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# COST OF SERVICE STUDY

APRIL 2017

*Marin Municipal Water District*

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## EXECUTIVE SUMMARY

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### OVERVIEW

The Marin Municipal Water District (District) serves the populous eastern corridor of Marin County from the Golden Gate Bridge northward, abutting Novato, and is bounded by the San Francisco Bay on the east, and stretches through the San Geronimo Valley in the west. The incorporated cities and towns of San Rafael, Mill Valley, Fairfax, San Anselmo, Ross, Larkspur, Corte Madera, Tiburon, Belvedere, and Sausalito are within the District's service area. The District provides high-quality drinking water to over 187,000 customers through over 60,000 accounts. Seventy-five percent of the District's water comes from more than 21,000 acres of protected watershed on Mt. Tamalpais and in the grassy hills of west Marin. Rainfall from these watersheds flow into one of seven reservoirs and is then treated at one of the District's potable water treatment plants before being delivered to residential and commercial customers.

The District has developed local surface water supplies and implemented both conservation programs and a recycled water program to maximize the use of local resources and increase water supply reliability. Approximately, a quarter of the District's average annual water is imported from the Sonoma County Water Agency (SCWA). SCWA water originates from Lake Sonoma and Lake Mendocino and is released into the Russian River. The Russian River water is filtered naturally through 80 feet of sand beds adjacent to the river and is blended with the District's reservoir water in the distribution system.

The District's current water rate structure includes three components - a Service Charge, a Watershed Management Charge, and a Commodity Charge. The Service Charge is a flat bi-monthly charge based on the size of the meter serving a property and generally recovers the District's costs of billing, customer service, meter replacement and repair, meter reading, and a portion of general administrative overhead. The Watershed Management Charge is a flat bi-monthly charge based on the size of the meter serving a property and recovers the costs of maintaining and preserving the District's watershed. The Commodity Charge is a variable per-unit charge measured in hundred cubic feet (CCF), or per 748 gallons, and is designed to recover the costs of water supply, treatment, and distribution. The District's rates for the Commodity Charge consist of three to four billing tiers that impose higher rates per unit of water as the level of consumption increases.

The tiered Commodity Charge system was designed in compliance with California Constitution Article XIII D, section 6 (commonly referred to as Proposition 218) by allocating a proportionately greater share of the cost of providing service to those customers whose water usage creates greater demands and burdens on the District's water system and water resources and therefore generates additional costs to the District. The tiered rates for the Commodity Charge also have the incidental effect of encouraging conservation by sending a price signal to customers to use less water.

In addition to the water charges described above, the District also imposes a fixed bi-monthly Private Fire Service Charge on certain properties as a condition of extending or initiating water service (1) by the installation of a private fire suppression system or (2) upon the request of the customer or property owner for the delivery of water to the property for the purpose of fire service protection. The rates for the Private Fire Service Charge are established on the basis of the size of the fire service lateral through which water is delivered (in inches) and is calculated to recover the cost of providing water to such properties for private fire service protection. All charges are billed on a bi-monthly basis.

Water demand in California has been in flux due to an extended drought. In response to the multi-year drought conditions, in April 2015 the Governor issued an Executive Order to direct the State Water Resources Control Board (SWRCB) to adopt a regulation to achieve an aggregate statewide 25-percent reduction in potable urban water use. The required reductions for each water provider were based on residential gallons per capita per day (R-GPCD). Based on the District's 2013 107.4 R-GPCD State reported water usage, the SWRCB required the District to achieve a 20-percent reduction in potable water usage. The State mandate and in conjunction with the District's call for conservation due to lower reservoir levels resulted in a 21-percent reduction in customer water usage in FY 2015/16 than used in FY 2013/14 exceeding the District's 20 percent target. Recognizing persistent yet less severe drought conditions throughout California, on May 18, 2016, the SWRCB adopted an emergency water conservation regulation that replaces the February 2016 emergency regulation. The May 2016 regulation that is in effect from June 2016 through May 2017 requires locally developed conservation standards based upon each agency's specific circumstances. It replaces the prior percentage reduction-based water conservation standard with a localized "stress test" approach. The SWRCB agreed to consider repeal of the regulation in May 2017 if the regulation has not been rescinded or modified by May 1, following a more thorough review of the state's water supply conditions. The extent of a rebound in water demand as a result of the reduced conservation measures and increase in water supply due to above average rainfall in 2017 remains to be seen. The extent of a rebound in water demand as a result of the reduced conservation measures and increase in water supply due to above average rainfall in 2017 remains to be seen.

## COST OF SERVICE STUDY

The District retained Carollo Engineers to conduct a comprehensive five-year cost of service study starting with its Fiscal Year (FY) 2017/18 water rate structure. This study builds on the previous cost of service study that was used to establish the current rates, beginning in FY 2015/16. Like many California water agencies, the District has been grappling with the effects of the multi-year drought, and while its customers have responded to calls for conservation, these cutbacks have resulted in increased revenue instability—i.e., decreased usage results in decreased revenues received from water service charges.

The District's rate setting process conforms to cost of service standards espoused by the American Water Works Association (AWWA). Those standards are as follows:

- In providing adequate service to its customers, each utility must recover sufficient total revenues to operate and maintain the system, adequately fund capital projects to develop and preserve the system, and maintain the utility's financial integrity;
- Development of the general rate structure should recover the cost of providing the service to various classes of customers in an equitable manner; and
- When diverse and competing objectives are well understood and evaluated, a utility has the opportunity to design a rate structure that does more than simply recover its costs. A properly selected rate structure should support and optimize a blend of various utility objectives and should work as a public information tool in communicating these objectives to customers.

In addition to industry standards, within the State of California, water agencies must establish rates in conformance with the substantive requirements defined by California Constitution Article XIII D, section 6 (commonly referred to as Proposition 218), while taking into consideration the constitutional mandate to conserve the water resources of the State set forth in California Constitution article X, section 2 and state statutes.

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

California Constitution Article XIII D, was enacted in 1996 and requires that fees and charges shall not exceed and shall be are proportional to the cost of providing service. The principal requirements of Article XIII D, section 6 of the Constitution, as they relate to public agency service fees are as follows:

1. A property related charge (such as water service charges) imposed by a public agency on a parcel shall not exceed the costs of providing the property related service.
2. Revenues derived from the charge shall not be used for any other purpose other than that for which the charge was imposed.
3. The amount of the charge imposed upon any parcel shall not exceed the proportional cost of service attributable to the parcel.
4. No charge may be imposed for a service unless that service is actually used or immediately available to the owner of property.
5. No charge may be imposed for general governmental services including, but not limited to, police, fire, ambulance, or library services, where the service is available to the public at large in substantially the same manner as it is to property owners.
6. A public agency shall hold a public hearing to consider the adoption of the new or increase in any existing charge and mail written notice of the public hearing and proposed charge to the record owner of each parcel upon which the charge is proposed for imposition and any tenant who is directly liable for the payment of the

charge at least 45 days prior to the public hearing, when the agency considers all written protests against the charge.

### **California Constitution - Article X, Section 2**

Article X, Section 2 of the California Constitution states the following:

“It is hereby declared that because of the conditions prevailing in this State the general welfare requires that the water resources of the State be put to beneficial use to the fullest extent of which they are capable, and that the waste or unreasonable use or unreasonable method of use of water be prevented, and that the conservation of such waters is to be exercised with a view to the reasonable and beneficial use thereof in the interest of the people and for the public welfare.”

As stated above Article X, section 2 of the Constitution declares the statewide policy that the State’s water supplies shall be preserved and the waste or unreasonable use, or unreasonable method of use of water shall be prevented by encouraging conservation. As such, public agencies are constitutionally mandated to maximize the beneficial use of water, prevent waste, and encourage conservation. The M-1 Manual recognizes that a properly designed inclining block rates recover class – specific cost of service, while also sending a more conservation oriented price signal to that class.

The District’s rates were developed in this Study to comply with Article XIII D section 6 and industry standards while meeting other emerging goals and objectives of the utility, including preserving and managing its water resources. To this end, Carollo applied a comprehensive four-prong cost of service rate setting analysis espoused by the AWWA M1 Manual entitled *Principles of Water Rates, Fees and Charges* (AWWA M1 Manual). Each of these analyses is described in more detail below and in the M1 Manual. Ultimately, these cost of service principles endeavor to proportionately distribute the costs of providing service to customer classes in accordance with the way each class uses the water system and the corresponding costs that their usage generates.



### Water Demand Analysis

Forecasting water sales and purchases is a critical component in the rate setting process. The District's forecast process includes a multi-year evaluation of system demands both on a customer class and system-wide basis. As the District does not have enough local supplies to meet all of its demand, it is necessary for the District to purchase imported water and expand recycled water at a significantly higher cost. As part of the budget process, the District forecasts the expected cost of water based on historical demand, proposed changes to rates, regulatory impacts, and even the weather. These forecasted water purchases are then compared against forecasted revenues and rates are developed to adequately recover costs.



#### Water Demand Analysis

Forecasts water sales based on historical billings, modifications to the rate structure, and any regulatory restrictions.



#### Revenue Requirements Analysis

Compares existing revenues of the utility to its operating, capital, and debt obligations to establish the adequacy of the existing rates to recover the utility's costs



#### Functional Cost Analysis

Identifies and apportions annual revenue requirements to functional rate components based on its application of the utility system.



#### Rate Design Analysis

Considers both the level and structure of the rate design to collect the distributed revenue requirements from each class of service

### Revenue Requirements

The methodology that the District applied to determine its annual rate revenue requirements is consistent with industry standards and the District's specific bonding requirements as described in its Official Statements, and as prescribed by its bond financing documents. The revenue requirements analysis compares the forecasted revenues of the utility to its forecasted operating and capital reserve costs to determine the adequacy of the existing rates to recover the utility's costs of providing service. If any shortfalls exist, rates might need to be increased. Through its annual budgeting process, the District performs a detailed review of its projected costs, including operations expenditures, capital needs, and funding requirements.

### Functional Cost Analysis

After determining a utility's revenue requirements, the next step in the analysis is to outline the cost to deliver each unit of water to serve each customer. This process takes each item in the District's budget and organizes the items collectively based on what function is served. For example, some cost items

support the ability to deliver basic and peak demand for water, while other costs are incurred to provide customer service or to fund watershed activities. Organizing the budget in terms of end function allows direct correlation between the budget item and the rate, coupling the cost incurred by the District and the benefit delivered to the customer or the demand and burden that the customer places on the District's system and/or water resources.

### Rate Design Analysis

The final component of the analysis is the rate design analysis. The rate design involves developing a rate structure that proportionately recovers costs among customer classes (i.e., single-family residential and commercial), as well as from customers on a parcel basis within their designated customer class. For example, in the potable water system, water supply costs are recovered based on the units of water sold (demand), while service costs are recovered based on the size of a customer's meter and therefore allocated based on the total number of meter equivalents, which accounts for the number and hydraulic capacity of the meters served. This step allows the District to develop unit costs that can then be layered based on customer characteristics. This is a critical process for establishing tiered rates, as increasing usage incurs additional costs that make each unit of water more expensive to provide. This process creates a fair and equitable foundation for establishing each charge and rate that the District levies in order to proportionally recover system costs from the District's customers.

With this approach, Carollo has taken into consideration not only industry accepted standards issued by the AWWA and the District's specific water system and customer characteristics, but also California's unique legal framework as discussed later within this study.

## RESULTS AND RECOMMENDATIONS

Based on the analysis as presented within this updated Cost of Service Study (Study), Carollo recommends that the District continues to use the existing rate structure consisting of a Service Charge, Watershed Management Charge, and a volumetric per-unit Commodity Charge. This rate structure was implemented as part of the FY 2015/16 rate setting process and continues to reflect the current conditions of the District. Given historical volatility in water demand and the potential of future regulatory restrictions, it is recommended the District also adopt the proposed demand reduction surcharges. These rates are designed to provide revenues sufficient to continue to meet the District's expenditures and debt obligations, despite significant reductions in demand/sales that may arise during water shortages or required conservation measures and, if implemented, would addition to the District's Service Charge, Watershed Management Charge, and per unit Commodity Charge.

The current proposed rates for all customer classes and the current and proposed changes in the units of water allotted to each tier of the rates for the multi-family residential customer (MFR) Commodity Charges are set forth in the tables below as well as Appendix J.

TABLE ES- 1 PROPOSED FIXED BI-MONTHLY RATE

METER SIZE	CURRENT	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21
5/8"	\$33.85	\$36.79	\$39.41	\$42.16	\$45.12
3/4"	42.90	46.62	49.93	53.42	57.17
1"	60.95	66.28	70.97	75.93	81.26
1.5"	106.05	115.43	123.57	132.20	141.48
2"	160.20	174.41	186.69	199.73	213.75
3"	331.70	361.18	386.57	413.58	442.61
4"	584.40	636.42	681.13	728.72	779.87
6"	1,279.30	1,393.33	1,491.17	1,595.35	1,707.33
8"	2,181.80	2,376.33	2,543.17	2,720.85	2,911.83
10"	3,445.30	3,752.53	4,015.97	4,296.55	4,598.13

TABLE ES- 2 PROPOSED BI-MONTHLY WATERSHED MANAGEMENT FEE

METER SIZE	CURRENT	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21
5/8"	\$8.80	\$9.78	\$10.41	\$11.09	\$11.79
3/4"	10.55	11.69	12.44	13.25	14.09
1"	14.00	15.50	16.49	17.57	18.68
1.5"	22.65	25.02	26.61	28.37	30.15
2"	33.05	36.45	38.76	41.33	43.92
3"	66.00	72.65	77.24	82.37	87.53
4"	114.60	125.99	133.94	142.85	151.79
6"	248.10	272.67	289.86	309.17	328.50
8"	421.50	463.17	492.36	525.17	558.00
10"	664.30	729.87	775.86	827.57	879.30

The water usage allotment by tier and the resulting tier rates are specific to each customer class in order to proportionally recover costs for each customer.

**TABLE ES- 3      PROPOSED RESIDENTIAL BI-MONTHLY TIER ALLOTMENTS (CCF)**

	SUMMER (CCF)	WINTER (CCF)
<b>SINGLE FAMILY</b>		
Tier 1	0 - 26	0 - 21
Tier 2	27 - 59	22 - 48
Tier 3	60 - 99	49 - 80
Tier 4	100+	81+
<b>MFR TIER ALLOTMENTS</b>		
Tier 1	0 - 10	0 - 10
Tier 2	11 - 20	11 - 18
Tier 3	21 - 28	19 - 26
Tier 4	29+	27+
<b>DUPLEX TIER ALLOTMENTS</b>		
Tier 1	0 - 20	0 - 18
Tier 2	21 - 45	19 - 35
Tier 3	46 - 78	36 - 68
Tier 4	79+	69+

**Notes:**

(1) Rates are shown in Appendix J.

TABLE ES- 4 PROPOSED RESIDENTIAL VARIABLE RATES

	CURRENT	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21
<b>SINGLE-FAMILY RESIDENTIAL</b>					
Tier 1	\$3.96	\$4.07	\$4.36	\$4.66	\$4.99
Tier 2	6.66	7.13	7.62	8.16	8.73
Tier 3	11.40	12.07	12.91	13.81	14.78
Tier 4	19.60	19.45	20.81	22.26	23.83
<b>MULTI-FAMILY RESIDENTIAL</b>					
Tier 1	\$3.93	\$4.16	\$4.47	\$4.78	\$5.11
Tier 2	6.50	7.07	7.58	8.11	8.68
Tier 3	10.71	11.25	12.05	12.89	13.79
Tier 4	18.36	18.94	20.28	21.70	23.22
<b>DUPLEX</b>					
Tier 1	\$3.95	\$4.10	\$4.39	\$4.70	\$5.02
Tier 2	6.77	7.24	7.75	8.29	8.87
Tier 3	11.11	12.02	12.86	13.76	14.72
Tier 4	18.89	18.90	20.23	21.64	23.16

TABLE ES- 5 PROPOSED COMMERCIAL, SINGLE FAMILY IRRIGATION, RECYCLED, AND RAW WATER RATES

	EXISTING	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21
<b>COMMERCIAL</b>					
Tier 1	\$3.80	\$3.98	\$4.25	\$4.55	\$4.87
Tier 2	\$9.75	10.82	11.58	12.39	13.25
Tier 3	\$14.98	16.26	17.40	18.61	19.92
<b>SINGLE FAMILY IRRIGATION</b>					
Tier 1	\$5.40	\$5.14	\$5.50	\$5.88	\$6.29
Tier 2	\$7.09	6.15	6.58	7.04	7.53
Tier 3	\$11.31	10.76	11.51	12.31	13.18
<b>RECYCLED WATER</b>					
Tier 1	\$2.76	\$3.17	\$3.40	\$3.63	\$3.89
Tier 2	\$7.56	10.05	10.76	11.51	12.31
Tier 3	\$15.78	18.73	20.04	21.44	22.94
<b>RAW WATER</b>					
Tier 1	\$3.80	\$4.23	\$4.53	\$4.84	\$5.22
Tier 2	\$6.70	-	-	-	-
Tier 3	\$15.20	-	-	-	-

# 1 INTRODUCTION

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## 1.1 PURPOSE

The District retained Carollo Engineers to conduct a water cost of service study (Study) for FY 2017/18 through FY 2020/21. This Study includes a rate design analysis and proposes rate adjustments to meet the ongoing revenue needs of the District. Furthermore, this analysis takes into account the substantial conservation that the District has already experienced, as well as water demands that the District reasonably anticipates to occur during the study period. The District, like most water providers in California, has been challenged by ongoing drought conditions and regulatory driven water usage restrictions. Users in the District responded to calls for increased conservation, resulting in a significant reduction in demand over the past several years when compared with historical averages. This significant reduction in demand has resulted in proportional declines in revenues, which in turn has made it challenging for the District to sustain positive cash flows, maintain adequate reserve funds, and meet debt coverage policy objectives. In the beginning of FY 2016/17, the District experienced a moderate bounce back in demand<sup>1</sup>. As explained in more detail in Section 4 of this study, the demand rebound is expected to be flat after FY 2017/18<sup>2</sup>. This forecast is reasonable for the purposes of developing the financial forecast and rates presented within this Study. Moreover, the District may and should adjust rates over time if demands deviate significantly from the current forecast, whether higher or lower.

The District commissioned Carollo to analyze its current revenue requirements and develop updated rates that proportionally recover costs from system users and are designed to balance conservation goals with revenue needs. To develop these rates, a detailed review of the District's revenue needs, customer usage patterns, capital improvement plans (CIP), and other future cost drivers were conducted. This Study documents the four-step approach Carollo used in developing the proposed rates, presents the rates and the overall impact to the District's financial projections, and provides further details of the methodology and assumptions used to develop the financial plan.

## 1.2 BACKGROUND ON MARIN MUNICIPAL WATER DISTRICT

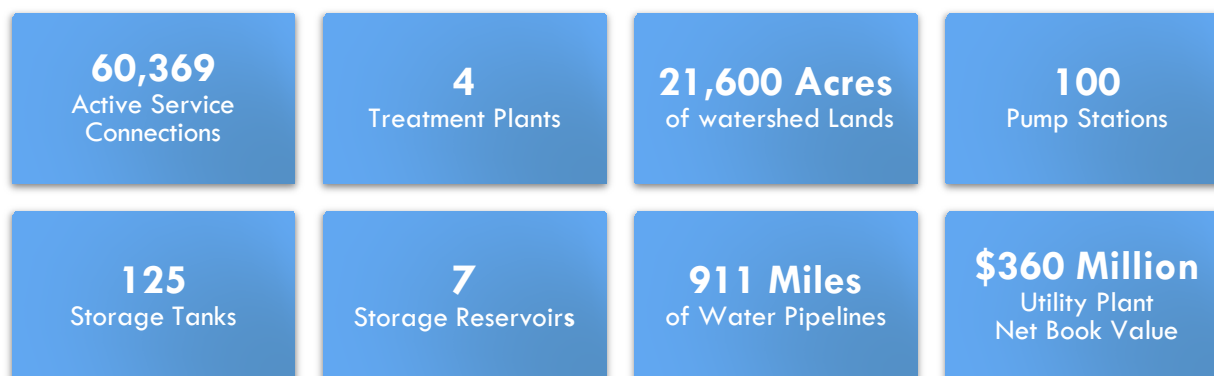
The District is a publicly-owned and operated municipal water district, and currently serves drinking water to over 185,000 people across a 147-square mile area in south and central Marin County, California. The District is the oldest municipal water district in the State of California and manages a substantial inventory of infrastructure, including over 900 miles of water pipeline, four treatment plants, seven reservoirs, and more than 60,000 service connections. The District operates a complex system of reservoirs, which provides an average of three-fourths of the District's annual water supply. The District's remaining supplies are imported from the SCWA. The District treats water at its three treatment plants:

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<sup>1</sup>In FY 2016/17, demand is now expected to have an overall bounce back of 5.95 percent.

<sup>2</sup>In FY 2017/18, total demand is projected to grow an additional 1.07 percent.

the San Geronimo Treatment Plant in Woodacre, the Bon Tempe Treatment Plant near Ross, and the Ignacio treatment facility. The cost to produce water varies throughout the District's supply system due to treatment requirements resulting from variations in water quality and pumping costs, distance and topography.



## Customer Profile

Based on FY 2015/16 customer data, the majority of the District's accounts are single-family residential customers (84 percent), followed by multi-family residential and duplex customers (3 and 4 percent, respectively). Commercial and industrial accounts comprise 7 percent of the District's accounts, while remaining classes—including agricultural and irrigation, institutional, recycled water, raw water, and single-family direct irrigation—collectively make up less than 5 percent of total accounts.

The District's customer class consumption profile reflects the differences between each class's average water use. In FY 2015/16, single-family residential customers consumed 56 percent of the District's total delivered water, with multi-family and duplex residential customers consuming 12 and 3 percent, respectively. Non-residential customers used 25 percent of total water demand, while recycled and raw water customers used 2 and 1 percent, respectively. All other customers comprised less than 1 percent of total system demand. As described later in this Study, based on the characteristics of their water use, each of the various customers has been assigned to a customer class.

## Current Water Rates and Fees

The District's current rate structure includes three components: a bi-monthly Service Charge per meter, a bi-monthly Watershed Management Charge per meter, and a variable per unit Commodity Charge. The rate for the

TABLE 1-1 EXISTING BI-MONTHLY FIXED CHARGES

METER SIZE	SERVICE CHARGE	WATERSHED MGM'T CHARGE
5/8"	\$33.85	\$8.80
3/4"	\$42.90	\$10.55
1"	\$60.95	\$14.00
1-1/2"	\$106.05	\$22.65
2"	\$160.20	\$33.05
3"	\$331.70	\$66.00
4"	\$584.40	\$114.60
6"	\$1,279.30	\$248.10
8"	\$2,181.80	\$421.50

bi-monthly Service Charge is based on the size of the water meter (in inches) serving a property and is designed to recover a portion of the District's fixed costs of providing water service. The Watershed Management Charge is a flat bi-monthly charge and is also based on the size of the meter (in inches) serving a property and recovers the costs of maintaining and preserving the District's watershed. The rate for the variable Commodity Charge has four tiers. For residential customers, the usage allotments within each tier differ in the winter and summer months. The rates charged for each unit of water (one unit equals one hundred CCF or 748 gallons) do not change between seasons, rather the volume of water allotted to each tier is adjusted between the winter (December through May) and summer (June through November) billing periods. This seasonal tiered rate structure (changes in allotments) serves several purposes. First, the structure adjusts the amount of water allotted to each tier based on seasonal reductions in residential water consumption. Second, during the winter, wetter months, the District attempts to maximize reservoir levels in anticipation of the peak summer season to minimize the annual purchases of more expensive imported water. Finally, the structure has the incidental benefit of encouraging conservation based on seasonal outdoor irrigation needs measured by evapotranspiration.<sup>3</sup> The residential tier breakpoints (i.e., the amount of water allotted to each tier) are shown in Table 1-2 below.

TABLE 1-2 EXISTING RESIDENTIAL TIER BREAKPOINTS

	SINGLE-FAMILY		DUPLEX		MULTI-FAMILY	
TIER	SUMMER	WINTER	SUMMER	WINTER	SUMMER	WINTER
1	0 - 26	0 - 21	0 - 20	0 - 18	0 - 10	0 - 10
2	27 - 59	22 - 48	21 - 45	19 - 35	11 - 20	11 - 18
3	60 - 99	49 - 80	46 - 78	36 - 68	21 - 28	19 - 26
4	100+	81+	79+	69+	29+	27+

For non-residential and single-family irrigation customers<sup>4</sup>, each meter is provided an annual water budget (i.e., an annual allocation of water), which forms the basis of the tiered rate structure. The billing structure for non-residential meters is tied to the meter's water budget. For billing purposes, the water budget is divided into six bi-monthly allocations referred to as baselines. As a default, the budget is evenly allocated over the six billing periods. This is not a requirement and customers may adjust their baselines as to reflect their specific needs.

Residential customers who stay within their bi-monthly water budget are billed at the Tier 1 rate. Customers who exceed their bi-monthly water budgets pay progressively higher rates depending on the percentage of water delivered in excess of their water budget. Table 1-3 summarizes the District's

<sup>3</sup> Due to seasonal temperature reductions and shortened days, plants lose less water due to evaporation and require less irrigation. [www.allianceforwaterefficiency.org](http://www.allianceforwaterefficiency.org)

<sup>4</sup> Single-family residential irrigation customers are single-family residential customers who have water meters dedicated for outdoor irrigation.



current water rate structure. It reflects the District's budget, cost structure, demand profiles, and forecasts at that time.

