding levels

In reaching this conclusion, HDR recommends that the District adopts the proposed revenue levels for 2025 through 2029. The following sections of this report will outline the proposed rates to maintain the target revenue levels identified in the revenue requirement analysis. This results in sufficient funding for the O&M and capital improvement needs for the Study time period.

4 Cost of Service Analysis

4.1 Water Cost of Service

In the previous section, the revenue requirement analysis focused on the total sources and application of funds required to adequately fund the District’s water utility. This section will provide an overview of the cost of service analysis developed for the District.

A cost of service analysis determines the proportional distribution of the total revenue requirement between the identified customer classes of service (e.g., Residential, Commercial). The previously developed revenue requirement for 2025 was utilized in the development of the cost of service analysis.

4.2 Objectives of a Cost of Service Study

There are two primary objectives in conducting a cost of service analysis:

- Proportionally distribute the water revenue requirement among the customer classes of service; and
- Derive average unit costs (i.e., cost-based rates) for subsequent rate designs

The objectives of the cost of service analysis are different from determining a revenue requirement. As noted in the previous section, a revenue requirement analysis determines the utility’s overall revenue needs, while the cost of service analysis determines the proportional manner to collect the revenue requirement from each customer class of service.

The results of the cost of service analysis provide unit costs (i.e., cost-based rates) which are used in the development of the final proposed rate designs. The cost of service analysis provides a cost per unit of water consumption based on each customer class’s proportional share of costs. For example, a water utility incurs costs related to average day, peak day, fire protection, and customer-related cost components. A water utility must build sufficient capacity² to meet summer peak capacity needs. Therefore, those customers contributing to those peak demands on the system should pay their proportional share of the costs to provide the capacity in the system. The unit costs provide the relationship between these components which are then used to set cost-based rates.

² System capacity is the system’s ability to supply water to all delivery points at the time when demanded. Coincident peaking factors are calculated for each customer class at the time of greatest system demand. The time of greatest demand is known as peak demand. Both the operating costs and capital assets related costs incurred to accommodate the peak demands are generally allocated to each customer class based upon the class’s contribution to the peak month, day and hour event.

4.3 Determining the Customer Classes of Service

The first step in a cost of service analysis is to determine the customer classes of service. Based on discussion with District staff, and a review of the District's types of customers, the classes of service used within the cost of service analysis were:

- Residential
- Commercial
- Fireline

In determining classes of service for cost of service purposes, the objective is to group customers together into similar or homogeneous groups based upon similar facility requirements and/or demand characteristics. Currently, the District has a rate structure for each of the above noted customer classes of service. The analysis has been developed to reflect the consumption patterns of each class. For example, residential customers have different consumption characteristics and facility requirements than commercial customers. This is a key aspect of a cost of service analysis that allows for the proportional distribution of costs to establish the proposed rates for each customer class of service. Based on these customer classes of service, each with their own unique customer consumption patterns and characteristics, the cost of service can be developed.

4.4 General Cost of Service Procedures

In order to determine the cost to serve each customer class of service on the District's water system, a cost of service analysis is conducted. A cost of service analysis utilizes a three-step approach to review costs. These steps take the form of functionalization, allocation, and distribution. Provided below is a detailed discussion of the water cost of service analysis conducted for the District, and the specific steps taken within the analysis. The approach used for the District's Study conforms to generally accepted cost of service methodologies as outlined in the AWWA M1 manual to meet the intent and requirements of Proposition 218.

4.4.1 Functionalization of Costs

The first analytical step in the cost of service process is called functionalization. Functionalization is the arrangement of expense and asset (infrastructure) data by major operating functions (e.g., supply, transmission, storage, distribution). Within the Study, there was a limited amount of functionalization of the cost data since it was largely accomplished within the District's system of accounts.

4.4.2 Allocation of Costs

The second analytical task performed in a water cost of service study is the allocation of the costs. The allocation of costs examines why the expenses were incurred or what type of need is being met. The following allocations were used to develop the cost of service analysis:

- **Commodity Related Costs:** Commodity costs are those costs which tend to vary with the total quantity of water consumed by a customer. Commodity costs are those incurred under average load (demand) conditions and are generally specified for a period of time such as a month or year. Chemicals or utilities (electricity) are examples of commodity-related cost as these costs tend to vary based upon the total demand of water.
- **Capacity Related Costs:** Capacity costs are those which vary with peak demand, or the maximum rates of flow to customers. System capacity is required when there are large demands for water placed upon the system (e.g., summer outdoor watering). For water utilities, capacity related costs are generally related to the sizing of facilities needed to meet a customer's maximum water demand at any point in time. For example, portions of distribution storage reservoirs and mains (pipes) must be adequately sized to meet the peak demands of each customer class of service.
- **Customer Related Costs:** Customer costs are those costs which vary with the number of customers on the water system. They do not vary with system output or consumption levels. These costs are also sometimes referred to as readiness to serve or availability costs. Customer costs may also sometimes be further allocated as either actual or weighted. Actual customer costs vary proportionally, from customer to customer, with the addition or deletion of a customer regardless of the size of the customer. An example of an actual customer cost is postage for mailing bills. This cost does not vary from customer to customer, regardless of the size or consumption characteristics of the customer. In contrast, a weighted customer cost reflects a disproportionate cost, from customer to customer, with the addition or deletion of a customer. Examples of weighted customer costs are items such

Water Cost of Service Analysis Terminology

Functionalization – The arrangement of the cost data by functional category (e.g., source of supply, distribution).

Allocation – The assignment of functionalized costs to cost components (e.g., commodity, capacity, customer, and fire protection related).

Distribution – Distributing the allocated costs to each class of service based upon each class's proportional contribution to that specific cost component.

Commodity Costs – Costs that are allocated as commodity related vary with the total demand of water (e.g., chemicals, electricity).

Capacity Costs – Costs allocated as capacity related vary with peak day usage. Facilities are often designed and sized around meeting peak demands.

Fire Protection Costs – Costs that are related to fire protection services (e.g., hydrants, oversizing of storage and distribution mains).

Customer Costs – Costs allocated as customer related vary with the number of customers on the system (e.g., metering costs).

as meter maintenance expenses, where a large commercial customer can require a significantly more expensive meter than a typical residential customer. This allocation reflects a weighted cost by customer class and an allocation based on the equivalent capacity based on the size of meters for each customer class and the AWWA capacity of each meter size.

