

**FINAL**

**WATER RATE STUDY  
CSA 70 CG CEDAR GLEN**

**B&V PROJECT NO. 190740.0100**

**PREPARED FOR**

**County of San Bernardino, Special Districts**

**MARCH 8, 2017**





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# 1 Introduction

Black & Veatch has prepared this report for the County of San Bernardino (County), Special Districts (District) to document the development of a multi-year financial plan, cost of service analysis and rate design for County Service Area 70 CG Cedar Glen (water utility). The specific objectives of the study were to:

- Review and evaluate existing policies and procedures affecting water rates;
- Develop a financial plan for water covering a five-year study period between Fiscal Year (FY) 2018 and FY 2022 for ongoing operations and planned capital improvements;
- Allocate the water projected FY 2018 revenue requirements to the various customer class in accordance with the respective service requirements;
- Develop a suitable five-year rate schedule that produces revenues adequate to meet financial needs while recognizing customer costs of service and state policy considerations such as Proposition 218, San Juan Capistrano Ruling and State of California’s water conservation Executive Orders.

## 1.1 COUNTY BACKGROUND

The County of San Bernardino is in southeast portion of California covering 20,105 square miles with a population of over two million. The County through the District provides water and sewer services to unincorporated areas known as County Service Areas (CSAs). The following are the seven water CSAs and ten sewer CSAs.

WATER CSA	SEWER CSA
■ County Service Area 70 F - Morongo Valley	■ County Service Area 70 SP2 - High Country
■ County Service Area 70 J - Oak Hills	■ County Service Area 53 B - Fawnskin
■ County Service Area 70 CG - Cedar Glen	■ County Service Area 70 S3 - Lytle Creek
■ County Service Area 70 W3 – Hacienda	■ County Service Area 79 - Green Valley Lake
■ County Service Area 70 W4 – Pioneertown	■ County Service Area 82 - Searles Valley
■ County Service Area 42 - Oro Grande	■ County Service Area 70 GH - Glen Helen
■ County Service Area 64 - Spring Valley Lake	■ County Service Area 42 - Oro Grande
	■ County Service Area 64 - Spring Valley Lake
	■ County Service Area 70 Zone S-7 – Lenwood
	■ County Service Area 70 BL - Bloomington

Throughout the seven water CSAs, the District provides drinking water to approximately 7,939 residential and commercial connections. The District obtains its water supply from the Mojave and Morongo groundwater basins. Active wells located within each CSA pump groundwater where it is treated at the source. Groundwater meets the total annual demand of 3,850 acre-feet (AF) for all CSAs. The District distributes the pumped groundwater to its customers through a series of storage tanks and miles of distribution pipelines.

Throughout the ten sewer CSAs, the District provides sewer services to approximately 11,484 residential and commercial connections. The District collects and transports sewage flow over its miles of collection pipelines to a local treatment facility or to a third-party treatment provider. For

the CSAs that do not have treatment facilities, the District has treatment agreements with Victor Valley Wastewater Reclamation Authority (VWVRA), Running Springs Water Agency, and Big Bear Area Regional Wastewater Agency (BBARWA).

In general, the District operates and maintains each CSA as a self-supporting enterprise. As self-supporting enterprises, the water and sewer rates should provide sufficient levels of revenue to meet all operation and maintenance (O&M) expenses, debt service requirements, routine annual replacements of capital improvements funded from current revenues, and other revenue requirements within each CSA.

## 1.2 SCOPE OF WORK

The purpose of this study was to develop a water financial plan that project operating revenue, expenses and capital financing costs for water operations over a five-year planning period beginning July 1, 2018 and ending June 30, 2022. The plan considers future revenues under existing rates, O&M expense, principal and interest expense on bonded debt, establishment and/or maintenance of reserve funds, and capital improvement requirements. Annual projections of customers, revenues, and expenditures have been made using historical data and estimates based on Executive Order requirements and District forecast for the next five years.

Using the financial plan, Black & Veatch performed a cost of service analysis and rate design for the water utility. The water utility's costs of service were allocated to customer classes utilizing a cost causative approach endorsed by the American Water Works Association (AWWA) M1 *Principles of Water Rates & Charges* manual (M1). These allocation methodologies produce cost of service allocations recognizing the projected customer service requirements for the water utility. Proposed rates are designed in accordance with allocated cost of service and local policy considerations. Also evaluated was the extent to which the existing rate structure recovers revenues from customer classes in accordance with cost of service allocations.

## 1.3 DISCLAIMER

In conducting our study, we reviewed the books, records, agreements, capital improvement programs, and customer sales and financial projections of the water utility as we deemed necessary to express our opinion of the operating results and projections. While we consider such books, records, documents, and projections to be reliable, Black & Veatch has not verified the accuracy of these documents.

The projections set forth in this report below are intended as "forward-looking statements". In formulating these projections, Black & Veatch has made certain assumptions with respect to conditions, events, and circumstances that may occur in the future. The methodology utilized in performing the analyses follows generally accepted practices for such projections. Such assumptions and methodologies are reasonable and appropriate for the purpose for which they are used. While we believe the assumptions are reasonable and the projection methodology valid, actual results may differ materially from those projected, as influenced by the conditions, events, and circumstances that actually occur. Such factors may include the water utility's ability to execute the capital improvement program as scheduled and within budget, regional climate and weather conditions affecting the demand for water and adverse legislative, regulatory or legal decisions (including environmental laws and regulations) affecting the water utility's ability to manage the system and meet water quality requirements.