TABLE 1-3 EXISTING NON-RESIDENTIAL TIER BREAKPOINTS (PERCENT OF BUDGET)			
TIER	RECYCLED	COMMERCIAL, INSTITUTIONAL, RAW, & IRRIGATION	SINGLE-FAMILY IRRIGATION
1	0 – 100%	0 – 85%	0 – 50%
2	101 – 150	86 – 150	51 – 101
3	150+	151+	100+

Where residential customers are provided specific allocations of water within each tier (detailed above), non-residential customers and single-family irrigation customers are provided an allocation based on their defined water needs -the District's determination of the actual consumption requirement of the service (District Code 11.08.035).. This difference is generally implemented as non-residential customer demand varies significantly from customer to customer, whereas residential demand is relatively homogenous. Moreover, at the time that a non-residential customer connects to the District's system, the property owner is required to purchase system capacity through a development Connection Fee based upon anticipated demands and demand patterns. While costs are allocated proportionally among customer classes, the non-residential tier structure creates a basis for proportionally allocating costs within the non-residential customer class itself.

Every non-residential water customer has a water entitlement and a water budget. A water entitlement is the maximum amount of water the District is committed to supply any individual service on an annual basis (District Code 11.08.180). The water budget is the District's determination of the actual consumption requirement of the service (District Code 11.08.035). The water budget may be less than or equal to the water entitlement, but may never exceed the entitlement. As a result, if the District calculates a property's water budget at a level higher than the property's entitlement, an increase to the entitlement will be required before the water budget will be increased. The purchase or transfer of entitlement to a meter does not automatically increase the meter's water budget. The site must be inspected by District Conservation staff to ensure minimum efficiency standards have been met before an increase in the water budget will be considered. Non-Residential and single family irrigations customs who stay within their bi-monthly water budget are billed at the Tier 1 rate. Customer who exceed their bi-monthly water budget pay progressively higher rates within each tier depending on the percentage of water delivered in excess of their water budget

## 2 PROJECT OBJECTIVES

The District retained Carollo to perform an update to the 2015 Cost of Service Analysis. The update is designed to be an independent analysis and evaluation of the existing rate setting and methodology for cost recovery, allocations, and calculations, and based on current and project demand for the study period, to make recommendations as to any refinements that might meet the District's objectives. The goal of this analysis is to evaluate the rate setting process and include the following objectives:

1. Review the appropriateness of existing financial plans for the water, recycled water, and raw water functions to provide financial sufficiency and meet operation and maintenance (O&M) costs and capital replacement and enhancement (R&E) needs.
2. Evaluate and develop policy considerations for the existing water rate methodology to achieve the goals and objectives of the District, including ease of understanding, promoting water use efficiency/conservation, and complying with California Constitution cost of service and proportionality requirements.
3. Calculate and document the functionalization, classification, and allocation of costs—including capital reserves—among appropriate customer classes consistent with industry standards and California Constitution cost of service and proportionality requirements.
4. Provide a rate design framework that proportionately aligns customer demands, and allocations of costs associated with the District's operations, service classes, and pricing tiers in conformance with the California Constitution.

### Comprehensive Rate Design

Rates are typically designed to achieve multiple objectives. While industry standards provide a basis for testing the reasonableness (governed by or being in accordance with reason or sound thinking; being within the bounds

FIGURE 2-1 CONCEPTUAL STUDY OVERVIEW



of common sense; not excessive or extreme)<sup>5</sup> of proposed rates this basis does not on its own meet legal requirements – specifically those in California. The District must illustrate how its rates reasonably and proportionally recover costs from system users within this legal framework. Within the cost of service approach and legal requirements, the District's policy guidelines can influence rate structure design elements that are distinct to the District and the community. Within the District's rate structure, these policies encompass the entire structure, including the selection of the rate design (allocation-based rates for non-residential, single-family irrigation and recycled water customers, and inclining block rates for residential), the methodology for allotting the amount of water use within tiers, and how costs are budgeted to target water waste. With its rate structure, the District is able to satisfy its policy objectives and cost of service requirements.

## 2.1 FORWARD-LOOKING STATEMENT

The calculations and forecasts of this analysis are based on the reasonable projections of existing service costs, water demand, and system operations with information available and on existing cost of service proportionality requirements. Significant changes in the District's operations, customer demand, changes occurring in California law, or further regulatory actions by the Governor or the SWRCB in regard to water use may require the District to revisit the cost of service analysis.

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<sup>5</sup> Reasonableness. (n.d.) American Heritage® Dictionary of the English Language, Fifth Edition. (2011).

## 3 COST OF SERVICE REVIEW

### 3.1 STEP-BY-STEP APPROACH

Rate analyses are performed to determine the revenues necessary to sufficiently fund a utility's projected O&M costs, reserves, capital repair, replacement and enhancement capital needs, and other operational costs, and the appropriate rates to fairly and appropriately allocate the costs of providing water to customers and among the various customer classes.

When conducting the cost of service analysis, Carollo used a four-step approach, taking into consideration relevant legal standards and industry guidelines. Each step in this process shapes the subsequent step, ultimately resulting in a fair, equitable, and well-documented rate calculation. While the process is shown in a linear step-by-step approach, this is really an iterative process where the ultimate objective is to balance revenues with costs. The process presented below is advocated by the AWWA, a national industry trade group that makes recommendations on generally accepted practices in the water industry, including water rate design, and consistent with industry standards established by the AWWA *Principles of Water Rates, Fees and Charges: Manual of Water Supply Practices M1* (the "M1 Manual").

#### Step 1: Water Demand Analysis

Forecasting water sales and purchases is a critical component in the rate setting process. As part of the budget process, the District forecasts expected water usage based on historical demand, proposed changes to rates, regulatory impacts, the impacts of permanent and temporary conservation by customers, and weather. The forecasted water demand is then compared against the forecasted revenue requirements of the District, and used to develop rates that are sufficient to recover its projected costs. Thus, the recommended rates are then generated so that estimated sales match associated costs.



#### Water Demand Analysis

Forecasts water sales based on historical billings, modifications to the rate structure, and any regulatory restrictions.



#### Revenue Requirement Analysis

Compares the revenues of the utility to its operating and capital costs to determine the adequacy of the existing rates to recover the utility's costs



#### Functional Cost Analysis

Identifies and apportions annual revenue requirements to functional rate components based on its application of the utility system.



#### Rate Design Analysis

Considers both the level and structure of the rate design to collect the distributed revenue requirements from each class of service

## Step 2: Revenue Requirement Analysis

The revenue requirement analysis is the second step, serving as the initial diagnostic of the utility's financial health. The revenue requirement analysis evaluates the agency's expenses and other operating requirements, such as personnel costs, capital costs, and debt service and applicable coverage ratios, and establishes a baseline for the revenue that must be recovered through rates in order to fund the District's projected expenditures.

As these expenses increase over time due to cost escalation and changes in operating conditions, the revenue requirement analysis determines if projected revenues from user rates are adequate to recover the utility's costs. If revenues fall short of the revenue requirement at any point in the projection, it signals that the agency is in need of a revenue increase.

## Step 3: Cost of Service Review

After determining a utility's revenue requirements, the next step is the allocation of costs to functional categories (i.e., cost components)—effectively known as the cost of service analysis because of its role in developing a cost to serve each customer class and tier. The optimal goal of the cost of service review is to delineate how much of the utility's costs benefit each customer class and how much each customer class burdens a utility's system and water resources. In order to achieve this, costs are categorized by placing all of the expenses in an earmarked "bucket," such as customer service, which accounts for general support and administrative costs like customer billing. This process allows costs to be proportionally distributed to each customer class based on its respect demand on the system and then establish rates unique to each customer class. Then the rate calculation that follows becomes as simple as dividing the bucket by the appropriate units (units of water, accounts, etc.) for each customer class and tier.

## Step 4: Rate Design

The final part of the analysis is the rate design. The rate design process establishes a rate structure that proportionately recovers costs from customer classes and customers within each customer class. The final rate structure and rate recommendations are designed to: (1) fund the utility's long- and short-term projected costs of providing service; (2) proportionally allocate costs to system customers; (3) provide a reasonable and prudent balance of revenue stability which incidentally promotes conservation; and (4) comply with the substantive requirements of the California Constitution Article XIII D, section 6.

## 4 WATER DEMAND ANALYSIS

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As an update to the 2015 Cost of Service analysis, Carollo analyzed the District's billing records from FY 2011/12 through October 2016. Given the significant conservation response, to forecast future water demand, a combination of the FY 2013/14 billings and more recent consumption records were used to forecast the FY 2017/18 water demand and customer class usage profiles. Based on conservation trends and current water demand, the total forecasted water demand is 21,937 AF for FY 2017/18.

On January 17, 2014, Governor Jerry Brown issued a drought state of emergency declaration in response to record-low water levels in California's rivers and reservoirs as well as an abnormally low snowpack. On April 1, 2015, Governor Brown issued an Executive Order (Executive Order B-29-15) calling for statewide mandatory potable water reductions of up to 25%. On May 5, 2015, the State Water Resources Control Board approved a regulation, based on Governor Brown's Executive Order, mandating the District to reduce its water consumption by 20% percent for June 2015 through February 2016 as compared to the same months in 2013. On November 15, 2015, Governor Brown extended those conservation measures until October 31, 2016.

Recognizing persistent yet less severe drought conditions throughout California, on May 18, 2016, the SWRCB adopted an emergency water conservation regulation that replaced the February 2016 emergency regulation. The May 2016 regulation that is in effect from June 2016 through May 2017 requires locally developed conservation standards based upon each agency's specific circumstances. It replaces the prior percentage reduction-based water conservation standard with a localized "stress test" approach.<sup>6</sup> Based on the City's local conditions, the City has continued to implement some conservation measures in response to the continuing drought. District water customers used 21 percent less potable water in FY 2015/16 than they used in FY 2013/14 (20 percent was the District's target). Our analysis was focused on forecasting the extent and timing of a rebound in water demand during the Study period.

Based on billing records from July 2015 through June 2016, Table 4-1 provides a summary of customer statistics by customer class, including the number of accounts, Meter Equivalent Units (MEUs), and water demands. A MEU is based on the size and capacity of the meter and is an estimation of the potential demand, or capacity requirement, that the meter will place on the District's system. For example, the District's smallest meter is 5/8-inches is counted as one MEU and has a maximum capacity of 20 gallons per minute (gpm). A 1-inch meter, however, has a maximum capacity of 50 gpm, based on the same

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<sup>6</sup> The SWRCB agreed to consider repeal of the regulation in May if the regulation has not been rescinded or modified by May 1, following a more thorough review of the state's water supply conditions.

water pressure, or 2.5 times that of the 5/8-inch meter. Consequently, a customer with a 1-inch meter would have one account and 2.5 MEUs. Table 7-2 details a full list of ratios.

The number of accounts and MEUs in each customer class is expected to remain constant throughout the Study period as no customer growth is expected. From FY 2015/16 levels, which represent the lowest usage amount in the past 10 years, annual usage is projected to increase by 7 percent for forecasted FY 2017/18 levels for all customer classes. This is reflective of observed increase in demand and customer billings.

**TABLE 4-1 HISTORICAL FY 2015/16 WATER DEMANDS AND FY 2013/14 CUSTOMER CLASS PROFILE**

CUSTOMER CLASS	NUMBER OF ACCOUNTS	METER EQUIVALENT UNITS	TOTAL USAGE (CCF)	ANNUALIZED SUMMER (CCF)	SUMMER PEAK (SUMMER/AVG) <sup>1</sup>
Single Family	50,919	68,589	5,311,622	6,632,755	1.66
Duplex	2,258	2,941	261,621	303,907	1.39
Multi-Family	1,806	6,325	1,151,725	1,211,614	1.11
Commercial	3,964	13,765	2,409,779	2,972,518	1.61
SF Irrigation	27	69	6,628	9,499	2.53
Recycled Water	225	639	174,542	276,006	3.79
Raw Water	2	140	132,858	232,050	6.89
Fireline	1,251	N/A	N/A	N/A	N/A
<b>Total</b>	<b>60,452</b>	<b>92,467</b>	<b>9,448,774</b>	<b>11,638,350</b>	<b>1.60</b>

A peaking analysis was performed to consider not only the rate of peak demand (maximum demand over average demand), but also the volume of demand occurring during the peak period. The analysis was based on projected demand. FY 2013/14 was used as a proxy for the peaking analysis as the demand profile represents the forecasted distribution of demand in a year where weather and water supplies are average. In aggregate, Single Family demand is 1.66 times greater in the peak month relative to the average annual demand. Moreover, the peak demand occurs significantly more in tiers 3 and 4. In a typical winter month, only 1.2 percent of sales occur in Tier 4. During a typical summer month, this demand spikes in each tier due to increased water use during the hotter months, but significantly more in Tier 4, about 4.8 percent of monthly sales. This equates to over a 9 times multiple in the volume of peak (Tier 4) demand. This analysis was also performed at the individual customer level with similar demand ratios.

<sup>1</sup> Units are in hundred cubic feet (748 gallons) and based on FY 2013/14 demand profile.

TABLE 4-2 PEAK DEMAND ANALYSIS

WATER UNITS SOLD (CCF)	TIER 1	TIER 2	TIER 3	TIER 4	TOTAL
March 2014 (A)	258,463	29,658	5,564	3,441	297,126
September 2013 (B)	423,984	153,765	47,162	31,581	656,492
<b>Demand Ratio A / B</b>	<b>1.64</b>	<b>5.18</b>	<b>8.48</b>	<b>9.18</b>	

Forecasting water demand is a critical component to the analysis. In light of current demand fluctuations and recent dramatic reductions in demand, the forecast evaluates both historic trends and assumptions of future behavior. Given the recent cutbacks in demand, no additional conservation or demand growth is assumed after FY 2017/18. Carollo continued to analyze customer data through October of 2016 to best evaluate the impacts of rate changes, conservation messaging, and customer behavior. While the District has historically consumed over 25,000 acre-feet each year, permanent conservation behavior (e.g., turf replacement) is believed to limit the potential demand bounce back. For this rate analysis, forecasted demand is estimated to be just under 22,000 AF per year. As the District evaluates rate needs beyond the proposed FY 2017/18 through FY 2020/21 rate adoption period, it will be important to re-evaluate long-range water demand trends.

TABLE 4-3 PROJECTED FY 2017/18 DEMAND BY CUSTOMER CLASS

CUSTOMER CLASS	FY 2015/16 DEMAND (AF)	PROPOSED PERCENT CHANGE	PROJECTED INCREASE (AF)	PROJECTED USAGE (AF)
Single Family	11,601	6%	716	12,317
Duplex	570	6%	37	607
Multi-Family	2,540	5%	131	2,670
Commercial	5,095	9%	438	5,533
SF Irrigation	12	8%	1	13
Recycled Water	371	30%	112	483
Raw Water	289	6%	16	305
Fireline	8	7%	1	8
Total	20,485	7%	1,451	21,936

Notes

(1) Forecasted demands detailed in Appendix B



## 5 REVENUE REQUIREMENT ANALYSIS

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The revenue requirement analysis is the first test of a utility's fiscal health. This analysis evaluates the adequacy of current rates to generate sufficient revenue to meet the District's projected costs, and sets the basis for near- and long-term rate planning.

Carollo compiled the District's FY 2016/17 budget expenses updated for the recent bond issue as the base year for O&M costs and worked with the District to forecast long-range expenditures. Furthermore, Carollo collected information related to current reserve fund balances, the budgeted capital improvement plan expenditures and other future expenses, other future revenues, and other miscellaneous financial information.

Once the revenue requirement is established by compiling all of the agency's cost drivers, two tests are typically utilized to define the annual revenues necessary.

- The **cash flow sufficiency test** looks for a net positive cash flow at the end of each fiscal year. This test looks at whether revenues exceed expenses; when they do not, this test is not passed.
- The second test is the **debt service coverage test**. Many agencies use bonded indebtedness to fund a portion of their capital expenses. Debt service coverage is dictated by the agency's bond covenants, and establishes a threshold above basic debt service that the agency must collect in revenues. For example, the District's current bonds require it maintain fees and charges for the sale of water at levels sufficient to enable it to collect in each year the amount necessary to pay all of its water system operating expenses, debt service on the bonds, plus an amount equal to 25 percent of the annual debt service on outstanding bonded indebtedness. The additional 25 percent is referred to as coverage. In order to maintain more favorable bond ratings and prevent dropping below its legal bond coverage requirement, the District aims to achieve an annual bond coverage ratio of 1.50x, or 50 percent of annual debt service, and is currently evaluating the cost-benefit of increasing this ratio due to the potential for lower borrowing costs.

The following analysis summarizes the various costs by budget category, and compares the current revenue structure against these costs. Any shortfall between revenue and expenses is then highlighted and forms the basis for any needed rate increases.

### 5.1 DISTRICT BUDGET CATEGORY ANALYSIS

#### Water Supply and Costs

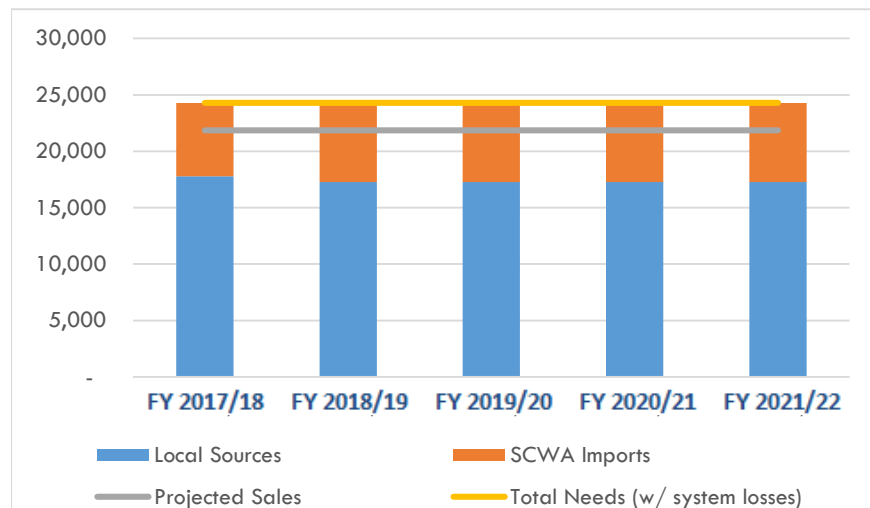
Water supply is one of the chief cost drivers incurred by any water agency, and the District is no exception. The District is capable of providing an estimated 28,000 acre-feet annually, with 20,000 acre feet (AF) coming from the District's reservoirs and 8,000 AF coming from imported water. Carollo met with District staff to gain an understanding and basis for allocating each of the District's local and imported sources of supply and operation and maintenance costs.

## Local Supplies

The District's primary source of water supply is rainfall from the North Slope of Mt. Tamalpais, which flows through Lagunitas and Nicasio Creeks. District facilities divert approximately two-thirds of the flow of Lagunitas Creek prior to reaching Kent Lake, and approximately one-third of the flow of Nicasio Creek. In addition, there are District diversion facilities located at Ross Creek at Phoenix Lake and Walker Creek above Soulañule Reservoir.

Average annual precipitation varies significantly across the watershed, as illustrated over both the past few years and last decade. The area above Kent Lake averages 60 inches of rainfall per year, while Walker Creek receives 28 inches. This variation has resulted in significant year-to-year fluctuations in the total volume of water that the District can capture, from an annual net runoff high of 213,000 AF, to a low of 3,000 AF. Approximately three-fourths of all potable water used by District customers comes from this reservoir system.

FIGURE 5-1 PROJECTED WATER DEMANDS AND SUPPLIES



## Watershed

In addition to its public water supply goals, the District also has obligations to preserve the ecological health of the watershed and downstream ecosystems. The District is responsible for releasing an average of 12,000 acre-feet per year for downstream fisheries, as stipulated in the District's water rights agreements.

The Mt. Tamalpais Watershed is one of Marin's most valuable natural resources as it is the major source of domestic water for the District's customers. The District understands that the best way to assure high water quality is to keep the lands in a natural condition, which means limiting use by people to activities that have the least impact on the watershed. Within certain constraints, permitted activities include hiking, biking, horseback riding, fishing, and picnicking. Camping, swimming, and boating are prohibited.

Caring for nature, managing visitors, and involving the public in watershed stewardship are the central tasks of the District's rangers, natural resource specialists, and watershed maintenance staff. Their responsibilities include protecting resources, managing fire risks, assisting visitors, monitoring plant and animal populations, restoring natural habitats, and maintaining access to roads and trails. These responsibilities are designed to improve forest management, water yield, and the overall health and resilience of this water supply.

### *Imported Water Supplies*

The District also has a contract to purchase imported water from Sonoma County Water Agency (SCWA). This agreement allows the District to import up to 14,300 AF per year and a minimum of 5,200 AF per year. In FY 2013/14, the District purchased over 8,000 AF of water from SCWA, up from an average of approximately 5,700 AF during FY 2010/11 to FY 2012/13. In FY 2015/16 the District purchased 5,300 AF from SCWA. Under non-drought conditions, the District expects to purchase approximately 7,000 AF per year of water from SCWA.

### *Projected Water Production and Costs*

Water production costs have been forecasted based on the demand projections and supply constraints discussed above in this Study. The District has consistent water costs as it must continue to operate and maintain its local water reservoir and treatment system, as well as maintain annual purchases of 7,000 AF<sup>8</sup> from SCWA.

### *Recycled Water and Conservation*

MMWD strives to achieve a resilient water portfolio that not only supplies water for basic health and human safety, but meets outdoor irrigation demands during the peak of the summer usage period. Accordingly, the District provides recycled water for non-domestic usage and maintains a general conservation program with target messaging during peak periods. The District is currently finalizing a long-term recycled water contract with the Las Gallinas Sanitary Agency in order to continue to deliver recycled water to its customers. Coupled with its conservation program, the District is able to reduce its overall dependence on imported water supplies and provide a more resilient water supply portfolio to its customers.

## **Existing Operating Expenditures**

For sound financial operations of the District's water system, the revenues generated must be sufficient to meet the expenditures or cash obligations of the utility. The revenue needs are defined as the amount of revenues that must be recovered through water rates in order to cover annual expenditures, less any offsetting revenues. Offsetting revenues may include interest earnings and other non-operating revenues, such as the land lease revenues. Based on the District's estimated FY 2016/17 expenditures, the table below identifies the projected expenditures and offsetting revenues for FY 2017/18.

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<sup>8</sup> MMWD projected

TABLE 5-1      OFFSETTING REVENUES AND OPERATING EXPENDITURES

OFFSETTING REVENUES	FY 2017/18 <sup>(1)</sup>	NOTES
Other Revenue	\$3,568	Includes rents and royalties, late payment charges, grants, watershed payments, and interest revenue.
Capital & Fire Flow Funds	6,400	Includes connection charges, fire flow charges, and other interest income.
<b>Total Offsetting Revenues</b>	<b>\$9,968</b>	
<b>OPERATING EXPENDITURES</b>		
Personnel Services	\$38,594	Includes salaries & wages (including overtime & standby), director fees, benefits, contract help, and other personnel services.
General & Admin	4,334	Includes taxes, fees, licenses, insurance, communications, and other miscellaneous expenses.
Materials & Supplies	9,123	Includes supplies, materials, chemicals, and water purchases.
Operations	9,987	Includes automotive, construction, equipment rentals, conservation rebates, professional fees, repair & maintenance, and utilities.
Debt Service	9,414	Typically included with General & Administrative expenses
<b>Total Operating Expenditures</b>	<b>\$71,452</b>	

**Notes**

(1) All values in thousand dollars.

**Operating Needs**

Operating needs are expenditures that the water utility incurs in the day-to-day operations of its system, such as employee salaries and benefits, fuel, chemicals, power and water purchases. Other costs in the operating budget include indirect costs from the District's indirect cost allocation plan.

The District's FY 2016/17 revised operating budget served as the basis for forecasting future operating expenses. The budget was compared to prior year actual financial information to identify any anomalies or one-time expenditures not appropriate for forecasting in future years. District staff also reviewed the budget for costs that might need to be adjusted due to future operational changes. Unless manually calculated, future years were forecasted using general cost inflation factors appropriate for the type of expense. These escalation factors, provided in Table 5-2, were assigned on a line-item basis.

TABLE 5-2 COST ESCALATION FACTORS

COST ESCALATOR	DESCRIPTION
Labor Cost Inflation	Labor rates after the expected negotiation in FY 2018/19 are assumed to increase at the long-term average of 5.5 percent.
Construction Cost Inflation	Although capital cost inflation is commonly linked to the Engineering News Record (ENR) Construction Cost Index (CCI), the inflation rate assumes the ENR's long-term average of 3 percent.
Utilities	This escalator applies to costs such as electricity and fuel, which typically exhibit annual increases higher than general inflation, it is set at 6 percent.
General Cost Inflation	This escalator applies to most expenses in the operating expense forecast; it is set at the long-term inflation rate of 4 percent.
Purchased Water Costs	This escalator is applied to replenishment and potable water purchased from SCWA. Costs are assumed to increase annually at 5 percent.

Note: The specific use of escalators is provided in more detailed in Appendix F

Operating expenses are projected to increase to \$86.3 million in FY 2020/21, representing a 31 percent overall increase from the FY 2016/17 budgeted level of \$66.1 million, and an average annual increase of approximately 6 percent (detailed in Appendix F). Projected annual operating expenditure levels are significantly influenced by the amount of water purchased from SCWA, as well as the level of debt service in each year. The projected operating expenditures have been developed with the conservation assumptions discussed previously in this Study.

## Debt Service

Existing debt service payments are established in the District's water debt repayment schedules. Currently, the District's annual payment for existing debt service is approximately \$7.5 million in FY 2016/17.

In 2016, the District refinanced the existing 2010 Series A bonds with a \$30.2 million bond issue. The current 2012 Series A and the new 2016 Series Water Revenue Bonds expire in 2040 and 2052, respectively. A full Listing of the District's existing debt schedule is provided in Appendix D.