- **Fire Protection Related Costs:** Fire protection costs are system and capacity costs necessary to allow for public fire protection functions. Usually, such costs relate to public fire hydrants and the over-sizing of mains and distribution storage reservoirs for fire protection purposes. Ultimately, for the District’s Study, fire protection costs were split between public and private to develop the proper allocation of costs.
- **Revenue Related Costs:** Some costs associated with the utility may vary with the amount of revenue received by the utility. An example of a revenue related cost would be a utility tax which is based on the gross utility revenue. For the District’s Study, no costs were allocated to the revenue requirement component.
- **Direct Assignment:** Some costs associated with the utility may be directly assigned to a specific customer class, or classes. This can be a specific O&M expense or component of the infrastructure that only benefits a specific customer class, or classes. For the District’s Study, no costs were distributed directly to an individual customer class of service.

4.4.3 Development of Distribution Factors

Once the allocation process is complete, and the customer classes of service have been defined, the allocated costs are proportionally distributed to each customer class of service. The District’s allocated costs were distributed to the previously identified customer groups using the following distribution factors.

- **Commodity Distribution Factor:** As noted earlier, commodity-related costs vary with the total water consumption. Therefore, the commodity distribution factor was based on the projected total metered consumption, plus losses for each class of service, and tier for Residential, for the projected test period. The development of the commodity distribution factor took into consideration the recent consumption patterns of each customer class of service. The projection of metered consumption therefore reflects current consumption levels and projected consumption levels for the Study time period.
- **Capacity Distribution Factor:** The capacity distribution factor was developed based on the estimated capacity contribution of each class. Capacity requirements by customer class of service was calculated using peaking factors for each customer class and tier, for Residential customers. For the District’s Study, the capacity requirements were defined as the relationship between peak and average capacity and determined for each customer group based on a review of the average month to peak month usage of each individual customer for each class of service. For the Residential tiers, the capacity requirements were calculated based on the average use of tier 1 and the average use in the subsequent tiers, and the peaking factor for each tier. This provided the basis for the proportional distribution for each tier.
- **Customer Distribution Factor:** Customer costs vary with the number of customers on the system. Two basic types of customer distribution factors were identified – actual and

weighted. The distribution factor for actual customer was based on the projection of the number of customers developed within the revenue requirement for each class of service. The weighted customer distribution factor is also broken down further to reflect the disproportionate costs associated with serving different types of customers. The first weighted customer factor is for customer service and accounting. This weighted customer distribution factor takes into account the fact that it may take more time to read a meter and process a bill for various customers. For the District's study no differences were developed for this factor. The next weighted customer distribution factor is for meters and services and capacity demand. This factor reflects the different demands associated with larger sized meters. For example, there is a significantly higher demand that a 6" meter can place on the system compared to a 3/4" meter. This factor reflects the average capacity needs of each customer class based on AWWA meter equivalencies and the number and size of meters for each customer class.

- **Fire Protection Distribution Factor:** The development of the distribution factor for fire protection expenses involved an analysis of each class of service and their fire flow requirements. The analysis took into account the gallon per minute fire flow requirements in the event of a fire, along with the duration of the required flow. The fire flow rates used within the distribution factor were based on industry standards. The minimum fire flow requirements are then multiplied by the number of customers in each class of service, and the assumed duration of the fire, to determine the class's prorated fire flow requirements. As the District also has private fire protection, additional distribution factors were developed to distribute the fire protection costs between public and private based on equivalent services which were calculated using the demand factors from the AWWA M1 Manual.
- **Revenue Related Distribution Factor:** The revenue related distribution factor was developed from the projected rate revenues for 2025 for each customer class of service. These same revenues were used within the revenue requirement analysis discussed in section 3.

As mentioned, in a cost of service analysis, the distribution factors represent a group of similar customers such as Residential or Commercial. For this analysis, however, additional cost detail was needed when distributing costs. This meant that the commodity and capacity distribution factors had the classes further broken down; Residential has a factor for each of the tiers whereas Commercial has only the uniform rate for the development of the proposed rates to provide the cost basis for the tiered rates (i.e., Proposition 218). Further discussion related to the distribution of costs to a greater cost level is discussed in more detail in the rate design analysis provided in Section 5 of the report and can be found in Exhibits 7 through 11 of the Technical Appendix.

4.5 Functionalization and Allocation of Plant in Service

As noted, one of the first steps of the cost of service analysis is the functionalization and allocation of plant in service. In performing the functionalization of plant in service, HDR utilized the District's historical plant (asset) records. Once the assets were functionalized, the analysis shifted to the allocation of the asset. The allocation process included reviewing each group of assets and determining which cost component(s) the assets were related to. For example, the

District’s assets were allocated as: commodity-related, capacity-related, customer-related, revenue-related, fire protection-related, or a direct assignment. Provided below is a summary of the allocation process. The following approach is based on the methodology as described in the AWWA M1 Manual and the District’s water system operating and customer characteristics.

Source of supply – Source of supply was allocated as commodity and capacity related given these assets meet both average day (commodity) and peak day (capacity) needs. Based on the operation of the water system, the source of supply assets are allocated 37.9% to commodity and 62.1% to capacity. This allocation reflects the use of these assets and infrastructure for both average day and peak day demands.

Pumping – Pumping (pump stations) was considered to be entirely related to the capacity requirements placed on the system and is allocated 100% to capacity demand, which is recovered through the customer, or fixed charge. Pump stations are in place to meet the system capacity needs when they incur to move water through the system.

Storage – Storage, or water tanks, are typically designed to meet at least two types of needs – capacity demands and fire protection. The total storage capacity of the District’s storage reservoirs was examined, and consideration given to the fire protection requirements. This amount of capacity, in relation to the total storage capacity, is considered fire protection related. The balance of storage capacity is considered to be in place to meet system capacity demands. This resulted in 54.5% of the storage costs being assigned to the capacity demand cost component and the remaining 45.5% to be assigned to the fire protection component.

Distribution Mains – Distribution lines (mains) are typically assumed to provide two types of costs. First, distribution mains are considered a function of meeting capacity requirements, or peak rates of flow requirements on the system. Distribution mains must be sized to adequately meet the maximum (peak) flows demanded by customers. This portion of the distribution main plant investment is considered capacity demand related and allocated on an equivalent meter basis which reflects the capacity, or demand, that can be placed on the system by customers with varying meter sizes. Next, distribution mains must also be over-sized for public fire flow demands. This final portion of over-sizing for distribution plant investment is allocated as public fire protection-related. Based on an analysis of the District’s assets, and the utilization of the system, the allocation of the distribution mains was therefore 86.9% capacity-related and 13.1% fire protection related.