## 2 Water Rate Study

### 2.1 REVENUE AND REVENUE REQUIREMENTS

The water utility provides drinking water to its residential and commercial customers. To meet the costs associated with providing water services to its customers, the water utility derives revenue from water charges, licenses, permits & franchises, tax revenue, miscellaneous revenue, and interest earned from the investment of available funds. The level of future revenue generated in the study uses a combination of an analysis of historical and future system growth in terms of number of connections and water consumption.

With revenue derived from the various sources, the water utility meets the cash requirements of operation and maintenance; debt service and reserve payments on bond indebtedness; and recurring annual capital expenditures for replacements, system betterments, and extensions not debt financed. O&M expenses are those expenditures necessary to maintain the system in good working order. Routine annual capital expenditures, which include equipment replacements, consist of recurring annual replacements, minor extensions, and betterments which are normally revenue financed. Other capital costs include principal and interest payments, bond covenant-required payments, and the costs of major capital improvements paid directly from annual operating revenues.

### 2.2 CUSTOMER AND USAGE PROJECTIONS

The water utility has several customer classes it provides service to, but the water utility does not classify customer accounts within the customer billing system. Therefore in this study, there is only one customer class which encompasses all accounts.

Based on a detailed review of growth patterns by the District, customer connection growth will experience a slight growth of 1.0% in FY 2018, 0.5% per year from FY 2019 to FY 2021, and 0.25% in FY 2022. Shown in Table 2-1 are the projected customer connections.

Table 2-1 Number of Water Customer Connections

Line No.	Description	Fiscal Year Ending June 30				
		FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
		(connections)	(connections)	(connections)	(connections)	(connections)
	County Service Area					
1	CSA 70 CG - Cedar Glen	321	322	323	324	324

Table 2-2 summarizes projected water consumption in hundred cubic feet (HCF) or 748 gallons for the study period. In determining the projected water consumption, Black & Veatch analyzed historical patterns of water usage in conjunction with the past mandatory reduction issued by the Governor of California through Executive Orders. In 2015, Governor Brown issued Executive Order B-29-15 mandated a statewide water reduction of 25 percent from the same time in 2013. The mandate affected each water utility throughout the State differently. The water utility did not have to meet any specific targets; however it still experienced a decrease of 11 percent in FY 2016 compared FY 2013. The water utility expects water consumption to rebound at 2 percent per year in the study period.

Table 2-2 Billed Water Consumption

Line No.	Description	Fiscal Year Ending June 30				
		FY 2018 (HCF)	FY 2019 (HCF)	FY 2020 (HCF)	FY 2021 (HCF)	FY 2022 (HCF)
County Service Area						
1	CSA 70 CG - Cedar Glen	13,792	14,068	14,349	14,636	14,929

## 2.3 REVENUE UNDER EXISTING RATES

The primary source of revenue for the water utility comes from the facility charge and commodity charge. The level of future revenue is based on an analysis of projected system growth in terms of number of connections and water consumption conducted in section 2.2. Applying the applicable rates shown in Table 2-3 to the number of connections and water consumption produces the total water revenue.

Table 2-3 Existing Water Rates

Meter Size	FY 2017
Facility Charge (\$/monthly)	
Flat Rate	\$ 151.06
5/8"	\$ 19.60
3/4"	19.60
1"	32.67
1 1/2"	65.33
2"	104.53
3"	209.07
4"	326.67
6"	653.33
8"	1,045.33
Commodity Charge	
0-14 hcf	\$ 10.15
>14-40 hcf	11.67
>40-80 hcf	13.42
>80 hcf	15.44

Table 2-4 represents a summary of projected water revenue under existing rates. As shown, the revenue generated increases over the study period in conjunction with the increase in water consumption. The projected water revenue increases from \$281,600 in FY 2018 to \$294,500 in FY 2022.

Table 2-4 Revenue under Existing Water Rates

Line No.	Description	Fiscal Year Ending June 30				
		FY 2018 (\$)	FY 2019 (\$)	FY 2020 (\$)	FY 2021 (\$)	FY 2022 (\$)
County Service Area						
1	CSA 70 CG - Cedar Glen	281,600	284,900	288,100	291,400	294,500



## 2.4 OTHER REVENUE

In addition to revenue from rates, the water utility obtains revenue from other operating sources. Other revenue sources include tax revenue, miscellaneous revenue, and interest earned from the investment of available funds. In total, these revenues represent about forty-two percent of total water revenues. Black & Veatch anticipates that these revenues will remain relatively constant for the duration of the study period.

## 2.5 OPERATING AND MAINTENANCE EXPENSES

Table 2-5 summarizes the water utility's O&M expenses for the study period. Costs categories separate the expenses into groups such as personnel services (salaries and benefits), materials and supplies (contracts and professional services, and utilities), other services and charges and capital outlay. An inflation factor ranging from 1.0 and 3.0 percent per year applies to these O&M categories depending on the type of category.