## Debt Service Coverage

The District must meet debt service coverage requirements on its outstanding bonds. Debt service coverage ratios are stipulated in the terms of the bond financing documents, and dictate the level of revenues that the District must generate in excess of the debt payments scheduled for that year. The District's required debt coverage ratio is 1.25x, which means that the District's adjusted net revenues shall amount to at least 125 percent of the annual debt service. Annual debt service includes the annual principal and interest payments on outstanding debt. For this analysis, a debt service coverage ratio of 1.50x was targeted. Should the District fail to meet its legally obligated coverage ratio, the District has a rate stabilization fund that may be used to meet its coverage obligations if an unanticipated deficiency occurs.

### *Capital Projects*

The capital improvement program (CIP) includes a variety of capital projects that involve repairing (or replacing) existing water system assets, as well as purchasing or replacing other small equipment. No expansion projects are expected. Approximately \$17.1 million in capital replacement projects are budgeted in FY 2016/17, increasing to \$31.6 in FY 2021/22. In addition, fire flow projects of approximately \$4.5 million are anticipated annually.

### *Capital Funding*

The District plans to increase the amount cash funding for capital projects to achieve its capital allocation strategy. Projects are anticipated to be funded by a nearly even mix of debt and cash funding in the future. This blend provides greater operational flexibility and enables the District to take advantage of historically low interest rates. The District's goal is for the cash funded capital to be directly funded from rate revenues, pay-as-you-go funding (PAYGO). Projected expenditures for the PAYGO CIP are shown in Appendix E.

## **Reserves**

In addition to the operating expenses outlined in this Study, the District has revenue requirements related to maintaining adequate water reserve funds. Each of the reserve funds is described below.

### *Operating Reserve*

The revenue requirement analysis targets a total minimum operating fund balance equal to 90 days of operating expenses. This minimum fund balance is adjusted annually to take into account changes to the District's operating expenditures.

The District should continue to monitor revenues and reserve levels on an annual basis. The reserve target may also be adjusted further as District policy dictates to minimize rates or to smooth future rate increases. Should the water utility reach and maintain desired reserve levels, it is recommended that the District implement a reserve policy to formally define desired funding levels, needs, and uses.

### *Capital Fund*

The capital fund is a capital reserve held by the District that is used to fund capital improvements to the water system, and to provide a source of funds for capital projects in the event of an emergency. The revenue requirements analysis targeted a minimum capital fund balance of \$10 million, which equates to approximately 1.5 percent of the book value of the District's capital assets.

### *Other Reserve Funds*

The District maintains reserve funds for several other purposes. These funds are generally reserved for specific purposes, such as rate stabilization and board designated initiatives. These fund levels, along with the operating and capital funds.

## 5.2 PROJECTED REVENUES UNDER EXISTING RATES

The District collects most of its revenues through user service charges, including bi-monthly Service Charges, bi-monthly Watershed Management Fees, and the volumetric-based, Commodity Charges. These water sales and service charges make up over 94 percent of the District's operating revenues.

Due to customer conservation efforts, the District has experienced a significant reduction in recent sales and a commensurate reduction in revenues. The District's historical annual demand has been generally exceeded 25,000 acre-feet each year. Given recent conservation efforts, however, the forecasted annual demand for the study period is just under 22,000 AF per year.

Given the reduction in demand and absent critical rate increases, the District will run budget deficits after FY 2018/19 and not be able to meet its rate funded capital targets for each year of the forecast. These conditions indicate a need for increased revenue. The District anticipates these reduced demand levels will continue. For the purposes of developing the five-year forecast, it is reasonable to assume that customer demand, or a demand bounce-back, will not go back to previous levels based on the experience of other water agencies throughout California during other recent curtailment periods.

Table 5-3 outlines the District's projected revenue and expense forecast for the next five years prior to any rate increases.

TABLE 5-3 REVENUE REQUIREMENT SUMMARY FOR CASH FLOW TEST (PRIOR TO ANY RATE INCREASES)					
REVENUE ITEMS	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21
Commodity Revenues	\$49,192	\$49,192	\$49,192	\$49,192	\$49,192
Service Charge Revenues	16,484	16,484	16,484	16,484	16,484
Watershed Protection Fee	3,818	3,818	3,818	3,818	3,818
Total Other Revenues	3,440	3,568	3,700	3,838	3,982
<b>Total Operating Revenues</b>	<b>72,934</b>	<b>73,062</b>	<b>73,194</b>	<b>73,332</b>	<b>73,476</b>
EXPENDITURE ITEMS	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21
Personnel Services	\$36,757	\$38,594	\$41,489	\$43,771	\$46,178
General & Admin	4,146	4,334	4,551	4,791	5,078
Materials & Supplies	8,696	9,123	9,567	10,043	10,562
Operations	9,019	9,987	10,529	11,100	11,702
Debt Service <sup>2</sup>	7,494	9,414	10,193	12,803	12,809
<b>Total Operating Expenditures<sup>3</sup></b>	<b>\$66,112</b>	<b>\$71,452</b>	<b>\$76,329</b>	<b>\$82,508</b>	<b>\$86,329</b>
Cash Flow Surplus (Deficit)	\$6,822	\$1,609	\$(3,134)	\$(9,175)	\$(12,853)

**Notes:**

- (1) All figures are in thousands of dollars and might differ from those in appendix due to rounding.
- (2) Includes modeled additional future debt issuances.
- (3) Does not include additions (cost) to fund PAYGO projects or to meet minimum fund balances.

As forecasted, for the next five years, without additional revenues, the District will fail to meet its targeted bond coverage obligation of 1.50 times debt service in each year.

## REVENUE REQUIREMENT ANALYSIS

TABLE 5-4 REVENUE REQUIREMENT SUMMARY FOR DEBT COVERAGE TEST (PRIOR TO ANY RATE INCREASES)

REVENUE ITEMS	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21
Water Revenues	\$69,494	\$69,494	\$69,494	\$69,494	\$69,494
Other Allowable Revenues	4,140	4,268	4,400	4,538	4,682
<b>Total Revenues for Debt Service</b>	<b>\$73,634</b>	<b>\$73,762</b>	<b>\$73,894</b>	<b>\$74,032</b>	<b>\$74,176</b>
<b>EXPENDITURE ITEMS</b>					
Water Expenditures <sup>2</sup>	\$58,618	\$62,039	\$66,136	\$69,705	\$73,520
Debt Service <sup>3</sup>	\$7,494	\$9,414	\$10,193	\$12,803	\$12,809
Additional Debt Coverage (1.50x)	\$3,747	\$4,707	\$5,096	\$6,402	\$6,404
<b>Total Operating Expenditures</b>	<b>\$69,858</b>	<b>\$76,159</b>	<b>\$81,425</b>	<b>\$88,909</b>	<b>\$92,734</b>
Bond Coverage Surplus (Deficit)	\$3,776	\$(2,398)	\$(7,531)	\$(14,877)	\$(18,558)

**Notes:**

- (1) All figures are in thousands of dollars.
- (2) Does not include expenditures related to PAYGO funding
- (3) Includes modeled additional future debt issuances.

Based on the tables above, the District needs to increase its revenues in order to comply with both the Cash Flow and Debt Coverage tests. However, as the Debt Coverage test requires greater revenue increases, the increases are aptly referred to as coverage driven. The revenue shortfall is due to the combination of increasing costs, the need to maintain and fund debt service, and decreasing water sales.



### 5.3 RECOMMENDED REVENUE REQUIREMENTS

Based on the results of this analysis, it is recommended that the District increase water revenues annually in order to meet projected revenue needs. Based on current projections, revenues will not adequately fund expenses or reserves in the coming years. As FY 2016/17 is the current fiscal year, and given the necessary noticing and implementation requirements, the proposed revenue increases will be effective beginning July 2017. The rate increase will be in effect for the entire FY 2017/18 period.

TABLE 5-5 RECOMMENDED REVENUE INCREASES AND RESULTING CASH FLOWS

	FY 2016/17 <sup>(1)</sup>	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21
Operating Revenues	\$72,934	\$73,062	\$78,059	\$83,402	\$89,115
Operating Expenditures	\$66,112	\$71,452	\$76,329	\$82,508	\$86,329
<b>Cash Flow Surplus (Deficit)</b>	<b>\$6,822</b>	<b>\$1,609</b>	<b>\$1,730</b>	<b>\$894</b>	<b>\$2,786</b>
Recommended Rate Increase		7%	7%	7%	8%
Month of Increase		July	July	July	July
Revenues from Rate Increase		\$4,865	\$5,205	\$5,569	\$5,959
<b>Resulting Cash Flows<sup>(2)</sup></b>	<b>\$6,822</b>	<b>\$6,474</b>	<b>\$6,935</b>	<b>\$6,464</b>	<b>\$8,745</b>
Debt Coverage	2.16 x	1.82 x	1.80 x	1.59 x	1.78 x
Revenues after Rate Increase		\$77,926	\$83,264	\$88,971	\$95,074
Capital Reserve C/O	\$6,679				
Proposed PAYGO		\$6,000	\$7,000	\$7,000	\$10,000

**Notes:**

- (1) All figures are in thousands of dollars.
- (2) Cash flow maintains the District's coverage factor. These funds are used later to cash fund non-operating expenditures, such as capital projects and reserve obligations.

While the District is forecasted to generate positive cash flow of over \$6 million per year, these funds are not to be considered excess. Any resulting positive cash flow will be utilized to either fund identified PAYGO capital projects or to rebuild reserves. Additionally, part of this positive cash flow is for the continued support the District's debt coverage ratio.

## 6 FUNCTIONAL COST ALLOCATION

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With the District's revenue requirements outlined—including needed rate increases—the next step is to link each cost item with a specific service to the system that it supports. This is commonly referred to as the cost of service analysis, or the functional cost allocation, because it connects each cost of the District with a functional category or purpose that it funds. For instance, expenses related to the billing system are allocated under the umbrella of the customer service function, while baseline water purchases go to support the base demand function.

The costs incurred are generally responsive to the specific service requirements or cost drivers imposed on the system and its water resources by its customers. The principal service requirements that drive costs include the annual volume of water consumed, the peak water demands incurred, and the number or customers or meter equivalents in the system. Accordingly, these service requirements are the basis for the selection of the categories utilized in the functional cost allocation process.

The AWWA M1 Manual outlines the two most widely used methods for the allocation of costs—the base-extra capacity method and the commodity demand methodology. Both methods recognize that the cost of serving a customer depends not only on the total volume of water used, but also on the rate of use or peak-demand requirements.

Similar to the previous cost of service study, the proposed rates presented within this Study are developed using a base-extra capacity method. In using the base-extra capacity method, costs are typically separated into four cost components: (1) Base (the average daily water flow in the system during the year), (2) Extra Capacity, (3) Customer, and (4) Fire. As noted in the AWWA M1 Manual, in detailed rate studies, such as the one performed for this Study, some of these elements might be broken down further into two or more subcomponents.

Based on the District's expenditures and system characteristics, the Customer cost (or fixed monthly) component was separated into two subcomponents: (1) Customer (accounts) and (2) Capacity (meter equivalents). A meter equivalent unit, or MEU, is a ratio of any given meter size to the baseline 5/8-inch meter. The ratio is developed by comparing the potential flow capacity of each meter with the benchmark. For instance, the 5/8-inch meter has a potential flow of 20 gallons per minute (gpm), while a 1-inch meter has a potential flow of 50 gpm, 2.5 times that of the 5/8-inch meter. Therefore, a 1-inch meter represents 2.5 meter equivalent units (MEUs). Larger meters have the potential to demand more capacity, or said, differently, exert more peaking characteristics compared to smaller meters.

This bifurcation of the Customer cost component is done to better identify and allocate costs that vary based on capacity needs (as defined by the size of the meter) from those that should be equally shared by each customer account. A significant portion of the District's operating and capital costs are related to meeting system capacity requirements and maintain the readiness to service each connection. Utilities invest in facilities to provide capacity, and these costs must be recovered regardless of the amount of water used during a given period. The potential capacity demanded (peaking) is proportional to the potential flow through each meter size.

Similarly, Extra Capacity cost component was split into four subcomponents: (1) Winter Demand, (2) Average Annual Demand, (3) Summer Demand, and (4) Peak Month Demand. These are designed to better distinguish that not all customer demand (and peaking) is equal. These calculated peaking factors are used to allocate the cost of providing extra-capacity in the system needed to serve those who use more, i.e., place more demand on the system and the District's water supplies. Different facilities, such as distribution and storage facilities, and the operation and maintenance costs associated with those facilities, are designed to meet the peaking demands of customers. Therefore, Extra Capacity costs<sup>9</sup> include the operations and maintenance costs and capital costs associated with meeting peak customer demand.

## 6.1 WATER SYSTEM COST CATEGORIES

Carollo developed a detailed cost allocation that serves as the foundation for the proposed rate adjustments. Carollo met with District staff (finance and engineering) to prepare a detailed evaluation and calculation of system capacity and utilization. This process served as the basis for allocating each line-item in the District's budget and forecasting how potential operational shifts would impact the cost of service.

As the first step in the evaluation process, a functional allocation was developed by analyzing the District's budget on a line-by-line basis and allocating each expenditure to the appropriate functional cost category. The revenue requirements, shown above, were then allocated to functional cost categories. The following are the functional cost categories based on the AWWA base-extra capacity methodology:

- **Customer:** Customer costs are fixed expenditures that relate to operational support activities, including accounting, billing, customer service, and administrative and technical support. These expenditures are essentially common to all customers, regardless of the meter size serving a property or the amount of water delivered to a property
- **Capacity:** Capacity costs are fixed expenditures that include meter and capacity related costs, such as meter maintenance and peaking charges, that are included based on the meter's hydraulic capacity (measured in gallons per minute).
- **Base:** Costs allocated to the Base function are those associated with providing the basic level of water service. It is assumed that allocated costs benefit usage uniformly and do not vary based on the peak or overall volume of water delivered.
- **Winter Demand:** Defined as the ratio of annualized Winter Demands<sup>10</sup> over Peak billing cycle, Winter Demands is used to allocate costs associated with minimal system demand used throughout the year. All of San Geronimo Treatment Plant and 67 percent of Bon Tempe Treatment Plant related costs are allocated to Winter Demand and recovered from customers based on average water consumption consumed from December through May, because these six months are typically the District's lowest water usage periods.
- **Average Annual Demand:** Defined as a peaking factor of 1 (the ratio of Annualized Demand over Annual Demand). The remaining 33 percent of Bon Tempe costs are allocated to customers based on

<sup>9</sup> The terms extra capacity, peaking, and capacity costs are used interchangeably.

<sup>10</sup> Winter Demand is calculated from consumption between December and May. To annualize Winter Demands, the sum of these six months were multiplied by two (2).

average annual water demand and above the average winter usage. As forecasted Average Annual Demand outstrips the capacity of the two plants and the remaining demand assumed to be served using imported water from SCWA (Ignacio Booster, Water Quality Station, and purchases).

- **Summer Demand:** Defined as the ratio of Annualized Summer Demands<sup>11</sup> over Annual Demand, Summer Demand is used to allocate costs associated with basic summer system peaking. Summer Demand is assumed to be served using SCWA imported water.
- **Peak Month Demand:** Defined as the ratio of Max Billing Cycled Demand over Annual Demand, Peak Demand is used to allocated costs associated with maximum system peaking.<sup>12</sup> Peak Demand is assumed to be served using SCWA imported water.
- **Raw Water Peak:** As raw water does not benefit from much of the potable infrastructure, some costs are allocated away from Raw Water, rather than through subsequent allocations.
- **Private Fire:** Costs related to providing private fire meters are allocated to Private Fire. As the system is partially designed around fire flows, a portion of the incremental fire flow capacity is allocated to Private Fire meters.
- **Watershed:** Funds all of the District's watershed activities, which protect one of the District's most valuable natural resources and the major source of domestic water for its customers. Funding includes protecting resources, managing fire risks, assisting visitors, monitoring plant and animal populations, restoring natural habitats, and maintaining access roads and trails.

This functional allocation process provides a reasonable, appropriate, and industry standard basis for proportionately distributing costs to system customers based cost causation principles—e.g., their usage patterns—and is grounded in cost of service principles and standards.

This methodology and process also provides the basis for the tiered rate structure. While every cost is specifically outlined in the functional allocation, specific focus was given to the District's various source of supplies, conservation expenditures, recycled water, and capacity reservation costs. The District's water resources were allocated to the aforementioned demand functions based on availability and cost. In normal operating conditions, San Geronimo and Bon Tempe are the cheapest sources of supply. These are allocated based on availability to each demand function. Once exhausted, SCWA imported water purchases are necessary. The table below details how the costs of each source of supply are being allocated.

<sup>11</sup> Summer Demand is calculated from consumption between June and November. To annualize Summer Demand, the sum of these six months were multiplied by two (2).

<sup>12</sup> System capacity is the system's ability to supply water to all delivery points when demanded. It is measured by each customer's water demand at the time of greatest system demand. The time of greatest demand is known as "peak demand." Peak demand costs recover the costs of facilities needed to meet the peak use, or demands, placed on the system by each customer class.

TABLE 6-1 WATER SUPPLY, CONSERVATION, AND SYSTEM EXPENDITURE ALLOCATIONS

EXPENDITURE <sup>1</sup>	WINTER DEMAND	AVERAGE ANNUAL DEMAND	SUMMER DEMAND	PEAK MONTH DEMAND
San Geronimo	100%	0%	0%	0%
Bon Tempe	67%	33%	0%	0%
SCWA	0%	49%	31%	20%
Las Galinas/ Recycled Water	0%	44%	30%	27%
Future CIP <sup>3</sup>	41%	11%	4%	3%

**Notes:**

- (1) Values may not sum to 100%, in which case the remainder is allocated to other functional categories
- (2) 50% of conservation costs are allocated to base. Remaining 50% are allocated to average, summer, and max month demands based on percentages as shown.
- (3) Future CIP excludes costs related to Recycled Water and SCWA and North Marin cost amortizations.
- (4) Full details provided in Appendix G

A detailed allocation of costs was performed in collaboration with District staff. For all projects included within the District's Capital Improvement Plan (CIP), costs were assigned to the respective sources of water that benefit from the project—San Geronimo, Bon Tempe, SCWA, and Las Galinas. This process was repeated in order to allocate debt to the appropriate source of supply. For the District's outstanding debt, a project by project allocation was performed for the capital projects included within the bond official statements.

The table above also illustrates the allocation factors used to proportionally distribute conservation and recycled water expenditures. Conservation is allocated to 50 percent to base demand to reflect all users benefit from the District's general or broader conservation program and should equally share in the costs. The remaining 50 percent of conservation is allocated to average and above demand. Based on conversations with District staff, targeted conservation efforts will continue to be aimed at those customers with average or greater demands. Similarly, recycled water is allocated to customers with average or greater demands. This reflects that peak demand is a primary driver for the need to develop additional water supplies, which might be avoided absent these higher demands. Without these peak demands, these programs would not exist in the same fashion (scope or cost) and are thus allocated accordingly. The detailed allocations of these costs are provided Appendix G of this report.

As shown in Table 6-2 below, peaking ratios are created for each capacity category to account for the proportionate burden placed on the system to provide increased water supplies and expanded, physical system capacity. The District must construct infrastructure to deliver water at peak times. These facilities may include, for example, conveyance, treatment, and storage facilities. The incremental costs associated with creating this excess, peak capacity ("peaking costs") include designing (i.e., sizing), constructing, and operating and maintain facilities. These costs should be proportionally allocated to those water users who place greater demands and burdens on the water system and its sources of supply. For the Winter Demand and Peak Month Demand, which represent the minimum and the maximum annual demands, respectively, peaking ratios are calculated relative to each other. The average Winter Demand establishes a baseline demand that the District's customers need. Because customers peak on the system, the District

must construct and maintain system capacity and water resources in excess of this baseline demand in order to meet peak annual water demands. Consequently, these demand levels are paired together and represent the bookend demands—i.e., the minimum and maximum demand in a year. For Average Annual Demand and Average Summer Demand categories, the respective ratios are calculated relative to Average Annual Demand. Average Summer Demand represents the incremental capacity needed in excess of average demands.

**TABLE 6-2 PEAK FACTOR CALCULATION**

CATEGORY	BASIS	FY 2016/17 DEMAND <sup>13</sup>	FACTOR
Winter Demand	Winter Average Month	602,437	0.59
	Peak Billing Cycle	1,023,719	
Annual Average Demand	Average Month	776,695	1.00
	Average Month	776,695	
Summer Demand	Average Summer Month	950,953	1.22
	Average Month	776,695	
Peak Month Demand	Peak Billing Cycle	1,023,719	1.70
	Winter Average Month	602,437	

In order to allocate conservation and recycled water costs between the demand categories, the peaking factors shown in Table 6-2 are then multiplied by the total consumption occurring in each customer class to create the cost distribution factors shown in Table 6-1 above.

**TABLE 6-3 CUSTOMER CLASS PEAK DEMAND WEIGHTING (CCF)**

CATEGORY	WINTER DEMAND <sup>(3)</sup>	ANNUAL AVERAGE DEMAND	SUMMER DEMAND	PEAK MONTH DEMAND	TOTAL ANNUAL DEMAND
Single Family	3,887,130	727,936	489,060	207,497	5,311,622
Duplex	200,740	38,744	21,486	652	261,621
Multi-Family	893,326	203,231	43,190	11,978	1,151,725
Commercial	1,745,031	312,463	161,794	190,491	2,409,779
SF Irrigation	4,228	607	372	1,421	6,628
Recycled Water	104,230	19,580	19,580	31,152	174,542
Raw Water	67,927	15,992	12,844	36,095	132,858
<b>Total</b>	<b>6,902,612</b>	<b>1,318,552</b>	<b>748,325</b>	<b>479,285</b>	<b>9,448,774</b>
Peaking Factors	0.59	1.00	1.22	1.70	
Weighted Total <sup>(1)</sup>	4,062,041	1,318,552	916,218	814,447	7,111,258
<b>Allocation Factor<sup>(2)</sup></b>	<b>57%</b>	<b>19%</b>	<b>13%</b>	<b>11%</b>	<b>100%</b>

**Notes**

- (1) Weighted using the peak factors outlined in Table 6-2.
- (2) As percent of weighted total annual demand.
- (3) Demand is annualized.

<sup>13</sup> The projected demand is distributed using the FY 2013/14 demand profile to forecast future system use

Finally, capital projects and debt expenditures are allocated in a similar allocation manner so that the system costs are allocated to those customers most impacting the design and sizing of the system (peak demand users). The full allocation is detailed in Appendix G.

Table 6-4 provides the functional allocation of costs by category to the specific component of the rates through which those functionalized costs are recovered. The functional cost allocation results for each category are shown in Appendix G and Appendix H of this Study.

**TABLE 6-4 FY 2017/18 FUNCTIONAL ALLOCATION RESULTS**

CATEGORY	TOTAL (IN \$1,000)	RATE COMPONENT
Customer	\$6,225	Fixed Monthly Charge – recovered on a per account basis
Capacity	\$10,906	Fixed Monthly Charge – recovered on a meter equivalent basis
Base	\$29,031	Commodity Charge – recovered on all units (CCF) of water
Winter Demands	\$6,885	Commodity Charge – recovered in Tier 1 of the Commodity Charge
Average Annual Demand	\$7,856	Commodity Charge – recovered in Tier 2 of the Commodity Charge
Summer Demand	\$4,946	Commodity Charge – recovered in Tier 3 of the Commodity Charge
Peak Month Demand	\$3,695	Commodity Charge – recovered in Tier 4 of the Residential Commodity Charge and Tier 3 of the Non-Residential Commodity Charge
Raw Peak	\$(202)	Raw Water Commodity – recovered in the class's Commodity Charge
Private Fire	\$788	Private Fire Service – recovered on a meter equivalent basis
Watershed	\$4,228	Watershed Management Fee – recovered on a per account and meter equivalent basis
<b>Total</b>	<b>\$74,359</b>	

**Notes:**

- (1) All figures are in thousands of dollars.
- (2) Full details provided in **Appendix G**

The proposed allocation increases the District's collection of revenues from fixed charges from 28 to 30 percent. This adjustment to the rate structure is more reflective of the fixed nature of the District's current expenditures. In addition, this will provide increased revenue stability as the District faces increasingly unpredictable and volatile water demand.

## 6.2 CUSTOMER CLASS DISTRIBUTION OF COSTS

When reviewing the District's expenses, Carollo used the FY 2016/17 budget by division. Basing the allocation on the budget by division allowed Carollo to isolate watershed and conservation costs.

The costs allocated to each functional category were then distributed across each customer class based upon each class' proportionate usage of the system or need for District services. As an example, customer service costs are assumed to benefit each customer account equally, as these costs are related to providing general services, such as utility billing. As a result, customer service costs are recovered on an equal per account basis from each customer. The allocation of customer service costs to each customer class is directly proportional to the number of accounts served within that customer class. Base and peak demands are allocated based on the projected number of units of water served per each customer class, while capacity is allocated based on MEUs.

When comparing the calculated cost of service allocation with the existing cost allocation based on the existing rates, there are minor changes in the percentage of costs allocated to each customer class. Table 6-5 shows these results. The calculated percentages for existing revenue allocations are based on collected revenues and the proposed allocations are based on each customer class's respective share of the system as shown in Table 4-1. The detailed distribution of functionalized costs to customer class is presented in Appendix I of this report.

TABLE 6-5 COST ALLOCATION CHANGE BY CUSTOMER CLASS

CUSTOMER CLASS	EXISTING REVENUE ALLOCATION (FY 2015/16 RATES)	PROPOSED ALLOCATION (FY 2017/18)	DIFFERENCE
Single-Family	65.0%	62.4%	-2.6%
Duplex	2.9%	2.9%	0.0%
Multi-Family	8.8%	9.5%	0.7%
Commercial	20.4%	21.4%	1.0%
SF Irrigation	0.1%	0.1%	0.0%
Recycled Water	1.6%	1.7%	0.1%
Fire	0.2%	1.2%	0.9%
Raw Water	1.1%	1.1%	0.0%

Based on the results of the cost of service analysis, minor adjustments are recommended for the current revenue structure for allocating costs on a customer class basis. For most classes, the share of revenue changes by roughly a percentage point. Residential sees the largest change, with a decrease of approximately -2.6 percentage points, while commercial sees an increase of 1.0 percentage points. These changes are a result of changes in customer demand and the reduction in peak water demand by the residential class in proportion to other classes.