Table 4 – 1 provides a summary of the basic functionalization and allocation of the major water plant items.

Table 4 - 1
Summary of the Allocation of Water Plant in Service

Category	Commodity	Capacity	Customer Related	Fire Protection	Direct Assign.
Source of Supply	37.9%	62.1%	0.0%	0.0%	0.0%
Pumping	0.0%	0.0%	100.0%	0.0%	0.0%
Storage	0.0%	0.0%	54.5%	45.5%	0.0%
Distribution Mains	0.0%	0.0%	86.5%	13.5%	0.0%
General Plant	<u>4.8%</u>	<u>7.9%</u>	<u>71.9%</u>	<u>15.4%</u>	<u>0.0%</u>
Total Net Plant In Service	4.8%	7.9%	71.9%	15.4%	0.0%

A more detailed exhibit of the functionalization and allocation of water plant (assets) can be found in the Technical Appendix in Exhibit 12.

4.6 Functionalization and Allocation of Operating Expenses

As noted in the AWWA M1 Manual, operating expenses are generally functionalized and allocated in a manner similar to the corresponding plant account. For example, maintenance of distribution mains is typically allocated in the same manner (allocation percentages) as the plant account for distribution mains. This approach to allocating the District’s operating expenses was used for this analysis. Although in general, the District does separate O&M expenses by function (e.g., supply, storage), not all of the O&M is functionalized which is not uncommon for utilities. As a result, the approach to allocate the operating expenses was based on the allocation of the plant, or asset data, which reflects the investment made by the District to provide service.

For the Study, the revenue requirement for 2025 was functionalized and allocated based on the approach noted above. The District utilized a cash basis revenue requirement, which was comprised of operation and maintenance expenses, rate funded capital, debt service, and reserve funding. Provided in Table 4 – 2 is a summary of the allocation of the water revenue requirement to the cost classifiers.

Table 4 - 2
Summary of the Classification of the Revenue Requirement (\$000)

	Total	Commodity	Capacity	Customer	Fire Protection	Direct Assign.
Net Revenue Requirement	\$10,587	\$983	\$850	\$8,376	\$378	\$0

The allocation of revenue requirement is further detailed in Exhibit 14 to the Technical Appendix.

4.7 Major Assumptions of the Cost of Service Analysis

A number of key assumptions were used within the District's cost of service analysis. Below is a brief discussion of the major assumptions used.

- A test period of 2025 was used for the cost of service analysis in order to select the expenses which should be allocated and distributed for the rate setting period. The revenue and expense data previously developed within the revenue requirement analysis.
- A cash basis approach was utilized which conforms to generally accepted water cost of service approaches and methodologies.
- The allocation of plant in service was developed based upon generally accepted cost allocation techniques. Furthermore, they were developed using the District's specific data.
- Consumption by cost or class of service used within the Study were developed for each class of service from historical usage information provided by the District.
- Capacity distribution factors were calculated based on each customer group's average to peak month relationship and capacity requirements by tier for Residential customers.

4.8 Summary Results of the Cost of Service Analysis

In summary form, the cost of service analysis began by functionalizing the previously developed revenue requirement for 2025. The functionalized revenue requirement was then allocated to the appropriate cost component(s) based on generally accepted methodologies and the District's system and customer characteristics. The individual allocation totals were then distributed to the customer classes of service and tiers based on the appropriate distribution factor. For example, commodity-related costs were distributed based on the commodity distribution factor which was based on annual water consumption. Each customer class is distributed their proportional share of commodity costs based on total annual water consumption and by tier. Similarly, capacity costs were distributed proportionally based on the capacity distribution factor. This factor reflects the capacity characteristics of each class, and tier. In this way, each class and tier is distributed the proportional share of costs allocated to the capacity component.

The distributed expenses for each customer class were then aggregated to determine each customer class's overall revenue responsibility. Table 4 – 3 provides a summary of the distributed costs to each customer class of service, also described in Exhibit 16 to the Technical Appendix.

Table 4 – 3
Summary of the Distribution of the Water Revenue Requirement (\$000)

Cost Classifier	Total Costs	Residential	Commercial	Fireline
Commodity	\$983	\$764	\$219	\$0
Capacity	850	644	171	35
Actual Customer	0	0	0	0
Customer Acctg.	0	0	0	0
Meters & Services	3,608	3,083	373	152
Capacity Demand	4,768	4,073	493	202
Public Fire Protection	348	313	35	0
Private Fire Protection	30	0	0	30
Direct Assignment	0	0	0	0
Total	\$10,587	\$8,877	\$1,291	\$419

The cost of service analysis proportionally distributes the 2025 revenue requirement to each customer class with their respective benefit received from and burdens placed on the water system. A cost of service analysis is based on one year’s O&M expense data and projected customer usage information. Given this, the results of the cost of service analysis may change from year to year. As the District continues to monitor rates and cost of service results through future studies, future cost of service adjustments may be necessary to reflect costs and customer consumption patterns at that time.

Based on the overall distribution of the costs, a comparison is made to the current revenues to determine the overall revenue adjustment by class of service to meet the overall system revenue needs. Provided in Table 4 - 4 is a summary of the cost of service analysis.

Table 4 – 4
Summary of the Water Cost of Service Analysis (\$000)

Class of Service	Present Revenues	Allocated Costs	\$ Difference
Residential	\$7,980	\$8,877	(\$897)
Commercial	1,045	1,291	(246)
Fireline	386	419	(33)
Total System	\$9,411	\$10,587	(\$1,176)

As can be seen in Table 4 – 4, while an overall revenue adjustment is necessary, the distribution of costs results in different revenue adjustments by class of service. In this case, all three customer classes current revenues are less than the distributed costs and should be increased. It is important to note that the overall system average and individual customer class revenue

adjustments do not reflect the actual customer bill impacts, only the overall revenue change for the class of service as a whole.