Table 2-5 Water Operating and Maintenance Expenses

Line No.	Description	Fiscal Year Ending June 30				
		FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
		(\$)	(\$)	(\$)	(\$)	(\$)
CSA 70 CG - O&M Expenses						
1	Personnel Services	119,400	121,800	124,200	126,700	129,200
2	Materials and Supplies	206,600	212,800	219,200	225,800	232,600
3	Other Services and Charges	4,400	4,400	4,400	4,400	4,400
4	Capital Outlay	0	0	0	0	0
5	Total	\$330,400	\$339,000	\$347,800	\$356,900	\$366,200

## 2.6 DEBT SERVICE REQUIREMENTS

The water utility has revolving loan debt service obligations that will expire during the study period as shown in Table 2-6. The water utility does not anticipate any future debt service obligations during the study period as the water utility will cash fund all capital projects.

Table 2-6 Water Debt Service

Line No.	Description	Fiscal Year Ending June 30				
		FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
		(\$)	(\$)	(\$)	(\$)	(\$)
CSA 70 CG - LT Debt						
1	Existing Long Term Debt	45,187	45,047	0	0	0
2	Proposed Long Term Debt	0	0	0	0	0
3	Total	\$45,187	\$45,047	\$0	\$0	\$0

## 2.7 CAPITAL IMPROVEMENT PROGRAM

Table 2-7 summarizes the water utility's Capital Improvement Program (CIP) for FY 2018 through FY 2022. The water utility developed this multi-year CIP covering its commitments for the study period. Based on this identified needs, the water utility will need to fund a total of \$610,600 in capital over the entire study period.

Table 2-7 Water Capital Improvement Projects by Function

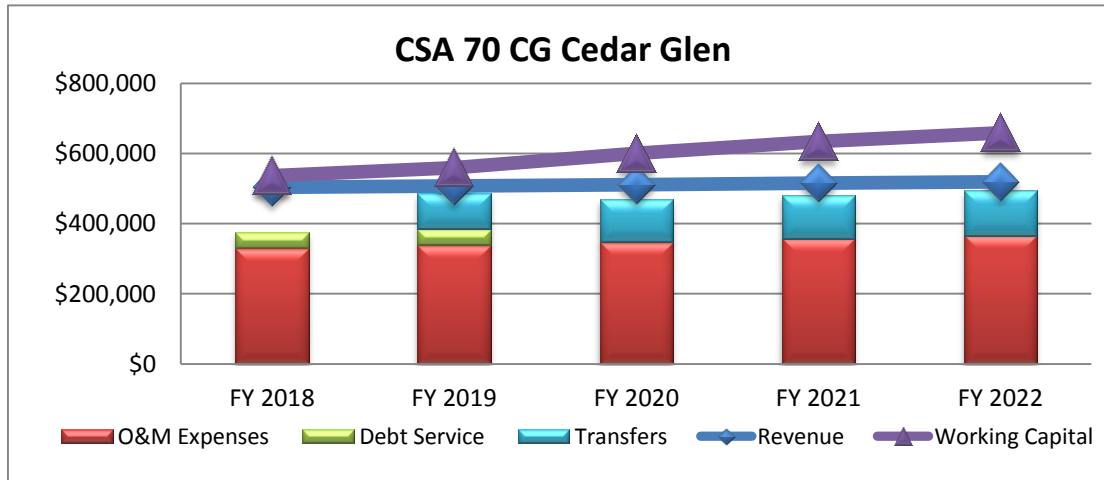
Line No.	Description	Fiscal Year Ending June 30				
		FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
		(\$)	(\$)	(\$)	(\$)	(\$)
County Service Area						
1	CSA 70 CG - Cedar Glen	115,900	119,000	122,000	125,300	128,400

## 2.8 PROJECTED OPERATING RESULTS

The revenue requirements of the water utility consist of system O&M expense, debt service requirements, and transfers (capital contributions).

In the analysis, it was important to identify the state of the water utility if no revenue increases were to occur, which is the status quo scenario. Under this scenario, the water utility would not impose any revenue increases over the study period. As shown in Figure 2-1, the status quo conditions means that the water utility will start drawing down on operating reserves as capital projects are initiated.

Figure 2-1 Status Quo



To avoid drawdown on reserves, the water utility examined various options for revenue increases that would meet the revenue requirements. Based on the goals and objectives, the water utility arrived at the revenue adjustments shown in the operating cash flow on Table 2-8.

The operating cash flow consist of revenue and revenue requirements. In line 1 is the revenue under existing rates while lines 2 through 7 are the additional revenue generated from the required annual revenue increases. Line 9 represents other revenues, which include miscellaneous revenue and interest earned from the investment of available funds. Line 10 shows the total revenues generated from existing rates, revenue from increases and other operating revenue.