## 7 RATE DESIGN ANALYSIS

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The rate design analysis brings together all of the pieces described thus far in the water demand analysis, the revenue requirement analysis, and the cost of service analysis. The expenses allocated to each functional category and then to each customer class needs to be fairly, equitably, and proportionally recovered through nuanced and balanced rates. The goal of the rate design analysis is simple: to develop a rate structure that collects revenue from each customer class and each customer in accordance with the proportionate benefits received from and the burdens placed on the water system and water resources by the District's each customer class and each customer within a class— i.e., there must be a cost and revenue nexus.

The District's existing structure provides a foundation for equitably and proportionately recovering costs from District customers and reflects the agency's cost structure. In advance of the adoption of the FY 2015/16 rate plan, the District held an extensive public outreach process to garner public input and to provide a forum to discuss the District's costs and resultant rate structure. The District's costs and customer water usage are not static. Therefore, the goal of the District's rate setting process is to continue to align that cost of service foundation with the District's updated revenue requirements and customer demand analysis each time the rates are updated.

As previously explained, the District's water service fees and charges are separated into bi-monthly fixed charges (Service Charge and Watershed Management Fee) and variable Commodity Charges. The fixed Service Charge and Watershed Management Fee are designed to recover the cost from system users based on their reserved capacity within the system regardless of day-to-day use of the system. Fixed Charge revenue is intended to defray a portion of the fixed costs that do not change with demand on a year-to-year basis, at least not in the short-term. These costs typically include costs of debt service, repairing and refurbishing the water system, and administrative costs such as utility billing. The Commodity Charges is designed to recover system costs from users based on the actual water used. The rates of the District's Commodity Charges are designed to recover the system costs to produce, purchase, treat, and distribute water to the District's customers, including indirect costs to support these activities. The cost of water includes water purchases, water contract costs, conservation costs, treatment costs, capital, as well as some staffing and general administration costs.

### 7.1 FIXED SERVICE CHARGE AND WATERSHED MANAGEMENT FEE

The District's current rates for the Service Charges are based on meter size (in inches), which is the most common method for developing fixed charges. Meter size serves as an estimate of the potential demand that a customer can place on the system; the District incurs fixed costs to create, operate, and maintain that capacity. This approach recognizes that regardless of a customer's actual demands, that customer has reserved capacity within the system that the District must operate and maintain. The customer is therefore responsible for a share of the District's fixed costs in proportion to reserved capacity.

Developing the bi-monthly rates for the fixed Service Charges is a function of the total budget needed for these costs and the number of meter equivalent units in the system. Meter equivalent units (MEUs) calculate

a capacity ratio based on the potential demand of a given meter size based on its flow rate and are set relative to the baseline 5/8-inch meter as discussed above. As shown in Table 7-1, below, the rates for the bi-monthly Service Charge are calculated by dividing the revenue requirement to be funded by the revenues of the Service Charge by the total number of MEUs, and then dividing again by six months.

Charges that would be collected from each account during each billing period are summarized in Table 7-1.

**TABLE 7-1 FY 2017/18 BI-MONTHLY SERVICE CHARGE CALCULATION**

	Customer	Capacity
Revenue Requirement <sup>1</sup> (A) - Table 6-4	\$6,225	\$10,906
Units of Service (B) - Table 4-1	60,569 accounts	92,267 MEUs
Bi-monthly Service Charge (A) ÷ (B) ÷ 6	\$17.13 per account	\$19.66 per MEU
Total Bi-monthly Service Charge per Meter Equivalent <sup>3</sup>	\$36.79	

**Notes**

- 1) In thousand dollars.
- 2) Meter Equivalent Units (MEU) – 5/8' standard.
- 3) Values may not foot due to rounding.

As discussed previously, the rates for the fixed Service Charges are based on a customer's meter size. The District defines the base, or smallest, meter as a 5/8-inch meter. As noted in Section 4 of this Study, larger meters have the potential to demand more capacity, or said differently, exert a greater instantaneous demand on the system. For example, a 5/8-inch meter has a hydraulic capacity of 20 gallons per minute, while a 1-inch meter has a hydraulic capacity of 50 gallons per minute, or 2.5 times that of the smaller meter. The potential capacity demand (peaking) is proportional to the potential flow through each meter size as established by AWWA hydraulic capacity ratios. Capacity ratios, a function of a meter's maximum flow rate, are used to proportionately allocate costs recovered by the Service Charge to larger capacity meters.

Table 7-2 below presents the calculation of the FY 2017/18 Service Charges by meter size.

**TABLE 7-2 COMPONENTS TO PROPOSED BI-MONTHLY SERVICE CHARGE (FY 2017/18)**

METER SIZE	MEU	EXISTING	CUSTOMER <sup>(1)</sup> (A)	CAPACITY <sup>(1)</sup> (B)	TOTAL A+B
5/8"	1.0	\$33.85	\$17.13	\$19.66	\$36.79
3/4"	1.5	\$42.90	\$17.13	\$29.49	\$46.62
1"	2.5	\$60.95	\$17.13	\$49.15	\$66.28
1.5"	5.0	\$106.05	\$17.13	\$98.30	\$115.43
2"	8.0	\$160.20	\$17.13	\$157.28	\$174.41
3"	17.5	\$331.70	\$17.13	\$344.05	\$361.18
4"	31.5	\$584.40	\$17.13	\$619.29	\$636.42
6"	70.0	\$1,279.30	\$17.13	\$1,376.20	\$1,393.33
8"	120.0	\$2,181.80	\$17.13	\$2,359.20	\$2,376.33
10"	190.0	\$3,445.30	\$17.13	\$3,735.40	\$3,752.53

**Notes:**

- (1) Calculated previously in **Table 7-1**. Components have been rounded up to the nearest \$0.01. Does not include bi-monthly Watershed Management Fee.

Prior to implementing any future rate increases, the District will revisit the cost of service analysis to update the appropriate rates for cost recovery, if necessary.

**TABLE 7-3 PROPOSED BI-MONTHLY SERVICE CHARGE PROJECTION<sup>(1)</sup>**

METER SIZE	CURRENT	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21
5/8"	\$33.85	\$36.79	39.41	42.16	45.12
3/4"	\$42.90	\$46.62	49.93	53.42	57.17
1"	\$60.95	\$66.28	70.97	75.93	81.26
1.5"	\$106.05	\$115.43	123.57	132.20	141.48
2"	\$160.20	\$174.41	186.69	199.73	213.75
3"	\$331.70	\$361.18	386.57	413.58	442.61
4"	\$584.40	\$636.42	681.13	728.72	779.87
6"	\$1,279.30	\$1,393.33	1,491.17	1,595.35	1,707.33
8"	\$2,181.80	\$2,376.33	2,543.17	2,720.85	2,911.83
10"	\$3,445.30	\$3,752.53	4,015.97	4,296.55	4,598.13

**Notes:**

- (1) Total has been rounded up to the nearest \$0.01. Does not include bi-monthly Watershed Management Fee.

The costs attributed to the watershed category form the basis of the separate Watershed Management Fee that is charged to each customer based on meter size. As discussed previously, the Watershed

Management Fee recovers costs related to the operations of the watershed and the protection of this sensitive habitat, and therefore, a significant portion of the District's water supply system. Similar to the bi-monthly fixed Service Charge, watershed costs were allocated to both a service and customer component. Watershed administration, protection, and fisheries were allocated on a per service account basis as each customer is assumed to benefit equally from having access to the watershed and from the District's stewardship of this precious natural resource. Vegetation management and watershed maintenance are believed to benefit customers based on their water capacity needs because these programs protect the water quality within the reservoirs. Water quality in the reservoirs directly ties to customers' water needs. Consequently, vegetation management and watershed maintenance costs are allocated on a customer capacity (MEU) basis, which require customers to pay for these services in proportion to their reserved system capacity.

The Watershed Management Fee is projected to recover \$4.2 million in FY 2017/18. As this fee was first developed in the 2015 Cost of Service Study, the rate was phased in, only recovering a portion of the watershed related costs. The proposed Watershed Management Charge now reflects the programs full budget.

Table 7-4 and Table 7-5 provide the calculation of the Watershed Management Fee. The rate components of the bi-monthly Watershed Management Fee is calculated by dividing the revenue requirement of the watershed management costs component by the total number of accounts and MEUs served, and then dividing again by six months to calculate the bi-monthly charge.

**TABLE 7-4 FY 2017/18 BI-MONTHLY WATERSHED CALCULATION**

	Watershed (Account)	Watershed (MEU)
Revenue Requirement <sup>1</sup> (A) - Table 6-4	\$2,119	\$2,110
Units of Service (B) <sup>2</sup> - Table 4-1	59,201 accounts	92,467 MEUs
Bimonthly Fixed Charges (A) ÷ (B) ÷ 6	\$5.97 per account	\$3.81 per MEU
Total Bi-monthly Watershed Management Fee per Meter Equivalent <sup>3</sup>		\$9.78

**Notes**

- 1) In thousand dollars.
- 2) Accounts exclude private fire service. Meter Equivalent Units (MEU) – 5/8" standard.
- 3) Values may not foot due to rounding.

The table below outlines the two components of the Watershed Management Fee and the proposed rates for each component of the fee for FY 2017/18.

**TABLE 7-5 PROPOSED BI-MONTHLY WATERSHED MANAGEMENT FEE**

METER SIZE	CURRENT	MEU	WATERSHED (ACCOUNT) <sup>(1)</sup> (A)	WATERSHED (MEU) <sup>(1)</sup> (B)	TOTAL A+B
5/8"	\$8.80	1.0	\$5.97	\$3.81	\$9.78
3/4"	10.55	1.5	\$5.97	\$5.72	\$11.69
1"	14.00	2.5	\$5.97	\$9.53	\$15.50
1.5"	22.65	5.0	\$5.97	\$19.05	\$25.02
2"	33.05	8.0	\$5.97	\$30.48	\$36.45
3"	66.00	17.5	\$5.97	\$66.68	\$72.65
4"	114.60	31.5	\$5.97	\$120.02	\$125.99
6"	48.10	70.0	\$5.97	\$266.70	\$272.67
8"	421.50	120.0	\$5.97	\$457.20	\$463.17
10"	664.30	190.0	\$5.97	\$723.90	\$729.87

**Notes:**

(1) Calculated previously in **Table 7-4**. Components have been rounded up to the nearest \$0.01.

Table 7-6 below outlines the proposed rates for the Watershed Management Fee for the next five years.

**TABLE 7-6 PROPOSED BI-MONTHLY WATERSHED MANAGEMENT FEE PROJECTION**

METER SIZE	CURRENT	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21
5/8"	\$8.80	\$9.78	\$10.41	\$11.09	\$11.79
3/4"	10.55	\$11.69	\$12.44	\$13.25	\$14.09
1"	14.00	\$15.50	\$16.49	\$17.57	\$18.68
1.5"	22.65	\$25.02	\$26.61	\$28.37	\$30.15
2"	33.05	\$36.45	\$38.76	\$41.33	\$43.92
3"	66.00	\$72.65	\$77.24	\$82.37	\$87.53
4"	114.60	\$125.99	\$133.94	\$142.85	\$151.79
6"	248.10	\$272.67	\$289.86	\$309.17	\$328.50
8"	421.50	\$463.17	\$492.36	\$525.17	\$558.00
10"	664.30	\$729.87	\$775.86	\$827.57	\$879.30

**Notes:**

(1) Total has been rounded up to the nearest \$0.01.

## 7.2 FIRE PROTECTION CHARGES

In addition to providing clean and reliable drinking water, the District's system also provides system capacity for fire suppression. This function, while critical, is auxiliary to the District's primary function of providing regular service water. The District recently began a comprehensive upgrade to the distribution

pipelines to create adequate capacity for water service for private fire suppression. This program totals approximately \$4.5 million per year and is funded through an assessment charge voted upon and approved by the District's customers. In addition to the providing distribution capacity, the District must also provide storage and conveyance capacity necessary to provide emergency water flows. The costs to provide and maintain this capacity are then recovered from customers through their bi-monthly rates, including the District's Fire Service Line Charge for private fire lines.

The District serves 1,251 private meters, ranging from 2-inch to 10-inch meters. Similar to the fixed capacity costs, water service for private fire protection costs are allocated to each customer with a private fire service meter based on the size of their meter, which defines the maximum flow rate of that meter. Based on the size of these private fire meters, the District serves 70,196 meter equivalents.

Based on the updated analysis, \$0.79 million of the District's total FY 2017/18 budget is allocated to private fire meters. Based on the District's *Tank Design Criteria Guidelines* as well as discussions with staff, these expenditures are incurred to construct and maintain system capacity necessary to provide adequate water flows during an emergency to those customers with private fire meters. Table 7-7 below illustrates the calculation of the private Fire Service Line Charge per meter equivalent.

**TABLE 7-7 FY 2017/18 FIRE SERVICE CHARGE CALCULATION**

	Fire Service Line
Revenue Requirement <sup>1</sup> (A) - Table 6-4	\$788
Units of Service (B) - Table 4-1	70,196 per MEU
Bi-monthly Fire Service Line Charge (A) ÷ (B) ÷ 6	\$1.88 per MEU

**Notes**

- 1) In thousand dollars.
- 2) Meter Equivalent Units (MEU) – 5/8' standard.

In addition to the cost specifically recovered for providing water service for private fire protection, a bi-monthly customer service charge of \$17.13 is also recovered on each bi-monthly bill similar to all other bills sent out by the District. This bi-monthly service charge is the same amount recovered on each customer's bi-monthly bill as shown in Table 7-1. Table 7-8 below shows the calculated and projected private fire charge by meter size from FY 2017/18 through FY 2020/21.

**TABLE 7-8 PROPOSED BI-MONTHLY FIRE SERVICE CHARGE PROJECTION**

METER (OR LATERAL) SIZE	CURRENT	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21
2 inches	\$43.40	\$32.17	\$34.45	\$36.85	\$39.43
4 inches	77.95	76.35	81.69	87.38	93.48
6 inches	134.60	148.73	159.07	170.15	182.03
8 inches	208.15	242.73	259.57	277.65	297.03
10 inches	311.15	374.33	400.27	428.15	458.03

### 7.3 COMMODITY CHARGE RATES

As with the other components of the District's rate structure, the Commodity Charges were updated as part of this study based on the current and projected costs to provide water service to each customer and customer class.

#### Tiered Rate Structure

The District's tiered rate structure is built upon the idea that peak usage results in increasing costs for the District, unique from the costs incurred for basic (i.e., average) service. Additionally, it indirectly incentivizes conservation by sending a price signal to customers that if they use more water they will have to pay a higher price. As users increase their demand, the District must continue to produce and import more water at an increasingly higher cost compared with base demand. Additionally, the District must size, operate, and maintain larger facilities to meet the higher demand. Built on the foundation of the base-extra capacity methodology, these additional costs are covered through the District's tiered rate system. Every unit of water begins with a base unit cost intended to recover the District's basic production, conveyance, and distribution costs. The concept of proportionality requires that cost allocations consider both the average quantity of water consumed (base) and the peak rate at which it is consumed (peaking). Use of peaking is consistent with the cost of providing service because a water system is designed to handle peak demands, and the additional costs associated with designing, constructing and maintaining facilities required to meet these peak demands. These incremental costs are allocated to those customers whose usage requires the need to size, operate, and maintain facilities to meet peak demand. Thus, under a tiered rate structure the incremental production costs for peak and excessive usage are recovered in the outer tiers.

The District uses three main sources of water supply: water collected in the District's reservoirs from rainfall; imported water from SCWA; and recycled water. Additionally, conservation is a major element of the District's water supply planning, as it frees capacity for new or excess usage and can help to reduce the District's imported water supplies. The three sources of supply and the direct and indirect costs to treat and deliver the water to the retail customers are increasingly expensive. Absent higher customer demands, the District would be less reliant on these more expensive water supply costs. As a result, the existing and proposed commodity rate structure allocates higher cost supplies and some conservation costs to high volume users. The District allocates supply costs first to customer classes and then to each tier within the respective customer class according to peaking factors. Every user "peaks" on the system in some way, either through seasonal peaking when their demand spikes in the hot summer months, or through diurnal peaking when their demand spikes in the morning and early evening. Peaking factors account for this behavior based on how significant the peaking behavior is. The District's low-volume users have modest peaking, meaning their demand throughout the course of the year is relatively stable and consistent. Customers in tiers two and three (and four for residential) have higher peaking factors as their usage is calculated relative to other customers. These peaking factors allow fair, equitable, and proportionate distribution of water supply and production costs to each customer class and tier. While efforts were taken to define various customer classes that group customers based upon consistent usage patterns, some individual customers may vary moderately from the peaking behavior displayed by the class as a whole; however, the system is operated in aggregate and the proposed rates are reflective of this collective demand.

## Tier Analysis

As part of the study Carollo evaluated the tier breaks for reasonableness. It is important that there is a nexus between the water used in each tier and the cost of providing that water. This nexus is demonstrated in the beginning of this section. Carollo evaluated the demand patterns of each class<sup>14</sup> to assess the application of the existing tier breaks in relation to how customers will consume and how water will be provided. Another critical part of the tier analysis was forecasting how much demand will occur in each tier. This forecast can have a significant impact on revenues, as over forecasting use in the upper tiers would cause the utility's revenue to be susceptible to volatile demand.

## Residential Tiers

As part of this cost of service study, Carollo evaluated the size of the tiers, or tier breakpoints, within the residential customer classes. For single-family residential, no changes to the tiers are assumed at this time. The District's existing tier breaks provide a reasonable basis for allocating peaking costs within this specific customer class. In both the winter and summer months, a majority of the single-family residential demand occur in Tiers 1 and 2. A discernable peaking pattern is shown, in which the volume of water consumed increases significantly in the summer. Tiers 3 and 4 capture this increased peak demands and provide a structure for recovering infrastructure and supply costs required to meet this peak demands. Table 7-9 below shows the total water consumed and percentage of water consumed within each single-family residential tier.

TABLE 7-9 SINGLE-FAMILY CONSUMPTION BY TIER

	Total Tier Consumption	Percentage of Consumption
<b>Tier 1</b>	3,841,085	72%
<b>Tier 2</b>	1,067,517	20%
<b>Tier 3</b>	359,055	7%
<b>Tier 4</b>	97,618	2%

The District's largest volume customers illustrate a higher season peak, in total water consumed, than do smaller volume customers. This is illustrated in the volume of water consumed in Tier 4 in the summer compared to the winter. During summer months customers are only charged at the Tier 4 rates for water consumed in excess of 99 CCF per bi-monthly billing cycle or roughly 1,200 gallons per day.<sup>15</sup>

<sup>14</sup> Class demand profiles are shown in Appendix B.

<sup>15</sup> As a point of comparison to the 1,200 gallons per day the District allows before a customer is charged for water at the Tier 4 rate, California Water Code section 10608.20 assumes that 55 gallons per day per person is required for basic indoor water needs.



Demand within each tier is forecasted based on an analysis of the historical customer consumption data provided by the District.

**TABLE 7-10 PROPOSED RATE STRUCTURE BREAKPOINTS**

	SUMMER (CCF)	WINTER (CCF)
<b>SINGLE FAMILY</b>		
Tier 1	0 - 26	0 - 21
Tier 2	27 - 59	22 - 48
Tier 3	60 - 99	49 - 80
Tier 4	100+	81+
<b>MFR TIER ALLOTMENTS</b>		
Tier 1	0 - 10	0 - 10
Tier 2	11 - 20	11 - 18
Tier 3	21 - 28	19 - 26
Tier 4	29+	27+
<b>DUPLEX TIER ALLOTMENTS</b>		
Tier 1	0 - 20	0 - 18
Tier 2	21 - 45	19 - 35
Tier 3	46 - 78	36 - 68
Tier 4	79+	69+

## *Nonresidential Tiers*

Where residential customers are provided tier allocations (detailed above), Commercial, Single Family Irrigation, Recycled Water, and Raw Water customers are provided a water allocation, or Tier 1 usage, based on the District's estimation of the basic water requirements for that particular property. Unlike residential customer classes whose customers generally demonstrate homogenous water demand patterns, non-residential water demand patterns can vary significantly between customers. Consequently, uniform tier sizes (CCF allotments) within this customer class would not proportionally recover costs from this class of users. As a result, the District develops individual tiers for customers, which are intended to reflect non-peak and peak usage. It is, however, important that the District continually revisit these allocations and adjust them as necessary in order to continue to equitably recover costs from its non-residential customers. The District plans to adjust commercial budget in the future and has plans to develop a modification program.

**TABLE 7-11 EXISTING NON-RESIDENTIAL TIER BREAKPOINTS**

	COMMERCIAL, INSTITUTIONAL, & IRRIGATION (% OF ALLOCATION)	SINGLE-FAMILY IRRIGATION (% OF ALLOCATION)
Tier 1	0 – 85%	0 – 50%
Tier 2	86 – 150	51 – 100
Tier 3	151+	100+

## *Raw Water Tier Analysis*

As a result of Carollo's review of nonresidential tiers, they determined that the raw water class would be better served by uniform rate (single tier). The reasons for this determination are the class's changing demand pattern and the unique nature of the class. Raw water customers did not use water in tier three during three out of the last five years. Demand in tier two has also been de minimis. The class itself is unique—there are only two customers and water is distributed to these customers before entering the treated water portion of the system. A single tier will allow the cost per unit of raw water to have an enhanced nexus with the cost to provide each unit of water to this unique class.

## **Rate Adjustments**

The proposed FY 2017/18 District rates remain consistent with cost of service based rate making principles and California Constitution Article XIII D, section 6 cost of service and proportionality requirements. Under this methodology each functional cost is divided by the number of billing units (in CCF) of projected water sales in the tier or tiers to which that functional cost is attributed.

To calculate the costs attributable to each tier, Table 7-12 shows the Commodity Charge functional cost components (base and peak) detailed above in Table 6-4 and Appendix G, and divides them across the projected sales of units of water. Each functional category benefits usage in a specific tier or tiers, and thus, the usage in that tier or tiers forms the denominator for allocating the cost in that category. The combined unit costs allocated to each tier can then be calculated, arriving at a unit cost for each customer and applicable tier.

TABLE 7-12 FY 2017/18 UNIT COST CALCULATIONS

	TOTAL <sup>2</sup>	SFR	DUPLEX	MFR	COMMERCIAL	SF IRRIGATION	RECYCLED WATER	RAW WATER
<b>REVENUE REQUIREMENT (IN \$1,000) <sup>1</sup></b>								
Base	\$29,031	\$16,416	\$809	\$3,559	\$7,447	\$20	\$539	\$251
Winter Demand	\$6,885	\$3,877	\$200	\$891	\$1,741	\$4	\$104	\$68
Average Annual Demand	\$7,856	\$4,337	\$231	\$1,211	\$1,862	\$4	\$117	\$95
Summer Demand	\$4,946	\$3,233	\$142	\$285	\$1,069	\$2	\$129	\$85
Max Month Demand	\$3,694	\$1,599	\$5	\$92	\$1,468	\$11	\$240	\$278
<b>DEMAND (CCF)</b>								
Total Demand		5,365,275	264,290	1,157,426	2,410,020	5,833	210,397	132,858
Tier 1		3,841,085	192,932	814,269	1,976,216	2,605	171,945	
Tier 2		1,067,517	55,237	302,443	241,002	1,375	15,586	
Tier 3		359,055	15,857	34,897	192,802	1,853	22,866	
Tier 4		97,618	317	5,816				
<b>RATE (\$/CCF) <sup>3</sup></b>								
Tier 1		\$4.07	\$4.10	\$4.16	\$3.98	\$5.14	\$3.17	\$4.23
Tier 2		7.13	7.24	7.07	10.82	6.15	10.05	
Tier 3		12.07	12.02	11.25	16.26	10.76	18.73	
Tier 4		19.45	18.90	18.94				

**Notes:**

(1) All figures are in thousands of dollars.

(2) See Table 6-4 and Appendix G for functional allocation calculations.

(3) The rates are calculated by dividing the revenue requirement by the corresponding demand (CCF). With Classes that only have 3 tiers, Tier 3 is calculated as (Base CCF)/(Base \$) + (Peak High \$ + Peak Max \$)/(Peak High & Max CCF).

The table below provides the proposed residential Commodity Charges rates for the next four years.

**TABLE 7-13 PROPOSED RESIDENTIAL WATER RATE PROJECTIONS**

	CURRENT	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21
<b>SINGLE-FAMILY RESIDENTIAL</b>					
Tier 1	\$3.96	\$4.07	\$4.36	\$4.66	\$4.99
Tier 2	\$6.66	7.13	7.62	8.16	8.73
Tier 3	\$11.40	12.07	12.91	13.81	14.78
Tier 4	\$19.60	19.45	20.81	22.26	23.83
<b>MULTI-FAMILY RESIDENTIAL</b>					
Tier 1	\$3.93	\$4.16	\$4.47	\$4.78	\$5.11
Tier 2	\$6.50	7.07	7.58	8.11	8.68
Tier 3	\$10.71	11.25	12.05	12.89	13.79
Tier 4	\$18.36	18.94	20.28	21.70	23.22
<b>DUPLEX</b>					
Tier 1	\$3.95	\$4.10	\$4.39	\$4.70	\$5.02
Tier 2	\$6.77	7.24	7.75	8.29	8.87
Tier 3	\$11.11	12.02	12.86	13.76	14.72
Tier 4	\$18.89	18.90	20.23	21.64	23.16

**Notes:**

(1) Rates are shown in Appendix J.

It is important to understand the relationship of tier break points and rates. Specifically, once a single-family residential user enters Tier 4, they are using an average of over 1,200 gallons per day. The proposed rates represent the significant excess capacity built into the system to provide this peak demand. Overall, the proposed rates reflect the additional cost of providing and servicing this additional capacity relative to the level of service (source of supply and capacity reservation).