4.9 Consultant’s Conclusions and Recommendations

Given the requirements of Article XIII D, section 6, the results of the cost of service will be used to establish the proposed rate designs for each of the District’s customer classes of service. A more detailed discussion of the use of the cost of service results, and average unit costs, is provided in the rate design section (Section 5) of this report.

4.10 Summary of the Cost of Service Analysis

This section of the report has provided the recommendations resulting from the cost of service analysis developed for the District’s water utility. This analysis was prepared using generally accepted cost of service techniques as provided in the AWWA M1 Manual and the District’s specific system and customer characteristics to meet the intent of Proposition 218 for proportional and cost-based water rates. The following section of the report will provide a summary of the present and proposed rates for the District’s water utility.



5 Rate Design Analysis

5.1 Water Rate Design

The final step of the District's water rate study is the design of rates to collect the appropriate level of revenues, based on the results of the revenue requirement and cost of service analyses. In reviewing District's rates, consideration must be given to the level of the rates as well as the structure of the rate schedules. The level of rates reflects the amount of revenues that should be collected in total while the structure of the rates is how it is collected (charged) from the customers.

The overall revenue level for the District has been established in the revenue requirement analysis and the proportional distribution of costs between the customer classes has been developed in the cost of service analysis. This provides the overall system revenues and how the total system revenues are proportionally collected from each class of service.

5.2 Rate Design Criteria and Considerations

Prudent rate administration dictates that several criteria should be considered when setting utility rates. Some of these rate design criteria are listed below:

- Rates which are easy to understand from the customer's perspective
- Rates which are easy for the District to administer
- Consideration of the customer's ability to pay
- Continuity, over time, of the rate making philosophy
- Policy considerations (encourage efficient use, economic development, etc.)
- Provide revenue stability from month to month and year to year
- Promote efficient allocation of the resource
- Proportional and non-discriminatory (cost-based)
- Legally defensible

It is important that the District provides its customers with a proper price signal as to what their consumption and capacity requirements are costing. This goal may be approached through rate level and structure. When developing the proposed rate designs, all the above listed criteria were taken into consideration. However, it is difficult - if not impossible - to design a rate that meets all the goals and objectives listed above. For example, it may be difficult to design a rate that takes into consideration the customer's ability to pay, and one which is cost-based. In designing rates, there are always trade-offs between these goals and objectives.

5.3 Development of Cost-Based Water Rates

Developing cost-based and proportional rates is of paramount importance in developing the District's proposed water rates. While always a key consideration in developing rates, meeting the legal requirements and documenting the steps taken to meet the requirements, has been a

requirement in the State of California for many years. The District’s proposed water rates have been developed to meet the legal requirements of California constitution Article XIII D, section 6 (Proposition 218). A key component of Article XIII D is the development of rates which reflect the cost of providing service and are proportionally distributed between the customer classes of service. There is no single prescribed methodology for proportionally distributing costs to the identified customer groups. The American Water Works Association (AWWA) M1 Manual clearly delineates various methodologies which may be used to establish cost-based and proportional rates. Article XIII D does not prescribe a particular methodology for establishing cost-based rates; consequently, HDR developed the District’s proposed water rates based on the methodologies provided in the AWWA M1 Manual to meet the requirements of Article XIII D and to provide an administrative record of the steps taken to establish the District’s water rates.

The proposed rates comply with legal requirements of Article XIII D. HDR reaches this conclusion based upon the following:

- **The revenue derived from water rates does not exceed the funds required to provide the property related service (i.e., water service).** The proposed rates are designed to collect the overall revenue requirements of the District’s water utility.
- **The revenues derived from water rates shall not be used for any purpose other than that for which the fee or charge is imposed.** The revenues derived from the District’s water rates are used exclusively to operate and maintain the District’s water system.
- **The amount of a fee or charge imposed upon a parcel or person as an incident of property ownership shall not exceed the proportional costs of the service attributable to the parcel.** The Study focused exclusively (Section 4) on the issue of proportional assignment of costs to customer classes of service. The proposed rates have appropriately grouped customers into customer classes of service that reflect the varying consumption patterns and system requirements of each customer class of service. The grouping of customers and rates into these classes of service creates the equity and fairness expected under Article XIII D by having differing rates by customer classes of service which reflect both the level of revenue to be collected by the utility, but also the manner in which these costs are incurred and equitably assigned to customer classes of service based on their proportional demands and burdens on District’s the water system.

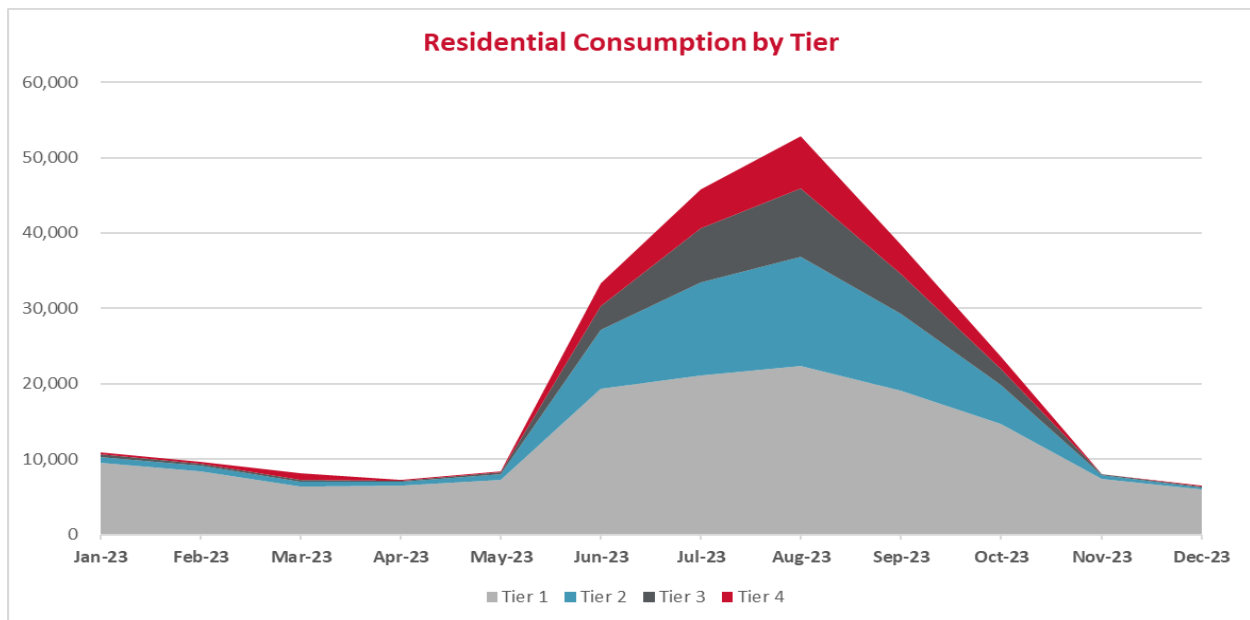
The District currently has a separate rate structure for each customer class of service. For Residential customers that includes a monthly base charge - which varies by meter size - and a four-tiered consumption charge on a dollar per 1,000 gallons basis. Commercial customers are charged a monthly base charge – again based on the meter size– and a uniform consumption charge also on a dollar per 1,000 gal basis. Finally, the Fireline rate structure consists of a monthly base charge based on the meter size. The monthly service charge, for each customer class of service, is designed to collect a proportional share of the fixed costs of providing water service. The consumption charge is designed to collect the District’s variable costs in providing water service.