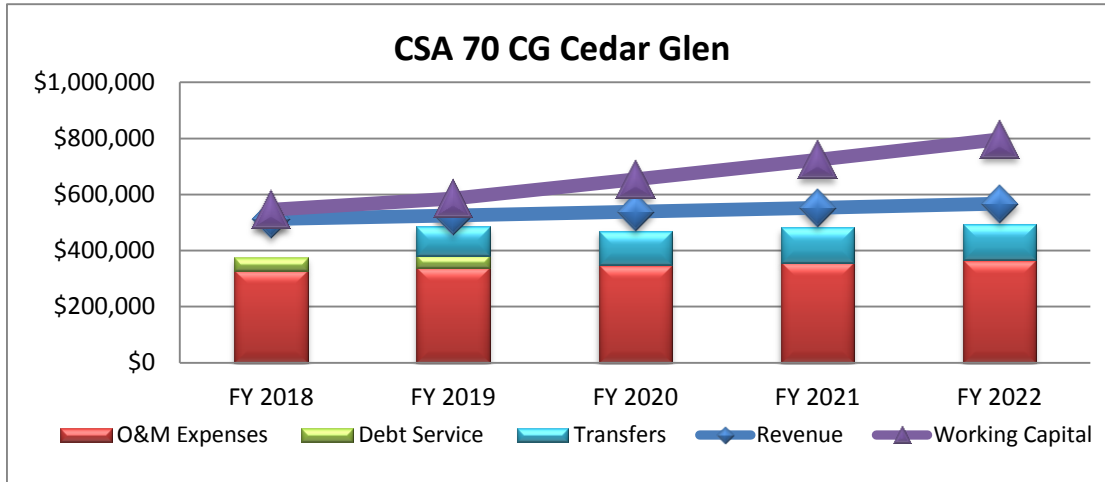
The revenue requirements for O&M, debt service, and transfer (capital projects) have been previously discussed. Lines 11 and 12 show the O&M expenses and debt service revenue requirements. Line 13 represent the total amount of rate revenue transferred to fund capital expenditures. The amount identified will be transferred to a replacement fund to pay the capital projects identified in Table 2-7. The amounts differ since funding the capital projects is combination of available funds in the replacement fund, expansion fund and new sources such as grants and

loans. Line 14 represents the total revenue requirement met through revenues. Line 17 indicates the net cumulative balance. The water utility will try to maintain an operating reserve balance consistent with industry standard of 90 days of O&M expenses. The recommended revenue adjustments allow the water utility to maintain a positive annual balance in FY 2022 while still incorporating capital improvements. Figure 2-2 represents the water utility with the revenue adjustments.

Table 2-8 Water Operating Cash Flow

Line No.	Description	Fiscal Year Ending June 30				
		FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
		(\$)	(\$)	(\$)	(\$)	(\$)
<b>Revenue</b>						
<b>Rate Revenue</b>						
1	Water Sales	281,600	284,900	288,100	291,400	294,500
	Year	Months Effective	Rate Adj			
2	FY 2018	12	3.0%	8,400	8,500	8,600
3	FY 2019	12	3.0%		8,800	8,900
4	FY 2020	12	3.0%			9,200
5	FY 2021	12	3.0%			9,300
6	FY 2022	12	3.0%			9,600
7	Increased Revenue Due to Adjustments			8,400	17,300	26,700
8	Subtotal Rate Revenue			\$290,000	\$302,200	\$314,800
9	Other Operating Revenue			222,500	223,300	223,400
10	Total Revenue			\$512,500	\$525,500	\$538,200
<b>Revenue Requirements</b>						
11	O&M Expenses			330,400	339,000	347,800
12	Long-Term Debt			45,200	45,000	0
13	Transfers			0	101,800	122,000
14	Subtotal			\$375,600	\$485,800	\$469,800
15	Net Annual Cash Balance			136,900	39,700	68,400
16	Beginning Fund Balance			408,738	545,638	585,338
17	Net Cumulative Fund Balance			\$545,638	\$585,338	\$653,738
18	Working Capital Reserves			81,500	83,600	85,800

Figure 2-2 Operating Cash Flow



### 2.8.1 Test Year Revenue Requirements

In analyzing the water utility’s cost of service for allocation to its customer classes, Black & Veatch selected the annual revenue requirements for FY 2018 as the Test Year (TY) requirements to demonstrate the development of cost-of-service water rates. Based on achieving the water utility’s principal goals within the study period, the cash flow in Tables 2-8 serves as the basis for the cost of service analyses.

### 3 Cost of Service Allocation

The revenue requirements derived from rates for water service are synonymous with the definition of the Cost of Service (COS). In developing equitable rate structures, revenue requirements are allocable to the various customer classifications based on the service rendered. Allocations of these requirements to customer classes should consider the account the quantity of water consumed, peak flows, number of customers, and other relevant factors. Table 3-1 summarizes the total costs of service recovered from water user rates for the TY 2018.

Table 3-1 Water Cost of Service

Line No.	Description	Operating Expense (\$)	Capital Cost (\$)	Total Cost (\$)
Revenue Requirements				
1	O&M Expenses	330,400	0	330,400
2	Debt Service	0	45,200	45,200
3	Transfers	0	0	0
4	Subtotal	\$330,400	\$45,200	\$375,600
Less Revenue Requirements Met from Other Sources				
5	Other Operating Revenue	222,500	0	222,500
6	Subtotal	\$222,500	\$0	\$222,500
Adjustments				
7	Adj for Annual Cash Balance	(136,900)	0	(136,900)
8	Adj to Annualize Rate Increase	0	0	0
9	Subtotal	(\$136,900)	\$0	(\$136,900)
10	COS to be Recovered from Rates	\$244,800	\$45,200	\$290,000

Shown in line 4 is the total revenue requirement that corresponds with the Table 2-8 line 14. In deriving the revenue requirement needed from rates, it is necessary to deduct revenues from other sources as shown in lines 6 and 9. Line 7 represents the net annual cash balance for the utility during the Test Year. In this case, the \$136,900 indicates that the water utility is projecting a positive cash balance for the year. Line 10 represents the total costs that rates need to cover.