Rates for non-residential classes, have been assigned unique rates for each class to reflect the updated cost of service and water demand of each class.

**TABLE 7-14 PROPOSED NON-RESIDENTIAL WATER RATE PROJECTIONS**

	EXISTING	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21
<b>COMMERCIAL</b>					
Tier 1	\$3.80	\$3.98	\$4.25	\$4.55	\$4.87
Tier 2	\$9.75	10.82	11.58	12.39	13.25
Tier 3	\$14.98	16.26	17.40	18.61	19.92
<b>SINGLE FAMILY IRRIGATION</b>					
Tier 1	\$5.40	\$5.14	\$5.50	\$5.88	\$6.29
Tier 2	\$7.09	6.15	6.58	7.04	7.53
Tier 3	\$11.31	10.76	11.51	12.31	13.18
<b>RECYCLED WATER</b>					
Tier 1	\$2.76	\$3.17	\$3.40	\$3.63	\$3.89
Tier 2	\$7.56	10.05	10.76	11.51	12.31
Tier 3	\$15.78	18.73	20.04	21.44	22.94
<b>RAW WATER</b>					
Tier 1	\$3.80	\$4.23	\$4.53	\$4.84	\$5.22
Tier 2	\$6.70				
Tier 3	\$15.20				

## 7.4 CUSTOMER IMPACTS

Despite four years of rates being proposed, the District is looking to adopt rates for the next two years, aligning the rates with its two-year budget. Sample bi-monthly bill impacts are presented in the table below. The 17 CCF sample represents a low volume user who stays within Tier 1. The 50 CCF sample reflects a mid to high volume user with consumption in both Tiers 1 and 2. As the District has tiers that vary by season, the sample bills assume the summer allotments.

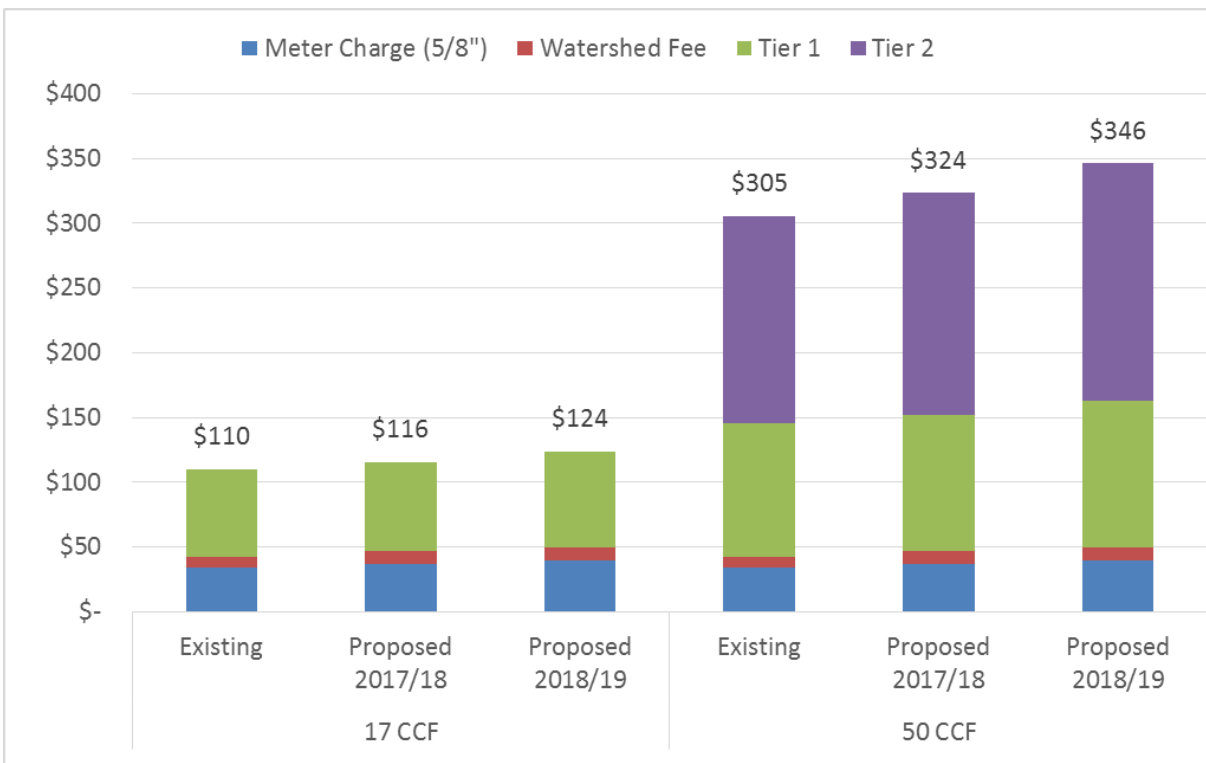
TABLE 7-15 BI-MONTHLY BILL COMPARISON FOR PROPOSED RATES

BILL COMPONENT	17 CCF			50 CCF		
	EXISTING	PROPOSED 2017/18	PROPOSED 2018/19	EXISTING	PROPOSED 2017/18	PROPOSED 2018/19
Service Charge (5/8")	\$33.85	\$36.79	\$39.41	\$33.85	\$36.79	\$39.41
Watershed Management	\$8.80	\$9.78	\$10.41	\$8.80	\$9.78	\$10.41
Commodity Charge <sup>1</sup>	\$67.32	\$69.19	\$74.12	\$262.80	\$276.94	\$296.24
Tier 1	\$67.32	\$69.19	\$74.12	\$102.96	\$105.82	\$113.36
Tier 2	\$0.00	\$0.00	\$0.00	\$159.84	\$171.12	\$182.88
Tier 3	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Tier 4	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
<b>Total Bi-Monthly Bill</b>	<b>\$109.97</b>	<b>\$115.76</b>	<b>\$123.94</b>	<b>\$305.45</b>	<b>\$323.51</b>	<b>\$346.06</b>
% Difference		5.3%	7.1%		5.9%	7.0%
Bi-monthly change		\$5.79	\$8.18		\$18.06	\$22.55
Bill as % of household income <sup>2</sup>	0.68%	0.72%	0.77%	1.89%	2.00%	2.14%
\$ per person/day <sup>3</sup>	\$0.45	\$0.48	\$0.51	\$1.26	\$1.33	\$1.42

**Notes**

- (1) Sum of Tiers 1 – 4. See Table 7-10 for allotments.
- (2) Assumes \$97,124 as the medium household income (MHI)
- (3) Assumes 4 person household size.

FIGURE 7-1 SINGLE-FAMILY RESIDENTIAL BI-MONTHLY BILL IMPACT



## 7.5 DEMAND REDUCTION SURCHARGE

In light of the current water demand uncertainty and need for financial resiliency, Carollo developed rates for Demand Reduction Surcharges for the District. Demand Reduction Surcharges are charges that may be imposed by the District following levels of extreme water demand reductions due to weather conditions, emergencies, or regulatory requirements. The objective of these rates is to recover system costs if customers' potable water usage declines as a result of expanded or future water shortage conditions. As discussed previously, many of the District's costs are fixed, in that they do not fluctuate with changes in water demands. The one significant exception to these fixed charges is purchased water costs from SCWA. While the District would attempt to identify cost savings, additional expenditure are likely to erase any savings or potential increase total expenditure as the District's conservation programs are implemented.

As presented previously in Section 4 of this Study, the District is forecasted to have water sales of roughly 9.55 million CCF in FY 2017/18. Based on an extreme water curtailment period, the District estimated three potential demand reduction scenarios. Appendix J details the calculations and assumptions use to estimate the potential revenue impacts of the following three demand reduction stages.

Demand Reduction Stage 1 would equate to a slight reduction in demands (5 percent). This is likely to correspond to the District's voluntary reduction levels. In this demand scenario, the District would have a revenue shortfall of \$4.6 million (detailed in Appendix J).

Under Demand Reduction Stage 2, the District forecasts that water deliveries could be required to be reduced by an additional 15 percent below FY 2017/18 levels, reducing sales down to 8.1 million CCF. This loss in sales would equate to an annual revenue reduction of \$11.3 million with no projected decreases in the District's operating expenditures. If higher than anticipated reductions in water consumption occur and there are further depletions of local water supplies, the District will be required to purchase additional, higher cost supplies from SCWA. Under this scenario, should the District purchase an addition 1,000 AF (435,600 CCF), the District expenditures (revenue requirement) would increase by slightly over \$1.0 million annually, based on FY 2017/18 forecasted wholesale prices.

Under Demand Reduction Stage 3, the District would need to cut back an additional 40 percent from FY 2017/18 levels (a 50 percent reduction from the historical 5-year average), revenues would under collect by an estimated \$24.6 million.

To safeguard against these significant financial implications, the District is proposing to authorize the following Demand Reduction Surcharge rates. If required to be implemented, these surcharges are projected to provide revenues sufficient to continue to meet the District's expenditures and debt obligations, despite significant reductions in demand/sales. Depending on the scenario and cost incurred, the Demand Reduction Surcharge rates are designed to recover revenues through both the District's fixed bi-monthly service charge and the water commodity charges. For example, under Demand Reduction Stage 2 (15 percent reduction), half of the forecasted shortfall would be funded through a fixed surcharge on a meter equivalent basis. The remaining costs would be collected from a surcharge on all units of consumption. This approach recovers a portion of the District's fixed expenditures in proportion to each customer's reserved capacity within the system and the remaining portion based on each customer's usage of the system and water purchases.

The tables below present the proposed Demand Reduction Surcharge rate calculations for each reduction scenario. The rates presented are only applicable one at a time (not cumulative).

**TABLE 7-16 DEMAND REDUCTION STAGE 1 SURCHARGE CALCULATION (5 PERCENT REDUCTION)**

	(MEU)
Lost Revenue Recovery <sup>1</sup>	4,624
Units of Service	92,467 MEUs
Demand Reduction Surcharge	\$8.34 per MEU <sup>2</sup>

**Notes**

- 1) In thousand dollars.
- 2) Meter Equivalent Units (MEU) – 5/8' standard – Bi-Monthly Cost.



The table below presents the calculated demand reduction surcharge for a 15 percent reduction in demand.

**TABLE 7-17 DEMAND REDUCTION STAGE 2 SURCHARGE CALCULATION (15 PERCENT REDUCTION)**

	(MEU)	Usage (CCF)
Lost Revenue Recovery <sup>1</sup>	\$5,663	\$5,663
Units of Service	92,467 MEUs	8,099,662 CCF
Demand Reduction Surcharge	\$10.21 per MEU <sup>2</sup>	\$0.70 per CCF

Notes

- 1) In thousand dollars.
- 2) Meter Equivalent Units (MEU) – 5/8' standard – Bi-Monthly Cost.

The table below presents the calculated demand reduction surcharge for a 45 percent reduction in demand.

**TABLE 7-18 DEMAND REDUCTION STAGE 3 SURCHARGE CALCULATION (40 PERCENT REDUCTION)**

	MEU	Usage (CCF)
Lost Revenue Recovery <sup>1</sup>	\$12,299	\$12,299
Units of Service	92,467 MEUs	5,162,161 CCF
Demand Reduction Surcharge	\$22.17 per MEU <sup>2</sup>	\$2.39 per CCF

Notes

- 1) In thousand dollars.
- 2) Meter Equivalent Units (MEU) – 5/8' standard – Bi-Monthly Cost.

If additional costs are incurred as the District continues to realize usage in excess of Tier 1, it is assumed this demand incurs the additional costs of purchasing SCWA water. A second SCWA Demand Reduction Surcharge is proposed for all usage to recover these costs.

**TABLE 7-19 ADDITIONAL DEMAND REDUCTION SURCHARGE FROM IMPORTED WATER**

	SCWA Demand Reduction Surcharge (15% Reduction)	SCWA Demand Reduction Surcharge (40% Reduction)
Cost of Additional SCWA Water <sup>1</sup> (A)	\$1,031,667	\$1,031,667
All Consumption (B)	8,113,210 CCF	5,185,961 CCF
Demand Reduction Surcharge (SCWA Portion) (A/B)	\$0.13 per CCF	\$0.20 per CCF

## APPENDIX A — HISTORICAL DEMAND SUMMARY

Details the historic demand by customer class over the past five fiscal years are set forth in the table below.

TABLE A-1 HISTORIC WATER DEMAND SUMMARY

CUSTOMER CLASS	FY 2011/12	FY 2012/13	FY 2013/14	FY 2014/15	FY 2015/16
Multi-Family Residential	774,490	794,141	807,251	817,814	801,235
Nonresidential	144,063	142,325	142,061	147,657	145,627
Duplex	287,716	291,024	290,673	295,790	293,119
Fireline	606,538	641,752	633,318	763,821	751,276
Hydrant Meter	1,188,603	1,190,331	1,178,683	1,237,197	1,225,573
Raw Water	284,262	282,960	287,349	299,176	302,641
Recycled Water	5,698	6,438	5,276	4,101	3,580
SFR Irrigation	10,421	11,768	9,137	15,059	15,257
Single-Family Residential	715,529	721,932	661,063	653,126	666,693
<b>Total</b>	<b>10,324,896</b>	<b>11,033,084</b>	<b>11,086,319</b>	<b>9,747,950</b>	<b>8,727,321</b>

The table below provides the average bi-monthly consumption per account over the past five fiscal years.

TABLE A-2 HISTORIC PER ACCOUNT CONSUMPTION

CUSTOMER CLASS	FY 2011/12	FY 2012/13	FY 2013/14	FY 2014/15	FY 2015/16
Multi-Family Residential	114	117	114	106	102
Nonresidential	99	106	106	96	89
Duplex	21	22	22	20	3
Fireline	1	1	0	1	0
Hydrant Meter	14	26	22	16	14
Raw Water	9,483	12,436	12,255	11,525	10,473
Recycled Water	230	268	256	213	212
SFR Irrigation	36	40	43	37	31
Single-Family Residential	20	21	21	18	17
Total	29	30	31	27	24

## APPENDIX B — PROJECTED WATER DEMAND AND SUPPLIES

The projected water supplies shown below detail the volume of water necessary to meet the District's forecasted demands. In addition to water sales, additional AF is required to cover the projected 10 percent unrecorded water use. This is meant to cover leaks, evaporation, and system flushing. As such the District is forecasting annual sales of 21,937 AF, but must acquire 24,374 AF from available sources to account for losses.

TABLE B- 1 PROJECTED WATER DEMAND AND SUPPLY

DEMAND (AF)	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21
Projected Water Sales (AF)	21,703	21,937	21,937	21,937	21,937
Unrecorded Water Use	10.00%	10.00%	10.00%	10.00%	10.00%
Projected Water Required (All Sources)	24,115	24,374	24,374	24,374	24,374
SUPPLY (AF)	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21
Marin County Sources	17,115	17,374	17,374	17,374	17,374
SCWA - Off Peak	7,000	7,000	7,000	7,000	7,000
Total Supply	24,115	24,374	24,374	24,374	24,374

TABLE B-2 MONTHLY WEIGHTED DEMAND

CATEGORY	ALLOCATION <sup>1</sup>	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	TOTAL
SFR														
Winter	343.3	343.3	343.3	343.3	343.3	343.3	343.3	321.9	343.3	241.7	287.4	289.5	343.3	3,887.1
Average	544.1	99.3	99.3	99.3	99.3	99.3	99.3	-	32.8	-	-	-	99.3	727.9
Summer	670.0	82.7	99.3	91.2	99.3	29.6	36.0	-	-	-	-	-	50.9	489.1
Peak		-	118.9	-	88.6	-	-	-	-	-	-	-	-	207.5
Total		525.4	660.8	533.9	630.6	472.3	478.6	321.9	376.1	241.7	287.4	289.5	493.5	5,311.6
Duplex														
Winter	16.9	16.9	16.9	16.9	16.9	16.9	16.9	16.9	16.9	15.0	16.6	16.9	16.9	200.7
Average	21.8	4.9	4.9	4.9	4.9	4.9	4.9	1.4	3.2	-	-	0.2	4.7	38.7
Summer	26.7	4.1	4.9	4.4	4.7	2.6	0.8	-	-	-	-	-	-	21.5
Peak		-	0.7	-	-	-	-	-	-	-	-	-	-	0.7
Total		25.9	27.3	26.2	26.5	24.4	22.6	18.3	20.1	15.0	16.6	17.1	21.6	261.6
Multi-Family														
Winter	148.9	-	148.9	-	148.9	-	148.9	-	148.9	-	148.9	-	148.9	893.3
Average	192.0	-	43.1	-	43.1	-	43.1	-	9.4	-	27.6	-	37.1	203.2
Summer	206.4	-	14.4	-	14.4	-	14.4	-	-	-	-	-	-	43.2
Peak		-	1.5	-	5.6	-	4.9	-	-	-	-	-	-	12.0
Total		-	207.9	-	211.9	-	211.2	-	158.2	-	176.4	-	186.0	1,151.7
Commercial														
Winter	155.8	155.8	155.8	155.8	155.8	155.8	155.8	116.4	155.8	95.9	155.8	130.9	155.8	1,745.0
Average	200.8	38.7	45.1	45.1	45.1	6.7	45.1	-	30.1	-	11.7	-	45.1	312.5
Summer	245.9	-	45.1	0.4	45.1	-	26.2	-	-	-	-	-	45.1	161.8
Peak		-	106.0	-	66.0	-	-	-	-	-	-	-	18.5	190.5
Total		194.5	351.9	201.2	311.9	162.4	227.0	116.4	185.8	95.9	167.5	130.9	264.4	2,409.8
SF Irrigation														
Winter	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.2	0.2	0.1	0.4	0.3	4.2
Average	0.6	0.1	0.1	0.1	0.0	0.1	-	0.0	-	-	-	0.1	-	0.6
Summer	0.7	0.1	-	0.1	-	0.1	-	-	-	-	-	-	-	0.4

CATEGORY	ALLOCATION <sup>1</sup>	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	TOTAL
Peak		0.4	-	0.8	-	0.2	-	-	-	-	-	-	-	1.4
Total		1.1	0.5	1.4	0.5	0.9	0.4	0.4	0.2	0.2	0.1	0.5	0.3	6.6
Recycled Water														
Winter	22.6	-	22.6	-	22.6	-	18.0	-	11.4	-	7.2	-	22.6	104.2
Average	29.1	-	6.5	-	6.5	-	-	-	-	-	-	-	6.5	19.6
Summer	35.6	-	6.5	-	6.5	-	-	-	-	-	-	-	6.5	19.6
Peak		-	15.9	-	10.0	-	-	-	-	-	-	-	5.3	31.2
Total		-	51.5	-	45.6	-	18.0	-	11.4	-	7.2	-	40.9	174.5
Total														
Winter	697.2	525.8	697.2	525.8	697.2	523.1	683.5	458.0	678.3	352.8	616.6	447.1	697.1	6,902.6
Average	898.9	145.8	201.7	152.1	201.6	111.0	192.3	1.4	75.3	-	39.3	2.7	195.4	1,318.6
Summer	1,071.9	89.7	172.9	98.9	171.9	32.4	77.4	-	-	-	-	-	105.2	748.3
Peak		9.7	253.3	10.3	170.2	0.2	4.9	-	-	-	-	-	30.6	479.3
Total		771.0	1,325.1	787.1	1,241.0	666.7	958.1	459.3	753.6	352.8	655.9	449.8	1,028.3	9,448.8

Notes

(1) All values are in thousand CCF.

## APPENDIX C — WATER SUPPLY COSTS

The following two tables outline the forecasted water supply costs, first cost per AF and then by source of supply.

**TABLE C-1 PROJECTED WATER UNIT COSTS BY SOURCE**

WATER SOURCE	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21
SCWA Third Off-Peak (\$/AF)	\$1,031.67	\$1,083.25	\$1,137.41	\$1,194.28
SCWA Supplemental (\$/AF)	1,031.67	1,083.25	1,137.41	1,194.28
North Marin Interconnection Agreement – Wheeling Charges (\$/AF)	18.18	18.73	19.29	19.87
Blended (\$/AF) (Imports)	\$301.51	\$316.48	\$332.19	\$348.69

**TABLE C-2 PROJECTED TOTAL WATER COSTS BY SOURCE**

WATER SOURCE	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21
SCWA - Third Off-Peak Cost	\$5,777	\$6,066	\$6,370	\$6,688
SCWA - Supplemental Cost	1,444	1,517	1,592	1,672
North Marin Interconnection Agreement - Wheeling Charges	127	131	135	139
<b>Total Water Supply Costs</b>	<b>\$7,349</b>	<b>\$7,714</b>	<b>\$8,097</b>	<b>\$8,499</b>

## APPENDIX D — CURRENT DEBT OBLIGATIONS

The following table outlines the District's existing debt service payments through FY 2020/21.

TABLE D- 1 DEBT SERVICE SCHEDULE					
FISCAL YEAR	2016 SERIES A	2012 SERIES A	LAS GALLINAS PAYMENTS	RENEWABLE ENERGY BOND	TOTAL DEBT PAYMENTS
2016/17	\$868,602	\$5,615,078	\$887,736	\$122,250	\$7,767,676
2017/18	1,481,975	5,609,278	554,173	122,250	7,771,276
2018/19	1,481,975	5,612,878	554,173	122,250	7,766,476
2019/20	1,481,975	5,608,078	554,173	122,250	7,774,788
2020/21	1,481,975	5,616,390	554,173	122,250	7,972,266





## APPENDIX E — REVENUE REQUIREMENT ANALYSIS

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Based on the O&M tables, the Revenue Requirement table details the total revenues, expenditures, as well as the calculations and results of the cash flow and coverage tests. The results of the revenue requirements are used to define the total revenue necessary to collect from rates.

TABLE E- 1 REVENUE REQUIREMENT ANALYSIS

	Budget		Projected -->				
	FY 2016/17		FY 2017/18		FY 2018/19	FY 2019/20	FY 2020/21
<b>Cash Flow Test</b>							
<b>Revenues</b>							
Total User Rate Revenues	\$ 69,494,000	\$	69,494,000	\$	74,358,580	\$ 79,563,681	\$ 85,133,138
Total Other Revenues	\$ 3,440,000	\$	3,567,600	\$	3,700,304	\$ 3,838,316	\$ 3,981,849
Total Additional Revenues	\$ -	\$	-	\$	-	\$ -	\$ -
<b>Total Revenues</b>	<b>\$ 72,934,000</b>	<b>\$</b>	<b>73,061,600</b>	<b>\$</b>	<b>78,058,884</b>	<b>\$ 83,401,997</b>	<b>\$ 89,114,987</b>
	\$ 58,617,950	\$	62,038,670	\$	66,136,082	\$ 69,704,502	\$ 73,520,498
<b>Expenditures</b>							
Personnel Services	\$ 36,756,610	\$	38,594,440	\$	41,489,020	\$ 43,770,920	\$ 46,178,320
General & Admin	4,146,330		4,334,350		4,551,070	4,790,840	5,078,290
Materials & Supplies	8,696,380		9,122,760		9,567,482	10,043,232	10,562,158
Operations	9,018,630		9,987,120		10,528,510	11,099,510	11,701,730
Capital	-		-		-	-	-
Debt Service	7,493,666		9,413,676		10,192,676	12,803,126	12,808,788
Capital Reserve C/O	6,679,000						
PAYGO			6,000,000		7,000,000	7,000,000	10,000,000
<b>Total Operating Expenditures</b>	<b>\$ 72,790,616</b>	<b>\$</b>	<b>77,452,346</b>	<b>\$</b>	<b>83,328,758</b>	<b>\$ 89,507,628</b>	<b>\$ 96,329,286</b>
<b>Policy Expenditures</b>							
Replacement Funding	\$ -	\$	-	\$	-	\$ -	\$ -
Transfers to Capital Reserve	-		-		-	-	-
Additions to Meet Minimum Fund Balances	-		-		-	-	-
<b>Total Policy Expenditures</b>	<b>\$ -</b>	<b>\$</b>	<b>-</b>	<b>\$</b>	<b>-</b>	<b>\$ -</b>	<b>\$ -</b>
<b>Policy Overrides</b>							
Replacement Funding							
Transfers to Capital Reserve							
Additions to Meet Min Fund Balances							
<b>Total Expenditures for Cash Flow Test</b>	<b>\$ 72,790,616</b>	<b>\$</b>	<b>77,452,346</b>	<b>\$</b>	<b>83,328,758</b>	<b>\$ 89,507,628</b>	<b>\$ 96,329,286</b>
	\$ 72,790,616	\$	77,452,346	\$	83,328,758	\$ 89,507,628	\$ 96,329,286
<b>Cash Flow Surplus (Deficit)</b>	<b>\$ 143,384</b>	<b>\$</b>	<b>(4,390,746)</b>	<b>\$</b>	<b>(5,269,874)</b>	<b>\$ (6,105,632)</b>	<b>\$ (7,214,299)</b>

Debt Coverage Test						
	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	
<b>Revenues</b>						
Water Revenues	\$ 69,494,000	\$ 69,494,000	\$ 74,358,580	\$ 79,563,681	\$ 85,133,138	
Other Revenues Allowed	\$ 4,140,000	\$ 4,267,600	\$ 4,400,304	\$ 4,538,316	\$ 4,681,849	
Rate Stabilization Revenue (deposit)	\$ -	\$ -	\$ -	\$ -	\$ -	
Rate Stabilization Revenue (Use)	\$ -	\$ -	\$ -	\$ -	\$ -	
<b>Total Revenues</b>	<b>\$ 73,634,000</b>	<b>\$ 73,761,600</b>	<b>\$ 78,758,884</b>	<b>\$ 84,101,997</b>	<b>\$ 89,814,987</b>	
<b>Expenditures</b>						
Water Expenditures	\$ 58,617,950	\$ 62,038,670	\$ 66,136,082	\$ 69,704,502	\$ 73,520,498	
Debt Service	7,493,666	9,413,676	10,192,676	12,803,126	12,808,788	
Coverage	3,746,833	4,706,838	5,096,338	6,401,563	6,404,394	
<b>Total Expenditures</b>	<b>\$ 69,858,449</b>	<b>\$ 76,159,184</b>	<b>\$ 81,425,096</b>	<b>\$ 88,909,191</b>	<b>\$ 92,733,680</b>	
Max Expenditures	\$ 72,790,616	\$ 77,452,346	\$ 83,328,758	\$ 89,507,628	\$ 96,329,286	
<b>Bond Coverage Surplus (Deficit)</b>	<b>\$ 3,775,551</b>	<b>\$ (2,397,584)</b>	<b>\$ (2,666,212)</b>	<b>\$ (4,807,195)</b>	<b>\$ (2,918,693)</b>	

Revenue Requirement					
	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21
Revenue Surplus/(Shortfalls)	\$ 143,384	\$ (4,390,746)	\$ (5,269,874)	\$ (6,105,632)	\$ (7,214,299)
	<i>Surplus</i>	<i>Cash Flow Driven</i>	<i>Cash Flow Driven</i>	<i>Cash Flow Driven</i>	<i>Cash Flow Driven</i>
Revenue Increase		July	July	July	July
Calculated Rate Increase (%)		7.00%	8.00%	8.00%	9.00%
<i>* Rounded to the nearest whole percent</i>					
Rate Override (%)		7.00%	7.00%	7.00%	7.00%
Rate Increases					
Rate Increase (%)		7.00%	7.00%	7.00%	7.00%
Cumulative Rate Increase (%)		7.00%	14.49%	22.50%	31.08%
Cash Flows					
Revenues Before Rate Increase	\$ 72,934,000	\$ 73,061,600	\$ 78,058,884	\$ 83,401,997	\$ 89,114,987
Revenues From Rate Increase	-	4,864,580	5,205,101	5,569,458	5,959,320
Less: Rate Increase Delay	-	-	-	-	-
Less: Expenditures	(72,790,616)	(77,452,346)	(83,328,758)	(89,507,628)	(96,329,286)
<b>Cash Flow</b>	<b>\$ 143,384</b>	<b>\$ 473,834</b>	<b>\$ (64,773)</b>	<b>\$ (536,174)</b>	<b>\$ (1,254,980)</b>
	-	4,865	5,205	5,569	5,959
Operating Fund					
Beginning Balance	\$ 16,947,253	\$ 19,537,527	\$ 20,011,361	\$ 19,946,588	\$ 19,410,414
Cash Flow	143,384	473,834	(64,773)	(536,174)	(1,254,980)
Additions (Subtractions)	-	-	-	-	-
Year End Transfer to Facilities Fund	-	-	-	-	-
<b>Ending Fund Balance</b>	<b>\$ 17,090,637</b>	<b>\$ 20,011,361</b>	<b>\$ 19,946,588</b>	<b>\$ 19,410,414</b>	<b>\$ 18,155,435</b>
Operating Balance	124 days 34%	118 days 32%	110 days 30%	99 days 27%	89 days 24%
Coverage					
Coverage Factor	2.16 x	1.82 x	1.80 x	1.59 x	1.78 x

## APPENDIX F — OPERATIONS AND MAINTENANCE OVERVIEW AND PROJECTIONS

The following series of tables detail the assumptions and forecasted O&M escalation percentages, a summary of the District's Revenues and Expenditures, and a detailed line item forecast by expenditure. Each expenditure shows the utilized escalation factor or source sheet.