In discussion with the District, it was determined that the current rate structure was appropriate and adequately addressed achieving the rate design goals and objectives. Given that no cost differences were determined in the fixed cost between Residential and Commercial base (meter) charges, the meter charges are the same to reflect the equivalent capacity of a meter, by size, regardless of the customer type.

Developing a separate consumption charge for each customer class that reflects the consumption patterns and impacts placed on the system provides the cost-basis to reflect the requirements of Proposition 218. As a part of the Study, HDR developed a water rate design discussion to demonstrate and support the proposed water rates and tiered pricing. The following discussion provides a more detailed analysis of the costing techniques and methodologies used to support the District’s proposed rate design.

5.4 Determination of Sizing and Number of Tiers

The first step in reviewing the District’s current, and proposed, tiered rate structure is to identify the number of tiers and determine the size of the tiers. Only the Residential customer class has a tiered structure, and no changes were recommended based on a review of individual customer consumption patterns. A summary of the average consumption by month for Residential customers is shown in the graphic below.



When reviewing the tier sizing, and consumption by tier, it can be seen that the tier sizes reflect the typical consumption patterns of the District’s customers. Initially, in 2009, the tiers were developed based on average customer characteristics of average indoor use, average outdoor use, peak outdoor use, and greater than peak outdoor use. As can be seen in the chart above, the tiers still reflect these consumption patterns with the summer season being when the vast majority of the consumption in the upper three tiers occurs. Based on the review for the current Study, the tier sizes appear to be appropriate and continue to reflect the District’s Residential

customer characteristics. As there is no recommended change, after the number and size of tiers have been identified, the pricing of the tiers is the next analytical step.

5.5 Establishing the Cost-Basis for Pricing Tiers

Given past legal decisions regarding water rates, HDR has concluded that utilities have available to them at least three technical approaches to be able to demonstrate (i.e., cost justify) the individual pricing of the tiers. These technical approaches encompass the following areas:

1. Cost differences in water supply (i.e., stacking of water supply resources to tiers).
2. Cost differences from high capacity use consumers (relationship of average use to peak capacity use).
3. Direct assignment of costs to specific tiers (conservation program costs, etc.).

In certain cases, the cost differences may be related to the cost of water supply when a utility has more than one source of water supply. Additionally, this water supply approach may also include the cost of alternative water supplies (e.g., recycled or reuse water). For example, reuse water may be assigned to higher tiers to reflect outdoor use or the need for additional/alternative water supply to meet the demands of the high use customers.

The second possible source of cost differences for the pricing of tiers is related to high-peak capacity use (peak demand) customers. Customers that use more water create greater demands and costs on the system. A water supply and distribution system must be sized to meet these peak use requirements. In other words, on the hottest day of the year when customers are watering their lawn, the supply and distribution system must be sized to meet those peak use demands. Economic theory clearly states that equity is achieved when those that create the demand event, pay for the demand event. In this particular case, this has implications upon the proportional distribution of capacity-related costs to the different usage tiers (average use vs. peak capacity use).

Finally, certain costs may be directly assigned to specific tiers. For example, a conservation program which focuses on outdoor water use may be directly assigned to the water tiers, or seasons, which are most directly related to outdoor use. The direct assignment to a specific price tier will create a price differential for that tier.

For the District's Study, the focus of the rate design analysis was on the second method of determining the cost impacts and cost differences associated with peak use. The pricing of the tiers, or uniform rate, was developed to provide the cost basis and meet the requirements of Proposition 218.

5.6 Development of the Unit Costs for Rate Designs

To begin the assignment of costs related to specific tiers, the results of the cost of service analysis is utilized. As noted in Section 4, the cost of service analysis allocates the revenue requirement between the cost components of average use (commodity), peak use (capacity), and customer (actual, weighted, and capacity-demand). However, the results provided in Table 4 - 1 which

distributed the totals to the customer classes of service are further allocated between the rate structure components (e.g., base charge, consumption charge/tiers). Provided in Table 5 – 1 is a summary of the allocation of the 2025 revenue requirement from the cost of service analysis (same as Table 4 - 3).

Table 5 – 1 Summary of the Distribution of the Water Revenue Requirement (\$000)				
Cost Classifier	Total Costs	Residential	Commercial	Fireline
Commodity	\$983	\$764	\$219	\$0
Capacity	850	644	171	35
Actual Customer	0	0	0	0
Customer Acctg.	0	0	0	0
Meters & Services	3,608	3,083	373	152
Capacity Demand	4,768	4,073	493	202
Public Fire Protection	348	313	35	0
Private Fire Protection	30	0	0	30
Direct Assignment	0	0	0	0
Total	\$10,587	\$8,877	\$1,291	\$419

The total of the above distributed costs, of approximately \$10.6 million, is the same as the total costs distributed in Table 4 - 4 of the cost of service analysis. This allocation of the total revenue requirement for 2025 is then distributed to the customer classes of service. Allocated costs are further distributed between the rate structure components based on the corresponding distribution factors. The distribution factors were discussed for the costs of service in Section 4 of this report. For example, the commodity costs are divided through by each customer class’s consumption from a given tier, or in total. Provided below is a discussion of the approach used to distribute the revenue requirement between the various customer classes of service to the rate components.