#### 3.1 FUNCTIONAL COST COMPONENTS

Cost of service methodology next analyzes the cost of providing water service by system function to properly allocate the costs to the various classes of customers and subsequently design rates. As a basis for allocating costs of service among customer classes and to help in the development of tier rates, rate making principles separate costs into the following four basic functional cost components: (1) "Base"; (2) "Extra Capacity"; (3) "Customer"; and (4) "Direct Assignment".

- Base costs represent operating and capital costs of the system associated with service to customers to the extent required for a constant, or average annual rate of use.

- Extra Capacity costs represent those operating costs incurred in meeting demands in excess of average, and capital related costs for additional plant and system capacity beyond that required for the average rate of use.
- Customer costs are those expenses that tend to vary in proportion to the number of customers connected to the system. These include meter reading, billing, collecting and accounting, and maintenance and capital costs associated with meters and services.
- Directly assigned costs are costs specifically identified as those incurred to serve a specific customer group(s).

The separation of costs of service into these principal categories facilitates allocating such costs to the various customer classes based on the respective service requirements of each class.

### 3.2 ALLOCATION TO COST COMPONENTS

Each element of cost is allocated to functional cost components based on the parameter(s) having the most significant influence on the magnitude of that element of cost. O&M expense items are allocated directly to appropriate cost components, while the allocation of capital and replacement costs uses a detailed allocation of related capital investment. The separation of costs into functional components provides a means for distributing such costs to the various classes of customers based on their respective responsibilities for each specific service.

Black & Veatch performed the following steps to derive the allocation percentages for apportioning the water utility's O&M and capital costs. As noted above, elements that are allocated directly to their cost component include customer costs and direct assigned costs.

For volume-related cost allocations, the first step in determining the allocation percentages is to assign system peaking factors. The base element is equal to the average daily demand (ADD) and assigned a value of 1.0. The water utility's maximum day (max day) demand is estimated to be 2.0 times the ADD. Thus, the max day is assigned a value of 2.0. The maximum instantaneous usage is approximated by the maximum hourly (max hour) usage and is estimated to be 4.0 times the ADD. Thus, max hour is assigned a value of 4.0. These peaking factors are based on the District's engineering department.

Cost components that are solely base-related, are allocated 100 percent to base. Cost components designed to meet max day requirements, such as reservoirs, are allocated to base and max day factors as follows:

- Base =  $(1.0/2.0) \times 100 = 50.0\%$
- Max Day =  $(2.0 - 1.0)/2.0 \times 100 = 50.0\%$

Cost components designed to meet max hour design requirements, such as Distribution, are allocated in a similar fashion, as follows:

- Base =  $(1.0/4.0) \times 100 = 25.0\%$
- Max Day =  $(2.0 - 1.0)/4.0 \times 100 = 25.0\%$
- Max Hour =  $(4.0 - 2.0)/4.0 \times 100 = 50.0\%$

### 3.2.1 Allocation of Operating and Maintenance Expense

In the allocation of O&M expense, costs are allocated directly to cost components to the extent possible. Personnel services, materials and supplies and other services and charges are allocated based on the allocation of fixed assets between base, extra capacity, meters, and fire protection. Thereafter 2 percent from base is allocated to customer for billing. Table 3-2 represents the allocation of O&M to the functional cost components. To determine the net operating expenses, we subtract lines 6 and 7 from the total of allocated costs.

Table 3-2 Allocation of Water O&M Expenses

Line No.	Description	Total Costs	Common to All Customers					Fire Protection
			Base	Extra Capacity		Customer		
			Base	Max. Day	Max. Hour	Meters	Cust./Bill.	
		(\$)	(\$)	(\$)	(\$)	(\$)	(\$)	
Operating Expenses								
1	Personnel Services	119,400	41,600	34,100	29,700	8,700	2,400	2,900
2	Materials and Supplies	206,600	72,100	59,000	51,400	15,000	4,100	5,000
3	Other Services and Charges	4,400	1,500	1,300	1,100	300	100	100
4	Capital Outlay	0	0	0	0	0	0	0
5	Subtotal	\$330,400	\$115,200	\$94,400	\$82,200	\$24,000	\$6,600	\$8,000
Less Other Revenue								
6	Miscellaneous Revenues	222,500	77,500	63,600	55,400	16,200	4,400	5,400
7	Other Adjustments	(136,900)	(47,800)	(39,100)	(34,100)	(9,900)	(2,700)	(3,300)
8	Net Operating Expenses	\$244,800	\$85,500	\$69,900	\$60,900	\$17,700	\$4,900	\$5,900

### 3.2.2 Allocation of Capital Investments

In the allocation of capital expenses, costs are allocated to cost components to the extent possible. Capital expenditures represent future capital investment into the water system. These costs are allocated using the cost distribution of total existing assets. Table 3-3 shows the distribution of the existing water investment, which serves as the basis for new investment.