TABLE F- 1 O&M ESCALATION FACTORS

O&M Escalators					
	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21
General Inflation	4.00%	4.00%	4.00%	4.00%	4.00%
Labor Inflation	5.00%	5.00%	7.50%	5.50%	5.50%
Utilities Inflation	5.00%	20.00%	6.00%	6.00%	6.00%
Construction Inflation	3.00%	3.50%	3.50%	3.50%	3.50%
Depreciation Funding	2.50%	3.50%	3.50%	3.50%	3.50%
Interest Income	1.00%	1.00%	1.00%	1.00%	1.00%
Customer Growth	0.00%	0.00%	0.00%	0.00%	0.00%
Gnrl Infltn + Cstmr Grwth	4.00%	4.00%	4.00%	4.00%	4.00%
No Annual Increase	0.00%	0.00%	0.00%	0.00%	0.00%
One Time Expense	-100.00%	-100.00%	-100.00%	-100.00%	-100.00%
Purchased Water Inflation	0.00%	5.00%	5.00%	5.00%	5.00%
Metered Water Demand	5.95%	1.07%	0.00%	0.00%	0.00%
Delivered Water Demand	0.00%	-1.00%	-1.00%	-1.00%	-1.00%
Water Inflation + Water Demand	0.00%	4.00%	4.00%	4.00%	4.00%

TABLE F- 2 PROJECTED REVENUES

## Revenues

		FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21
<b>User Rate Revenues</b>		<i>*Revenues based on existing rates and demand levels.</i>				
	<b>Escalator</b>					
Water Sales	Customer Growth	\$ 49,192,000	\$ 49,192,000	\$ 52,635,440	\$ 56,319,921	\$ 60,262,315
Service Charge	Customer Growth	\$ 16,484,000	\$ 16,484,000	\$ 17,637,880	\$ 18,872,532	\$ 20,193,609
Watershed Protection Fee	Customer Growth	\$ 3,818,000	\$ 3,818,000	\$ 4,085,260	\$ 4,371,228	\$ 4,677,214
<b>Total User Rate Revenues</b>		<b>\$ 69,494,000</b>	<b>\$ 69,494,000</b>	<b>\$ 74,358,580</b>	<b>\$ 79,563,681</b>	<b>\$ 85,133,138</b>
<b>Other Revenues</b>						
Other operating revenues	General Inflation	3,190,000	\$ 3,317,600	\$ 3,450,304	\$ 3,588,316	\$ 3,731,849
Total Federal, state and other grants	General Inflation	0	\$ -	\$ -	\$ -	\$ -
Other income	General Inflation	0	\$ -	\$ -	\$ -	\$ -
Interest Income	No Annual Increase	250,000	\$ 250,000	\$ 250,000	\$ 250,000	\$ 250,000
Interest Revenue	General Inflation	0	\$ -	\$ -	\$ -	\$ -
<b>Total Other Revenues</b>		<b>\$ 3,440,000</b>	<b>\$ 3,567,600</b>	<b>\$ 3,700,304</b>	<b>\$ 3,838,316</b>	<b>\$ 3,981,849</b>
		72,934,000	73,061,600	78,058,884	83,401,997	89,114,987
<b>Capital &amp; Fire Flow Funds</b>						
Interest Income	General Inflation	0	\$ -	\$ -	\$ -	\$ -
Connection Charges	No Annual Increase	1,200,000	\$ 1,200,000	\$ 1,200,000	\$ 1,200,000	\$ 1,200,000
Fire Flow	No Annual Increase	4,500,000	\$ 4,500,000	\$ 4,500,000	\$ 4,500,000	\$ 4,500,000
Connection Fees	No Annual Increase	700,000	\$ 700,000	\$ 700,000	\$ 700,000	\$ 700,000
Capital Grants	One Time Expense	1,000,000	\$ -	\$ -	\$ -	\$ -
<b>Total Capital &amp; Fire Flow Funds</b>		<b>\$ 7,400,000</b>	<b>\$ 6,400,000</b>	<b>\$ 6,400,000</b>	<b>\$ 6,400,000</b>	<b>\$ 6,400,000</b>
<b>Total Operating Revenues</b>		<b>\$ 72,934,000</b>	<b>\$ 73,061,600</b>	<b>\$ 78,058,884</b>	<b>\$ 83,401,997</b>	<b>\$ 89,114,987</b>
<b>Total Capital and FF Funds</b>		<b>\$ 7,400,000</b>	<b>\$ 6,400,000</b>	<b>\$ 6,400,000</b>	<b>\$ 6,400,000</b>	<b>\$ 6,400,000</b>
<b>Total Revenues: All Sources</b>		<b>\$ 80,334,000</b>	<b>\$ 79,461,600</b>	<b>\$ 84,458,884</b>	<b>\$ 89,801,997</b>	<b>\$ 95,514,987</b>

TABLE F- 3 PROJECTED EXPENDITURES

Expenditures		Escalator	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21
Regular Salaries & Wages		Labor Inflation	19,316,497	\$ 20,282,321	\$ 21,803,494	\$ 23,002,688	\$ 24,267,835
Overtime & Standby		Labor Inflation	942,871	990,014	1,064,265	1,122,800	1,184,554
Temporary		Labor Inflation	361,126	379,182	407,621	430,040	453,692
Director Fees		Labor Inflation	39,484	41,458	44,568	47,019	49,605
Contract Help		Labor Inflation	386,312	405,627	436,049	460,032	485,334
Finge Benefits		Labor Inflation	15,710,321	16,495,837	17,733,024	18,708,341	19,737,300
<b>Personnel Services</b>		Labor Inflation	<b>36,756,610</b>	<b>38,594,440</b>	<b>41,489,020</b>	<b>43,770,920</b>	<b>46,178,320</b>
Fees & Subscriptions		General Inflation	338,953	\$ 352,512	\$ 370,138	\$ 388,644	\$ 411,963
Communications		General Inflation	354,458	368,637	387,069	406,422	430,807
Debt Service		--Debt Sheet--	7,493,666	7,767,676	7,771,276	7,766,476	7,774,788
Future Debt		--Debt Sheet--		1,646,000	2,421,400	5,036,650	5,034,000
Recycled Water Debt (Peacock)		--Debt Sheet--		-	-	-	-
Taxes, Fees & Liscenses		General Inflation	666,342	692,997	727,648	764,029	809,871
Insurance		General Inflation	2,216,410	2,327,230	2,443,590	2,577,990	2,732,670
Misc Expenses		General Inflation	570,167	592,974	622,624	653,754	692,979
<b>General &amp; Admin</b>			<b>11,639,996</b>	<b>13,748,026</b>	<b>14,743,746</b>	<b>17,593,966</b>	<b>17,887,078</b>
Supplies		General Inflation	295,538	307,359	321,189	337,249	357,484
Materials		General Inflation	453,777	471,927	493,163	517,821	548,891
Chemicals		Utilities Inflation	956,275	994,524	1,039,277	1,091,240	1,156,715
Water Purchases		--Source of Supply Sheet--	6,990,790	7,348,950	7,713,852	8,096,922	8,499,068
<b>Materials &amp; Supplies</b>			<b>8,696,380</b>	<b>9,122,760</b>	<b>9,567,482</b>	<b>10,043,232</b>	<b>10,562,158</b>
Automotive		General Inflation	577,555	606,433	636,754	668,592	702,022
Construction Contracts		General Inflation	499,083	524,036	550,238	577,750	606,638
Equipment Rentals		General Inflation	256,154	268,961	282,409	296,530	311,356
Conservation Rebates		General Inflation	595,500	625,280	656,540	689,370	723,840
Professional Fees		General Inflation	1,656,260	1,739,072	1,826,024	1,917,326	2,013,194
Repair & Maintenance		General Inflation	1,819,950	1,910,947	2,006,493	2,106,818	2,212,161
Small Tools & Equipment		General Inflation	103,068	108,221	113,632	119,314	125,280
Utilities		Utilities Inflation	3,511,060	4,204,170	4,456,420	4,723,810	5,007,240
<b>Operations</b>			<b>9,018,630</b>	<b>9,987,120</b>	<b>10,528,510</b>	<b>11,099,510</b>	<b>11,701,730</b>
<b>Expenditures</b>			<b>\$ 66,111,616</b>	<b>\$ 71,452,346</b>	<b>\$ 76,328,758</b>	<b>\$ 82,507,628</b>	<b>\$ 86,329,286</b>
Expenditures less debt service			\$ 58,617,950	\$ 62,038,670	\$ 66,136,082	\$ 69,704,502	\$ 73,520,498
Capital Reserve C/O	--Calculated--		6,679,000				
PAYGO	--Calculated--			\$ 6,000,000	\$ 7,000,000	\$ 7,000,000	\$ 10,000,000
<b>Capital</b>			<b>6,679,000</b>	<b>6,000,000</b>	<b>7,000,000</b>	<b>7,000,000</b>	<b>10,000,000</b>
<b>Total Expenditures</b>			<b>\$ 72,790,616</b>	<b>\$ 77,452,346</b>	<b>\$ 83,328,758</b>	<b>\$ 89,507,628</b>	<b>\$ 96,329,286</b>

# APPENDIX G — FUNCTIONAL COST ALLOCATION

The functional allocation tables are broken into two components. The first table details the index, which consists of various allocations factors that define how each line item is to be distributed. Many factors are detailed in the Index based on how expenditures relate to the functions (columns) being provided. The subsequent tables detail how each line-item from the O&M table is being allocated.

TABLE G- 1      FUNCTIONAL ALLOCATION FACTORS

Allocation Index	Customer	Capacity	Base	Winter Demand	Average Demand	Summer Demand	Max Demand	Peak	Raw Water Exclusion	Private Fire	Watershed	As All Others
Customer Only	100%											0.0%
Capacity Only		100%										0.0%
Base Only			100%									0.0%
Bon Tempe				67%	33%							0.0%
San Geronimo				100%		0%	0%					0.0%
SCWA				0%	49%	31%	20%					0.0%
Conservation			50%		22%	15%	13%					0.0%
Peak Only				57%	19%	13%	11%					0.0%
Recycled					43%	30%	27%					0.0%
As All Others												100.0%
As Fixed Assets	2%	45%	38%	0%	0%	0%	0%	3%	0%	7%	1%	4.5%
All Functions	12%	15%	39%					27%		0%	7%	0.0%
Watershed											100%	0.0%
Customer/Capacity	50%	50%										0.0%
Base/Peak			63%					37%				0.0%
Capacity / Base		50%	50%									0.0%
Pumping		50%	17%					33%				0.0%
Transmission & Distribution		50%	50%									0.0%
Storage		29%			12%	9%	8%			43%		0.0%
As 2016-2020 CIP	0%	21%	7%	41%	11%	4%	3%	1%	0%	5%	0%	6.7%



Allocation Index	Notes
Customer Only	Allocations assumes 100% of the costs/benefits occur on a per account basis
Capacity Only	Allocations assumes 100% of the costs/benefits increase relative to the size of a customer's meter
Base Only	Allocations assumes 100% of the costs/benefits increase relative water usage. The adjustment of 2% to peak is due to RW Usage.
Bon Tempe	Reflects costs associated with Bon Tempe - Costs are spread based on ability to service system peaks
San Geronimo	Reflects costs associated with San Geronimo - Costs are spread based on ability to service system peaks
SCWA	Calculated as % of SCWA demand to each tier
Conservation	Allocated based on each Functions weighted usage of peak (Usage * Peaking Factor)
Peak Only	Allocated based on each Functions weighted usage of peak (Usage * Peaking Factor)
Recycled	Allocated based on each Functions weighted usage of peak (excludes Winter Peak)
As All Others	Weighted Average of all other allocated expenditures - Commonly used when specific factors are not applicable
As Fixed Assets	Allocations reflect how the system was designed to service each of the functions.
All Functions	Similar to As All Others, but specifically designed to reflect the budget % of water shed
Watershed	Costs related to the Watershed Program
Customer/Capacity	For costs that are assumed fixed with equal benefit to customer and capacity components
Base/Peak	Allocations assumes the costs/benefits occur as a result of system peaking (peak usage vs base (non-peak) usage)
Capacity / Base	For costs are are primarily (MEU) fixed, but for the purposes of affordability are allocated partially to variable charges (base only)
Pumping	For costs are are primarily (MEU) fixed, but for the purposes of affordability are allocated partially to variable charges based on system peaking.
Transmisson & Distribution	Reflect capacity, usage, and fire functions utilization of the distribution system
Storage	Reflects the District's design criteria for sizing of a storage tank and ratio of fire and regular MEUs
As 2016-2020 CIP	Reflects the changes to assets reflective of future investment in the system



TABLE G- 2      FUNCTIONAL ALLOCATION RESULTS

PLANT IN SERVICE      Book Value			Customer	Capacity	Base	Winter Demand	Average Demand	Summer Demand	Max Demand	Peak	Raw Water Exclusion	Private Fire	Watershed	As All Others
Land	11,129,340	As All Others	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%
Buildings	11,472,580	As All Others	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%
Dams & Reservoir	21,046,096	All Functions	12%	15%	39%	0%	0%	0%	0%	27%	0%	0%	7%	0%
Storage Tanks	46,003,171	Storage	0%	29%	0%	0%	12%	9%	8%	0%	0%	43%	0%	0%
Pumping Plants	13,632,641	Pumping	0%	50%	17%	0%	0%	0%	0%	33%	0%	0%	0%	0%
Water Treatmt Pla	16,922,102	Capacity / Base	0%	50%	50%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Transmissn & Dist	186,508,367	Transmisson & Distribution	0%	50%	50%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Service Connector	8,745,323	Capacity Only	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Meters	562,375	Customer Only	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Vehicles	1,636,598	Customer Only	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Equipment	3,334,789	As All Others	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%
Cap Inv't Mgt - AuC	25,295,632	As All Others	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%
LVA-Equipment	-	As All Others	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%
LVA-Computers	-	As All Others	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%
LVA-Tools	-	As All Others	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%
Recycled Water A	316,021,058	As All Others	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%
BMP Capital Sub Total      \$ 662,310,072			\$ 4,640,321	\$ 133,534,543	\$ 112,276,808	\$ -	\$ 5,696,922	\$ 3,958,601	\$ 3,518,889	\$ 10,263,788	\$ -	\$ 19,654,346	\$ 1,511,758	\$ 367,254,095
Reallocation of "As All Others"			\$ 5,805,520	\$ 167,065,486	\$ 140,469,868	\$ -	\$ 7,127,438	\$ 4,952,618	\$ 4,402,494	\$ 12,841,058	\$ -	\$ 24,589,615	\$ 1,891,365	\$ (369,145,460)
Total Allocation      \$ 664,201,437			\$ 10,445,841	\$ 300,600,029	\$ 252,746,676	\$ -	\$ 12,824,360	\$ 8,911,218	\$ 7,921,383	\$ 23,104,846	\$ -	\$ 44,243,961	\$ 3,403,123	\$ (1,891,365)
Percentage Allocation      100.0%			1.6%	45.3%	38.1%	0.0%	1.9%	1.3%	1.2%	3.5%	0.0%	6.7%	0.5%	0.0%



OPERATING EXPENDITURES			Allocation	Customer	Capacity	Base	Winter Demand	Average Demand	Summer Demand	Max Demand	Peak	Raw Water Exclusion	Private Fire	Watershed	As All Others
Water Production							1	2	3	4					
<b>Bon Tempe</b>															
Chemicals	\$	321,006	Bon Tempe	0%	0%	0%	67%	33%	0%	0%	0%	0.0%	0.0%	0%	0%
Utilities	\$	381,549	Bon Tempe	0%	0%	0%	67%	33%	0%	0%	0%	0.0%	0.0%	0%	0%
<b>San Geronimo</b>															
Chemicals	\$	1,074,734	San Geronimo	0%	0%	0%	100%	0%	0%	0%	0%	0.0%	0.0%	0%	0%
Utilities	\$	3,322,864	San Geronimo	0%	0%	0%	100%	0%	0%	0%	0%	0.0%	0.0%	0%	0%
<b>SCWA</b>															
Water Purchases	\$	7,455,000	SCWA	0%	0%	0%	0%	49%	31%	20%	0%	0.0%	0.0%	0%	0%
Chemicals	\$	141,797	SCWA	0%	0%	0%	0%	49%	31%	20%	0%	0.0%	0.0%	0%	0%
Utilities	\$	846,523	SCWA	0%	0%	0%	0%	49%	31%	20%	0%	0.0%	0.0%	0%	0%
<b>Las Gallinas</b>															
Chemicals	\$	74,463	Recycled	0%	0%	0%	0%	43%	30%	27%	0%	0.0%	0.0%	0%	0%
Utilities	\$	226,064	Recycled	0%	0%	0%	0%	43%	30%	27%	0%	0.0%	0.0%	0%	0%
<b>Board of Directors</b>															
<b>Personnel Services</b>															
4170 Director Fees	45,000		Customer/Capacity	50%	50%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%
4200 Fringe Benefits	88,000		Customer/Capacity	50%	50%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%
<b>General &amp; Admin</b>															
4500 Fees & Subscripti	\$ 6,165		Customer/Capacity	50%	50%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%
5200 Communications &	2,800		Customer/Capacity	50%	50%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%
5600 Misc Expenses	100		Customer/Capacity	50%	50%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%
<b>Legal</b>															
<b>Personnel Services</b>															
4100 Regular Salaries & \$	308,279		As All Others	0%	0%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	100%
4110 Overtime	2,000		As All Others	0%	0%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	100%
4200 Fringe Benefits	165,929		As All Others	0%	0%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	100%
<b>General &amp; Admin</b>															
4500 Fees & Subscripti	\$ 20,780		As All Others	0%	0%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	100%
5200 Communications &	1,100		As All Others	0%	0%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	100%
5600 Misc Expenses	300		As All Others	0%	0%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	100%
<b>Materials &amp; Supplies</b>															
4600 Supplies	\$ 3,200		As All Others	0%	0%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	100%
<b>District Operations</b>															
6200 Professional Fees	469,000		Customer/Capacity	50%	50%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%



General Manager															
Personnel Services															
4100	Regular Salaries & \$	1,461,890	Customer/Capacity	50%	50%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%
4110	Overtime	38,500	Customer/Capacity	50%	50%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%
4190	Temporary	8,714	Customer/Capacity	50%	50%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%
4195	Contract Help	25,000	Customer/Capacity	50%	50%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%
4200	Fringe Benefits	735,680	Customer/Capacity	50%	50%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%
General & Admin															
4500	Fees & Subscripti \$	26,645	Customer/Capacity	50%	50%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%
5200	Communications &	90,000	Customer/Capacity	50%	50%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%
5600	Misc Expenses	2,000	Customer/Capacity	50%	50%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%
Materials & Supplies															
4600	Supplies	\$ 18,500	Customer/Capacity	50%	50%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%
District Operations															
5900	Equipment & Facil	2,000	Customer/Capacity	50%	50%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%
6200	Professional Fees	164,750	Customer/Capacity	50%	50%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%
6300	Repair & Maintena	479,000	Customer/Capacity	50%	50%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%
8000	Capital Expenditur	146,400	Customer/Capacity	50%	50%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%
Public Information															
Personnel Services															
4100	Regular Salaries & \$	309,903	Peak Only	0%	0%	0%	57%	19%	13%	11%	0%	0.0%	0.0%	0%	0%
4110	Overtime	20,000	Peak Only	0%	0%	0%	57%	19%	13%	11%	0%	0.0%	0.0%	0%	0%
4190	Temporary	7,800	Peak Only	0%	0%	0%	57%	19%	13%	11%	0%	0.0%	0.0%	0%	0%
4200	Fringe Benefits	169,608	Peak Only	0%	0%	0%	57%	19%	13%	11%	0%	0.0%	0.0%	0%	0%
			Peak Only	0%	0%	0%					0%	0.0%	0.0%	0%	100%
General & Admin															
4500	Fees & Subscripti \$	5,504	Peak Only	0%	0%	0%	57%	19%	13%	11%	0%	0.0%	0.0%	0%	0%
5600	Misc Expenses	81,000	Peak Only	0%	0%	0%	57%	19%	13%	11%	0%	0.0%	0.0%	0%	0%
Materials & Supplies															
4600	Supplies	\$ 6,150	Peak Only	0%	0%	0%	57%	19%	13%	11%	0%	0.0%	0.0%	0%	0%
District Operations															
6200	Professional Fees	48,000	Peak Only	0%	0%	0%	57%	19%	13%	11%	0%	0.0%	0.0%	0%	0%



Conservation															
Personnel Services															
4100	Regular Salaries & \$	989,652	Conservation	0%	0%	50%	0%	22%	15%	13%	0%	0.0%	0.0%	0%	0%
4110	Overtime	10,000	Conservation	0%	0%	50%	0%	22%	15%	13%	0%	0.0%	0.0%	0%	0%
4200	Fringe Benefits	556,778	Conservation	0%	0%	50%	0%	22%	15%	13%	0%	0.0%	0.0%	0%	0%
General & Admin															
4500	Fees & Subscripti \$	15,230	Conservation	0%	0%	50%	0%	22%	15%	13%	0%	0.0%	0.0%	0%	0%
5200	Communications &	6,900	Conservation	0%	0%	50%	0%	22%	15%	13%	0%	0.0%	0.0%	0%	0%
5400	Taxes, Fees & Lic	475	Conservation	0%	0%	50%	0%	22%	15%	13%	0%	0.0%	0.0%	0%	0%
5600	Misc Expenses	20,225	Conservation	0%	0%	50%	0%	22%	15%	13%	0%	0.0%	0.0%	0%	0%
7000	Agency Expenses	-	Conservation	0%	0%	50%	0%	22%	15%	13%	0%	0.0%	0.0%	0%	0%
Materials & Supplies															
4600	Supplies \$	57,000	Conservation	0%	0%	50%	0%	22%	15%	13%	0%	0.0%	0.0%	0%	0%
District Operations															
5900	Equipment & Facil	9,800	Conservation	0%	0%	50%	0%	22%	15%	13%	0%	0.0%	0.0%	0%	0%
6000	Rebates & Backflc	992,500	Conservation	0%	0%	50%	0%	22%	15%	13%	0%	0.0%	0.0%	0%	0%
6200	Professional Fees	30,000	Conservation	0%	0%	50%	0%	22%	15%	13%	0%	0.0%	0.0%	0%	0%
6300	Repair & Maintena	1,200	Conservation	0%	0%	50%	0%	22%	15%	13%	0%	0.0%	0.0%	0%	0%
Finance															
Personnel Services															
4100	Regular Salaries & \$	3,152,167	Customer/Capacity	50%	50%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%
4110	Overtime	18,000	Customer/Capacity	50%	50%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%
4190	Temporary	7,500	Customer/Capacity	50%	50%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%
4195	Contract Help	7,000	Customer/Capacity	50%	50%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%
4200	Fringe Benefits	1,798,372	Customer/Capacity	50%	50%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%
General & Admin															
4500	Fees & Subscripti \$	17,110	Customer/Capacity	50%	50%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%
5200	Communications &	192,657	Customer/Capacity	50%	50%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%
5400	Taxes, Fees & Lic	368,700	Customer/Capacity	50%	50%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%
5600	Misc Expenses	87,091	Customer/Capacity	50%	50%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%
Materials & Supplies															
4600	Supplies \$	19,383	Customer/Capacity	50%	50%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%
4700	Materials	167,500	Customer/Capacity	50%	50%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%
District Operations															
5900	Equipment & Facil	27,000	Customer/Capacity	50%	50%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%
6200	Professional Fees	144,500	Customer/Capacity	50%	50%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%
6300	Repair & Maintena	19,700	Customer/Capacity	50%	50%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%
6500	Small Tools & Equ	8,444	Customer/Capacity	50%	50%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%
8000	Capital Expenditur \$	3,500	Customer/Capacity	50%	50%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%