5.6.1 Commodity Distribution Factor

The commodity distribution factor is based on the average annual use for each of the customer classes of service, and by tier. For the development of the pricing of the proposed rates the following customer class and rate components were used:

- Residential
 - Tier 1
 - Tier 2
 - Tier 3
 - Tier 4
- Commercial
- Fireline

To develop the commodity distribution factor for each customer class, the usage for each class, and tier, was divided by the total usage of the system. This produces the percentage of the system that each class is responsible for and, therefore, their contribution to commodity related costs. The development of the commodity distribution factor (Exhibit 7 of the Technical Appendix) is based on the actual metered consumption for each customer class and tier where applicable. Next, the total metered consumption is compared to actual production reports. The difference, or system losses, is spread evenly between the Residential and Commercial customer classes as all customers share in system losses (Fireline is excluded as there is no consumption unless there is a fire event).

Provided below in Table 5 – 2 is a summary of the commodity distribution factor, which is provided in Exhibit 7 of the Technical Appendix.

Table 5 - 2 Summary of the Commodity Distribution Factor				
<i>Reference Calculation</i>	<i>A</i>	<i>B</i>	<i>C</i> C = A + B	<i>D</i>
	2023 Consumption (1,000 gal)	Est. System Losses (1,000 gal)	Total Annual Use (1,000 gal)	% of Total
Residential				
Tier 1	153,507	23,026	176,533	44.5%
Tier 2	56,527	8,479	65,006	16.4%
Tier 3	30,704	4,606	35,310	8.9%
Tier 4	27,330	4,099	31,429	7.9%
Residential Total	268,068	40,210	308,278	77.7%
Commercial	76,854	11,528	88,383	22.3%
Fireline	0	0	0	0.0%
Grand Total	344,922	51,738	396,660	100.0%

The development of the commodity distribution factor is fairly straightforward. The distribution factor is based on the actual metered consumption of each class and tier, plus assumed losses on the system. In this way, those costs allocated to the commodity component can be proportionally distributed to the appropriate customer class and customer class tier. As an example, Tier 1 consumption of the Residential class of service represents 44.5% of the total consumption on the system. As a result, 44.5% of the commodity-related costs are then distributed to Tier 1 of the Residential customers.

This approach is used for each of the customer classes of service for each rate component and tier. Using the costs allocated to the commodity component in the cost of service analysis from Table 5 - 1, and the commodity distribution factor in Table 5 - 2, the distribution of costs to each

tier or customer class can be developed. The summary of the distributed commodity costs is shown below in Table 5 – 3.

Table 5 - 3 Distributed Commodity Costs (\$000s)				
<i>Reference Calculation</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>D D = B / C</i>
	% of Total	Commodity Costs	Water Sales (1,000 gal)	Unit Cost (\$ / 1,000 gal)
Residential				
Tier 1	44.5%	\$438	153,507	\$2.85
Tier 2	16.4%	161	56,527	2.85
Tier 3	8.9%	87	30,704	2.85
Tier 4	7.9%	78	27,330	2.85
Residential Total	77.7%	\$764	268,068	
Commercial	22.3%	\$219	76,854	\$2.85
Fireline	0.0%	0	0	0.00
Grand Total	100.0%	\$983	344,922	

The figures in column A are from column D in Table 5 – 2. The costs shown in column B are based on the total commodity related costs from Table 5 – 1. Column C is from column A in Table 5 – 2, or the actual consumption that is billed to the customers.

From the unit costs developed in Table 5 – 3 above, the per unit cost basis of the tiered and uniform rates can be determined for the commodity related costs identified in the cost of service analysis (Column D). For example, for the proposed Residential Tier 1 rate, the commodity component is \$2.85 per 1,000 gallons. This applies to each tier and customer class.

5.6.2 Capacity Distribution Factor

Whereas commodity costs are related to the total amount of water used by each class of service and tier, the capacity costs are related to how each customer class uses that water in each tier or annually. Customers use water in different ways and at different times, thus creating different usage patterns and resulting in different peaking factors. These usage patterns drive how the District must size the system (pipes, pumps, storage) to meet the peak demands of customers. To determine the distribution by tier or annually, peaking factors need to be developed for each customer class of service tier. The peaking factors for each class of service is calculated based on the data available, in this case monthly metered consumption data for each class of service. One method discussed in the AWWA M1 Manual used to estimate a class’s peaking factor is to review the average monthly volume of water consumed and compare it to the maximum monthly usage of water. By dividing the maximum month by the average month, a peak-day factor is calculated. Essentially, this factor provides the difference between the average use and peak capacity use in each tier. For example, if a customer used 10,000 gallons per month on average and in the peak

month 15,000 gallons was used, the peaking factor would be 1.50 (15,000 / 10,000 = 1.50). In this example, the peaking factor is stating that the maximum usage in a month is 1.50 times higher than the average usage per month.

For the District’s Study, the consumption patterns of each customer class and tier were reviewed and peaking factors were developed for each tier based on each customer’s peak contribution to the system peak. In other words, a peak factor for each customer, by tier was developed depending on the amount of water used and the peak demands of those customers within that tier compared to the average customer consumption peak. Shown below in Table 5 – 4 is a summary of the capacity distribution factor for each customer class.

Table 5 - 4 Summary of the Capacity Distribution Factor				
<i>Reference</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>
Calculation			C = A x B	
	Average Consumption (MGD)	Peaking Factors	Peak Day Use (MGD)	% of Total
Residential				
Tier 1	0.48	2.32	1.12	39.0%
Tier 2	0.18	2.57	0.46	15.9%
Tier 3	0.10	2.98	0.26	10.0%
Tier 4	<u>0.09</u>	3.58	<u>0.31</u>	<u>10.7%</u>
Residential Total	0.84		2.18	75.7%
Commercial	0.24	2.39	0.58	20.1%
Fireline	<u>0.00</u>	0.00	<u>0.12</u>	<u>4.2%</u>
Grand Total	1.09		2.88	100.0%

Table 5 – 4 above shows the development of the capacity distribution factor. For example, based on the District’s Residential customer consumption data, Tier 1 has a peaking factor of 2.32. In other words, those customers use 2.32 times more water in the peak period than on average. This is compared to customers in the remaining tiers which show a higher peaking factor based on how the customers in these tiers consume water. These peaking factors were developed around the District’s specific customers consumption patterns. Similar to the distribution of commodity costs to the tiers or customer classes, the capacity related costs are distributed in the same manner. For example, 39.0% of the capacity costs are allocated to Tier 1 of the Residential customers based on column D in Table 5 - 4. To determine this, the total average day use (column A) of each tier or class is multiplied by the peaking factor (column B). The total peak use by tier or class is divided by the system total peak use to develop the proportional distribution.