Table 3-3 Allocation of Water Capital Costs

Line No.	Description	Total Costs	Common to All Customers					Fire Protection
			Base	Extra Capacity		Customer		
			Base	Max. Day	Max. Hour	Meters	Cust./Bill.	
		(\$)	(\$)	(\$)	(\$)	(\$)	(\$)	
Plant Assets								
1	Source of Supply	382,820	382,820	0	0	0	0	0
2	Pumping	739,623	369,823	369,800	0	0	0	0
3	Treatment	739,623	369,823	369,800	0	0	0	0
4	T&D	2,289,046	572,246	572,300	1,144,500	0	0	0
5	Meters & Service	333,637	37	0	0	333,600	0	0
6	Hydrants	111,212	12	0	0	0	0	111,200
7	General Plant	461,081	169,981	131,600	114,800	33,500	0	11,200
8	Net Plant Assets	\$5,057,043	\$1,864,743	\$1,443,500	\$1,259,300	\$367,100	\$0	\$122,400

## 3.3 UNITS OF SERVICE

The total cost responsibility for each customer class may be established by developing unit costs of service for each cost function and subsequently assigning those costs to the customer classes based on the respective service requirements of each. To properly recognize the cost of service, each customer class is allocated its share of base, maximum day and maximum hour costs. The number of units of service required by each customer class provides a means for the proportionate distribution of costs previously allocated to respective cost categories. Table 3-4 is a summary of the estimated units of service for the various customer classes.

Base costs vary with the volume of water used and distributed to customer classes on that basis. Extra Capacity costs are those associated with meeting maximum rates of water use, and is distributed to customer classes based on the respective class capacity requirements in excess of average rates of use. Customer costs, which consist of meter related, billing, collection and accounting costs, are allocated to the various classes using the number of bills and equivalent meters. The American Water Works Association establishes meter ratios in its manual M6; “*Water Meters - Selection, Installation, Testing and Maintenance*”. The estimated number of equivalent meters for each customer class is based on the total number of various sizes of meters serving respective classes and the ratio of the cost of meters for the various sizes to the cost of 3/4-inch meters. Private fire protection costs are allocated based on equivalent fire hydrants.

Table 3-4 Water Units of Service

Line No.	Description	Consumption	Maximum Day			Maximum Hour			Meters (EMs)	Bills (Bills)	Fire Protection (EHs)
		Annual (HCF)	Factor	Total (HCF/day)	Extra (HCF/day)	Factor	Total (HCF/day)	Extra (HCF/day)			
1	Flat Rate Customers*	3,355	126%	12	2	208%	19	8			
2	All Customers	13,792	126%	48	10	208%	79	31	382	3,852	
3	Subtotal	17,147		59	12		98	39	382	3,852	
4	Public Fire (1)			401	401		4,813	4,412		112	
5	Subtotal			401	401		4,813	4,412	0	0	
6	Total Water System	17,147		460	413		4,911	4,451	382	3,852	

\* Assumes 275 gpd per connection.

### 3.4 COST OF SERVICE ALLOCATIONS

Following cost of service methodology, we distribute the costs of service to the various customer classes by applying the unit costs of service to respective service requirements. The total unit costs of service applied to the respective requirements for each customer class results in the total cost of service for each customer class.

#### 3.4.1 Units Costs of Service

The Test Year unit cost of service for each functional cost component is based on the total cost divided by the applicable units of service as shown in Tables 3-5. In lines 1 and 2, the total costs represent the cost needed from rates shown in Table 3-1 line 10. Line 5 represents the unit costs used in allocating the costs to the specific customer classes.

Table 3-5 Water Unit Costs of Service

Line No.	Description	Total Costs (\$)	Common to All Customers					Fire Protection (\$)
			Base	Extra Capacity		Customer		
			Base (\$)	Max. Day (\$)	Max. Hour (\$)	Meters (\$)	Cust/Bill. (\$)	
Unit Cost of Service								
1	Net Operating Expense	244,800	85,500	69,900	60,900	17,700	4,900	5,900
2	Capital Costs	45,200	16,600	12,900	11,300	3,300	0	1,100
3	Total	\$290,000	\$102,100	\$82,800	\$72,200	\$21,000	\$4,900	\$7,000
4	Units of Service (Total)		17,147	413	4,451	382	3,852	112
5	Cost per Unit		\$5.95 per HCF	\$200.36 per HCF/Day	\$16.22 per HCF/Day	\$55.03 Per Eq. Meter	\$1.27 per Bill	\$62.50 per Eq. Hyd



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

We arrive at the customer class responsibility for service by applying the unit costs of service to the number of units for which the customer class is responsible. Table 3-6 illustrates this process in which we apply the unit costs of service to the customer class units of service.

Table 3-6 Distribution of Water Cost to Customer Classes

Line No.	Description	Total Costs (\$)	Common to All Customers				Fire Protection (\$)	
			Base Base (\$)	Extra Capacity Max. Day Max. Hour (\$)		Customer Meters Cust/Bill. (\$)		
1	Cost per Unit		\$5.95 per HCF	\$200.36 per HCF/day	\$16.22 per HCF/day	\$55.03 per EM	\$1.27 per Bill	\$62.50 per EH
Flat Rate Customers								
1	Units		3,355	2	8	0	0	0
2	Allocation of costs of service	20,500	20,000	400	100	0	0	0
All Customers								
2	Units		13,792	10	31	382	3,852	0
3	Allocation of costs of service	110,500	82,100	2,000	500	21,000	4,900	0
Public Fire								
4	Units		0	401	4,412	0	0	112
5	Allocation of costs of service	159,000	0	80,400	71,600	0	0	7,000
4	Total Cost of Service	\$290,000	\$102,100	\$82,800	\$72,200	\$21,000	\$4,900	\$7,000

### 3.5 ADEQUACY OF EXISTING RATES TO MEET COST OF SERVICE

Presented in Tables 3-7 is a comparison of the allocated cost of service and revenue under existing rates for the system in total. The 3.0 percent, overall increase is the minimum necessary to meet the projected revenue requirements for the FY 2018 Test Year.