HR															
<b>Personnel Services</b>															
4100	Regular Salaries & \$	847,585	Customer/Capacity	50%	50%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%	
4110	Overtime	1,300	Customer/Capacity	50%	50%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%	
4190	Temporary	8,000	Customer/Capacity	50%	50%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%	
4200	Fringe Benefits	468,179	Customer/Capacity	50%	50%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%	
			Customer/Capacity	50%	50%	0%				0%	0.0%	0.0%	0%	0%	
<b>General &amp; Admin</b>															
4500	Fees & Subscripti	21,205	Customer/Capacity	50%	50%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%	
5200	Communications &	645	Customer/Capacity	50%	50%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%	
5400	Taxes, Fees & Lic	17,500	Customer/Capacity	50%	50%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%	
5600	Misc Expenses	18,550	Customer/Capacity	50%	50%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%	
<b>Materials &amp; Supplies</b>															
4600	Supplies	\$ 5,300	Customer/Capacity	50%	50%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%	
<b>District Operations</b>															
5900	Equipment & Facil	4,350	Customer/Capacity	50%	50%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%	
6200	Professional Fees	11,000	Customer/Capacity	50%	50%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%	
6300	Repair & Maintena	6,120	Customer/Capacity	50%	50%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%	
6500	Small Tools & Equ	2,300	Customer/Capacity	50%	50%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%	
<b>Environment &amp; Engineering</b>															
<b>Personnel Services</b>															
4100	Regular Salaries & \$	8,158,853	Base/Peak	0%	0%	63%	0%	0%	0%	0%	0.0%	0.0%	0%	0%	
4100	Dedicated to CIP		As 2016-2020 CIP	0%	21%	7%	41%	11%	4%	3%	1%	0.0%	5.0%	0%	7%
4110	Overtime	367,626	Base/Peak	0%	0%	63%	0%	0%	0%	0%	37%	0.0%	0.0%	0%	0%
4190	Temporary	132,000	Base/Peak	0%	0%	63%	0%	0%	0%	0%	37%	0.0%	0.0%	0%	0%
4195	Contract Help	4,000	Base/Peak	0%	0%	63%	0%	0%	0%	0%	37%	0.0%	0.0%	0%	0%
4200	Fringe Benefits	5,677,574	Base/Peak	0%	0%	63%	0%	0%	0%	0%	37%	0.0%	0.0%	0%	0%
<b>General &amp; Admin</b>															
4500	Fees & Subscripti	73,411	Base/Peak	0%	0%	63%	0%	0%	0%	0%	37%	0.0%	0.0%	0%	0%
5200	Communications &	76,570	Base/Peak	0%	0%	63%	0%	0%	0%	0%	37%	0.0%	0.0%	0%	0%
5400	Taxes, Fees & Lic	303,021	Base/Peak	0%	0%	63%	0%	0%	0%	0%	37%	0.0%	0.0%	0%	0%
5600	Misc Expenses	4,550	Base/Peak	0%	0%	63%	0%	0%	0%	0%	37%	0.0%	0.0%	0%	0%
<b>Materials &amp; Supplies</b>															
4600	Supplies	\$ 203,637	Base/Peak	0%	0%	63%	0%	0%	0%	0%	37%	0.0%	0.0%	0%	0%
4700	Materials	138,700	Base/Peak	0%	0%	63%	0%	0%	0%	0%	37%	0.0%	0.0%	0%	0%
<b>District Operations</b>															
5100	Automotive	\$ 4,000	Base/Peak	0%	0%	63%	0%	0%	0%	0%	37%	0.0%	0.0%	0%	0%
5900	Equipment & Facil	55,900	Base/Peak	0%	0%	63%	0%	0%	0%	0%	37%	0.0%	0.0%	0%	0%
6200	Professional Fees	267,596	Base/Peak	0%	0%	63%	0%	0%	0%	0%	37%	0.0%	0.0%	0%	0%
6300	Repair & Maintena	225,176	Base/Peak	0%	0%	63%	0%	0%	0%	0%	37%	0.0%	0.0%	0%	0%
6500	Small Tools & Equ	20,168	Base/Peak	0%	0%	63%	0%	0%	0%	0%	37%	0.0%	0.0%	0%	0%
6600	Utilities	74,017	Base/Peak	0%	0%	63%	0%	0%	0%	0%	37%	0.0%	0.0%	0%	0%



8000	Capital Expenditur	\$ 176,400	As Fixed Assets	2%	45%	38%	0%	0%	0%	0%	3%	0.0%	6.7%	1%	4%
9999	Allocation to Capit.	\$ (2,904,609)	As Fixed Assets	2%	45%	38%	0%	0%	0%	0%	3%	0.0%	6.7%	1%	4%
Facilities & Watershed															
Personnel Services															
4100	Regular Salaries &	4,829,716	Base/Peak	0%	0%	63%	0%	0%	0%	0%	37%	0.0%	0.0%	0%	0%
4110	Overtime	494,500	Base/Peak	0%	0%	63%	0%	0%	0%	0%	37%	0.0%	0.0%	0%	0%
4190	Temporary	24,000	Base/Peak	0%	0%	63%	0%	0%	0%	0%	37%	0.0%	0.0%	0%	0%
4200	Fringe Benefits	3,237,719	Base/Peak	0%	0%	63%	0%	0%	0%	0%	37%	0.0%	0.0%	0%	0%
General & Admin															
4500	Fees & Subscriptic	\$ 38,707	Base/Peak	0%	0%	63%	0%	0%	0%	0%	37%	0.0%	0.0%	0%	0%
5200	Communications &	27,120	Base/Peak	0%	0%	63%	0%	0%	0%	0%	37%	0.0%	0.0%	0%	0%
5400	Taxes, Fees & Lic	134,250	Base/Peak	0%	0%	63%	0%	0%	0%	0%	37%	0.0%	0.0%	0%	0%
5600	Misc Expenses	3,150	Base/Peak	0%	0%	63%	0%	0%	0%	0%	37%	0.0%	0.0%	0%	0%
Materials & Supplies															
4600	Supplies	\$ 107,500	Base/Peak	0%	0%	63%	0%	0%	0%	0%	37%	0.0%	0.0%	0%	0%
4700	Materials	424,500	Base/Peak	0%	0%	63%	0%	0%	0%	0%	37%	0.0%	0.0%	0%	0%
District Operations															
5100	Automotive	\$ 539,900	Base/Peak	0%	0%	63%	0%	0%	0%	0%	37%	0.0%	0.0%	0%	0%
5800	Construction Contr	470,000	Base/Peak	0%	0%	63%	0%	0%	0%	0%	37%	0.0%	0.0%	0%	0%
5900	Equipment & Facil	70,567	Base/Peak	0%	0%	63%	0%	0%	0%	0%	37%	0.0%	0.0%	0%	0%
6200	Professional Fees	20,000	Base/Peak	0%	0%	63%	0%	0%	0%	0%	37%	0.0%	0.0%	0%	0%
6300	Repair & Maintena	204,550	Base/Peak	0%	0%	63%	0%	0%	0%	0%	37%	0.0%	0.0%	0%	0%
6500	Small Tools & Equ	28,850	Base/Peak	0%	0%	63%	0%	0%	0%	0%	37%	0.0%	0.0%	0%	0%
6600	Utilities	122,500	Base/Peak	0%	0%	63%	0%	0%	0%	0%	37%	0.0%	0.0%	0%	0%
8000	Capital Expenditur	\$ 1,131,900	Base/Peak	0%	0%	63%	0%	0%	0%	0%	37%	0.0%	0.0%	0%	0%
9999	Allocation to Capit	\$ (1,052,606)	All Functions	12%	15%	39%	0%	0%	0%	0%	27%	0.0%	0.0%	7%	0%



Watershed															
Personnel Services															
4100	Regular Salaries & \$	1,956,852	Watershed	0%	0%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	100%	0%
4110	Overtime	122,658	Watershed	0%	0%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	100%	0%
4190	Temporary	223,559	Watershed	0%	0%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	100%	0%
4195	Contract Help	404,277	Watershed	0%	0%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	100%	0%
4200	Fringe Benefits	1,204,119	Watershed	0%	0%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	100%	0%
			Watershed	0%	0%	0%					0%	0.0%	0.0%	100%	0%
General & Admin															
4500	Fees & Subscripti \$	22,821	Watershed	0%	0%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	100%	0%
5200	Communications &	4,973	Watershed	0%	0%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	100%	0%
5400	Taxes, Fees & Lic	15,360	Watershed	0%	0%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	100%	0%
5600	Misc Expenses	23,100	Watershed	0%	0%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	100%	0%
Materials & Supplies															
4600	Supplies \$	14,000	Watershed	0%	0%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	100%	0%
4700	Materials	34,235	Watershed	0%	0%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	100%	0%
District Operations															
5900	Equipment & Facil	50,360	Watershed	0%	0%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	100%	0%
6200	Professional Fees	326,500	Base Only	0%	0%	100%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%
6300	Repair & Maintena	685,352	Base Only	0%	0%	100%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%
6500	Small Tools & Equ	37,300	Watershed	0%	0%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	100%	0%
6600	Utilities	14,850	Watershed	0%	0%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	100%	0%
8000	Capital Expenditur \$	40,000	Watershed	0%	0%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	100%	0%





Inter-Departmental															
Personnel Services															
4200	Fringe Benefits	3,803,000	As Fixed Assets	2%	45%	38%	0%	0%	0%	0%	3%	0.0%	6.7%	1%	4%
General & Admin															
4500	Fees & Subscripti	\$ 179,359	Base Only	0%	0%	100%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%
5200	Communications &	43,700	Base Only	0%	0%	100%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%
5300	Debt Service	7,898,348	As Fixed Assets	2%	45%	38%	0%	0%	0%	0%	3%	0.0%	6.7%	1%	4%
	Future Debt	3,834,410	As 2016-2020 CIP	0%	21%	7%	41%	11%	4%	3%	1%	0.0%	5.0%	0%	7%
	Recycled Water D	-	Peak Only	0%	0%	0%	57%	19%	13%	11%	0%	0.0%	0.0%	0%	0%
	North Marin AEEP	245,000	Base Only	0%	0%	100%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%
	SCWA Water Sup	129,106	Peak Only	0%	0%	0%	57%	19%	13%	11%	0%	0.0%	0.0%	0%	0%
5400	Taxes, Fees & Lic	-	Base/Peak	0%	0%	63%	0%	0%	0%	0%	37%	0.0%	0.0%	0%	0%
5500	Insurance	1,145,000	Customer/Capacity	50%	50%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%
5600	Misc Expenses	478,100	As All Others	0%	0%	0%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	100%
Materials & Supplies															
4600	Supplies	\$ 63,520	Base Only	0%	0%	100%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%
District Operations															
5900	Equipment & Facil	21,250	Base Only	0%	0%	100%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%
6200	Professional Fees	78,400	Base Only	0%	0%	100%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%
6300	Repair & Maintena	92,800	Base Only	0%	0%	100%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%
6600	Utilities	-	Base Only	0%	0%	100%	0%	0%	0%	0%	0%	0.0%	0.0%	0%	0%
8000	Capital Expenditur	\$ 30,000	As Fixed Assets	2%	45%	38%	0%	0%	0%	0%	3%	0.0%	6.7%	1%	4%
Operating Expenditures Su \$ 76,081,835				\$ 6,240,262	\$ 10,933,403	\$ 23,895,639	\$ 6,902,673	\$ 5,623,011	\$ 3,393,601	\$ 2,312,555	\$ 10,214,744	\$ -	\$ 790,255	\$ 4,138,983	\$ 1,636,708
Reallocation of "As All Others"				\$ 145,272	\$ 254,527	\$ 556,284	\$ 160,692	\$ 130,902	\$ 79,002	\$ 53,836	\$ 237,796	\$ -	\$ 18,397	\$ 96,354	\$ (1,733,062)
Total Allocation \$ 76,178,189				\$ 6,385,534	\$ 11,187,929	\$ 24,451,923	\$ 7,063,365	\$ 5,753,914	\$ 3,472,603	\$ 2,366,391	\$ 10,452,540	\$ -	\$ 808,652	\$ 4,235,338	\$ (96,354)
Percentage Allocation 100.0%				8.4%	14.7%	32.1%	9.3%	7.6%	4.6%	3.1%	13.7%	0.0%	1.1%	5.6%	0.0%

RATE REVENUE REQUIREMENT		Allocation	Customer	Capacity	Base	Winter Demand	Average Demand	Summer Demand	Max Demand	Peak	w Water Exclsi	Private Fire	Watershed	As All Others
Operating Expenses	\$ 76,081,835	As O&M	8%	14%	31%	9%	7%	4%	3%	13%	0%	1%	5%	2%
Additional O&M	\$ -	As Fixed Assets	2%	45%	38%	0%	0%	0%	0%	3%	0%	7%	1%	4%
Debt	Included Above	As Fixed Assets	2%	45%	38%	0%	0%	0%	0%	3%	0%	7%	1%	4%
Rate Funded Capital	Included Above	As All Others	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%
Replacement Funding (Depre	\$ -	As All Others	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%
Transfers to Capital Reserve	\$ -	As All Others	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%
Coverage Driven Increase		As All Others	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%
Less Offsetting Revenues														
Cash Flow	\$ 143,384	As All Others	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%
Total Other Revenues	\$ (3,440,000)	As All Others	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%
Total Additional Revenues	\$ -	As All Others	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%
Total Rate Revenues to be \$ 72,785,219			\$ 6,240,262	\$ 10,933,403	\$ 23,895,639	\$ 6,902,673	\$ 5,623,011	\$ 3,393,601	\$ 2,312,555	\$ 10,214,744	\$ -	\$ 790,255	\$ 4,138,983	\$ (1,659,908)
Reallocation of "As All Others"			\$ (147,331)	\$ (258,135)	\$ (564,169)	\$ (162,970)	\$ (132,758)	\$ (80,122)	\$ (54,599)	\$ (241,167)	\$ -	\$ (18,658)		\$ 1,659,908
Reallocation of Plant in Service from Raw										\$ 197,634	\$ (197,634)			\$ -
Reallocation of peak to tiers			\$ -	\$ -	\$ 5,085,605	\$ -	\$ 2,199,134	\$ 1,528,105	\$ 1,358,367	\$ (10,171,210)	\$ -	\$ -	\$ -	\$ -
Total Allocation \$ 72,785,219			\$ 6,092,931	\$ 10,675,268	\$ 28,417,075	\$ 6,739,703	\$ 7,689,388	\$ 4,841,584	\$ 3,616,323	\$ -	\$ (197,634)	\$ 771,598	\$ 4,138,983	\$ -
Percentage Allocation 100.0%			8.4%	14.7%	39.0%	9.3%	10.6%	6.7%	5.0%	0.0%	-0.3%	1.1%	5.7%	0.0%

## APPENDIX H — MULTI YEAR FUNCTIONAL ALLOCATION

The results of the functional allocation Appendix G are then multiplied by the revenue requirement (Appendix E) to distribute the necessary rate revenues across each function.

TABLE H- 1 MULTI-YEAR FUNCTIONAL ALLOCATION RESULTS

### Multi-Year Functional Cost Allocation

2020-2021 WATER FUNDING SUMMARY											
	Customer	Capacity	Base	Winter Demand	Average Demand	Summer Demand	Max Demand	Raw Water Exclusion	Private Fire	Watershed	
% Allocation	100%	8.4%	14.7%	39%	9%	11%	7%	5%	-0.3%	1.1%	5.7%
	\$ Allocation	Amount Allocable to Constituent									
FY 2017/18	\$ 74,358,580	6,224,639	10,906,030	29,031,352	6,885,391	7,855,605	4,946,242	3,694,495	(201,906)	788,277	4,228,454
FY 2018/19	79,563,681	6,660,364	11,669,452	31,063,547	7,367,369	8,405,498	5,292,479	3,953,110	(216,039)	843,456	4,524,446
FY 2019/20	85,133,138	7,126,589	12,486,314	33,237,995	7,883,085	8,993,883	5,662,952	4,229,828	(231,162)	902,498	4,841,157
FY 2020/21	91,092,458	7,625,451	13,360,356	35,564,655	8,434,901	9,623,454	6,059,359	4,525,916	(247,343)	965,673	5,180,038

## APPENDIX I — CUSTOMER CLASS ALLOCATIONS

The results of the multi-year functional allocation Appendix H are then multiplied by the each customer class's share of the function. While the customer and service functions are calculated in aggregate, the methodology is consistent. Customer costs are allocated to each class based on its respective share of customer accounts. This continues until each function is allocated. The series of tables below outline the costs allocated to each class, function, and year.

TABLE I- 1 CUSTOMER CLASS COST ALLOCATION RESULTS

Base		Costs							
Allocation Factor	Total Allocation	Single Family	Duplex	Multi-Family	Commercial	SF Irrigation	Recycled Water	Raw Water	
Total Usage	100.0%	56.2%	2.8%	12.2%	25.5%	0.1%	1.8%	1.4%	
FY 2016/17	\$ 20,454,549	\$ 11,566,009	\$ 569,677	\$ 2,507,870	\$ 5,247,271	\$ 14,432	\$ 380,063	\$ 177,097	
FY 2017/18	29,031,352	16,415,756	808,548	3,559,446	7,447,506	20,484	539,428	251,356	
FY 2018/19	31,063,547	17,564,859	865,147	3,808,607	7,968,831	21,918	577,188	268,951	
FY 2019/20	33,237,995	18,794,399	925,707	4,075,209	8,526,649	23,452	617,591	287,777	
FY 2020/21	35,564,655	20,110,007	990,506	4,360,474	9,123,515	25,094	660,822	307,921	

Winter Demand		Costs							
Allocation Factor	Total Allocation	Single Family	Duplex	Multi-Family	Commercial	SF Irrigation	Recycled Water	Raw Water	
Peak 1	100.0%	56.3%	2.9%	12.9%	25.3%	0.1%	1.5%	1.0%	
FY 2016/17	\$ 12,748,381	\$ 7,179,111.0	\$ 370,744.5	\$ 1,649,876.5	\$ 3,222,883.6	\$ 7,809.4	\$ 192,501.5	\$ 125,454.6	
FY 2017/18	6,885,391	3,877,433	200,239	891,097	1,740,677	4,218	103,970	67,758	
FY 2018/19	7,367,369	4,148,853	214,256	953,474	1,862,524	4,513	111,248	72,501	
FY 2019/20	7,883,085	4,439,273	229,253	1,020,217	1,992,901	4,829	119,035	77,576	
FY 2020/21	8,434,901	4,750,022	245,301	1,091,632	2,132,404	5,167	127,368	83,006	

### Average Demand Costs

Allocation Factor	Total Allocation	Single Family	Duplex	Multi-Family	Commercial	SF Irrigation	Recycled Water	Raw Water
Peak 2	100.0%	55.2%	2.9%	15.4%	23.7%	0.0%	1.5%	1.2%
FY 2016/17	\$ 7,458,934	\$ 4,117,868	\$ 219,169	\$ 1,149,661	\$ 1,767,577	\$ 3,432	\$ 110,762	\$ 90,465
FY 2017/18	7,855,605	4,336,859	230,825	1,210,800	1,861,578	3,615	116,652	95,276
FY 2018/19	8,405,498	4,640,439	246,982	1,295,557	1,991,889	3,868	124,818	101,945
FY 2019/20	8,993,883	4,965,270	264,271	1,386,245	2,131,321	4,139	133,555	109,081
FY 2020/21	9,623,454	5,312,839	282,770	1,483,283	2,280,513	4,428	142,904	116,717

### Summer Demand Costs

Allocation Factor	Total Allocation	Single Family	Duplex	Multi-Family	Commercial	SF Irrigation	Recycled Water	Raw Water
Peak 3	100.0%	65.4%	2.9%	5.8%	21.6%	0.05%	2.6%	1.7%
FY 2016/17	\$ 4,554,851	\$ 2,976,773	\$ 130,778	\$ 262,884	\$ 984,797	\$ 2,263	\$ 119,178	\$ 78,179
FY 2017/18	\$ 4,946,242	3,232,562	142,016	285,473	1,069,418	2,457	129,419	84,897
FY 2018/19	\$ 5,292,479	3,458,841	151,957	305,456	1,144,278	2,629	138,478	90,839
FY 2019/20	\$ 5,662,952	3,700,960	162,594	326,838	1,224,377	2,813	148,171	97,198
FY 2020/21	\$ 6,059,359	3,960,027	173,976	349,717	1,310,084	3,010	158,543	104,002

### Max Demand Costs

Allocation Factor	Total Allocation	Single Family	Duplex	Multi-Family	Commercial	SF Irrigation	Recycled Water	Raw Water
Peak 4	100.0%	43.3%	0.1%	2.5%	39.7%	0.3%	6.5%	7.5%
FY 2016/17	\$ 3,488,522	\$ 1,510,285	\$ 4,744	\$ 87,183	\$ 1,386,505	\$ 10,344	\$ 226,743	\$ 262,720
FY 2017/18	3,694,495	1,599,456	5,024	92,330	1,468,368	10,954	240,131	278,231
FY 2018/19	3,953,110	1,711,418	5,375	98,793	1,571,154	11,721	256,940	297,708
FY 2019/20	4,229,828	1,831,218	5,752	105,709	1,681,135	12,542	274,926	318,547
FY 2020/21	4,525,916	1,959,403	6,154	113,108	1,798,814	13,420	294,171	340,845

### Private Fire Costs

Allocation Factor	Total Allocation	Single Family	Duplex	Multi-Family	Commercial	SF Irrigation	Recycled Water	Raw Water	Fireline & Hydrant
Fire Direct	100.0%								100.0%
FY 2016/17	\$ 609,196	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 609,196
FY 2017/18	788,277	-	-	-	-	-	-	-	788,277
FY 2018/19	843,456	-	-	-	-	-	-	-	843,456
FY 2019/20	902,498	-	-	-	-	-	-	-	902,498
FY 2020/21	965,673	-	-	-	-	-	-	-	965,673

## APPENDIX J — RATE DESIGN

The costs allocated in Appendix I are the basis for what needs to be recovered from the rate component. Each cost shown in Appendix I will serve as the numerator in the rate calculation. The numerator will be derived from Table 7-9 of the report that summarizes demand and demand by tier. For the commodity charge, each of the Peak components are allocated to its corresponding tier and added to the base rate. For example, SFR Winter Demand costs are divided by SFR Tier 1 demand. This result is added to the result of SFR Base cost divided by SFR total demand. The combined Base and Tier 1 components equate to the proposed Tier 1 rate.