Table 5 – 5 provides a summary of the distributed capacity related costs to each tier.

**Table 5 - 5
Distributed Capacity Costs (\$000s)**

<i>Reference Calculation</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>D D = B / C</i>
	% of Total	Capacity Costs	Water Sales (1,000 gal)	Unit Cost (\$ / 1,000 gal)
Residential				
Tier 1	39.0%	\$136	153,507	\$0.88
Tier 2	15.9%	115	56,527	2.04
Tier 3	10.0%	118	30,704	3.84
Tier 4	<u>10.7%</u>	<u>275</u>	<u>27,330</u>	10.06
Residential Total	75.7%	\$644	268,068	
Commercial	20.1%	\$171	76,854	\$2.23
Fireline	<u>4.2%</u>	<u>36</u>	<u>0</u>	0.00
Grand Total	100.0%	\$207	344,922	

The figures in column A are from column D in Table 5 – 4. The costs shown in column B are based on the total capacity-related costs from Table 5 – 1. Column C is from column A in Table 5 – 2. For example, the proposed rate for Tier 2 includes a capacity component cost of \$2.04 per 1,000 gal while the Tier 3 capacity cost is \$3.84 per 1,000 gal. This difference reflects the costs associated with providing consumption at higher tiers and the costs of providing that capacity.

5.6.3 Summary of the Consumption Based Unit Costs

Combining the District’s unit costs from the commodity and capacity unit costs results in the basis of the tiered rate pricing. Table 5 – 6 provides the summation of the costs for each tier / rate. This table sums the costs from Table 5 – 3 column D and Table 5 – 5 column D as well as the direct assignment and fire protection costs which were distributed based on the proportion of consumption for each customer class tier / rate.

Table 5 - 6
Summary of the Unit Costs for Rate Design

<i>Reference</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>
	Commodity Costs (\$ / 1,000 gal)	Capacity Costs (\$ / 1,000 gal)	Direct Assignment Costs (\$ / 1,000 gal)	Total Unit Cost (\$ / 1,000 gal)
Residential				
Tier 1	\$2.85	\$0.88	\$0.00	\$3.74
Tier 2	2.85	2.04	0.00	4.89
Tier 3	2.85	3.84	0.00	6.70
Tier 4	2.85	10.06	0.00	12.91
Commercial	\$2.85	\$1.75	\$0.00	\$5.08
Fireline	\$0.00	\$0.00	\$0.00	\$0.00

The results shown in Table 5 – 6 above are the basis for the District’s consumption pricing for the proposed rates. The analysis and costs shown above have been developed to meet the requirements of Proposition 218 to develop cost-based and proportional water rates.

5.6.4 Summary of the Customer (Fixed) Costs

The allocated customer related costs are used to establish the monthly service charge which varies by meter size. As a result, the total customer costs were divided by the number of equivalent meters on the system. An equivalent meter uses the capacity ratio of a 3/4-inch meter to the larger meter sizes to determine the pricing for each meter size. In this way the meter charge reflects the equitable proportion of fixed costs on the system based on the capacity demands the customer can place on the system based on the size of the meter. Shown in Table 5 – 7 is a summary of the customer related costs and customer charge development.

Table 5 - 7
Summary of the Base Charge for Rate Design

	Res / Com Meter Equivalency Ratios	Total Residential & Commercial Fixed Cost (\$/ Acct. / Mo)	Fireline Meter Equivalency Ratios	Total Fireline Fixed Cost (\$/ Acct. / Mo)
Total Allocated Costs		\$8,369,604		\$419,310
Total 3/4" Meter Equiv. ^[1]		6,545		934
Cost per Equiv. Meter		\$106.57		\$37.40
Proposed Rates				
3/4"	1.00	\$106.57	1.00	\$37.40
1"	1.67	177.96	1.33	49.87
1.25"	2.50	266.41	1.67	62.33
1.5"	3.33	354.86	2.00	74.80
2"	5.33	567.99	2.67	99.73
3"	10.00	1,776.44	4.00	149.60
4"	16.67	3,551.82	5.33	199.47
6"	33.33	5,683.13	8.00	299.20
8"	53.33	8,170.37	10.67	398.93
10"	n/a	n/a	13.33	498.67

[1] – Based on the AWWA equivalent meter ratios based on safe operating capacity

Table 5 – 7 shows the proposed customer charge, on a per equivalent meter basis (e.g., a 3/4" meter). It is important to note that the proposed water fixed charges are based on the AWWA equivalent meter ratios which will impact the calculated number of equivalent meters (total meters in terms of a 3/4" meter). Meter equivalency ratios are defined as the maximum rate of flow through each meter size. For example, a 2" meter has the capacity of 5.33 3/4" meters. This provides a relationship that can be used to calculate the proportional capacity needs and demands as meter sizes increase. The proposed rates for the Fireline customers are designed to collect the allocated costs from the base charge as there is no proposed consumption or usage charge.

5.7 Summary of the Present and Proposed Water Rates

Given the development of the unit costs for rate design purposes, the next step is to develop the proposed rates for the next five year period. As a note, the proposed rates are being developed for 2025 based on the unit costs as discussed above based on generally accepted cost of service principles. The rates for the remaining projected time period are based on the overall system revenue adjustment and all rates are adjusted by that revenue adjustment.

As noted, the rate structure for all customer classes has been maintained and only the pricing of the components have been adjusted based on the results of the cost of service analysis and average unit costs. The proposed rates reflect the results of the revenue requirement and cost of service analysis. Provided below in Table 5 – 8 is a summary of the Residential present and proposed rates for the District. The proposed rates utilize the unit cost results from the cost of service analysis and reflect cost-based tier pricing.