Table 3-7 Comparison of Water Cost of Service to Existing Revenue

Line No.	Description	Allocated COS (\$)	Beneficial Use Allocation (\$)	Adjusted COS (\$)	Rev under Exst Rates (\$)	Indicated Rev Increase (%)
Customer Class						
1	Flat Rate Customers	20,500	24,900	45,400	45,300	0.2%
2	All Customers	110,500	134,100	244,600	236,300	3.5%
3	Public Fire	159,000	(159,000)	0	0	0.0%
4	Total	\$290,000	\$0	\$290,000	\$281,600	3.0%

## 4 Proposed Rate Adjustments

The initial consideration in the derivation of rate schedules for water service is the establishment of equitable charges to the customers commensurate with the cost of providing the service. While the cost of service allocations to customer classes should not be construed as literal or exact determinations, they offer a guide to the necessity for, and the extent of, rate adjustments. The cost of service analysis was performed per M1 guidelines, yet practical considerations sometimes modify rate adjustments by considering additional factors such as the extent of bill impacts, and local policies and practices such as with the District.

### 4.1 EXISTING RATES

The water utility's existing rates consists of a facility charge and a commodity charge which is an inclining tier rate for all customer classes. A summary of existing water rates was presented earlier in this report in Table 2-3.

### 4.2 PROPOSED RATES

The costs of service analysis described in preceding sections of this report provide a basis for the design of water rates. The rate schedules for FY 2018 to FY 2022 shown in Tables 4-2 and 4-3 take into consideration the water utility's objectives and policies. The District has a general practice of stabilizing revenue by requiring 60 percent cost recovery through the fixed charge (facility charge) and 40 percent cost recovery through the variable charge (commodity charge). It is common to allocation max day and max hour fire protection costs to fixed charges. For the water utility, in order to comply with the 60/40 practice, we have reallocated costs that are fixed in nature to the commodity side. This does increase the level of revenue uncertainty for the water utility, but the District feels it helps manage the costs for the customer better. Table 4-1 shows the reallocation of costs.

Table 4-1 Reallocation of Costs for FY 2018

Line No.	Description	Total Costs of Service (\$)	All Customers (\$)	Fire Protection (\$)	Fire Reallocation (\$)	60/40 Reallocation (\$)	Total Costs of Service (%)
	Cost Component	Table 3-5	Table 3-6	Table 3-6			
Variable Costs							
1	Base	102,100	102,100	0		5,500	107,600
2	Max Day	82,800	2,400	80,400	(80,400)	2,750	5,150
3	Max Hour	72,200	600	71,600	(71,600)	2,750	3,350
Fixed Costs							
4	Meter & Services	21,000	21,000	0			21,000
5	Customer Billing	4,900	4,900	0			4,900
6	Fire Protection	7,000	0	7,000	152,000	(11,000)	148,000
7	Total	\$290,000	\$131,000	\$159,000	\$0	\$0	\$290,000

The water utility will keep the current rate structure which consists of a facility charge plus a commodity charge for all customers. The facility charge will be based on meter size while the commodity charge incorporates the amount of water consumed based on an inclining tier rate structure. With an inclining rate structure, the users pay different commodity rates for different block usages. Based on the consumption analysis, the selected tiers are: Tier 1 1-6 units, Tier 2 7-12 units and Tier 3 is 13 units and over. Tier 1 represents average winter consumption. Average winter consumption is typically associated with indoor use. Tier 2 represents average summer

consumption. Average summer consumption is typically associated with indoor and outdoor use. Tier 3 is considered all discretionary use.

The inclining tiered rate structure proposed meets California Urban Water Conservation Council (CUWCC) requirements as well as promotes water conservation. The inclining tier rates send a strong price signal for water conservation, consistent with Article X Section 2 of the State of California Constitutions. The cost associated with each charge is described in the sections below.

#### 4.2.1 Facility Charge

The facility charge includes a portion of the meter maintenance, reading customer meters, issuing bills, and public fire protection costs. The facility charge increases with increasing meter size. The meter ratio used follows those recommended by AWWA and recognizes that as meter size increases, so does the capacity. For example, customers with a 4" meter have an expectation of being able to use more water (at a higher flow capacity) than customers are with a 3/4" meter. There are customers with a 5/8" meter but the water utility is working to transition all customers to a 3/4" meter as the base meter. Consequently, the water system has a responsibility to provide each customer the level of service expected from their meter connection when the tap is turned on. Therefore we distribute the costs of providing more water and capacity based on meter size. Table 4-2 demonstrates the cost buildup that incorporated into the facility charge for FY 2018 and Table 4-3 shows the five-year facility charge rate schedule.