**TABLE J-1 SINGLE-FAMILY RESIDENTIAL RATE CALCULATION**

Projected Annual Consumption (HCF)	<i>no pe</i>	5,365,275	5,365,275	5,365,275	5,365,275
Price Elasticity Adjustment (beginning FY 2015/16)					
Projected Annual Consumption (HCF)		5,365,275	5,365,275	5,365,275	5,365,275
Base Revenue Requirement		16,415,756	17,564,859	18,794,399	20,110,007
Base Unit Cost (\$/CCF)		\$ 3.06	\$ 3.27	\$ 3.50	\$ 3.75

Single Family		Projected Revenue Requirement per Block			
Tier	Tier Allocation	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21
Peak Low		\$ 3,877,433	\$ 4,148,853	\$ 4,439,273	\$ 4,750,022
Peak Med		4,336,859	4,640,439	4,965,270	5,312,839
Peak High		3,232,562	3,458,841	3,700,960	3,960,027
Peak Max		1,599,456	1,711,418	1,831,218	1,959,403
<b>Total</b>		<b>13,046,310</b>	<b>13,959,552</b>	<b>14,936,720</b>	<b>15,982,291</b>

SF 2		Projected Consumption per Block (%)			
Tier	Tier Allocation	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21
Tier 1	71.59%	72%	72%	72%	72%
Tier 2	19.90%	20%	20%	20%	20%
Tier 3	6.69%	7%	7%	7%	7%
Tier 4	1.82%	2%	2%	1.82%	2%

Tier	pe adjustment	Projected Consumption per Block after Reduction (HCF)			
Tier 1	0%	3,841,085	3,841,085	3,841,085	3,841,085
Tier 2	0%	1,067,517	1,067,517	1,067,517	1,067,517
Tier 3	0%	359,055	359,055	359,055	359,055
Tier 4	0%	97,618	97,618	97,618	97,618
<b>Total</b>		<b>5,365,275</b>	<b>5,365,275</b>	<b>5,365,275</b>	<b>5,365,275</b>

Tier	Projected Rate				
Tier 1	0%	\$ 4.07	\$ 4.36	\$ 4.66	\$ 4.99
Tier 2	0%	\$ 7.13	\$ 7.62	\$ 8.16	\$ 8.73
Tier 3	0%	\$ 12.07	\$ 12.91	\$ 13.81	\$ 14.78
Tier 4	0%	\$ 19.45	\$ 20.81	\$ 22.26	\$ 23.83

**TABLE J- 2                      DUPLEX RATE CALCULATION**

Projected Annual Consumption (HCF)		264,343		264,343		264,343		264,343		264,343
Base Revenue Requirement		808,548		865,147		925,707		990,506		1,040,032
Base Unit Cost (\$/CCF)		\$ 3.06		\$ 3.27		\$ 3.50		\$ 3.75		\$ 3.93

Duplex		Peak Allocation (\$)				
Tier	Tier Allocation	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22
Tier 1		\$ 200,239	\$ 214,256	\$ 229,253	\$ 245,301	\$ 257,566
Tier 2		230,825	246,982	264,271	282,770	296,909
Tier 3		142,016	151,957	162,594	173,976	182,674
Tier 4		5,024	5,375	5,752	6,154	6,462
<b>Total</b>		<b>578,103</b>	<b>618,570</b>	<b>661,870</b>	<b>708,201</b>	<b>743,611</b>

Duplex 2		Projected Consumption per Block (%)				
Tier	Tier Allocation	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22
Tier 1	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%
Tier 2	20.9%	20.9%	20.9%	20.9%	20.9%	20.9%
Tier 3	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%
Tier 4	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%

Tier	pe adjustment	Projected Consumption per Block after Reduction (HCF)				
Tier 1	0%	192,932	192,932	192,932	192,932	192,932
Tier 2	0%	55,237	55,237	55,237	55,237	55,237
Tier 3	0%	15,857	15,857	15,857	15,857	15,857
Tier 4	0%	317	317	317	317	317
<b>Total</b>		<b>264,343</b>	<b>264,343</b>	<b>264,343</b>	<b>264,343</b>	<b>264,343</b>

Tier	Projected Rate				
Tier 1	\$ 4.10	\$ 4.39	\$ 4.70	\$ 5.02	\$ 5.27
Tier 2	\$ 7.24	\$ 7.75	\$ 8.29	\$ 8.87	\$ 9.31
Tier 3	\$ 12.02	\$ 12.86	\$ 13.76	\$ 14.72	\$ 15.46
Tier 4	\$ 18.90	\$ 20.23	\$ 21.64	\$ 23.16	\$ 24.31

TABLE J- 3 MULTI-FAMILY RESIDENTIAL RATE CALCULATION

Projected Annual Consumption (HCF)	1,157,426	1,157,426	1,157,426	1,157,426	1,157,426
Base Revenue Requirement	3,559,446	3,808,607	4,075,209	4,360,474	4,578,498
Base Unit Cost (\$/CCF)	\$ 3.06	\$ 3.29	\$ 3.52	\$ 3.77	\$ 3.96

Multi-Family		Projected Consumption per Block (%)				
Tier	Tier Allocation	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22
Tier 1		\$ 891,097	\$ 953,474	\$ 1,020,217	\$ 1,091,632	\$ 1,146,214
Tier 2		1,210,800	1,295,557	1,386,245	1,483,283	1,557,447
Tier 3		285,473	305,456	326,838	349,717	367,202
Tier 4		92,330	98,793	105,709	113,108	118,764
Total		2,479,701	2,653,280	2,839,009	3,037,740	3,189,627

MF2		Projected Consumption per Block (%)				
Tier	Tier Allocation	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22
Tier 1	70%	70%	70%	70%	70%	70%
Tier 2	26%	26%	26%	26%	26%	26%
Tier 3	3%	3%	3%	3%	3%	3%
Tier 4	1%	1%	1%	1%	1%	1%

Tier	pe adjustment	Projected Consumption per Block after Reduction (HCF)				
Tier 1	0%	814,269	814,269	814,269	814,269	814,269
Tier 2	0%	302,443	302,443	302,443	302,443	302,443
Tier 3	0%	34,897	34,897	34,897	34,897	34,897
Tier 4	0%	5,816	5,816	5,816	5,816	5,816
Total		1,157,426	1,157,426	1,157,426	1,157,426	1,157,426

Tier	Projected Rates				
Tier 1	\$ 4.16	\$ 4.47	\$ 4.78	\$ 5.11	\$ 5.37
Tier 2	\$ 7.07	\$ 7.58	\$ 8.11	\$ 8.68	\$ 9.11
Tier 3	\$ 11.25	\$ 12.05	\$ 12.89	\$ 13.79	\$ 14.48
Tier 4	\$ 18.94	\$ 20.28	\$ 21.70	\$ 23.22	\$ 24.38



**TABLE J- 4 COMMERCIAL RATE CALCULATION**

Projected Annual Consumption (HCF)	2,410,020	2,410,020	2,410,020	2,410,020	2,410,020
Base Revenue Requirement	\$ 7,447,506	\$ 7,968,831	\$ 8,526,649	\$ 9,123,515	\$ 9,579,691
Base Cost (\$/CCF)	\$ 3.09	\$ 3.31	\$ 3.54	\$ 3.79	\$ 3.97

Commercial 2		Projected Consumption per Block (%)				
Tier	Tier Allocation	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22
Tier 1	0%	\$ 1,740,677	\$ 1,862,524	\$ 1,992,901	\$ 2,132,404	\$ 2,239,025
Tier 2	0%	1,861,578	1,991,889	2,131,321	2,280,513	2,394,539
Tier 3	0%	1,069,418	1,144,278	1,224,377	1,310,084	1,375,588
Tier 4	0%	1,468,368	1,571,154	1,681,135	1,798,814	1,888,755
<b>Total</b>		<b>\$ 6,140,042</b>	<b>\$ 6,569,845</b>	<b>\$ 7,029,734</b>	<b>\$ 7,521,816</b>	<b>\$ 7,897,906</b>

Commercial 2		Projected Consumption per Block (%)				
Tier	Tier Allocation	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22
Tier 1	82%	82%	82%	82%	82%	82%
Tier 2	10%	10%	10%	10%	10%	10%
Tier 3	8%	8%	8%	8%	8%	8%

Tier	pe adjustment	Projected Consumption per Block after Reduction (HCF)				
Tier 1	0%	1,976,216	1,976,216	1,976,216	1,976,216	1,976,216
Tier 2	0%	241,002	241,002	241,002	241,002	241,002
Tier 3	0%	192,802	192,802	192,802	192,802	192,802
<b>Total</b>		<b>2,410,020</b>	<b>2,410,020</b>	<b>2,410,020</b>	<b>2,410,020</b>	<b>2,410,020</b>

Tier	Projected Rate				
Tier 1	\$3.98	\$4.25	\$4.55	\$4.87	\$5.11
Tier 2	\$10.82	\$11.58	\$12.39	\$13.25	\$13.92
Tier 3	\$16.26	\$17.40	\$18.61	\$19.92	\$20.91

TABLE J- 5 SINGLE-FAMILY IRRIGATION RATE CALCULATION

Projected Annual Consumption (HCF)	5,833	5,833	5,833	5,833	5,833
Base Revenue Requirement	\$ 20,484.07	\$ 21,917.96	\$ 23,452.22	\$ 25,093.87	\$ 26,348.56
Base Cost (\$/CCF)	\$ 3.51	\$ 3.76	\$ 4.02	\$ 4.30	\$ 4.52

SF Irrigation		Projected Peak Cost per Block (\$)				
Tier	Tier Allocation	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22
Tier 1	0%	\$ 4,218	\$ 4,513	\$ 4,829	\$ 5,167	\$ 5,425
Tier 2	64%	3,615	3,868	4,139	4,428	4,650
Tier 3	9%	2,457	2,629	2,813	3,010	3,161
Tier 4	6%	10,954	11,721	12,542	13,420	14,091
<b>Total</b>		<b>\$ 21,244</b>	<b>\$ 22,731</b>	<b>\$ 24,323</b>	<b>\$ 26,025</b>	<b>\$ 27,326</b>

SF Irrigation		Projected Consumption per Block (%)				
Tier	Tier Allocation	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22
Tier 1	45%	45%	45%	45%	45%	45%
Tier 2	24%	24%	24%	24%	24%	24%
Tier 3	32%	32%	32%	32%	32%	32%

Tier	pe adjustment	Projected Consumption per Block after Reduction (HCF)				
Tier 1	0%	2,605	2,605	2,605	2,605	2,605
Tier 2	0%	1,375	1,375	1,375	1,375	1,375
Tier 3	0%	1,853	1,853	1,853	1,853	1,853
<b>Total</b>		<b>5,833</b>	<b>5,833</b>	<b>5,833</b>	<b>5,833</b>	<b>5,833</b>

Tier	Projected Rate				
Tier 1	\$ 5.14	\$ 5.50	\$ 5.88	\$ 6.29	\$ 6.61
Tier 2	\$ 6.15	\$ 6.58	\$ 7.04	\$ 7.53	\$ 7.90
Tier 3	\$ 10.76	\$ 11.51	\$ 12.31	\$ 13.18	\$ 13.83

TABLE J- 6 RECYCLED WATER RATE CALCULATION

		Allocated Base & Peak Water Costs				
Base Revenue to Recover		539,428	577,188	617,591	660,822	693,864
Tier	Tier Allocation	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22
Peak Low		\$ 103,970	\$ 111,248	\$ 119,035	\$ 127,368	\$ 133,736
Peak Med		\$ 116,652	\$ 124,818	\$ 133,555	\$ 142,904	\$ 150,049
Peak High		\$ 129,419	\$ 138,478	\$ 148,171	\$ 158,543	\$ 166,470
Peak Max		\$ 240,131	\$ 256,940	\$ 274,926	\$ 294,171	\$ 308,879
Total		590,172	631,484	675,688	722,986	759,135
Projected Base Unit Cost (\$/HCF)		\$ 2.56	\$ 2.74	\$ 2.94	\$ 3.14	\$ 3.30
Recycled Water		Projected Consumption per Block (%)				
Tier	Tier Allocation	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22
Tier 1	82%	82%	82%	82%	82%	82%
Tier 2	7%	7%	7%	7%	7%	7%
Tier 3	11%	11%	11%	11%	11%	11%
Tier	pe adjustment	Projected Consumption per Block after Reduction (HCF)				
Tier 1	0%	171,945	171,945	171,945	171,945	171,945
Tier 2	0%	15,586	15,586	15,586	15,586	15,586
Tier 3	0%	22,866	22,866	22,866	22,866	22,866
Total		210,397	210,397	210,397	210,397	210,397
Tier	Projected Rate Cost (\$/ccf)					
Tier 1		\$3.17	\$3.40	\$3.63	\$3.89	4.08
Tier 2		\$10.05	\$10.76	\$11.51	\$12.31	12.93
Tier 3		\$18.73	\$20.04	\$21.44	\$22.94	24.09

TABLE J- 7 RAW WATER RATE CALCULATION

	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22
Base Cost	\$ 251,356	\$ 268,951	\$ 287,777	\$ 307,921	\$ 323,318
Peak Low	\$ 67,758	\$ 72,501	\$ 77,576	\$ 83,006	\$ 87,157
Peak Med	\$ 95,276	\$ 101,945	\$ 109,081	\$ 116,717	\$ 122,553
Peak High	\$ 84,897	\$ 90,839	\$ 97,198	\$ 104,002	\$ 109,202
Peak Max	\$ 278,231	\$ 297,708	\$ 318,547	\$ 340,845	\$ 357,888
Raw Exclusion	\$ (216,039)	\$ (231,162)	\$ (247,343)	\$ (259,710)	\$ (272,696)
Total Raw Water Cost	\$ 561,478	\$ 600,782	\$ 642,836	\$ 692,782	\$ 727,421
Raw Water Usage	132,858	132,858	132,858	132,858	132,858
Raw Base	\$ 1.89	\$ 2.02	\$ 2.17	\$ 2.32	\$ 2.43
Peak Cost	\$ 2.33	\$ 2.50	\$ 2.67	\$ 2.90	\$ 3.04
Usage	132,858	132,858	132,858	132,858	132,858
Total Raw Water Allocation	\$ 561,478	\$ 600,782	\$ 642,836	\$ 692,782	\$ 727,421
Tier	Projected Unit Cost (\$/ccf)				
Uniform Rate	\$ 4.23	\$ 4.53	\$ 4.84	\$ 5.22	\$ 5.48

TABLE J- 8 SERVICE CHARGE CALCULATION

		FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	
Fixed Charges for All Customers						
Number of Accounts		60,569	60,452	60,452	60,452	
Number of MEUs		92,467	92,467	92,467	92,467	
Customer Revenue to Recover		\$ 6,224,639	\$ 6,660,364	\$ 7,126,589	\$ 7,625,451	
Capacity Revenue to Recover		10,906,030	11,669,452	12,486,314	13,360,356	
Bi-Monthly Component Charge per Account		\$ 17.13	\$ 18.37	\$ 19.65	\$ 21.03	
Bi-Monthly Component Charge per ME		\$ 19.66	\$ 21.04	\$ 22.51	\$ 24.09	
Meter Size	Equivalents	Bi-Monthly				
5/8"	1.0	\$ 36.79	\$ 39.41	\$ 42.16	\$ 45.12	
3/4"	1.5	46.62	49.93	53.42	57.17	
1"	2.5	66.28	70.97	75.93	81.26	
1.5"	5.0	115.43	123.57	132.20	141.48	
2"	8.0	174.41	186.69	199.73	213.75	
3"	17.5	361.18	386.57	413.58	442.61	
4"	31.5	636.42	681.13	728.72	779.87	
6"	70.0	1,393.33	1,491.17	1,595.35	1,707.33	
8"	120.0	2,376.33	2,543.17	2,720.85	2,911.83	
10"	190.0	3,752.53	4,015.97	4,296.55	4,598.13	
Meter Size	Equivalents	Existing 2014	Bi-Monthly			
5/8"	1.0	21.53	\$ 36.79	39.41	42.16	45.12
3/4"	1.5	23.81	\$ 46.62	49.93	53.42	57.17
1"	2.5	32.88	\$ 66.28	70.97	75.93	81.26
1.5"	5.0	55.66	\$ 115.43	123.57	132.20	141.48
2"	8.0	82.85	\$ 174.41	186.69	199.73	213.75
3"	17.5	155.51	\$ 361.18	386.57	413.58	442.61
4"	31.5	214.69	\$ 636.42	681.13	728.72	779.87
6"	70.0	463.76	\$ 1,393.33	1,491.17	1,595.35	1,707.33
8"	120.0	917.90	\$ 2,376.33	2,543.17	2,720.85	2,911.83
10"	190.0	1,372.04	\$ 3,752.53	4,015.97	4,296.55	4,598.13

TABLE J- 9 WATERSHED CHARGE CALCULATION

	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21
<b>Allocated to Customer</b>	\$ 2,118,584	\$ 2,266,885	\$ 2,425,567	\$ 2,595,357
<b>Allocated to Meter Equivalent</b>	\$ 2,109,870	\$ 2,257,561	\$ 2,415,590	\$ 2,584,681
<b>Total Allocated Costs</b>	<b>\$ 4,228,454</b>	<b>\$4,524,446</b>	<b>\$4,841,157</b>	<b>\$5,180,038</b>
<b>Number of Accounts</b>	59,201	59,497	59,794	60,093
<b>Number of Meter Equivalents</b>	92,467	92,929	93,394	93,861
<b>Bi Monthly Cost per Account</b>	<b>\$ 5.97</b>	<b>\$ 6.36</b>	<b>\$ 6.77</b>	<b>\$ 7.20</b>
<b>Bi Monthly Cost per Meter Equivalent</b>	<b>\$ 3.81</b>	<b>\$ 4.05</b>	<b>\$ 4.32</b>	<b>\$ 4.59</b>

#### Watershed Fee - Bi-Monthly

#### Hybrid Approach (MEU & Account Based)

Meter Size	Meter Equivalents	Accounts	Watershed Fee @ Existing ME			
5/8"	1.00		\$9.78	\$10.41	\$11.09	\$11.79
3/4"	1.50		\$11.69	\$12.44	\$13.25	\$14.09
1"	2.50		\$15.50	\$16.49	\$17.57	\$18.68
1.5"	5.00		\$25.02	\$26.61	\$28.37	\$30.15
2"	8.00		\$36.45	\$38.76	\$41.33	\$43.92
3"	17.50		\$72.65	\$77.24	\$82.37	\$87.53
4"	31.50		\$125.99	\$133.94	\$142.85	\$151.79
6"	70.00		\$272.67	\$289.86	\$309.17	\$328.50
8"	120.00		\$463.17	\$492.36	\$525.17	\$558.00
10"	190.00		\$729.87	\$775.86	\$827.57	\$879.30

TABLE J- 10 PRIVATE FIRE SERVICE CHARGE CALCULATION

	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21
<b>Private Fire Tap Service Charge</b>				
Number of Accounts	1,251	1,251	1,251	1,251
Number of MEUs	70,196	70,196	70,196	70,196
Customer Revenue to Recover				
Capacity Revenue to Recover				
Direct Fire Allocation	788,277	843,456	902,498	965,673
Bi-Monthly Account Charge (from Service Charge Calc)	\$ 17.13	\$ 18.37	\$ 19.65	\$ 21.03
Fire Related Bi-Monthly Component Charge per EDU	1.88	2.01	2.15	2.30

<i>Existing</i>					
Meter Size	Equivalents	<b>Bi-Monthly Fixed Charges (Rounded up to nearest cent)</b>			
2 inches	8.00	\$ 32.17	\$ 34.45	\$ 36.85	\$ 39.43
4 inches	31.50	\$ 76.35	\$ 81.69	\$ 87.38	\$ 93.48
6 inches	70.00	\$ 148.73	\$ 159.07	\$ 170.15	\$ 182.03
8 inches	120.00	\$ 242.73	\$ 259.57	\$ 277.65	\$ 297.03
10 inches	190.00	\$ 374.33	\$ 400.27	\$ 428.15	\$ 458.03



## APPENDIX K — DEMAND REDUCTION RATES

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The following tables present the calculations and assumptions used to estimate the potential revenue shortfall from under each of the three demand reduction scenarios (5, 15, and 45 percent).

TABLE K- 1 REVENUES UNDER 5% SCENARIO

	Demand Assumption	Units	Revenue
<b>Demand Reduction Conditions</b>			
Total Fixed		59,092	21,196,005
Total Variable	-5%	9,076,706 CCF	47,609,945
Total Revenue	-4%	20,837 AF	<b>\$ 68,805,950</b>
	<i>Demand Reduction Impact</i>		<i>\$ (4,624,731)</i>
	<i>Additional SCWA Need (\$)</i>		<i>\$ 1,031,667</i>
<b>Single Family Volumetric Rates</b>			
Tier 1	0%	3,841,085	\$ 15,633,217
Tier 2	-10%	960,765	6,850,258
Tier 3	-25%	269,291	3,250,341
Tier 4	-50%	48,809	949,335
	<b>-5%</b>	<b>5,119,951</b>	<b>\$ 26,683,151</b>
	10,231 AF	11,754 AF	
<b>Duplex Volumetric Rates</b>			
Tier 1	0%	192,932	\$ 791,019
Tier 2	-10%	49,713	359,922
Tier 3	-25%	11,893	142,954
Tier 4	-50%	159	2,997
	<b>-4%</b>	<b>254,696</b>	<b>\$ 1,296,892</b>
	0,502 AF	0,585 AF	
<b>Multi Family Volumetric Rates</b>			
Tier 1	0%	814,269	\$ 3,387,360
Tier 2	-10%	272,199	1,924,444
Tier 3	-25%	26,173	294,446
Tier 4	-50%	2,908	55,080
	<b>-4%</b>	<b>1,115,549</b>	<b>\$ 5,661,329</b>
	2,404 AF	2,561 AF	
<b>Commercial Volumetric Rates</b>			
Tier 1	-5%	1,877,405	7,472,073
Tier 2	-10%	216,902	2,346,877
Tier 3	-20%	154,241	2,507,963
	<b>-7%</b>	<b>2,248,548</b>	<b>\$ 12,326,913</b>
	4,353 AF	5,162 AF	
<b>Single Family Irrigation Volumetric Rates</b>			
Tier 1	-5%	2,475	12,720
Tier 2	-10%	1,238	7,612
Tier 3	-20%	1,482	15,947
	<b>-11%</b>	<b>5,194</b>	<b>\$ 36,278</b>
	0,012 AF	0,012 AF	
<b>Recycled Water Rates</b>			
0	0%	171,945	545,066
0	-10%	14,028	140,978
0	-10%	20,579	385,446
	<b>-2%</b>	<b>206,552</b>	<b>\$ 1,071,490</b>
	0,690 AF	0,474 AF	
<b>Raw Water Rates</b>			
Uniform Rate	-5%	126,215	533,891
	<b>-5%</b>	<b>126,215</b>	<b>\$ 533,891</b>
	0,146 AF	0,290 AF	



**TABLE K- 2 REVENUES UNDER 15% SCENARIO**

	Demand Assumption	Units	Revenue
Demand Reduction Conditions			
Total Fixed		59,092	21,196,005
Total Variable	-15%	8,099,662 CCF	40,908,541
Total Revenue	-14%	18,594 AF	<b>\$ 62,104,546</b>
	Demand Reduction Impact		\$ (11,326,135)
	Additional SCWA Need (\$)		\$ 1,031,667

**Single Family Volumetric Rates**

Tier 1	-10%	3,456,977	\$ 14,069,896
Tier 2	-20%	854,014	6,089,118
Tier 3	-50%	179,527	2,166,894
Tier 4	-80%	19,524	379,734
	<b>-16%</b>	<b>4,510,041</b>	<b>\$ 22,705,641</b>
	10,231 AF	10,354 AF	

**Duplex Volumetric Rates**

Tier 1	-10%	173,638	\$ 711,918
Tier 2	-20%	44,189	319,930
Tier 3	-50%	7,929	95,303
Tier 4	-80%	63	1,199
	<b>-15%</b>	<b>225,820</b>	<b>\$ 1,128,349</b>
	0,502 AF	0,518 AF	

**Multi Family Volumetric Rates**

Tier 1	-10%	732,842	\$ 3,048,624
Tier 2	-20%	241,954	1,710,617
Tier 3	-50%	17,449	196,297
Tier 4	-80%	1,163	22,032
	<b>-14%</b>	<b>993,409</b>	<b>\$ 4,977,570</b>
	2,404 AF	2,281 AF	

**Commercial Volumetric Rates**

Tier 1	-10%	1,778,594	7,078,806
Tier 2	-20%	192,802	2,086,113
Tier 3	-50%	96,401	1,567,477
	<b>-14%</b>	<b>2,067,797</b>	<b>\$ 10,732,396</b>
	4,353 AF	4,747 AF	

**Single Family Irrigation Volumetric Rates**

Tier 1	-10%	2,344	12,050
Tier 2	-20%	1,100	6,766
Tier 3	-50%	926	9,967
	<b>-25%</b>	<b>4,371</b>	<b>\$ 28,783</b>
	0,012 AF	0,010 AF	

**Recycled Water Rates**

0	-10%	154,751	490,560
0	-20%	12,469	125,314
0	-50%	11,433	214,137
	<b>-15%</b>	<b>178,652</b>	<b>\$ 830,010</b>
	0,690 AF	0,410 AF	

**Raw Water Rates**

Uniform Rate	-10%	119,572	505,791
	<b>-10%</b>	<b>119,572</b>	<b>\$ 505,791</b>
	0,146 AF	0,275 AF	

**TABLE K- 3 REVENUES UNDER 50% SCENARIO**

	Demand Assumption	Units	Revenue
Demand Reduction Conditions			
Total Fixed		59,092	21,196,005
Total Variable	-45.92%	5,162,161 CCF	27,636,203
Total Revenue	-45.37%	11,851 AF	<b>\$ 48,832,208</b>
	Demand Reduction Impact		\$ (24,598,473)
	Additional SCWA Need (\$)		\$ 1,031,667
Single Family Volumetric Rates			
Tier 1	-38%	2,381,473	\$ 11,478,700
Tier 2	-70%	320,255	2,338,663
Tier 3	-80%	71,811	871,066
Tier 4	-100%	-	-
	<b>-50%</b>	<b>2,773,539</b>	<b>\$ 14,688,429</b>
	10,231 AF	6,367 AF	
Duplex Volumetric Rates			
Tier 1	-38%	119,618	\$ 581,666
Tier 2	-70%	16,571	123,024
Tier 3	-80%	3,171	38,287
Tier 4	-100%	-	-
	<b>-49%</b>	<b>139,360</b>	<b>\$ 742,977</b>
	0,502 AF	0,320 AF	
Multi Family Volumetric Rates			
Tier 1	-38%	504,847	\$ 2,481,506
Tier 2	-70%	90,733	661,118
Tier 3	-80%	6,979	78,683
Tier 4	-100%	-	-
	<b>-49%</b>	<b>602,559</b>	<b>\$ 3,221,307</b>
	2,404 AF	1,383 AF	
Commercial Volumetric Rates			
Tier 1	-35%	1,284,540	6,167,654
Tier 2	-70%	72,301	789,362
Tier 3	-80%	38,560	630,105
	<b>-43%</b>	<b>1,395,401</b>	<b>\$ 7,587,121</b>
	4,353 AF	3,203 AF	
Single Family Irrigation Volumetric Rates			
Tier 1	-50%	1,302	7,411
Tier 2	-75%	344	2,166
Tier 3	-100%	-	-
	<b>-69%</b>	<b>1,646</b>	<b>\$ 9,577</b>
	0,012 AF	0,004 AF	
Recycled Water Rates			
0	-10%	154,751	614,554
0	-20%	12,469	126,355
0	-30%	16,006	301,636
	<b>-13%</b>	<b>183,226</b>	<b>\$ 1,042,545</b>
	0,690 AF	0,421 AF	
Raw Water Rates			
Uniform Rate	-50%	66,429	344,247
	<b>-52%</b>	<b>66,429</b>	<b>\$ 344,247</b>
	0,146 AF	0,153 AF	