Table 5 - 8
Summary of the Monthly Present and Proposed Residential Water Rates

	<i>Present Rates</i>	2025	2026	2027	2028	2029
Base Charge		<i>\$ / Acct. / Mo.</i>				
3/4"	\$94.57	\$106.57	\$116.69	\$127.78	\$139.92	\$153.21
1"	157.93	177.96	194.87	213.38	233.65	255.85
1 1/4"	236.42	266.41	291.72	319.43	349.78	383.01
1 1/2"	314.92	354.86	388.57	425.48	465.90	510.16
2"	504.06	567.99	621.95	681.04	745.74	816.59
3"	945.70	1,776.44	1,945.20	2,129.99	2,332.34	2,553.91
4"	1,576.48	3,551.82	3,889.24	4,258.72	4,663.30	5,106.31
6"	3,152.02	5,683.13	6,223.03	6,814.22	7,461.57	8,170.42
8"	5,043.42	8,170.37	8,946.56	9,796.48	10,727.15	11,746.23
OR		<i>\$ / Acct. / Mo.</i>				
Combined Fire Service (CFS) Base Rate By Meter Size						
CFS - 3/4"	\$134.35	\$143.97	\$157.64	\$172.62	\$189.02	\$206.97
CFS - 1"	147.61	156.44	171.30	\$187.58	205.40	224.91
CFS - 1 1/2"	237.49	252.76	276.78	\$303.07	331.86	363.39
CFS - 2"	264.01	277.69	304.07	\$332.95	364.58	399.22
CFS - > 2"	<i>Service Classification Size Determined by District</i>					
Commodity Charge		<i>\$ / 1,000 gal</i>				
0 – 8,000 gal	\$3.55	\$3.74	\$4.10	\$4.49	\$4.92	\$5.39
8,000 – 20,000 gal	4.64	4.89	5.35	5.86	6.42	7.03
20,000 – 40,000 gal	6.68	6.70	7.34	8.04	8.80	9.64
40,000 + gal	13.21	12.91	14.14	15.48	16.95	18.56

As mentioned, the Commercial customers have the same proposed base charge as residential customers by meter size. The current uniform consumption charge structure will remain and only the pricing of the uniform rate is updated to reflect the cost of service unit costs. Shown in Table 5 – 9 are the present and proposed Commercial water rates.

Table 5 - 9
Summary of the Monthly Present and Proposed Commercial Water Rates

	Present Rates	2025	2026	2027	2028	2029
Base Charge						
			<u>\$ / Acct. / Mo.</u>			
3/4"	\$94.57	\$106.57	\$116.69	\$127.78	\$139.92	\$153.21
1"	157.93	177.96	194.87	213.38	233.65	255.85
1 1/4"	236.42	266.41	291.72	319.43	349.78	383.01
1 1/2"	314.92	354.86	388.57	425.48	465.90	510.16
2"	504.06	567.99	621.95	681.04	745.74	816.59
3"	945.70	1,776.44	1,945.20	2,129.99	2,332.34	2,553.91
4"	1,576.48	3,551.82	3,889.24	4,258.72	4,663.30	5,106.31
6"	3,152.02	5,683.13	6,223.03	6,814.22	7,461.57	8,170.42
8"	5,043.42	8,170.37	8,946.56	9,796.48	10,727.15	11,746.23
OR						
			<u>\$ / Acct. / Mo.</u>			
Combined Fire Service (CFS) Base Rate By Meter Size						
CFS - 3/4"	\$134.35	\$143.97	\$157.64	\$172.62	\$189.02	\$206.97
CFS - 1"	147.61	156.44	171.30	\$187.58	205.40	224.91
CFS - 1 1/2"	237.49	252.76	276.78	\$303.07	331.86	363.39
CFS - 2"	264.01	277.69	304.07	\$332.95	364.58	399.22
CFS - > 2"			<i>Service Classification Size Determined by District</i>			
Commodity Charge						
			<u>\$ / 1,000 gal</u>			
All Usage	\$5.01	\$5.08	\$5.56	\$6.09	\$6.67	\$7.30

As can be seen, the Commercial proposed base charges and combined fire service are the same as for Residential. The other significant change to the proposed rates is the transition from the current meter rates to the AWWA equivalent meter ratios based on safe operating capacity.

The final rate structure summary is for Fireline customers shown in Table 5 – 10. The proposed rates below are the rates for a customer with a Fireline meter providing fire protection services.

Table 5 - 10
Summary of the Monthly Present and Proposed Fireline Water Rates

	<i>Present Rates</i>	2025	2026	2027	2028	2029
	<i>\$ / inch diameter / Mo.</i>					
Private Fire Protection	\$53.04	\$49.87	\$54.61	\$59.80	\$65.48	\$71.70
Private Fire Hydrant	\$53.04	\$49.87	\$54.61	\$59.80	\$65.48	\$71.70

In summary, bill impacts will not only vary between customer classes - as the cost of service results show cost differences - but also customers in the same class depending on overall water consumption. This is due to the tier and uniform pricing being based on the costs associated with the District’s costs and distributed based on a snapshot of consumption characteristics.

5.8 Summary of the Water Rate Study

This completes the analysis for the Tahoe City Public Utility District’s water utility. This study has provided a comprehensive review and development of proposed water rates for the District. Adoption of the proposed water rates will allow the District to meet its current and projected water system financial obligations for the time period reviewed based on the assumed customer growth, capital plan, and inflationary increases in operating costs. Should these assumptions change, the proposed level of rate revenue necessary to adequately fund operating and capital needs may also need to be revised to reflect the current conditions. Based on the results of the water rate study, HDR recommends the following:

- Revenue adjustments are necessary to prudently fund operating and capital renewal and replacement expenses
 - Water rate revenues should be adjusted annually in 2025 through 2029
 - The proposed rates would be effective January 1st of each year
- The proposed rates reflect the results of the cost of service analysis and the proportional distribution of costs to the customer classes of service.
- Prior to the end of the projected period, the District should complete a review of the water revenue levels and costs at that time.

5.9 Board Review

Proposition 218 outlines the process to adopt and implement the proposed water rates. This includes the establishment of the cost basis and proportionality of the water rates which is the purpose of the study and summarized in this report. As part of the public review process, the study results and recommendations were presented to the District Board at the August 16, 2024 and September 20, 2024 public meetings. At the conclusion of the September Board meeting, District staff was directed to mail the Proposition 218 notices to the District’s customers which outlined the proposed changes in rates along with the time, date, and location of the public hearing. The District held a public hearing on November 15, 2024, to discuss the publicly noticed

proposed water rates. At the completion of the public hearing, the Board accepted the water rate study and adopted the proposed water rates as outlined in this report for 2025 through 2029.



Technical Appendix – Water Analysis