Table 4-2 Costs within the Facility Charge for FY 2018

Meter Size	Meter & Fire Protection			Billing			Total Service Charge
	Unit Cost	Meter Ratio	Adjusted Unit Cost	Unit Cost	Bill Ratio	Adjusted Unit Cost	
	per EM			per Bill			\$/Month
Operating Costs	\$ 169,000			\$ 4,900			
5/8"	\$ 26.99	1.00	\$ 26.99	\$ 1.27	1.00	\$ 1.27	\$ 28.26
3/4"	26.99	1.00	26.99	1.27	1.00	1.27	28.26
1"	26.99	1.67	45.07	1.27	1.00	1.27	46.35
1 1/2"	26.99	3.33	89.88	1.27	1.00	1.27	91.15
2"	26.99	5.33	143.86	1.27	1.00	1.27	145.13
3"	26.99	10.67	287.99	1.27	1.00	1.27	289.27
4"	26.99	16.67	449.94	1.27	1.00	1.27	451.21
6"	26.99	33.33	899.61	1.27	1.00	1.27	900.88
8"	26.99	53.33	1,439.43	1.27	1.00	1.27	1,440.70

Table 4-3 Proposed Facility Charge

Description	Proposed Rate Schedule				
	2018	2019	2020	2021	2022
Facility Charge (by Month)					
Flat Rate	\$ 151.33	\$ 155.87	\$ 160.55	\$ 165.37	\$ 170.33
5/8"	\$ 28.26	\$ 29.11	\$ 29.98	\$ 30.88	\$ 31.81
3/4"	28.26	29.11	29.98	30.88	31.81
1"	46.35	47.74	49.17	50.64	52.16
1 1/2"	91.15	93.89	96.70	99.60	102.59
2"	145.13	149.49	153.97	158.59	163.35
3"	289.27	297.94	306.88	316.09	325.57
4"	451.21	464.75	478.69	493.05	507.84
6"	900.88	927.91	955.74	984.41	1,013.95
8"	1,440.70	1,483.92	1,528.44	1,574.29	1,621.52

### 4.2.2 Commodity Charge

The commodity charge includes costs associated with base and extra capacity. Therefore, the commodity charge is derived for each of the component in the sections below. Table 4-4 shows the results in a five-year commodity charge rate schedule.

Table 4-4 Proposed Commodity Charge

Description	Proposed Rate Schedule				
	2018	2019	2020	2021	2022
Commodity Charge (Bi-Monthly Fee per hcf)					
0-6 hcf	\$ 8.08	\$ 8.32	\$ 8.57	\$ 8.83	\$ 9.09
7-12 hcf	8.26	8.51	8.76	9.03	9.30
≥ 13 hcf	8.95	9.22	9.50	9.78	10.08

#### 4.2.2.1 Base Costs

The base costs represent costs associated with delivery costs. Delivery costs are the operating and capital costs associated with delivering water through the transmission and distribution system to all customers at base use (average daily demand) conditions. Table 4-5 shows the delivery unit costs applied to all water consumption.

Table 4-5 Water Delivery Unit Costs

Description	Delivery Costs
Base Operating Costs	\$107,600
HCF	13,792
Unit Costs \$/HCF	\$7.80

#### 4.2.2.2 Extra Capacity Costs

The extra capacity represents costs associated with peak demands in excess of base demand. Total extra capacity costs are comprised of maximum day and maximum hour demands. The total peaking costs are shown in Table 4-1 under max day and max hour. Table 4-6 shows the derivation of the extra capacity unit costs for the entire system.

Table 4-6 Water Peaking Unit Costs

Description	Peaking Costs
Extra Capacity Operating Costs	\$8,000
HCF	13,792
Unit Costs \$/HCF	\$0.58

To obtain the extra capacity unit costs by tier, peaking factors for each tier were determined and used to allocate total costs to each tier. The distribution of the costs to tiers was performed in similar methodology as Table 3-6 taking under consideration the costs in Table 4-1. Table 4-7 shows the results of extra capacity costs by tier.

Table 4-7 Water Peaking Unit Costs by Tier

Description	Peaking Costs	Usage	Unit Peaking Costs
All Customers			
Tier 1	\$1,765	6,400	\$0.28
Tier 2	\$1,532	3,331	\$0.46
Tier 3	\$4,674	4,062	\$1.15
Total	\$7,971	13,792	\$0.58

### 4.3 REVENUE RECOVERY UNDER PROPOSED RATES

As previously discussed, the proposed rate schedule shown in Table 4-3 and 4-4 would increase rate revenues by the average system-wide cumulative increase of 15.9 percent over the five-year study period and maintain current cost recovery, as indicated in Tables 4-8.

Table 4-8 Comparison of Water Cost of Service to Proposed Revenue

Line No.	Description	Adjusted COS (\$)	Rev under New Rates (\$)	Percent Recovery (%)
Customer Class				
1	Flat Rate Customers	45,400	45,400	100.0%
2	All Customers	244,600	244,000	99.8%
3	Total	\$290,000	\$289,400	99.8%

### 4.4 NEIGHBORING UTILITIES

Presented in Table 4-9 are the proposed rates compared to rates of neighboring cities and agencies, for a single family residential customer. Single family residential is considered a customer with a 1-inch meter using 6 units per month. With the proposed rate increases, the water utility continues to be the lowest water providers of the surveyed communities. All surveyed community rates are current as of October 2016. The water utility proposed single family residential bill is anticipated to be \$103.48 after the adjustment.

Table 4-9 Comparison of Water Fees to Neighboring Agencies

Water Utility	Typical Bill (\$/month)
Cedar Glen (Existing)	\$93.57
Cedar Glen (Proposed)	95.37
Lake Arrowhead CSD	103.48