EAST BAY
MUNICIPAL UTILITY DISTRICT

Water and Wastewater Cost of Service Study

Report / April 9, 2015

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April 9, 2015

Mr. Richard Lou
Principal Management Analyst
East Bay Municipal Utility District
375 11th Street
Oakland, CA 94607

Subject: Water and Wastewater Cost of Service Rate Study Report

Dear Mr. Lou:

Raftelis Financial Consultants, Inc. (RFC) is pleased to provide this Water and Wastewater Cost of Service Rate Study Report (Report) for the East Bay Municipal Utility District (District) to establish water and wastewater user charges that are equitable and address Proposition 218 requirements.

The major objectives of the study include the following:

1. Review current water and wastewater rate structures
2. Conduct a cost of service analysis for water and wastewater
3. Develop fair and equitable water and wastewater user charges
4. Validate cost of service methodology and calculation of water drought surcharges
5. Demonstrate the impacts of the proposed water and wastewater user charges on typical customer bills

The Report summarizes the key findings and recommendations related to the development of the water and wastewater user charges.

It has been a pleasure working with you, and we thank you and the District staff for the support provided during the course of this study.

Sincerely,

RAFTELIS FINANCIAL CONSULTANTS, INC.

Sanjay Gaur
Vice President

Hannah Phan
Senior Consultant

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GLOSSARY

Acre feet	Unit of volume of water equal to 43,560 cubic feet or 325,850 gallons of water
Ad Valorem Bond Levy	A tax based on the assessed value of real estate with the proceeds designated to pay for municipal bonds
American Water Works Association (AWWA)	American Water Works Association is the largest nonprofit, scientific and educational association dedicated to managing and treating water
Base Demand	Average demand
Business Classification Category (BCC)	EBMUD classification system of customers based on the 1972 Standard Industrial Classification Manual
Capacity Charges	A fee assessed for new connections to the water or wastewater system to recover the appropriate share of the cost of capital improvements to serve new connections
Capital Expenses	Expenditures for capital assets
Chemical Oxygen Demand Filtered (CODf)	Measurement of the amount of organic compounds in wastewater expressed in milligrams per liter (mg/l)
Commodity Charge	Charge for per unit of water (ccf) consumed
Debt Service	The principal and interest payments on debt issued
Domestic Strength - Wastewater	Concentration of CODf and TSS assigned to domestic strength discharges
Drought Surcharge	Commodity charge that is added to the normal water commodity charge when a water shortage has been declared
EBMUD	East Bay Municipal Utility District
Effluent	Outflow from a sewer system
Elevation Charge	Charge assessed on each unit (ccf) of water delivered to recover the cost to pump water to higher elevations
Fixed Charge	Portion of the customer monthly charge that does not vary with water use. For water charges, sometimes referred to as the meter charge. For wastewater charges, sometimes referred to as the service charge.
Flow - Wastewater	Volume (ccf) for a given billing period (usually one month) that is used to calculate the wastewater charge
Hundred Cubic Feet (ccf)	Volume of water or wastewater equal to 100 cubic feet or 748 gallons
Infiltration and Inflow (I&I)	Water that enters the wastewater system from cross-connections with storm drains and downspouts, and through holes, breaks, joint failures, connection failures and other openings in the sewer transmission, collection and lateral systems
Influent	Inflow to a sewer system
Loadings - Wastewater	Amount of wastewater flow and strength in the influent
Meter Service Charge	Fixed water charge based on the size of the water meter
Million Gallons Per Day (MGD)	Equal to 1 million gallons over the period of one day

Multi-Family Residential - Wastewater	Customer Class for multi-dwelling residential buildings (up to 4 dwelling units per building) without individual water meters. Multi-dwelling residential units with 5 or more dwelling units per building without individual meters are considered non-residential for wastewater billing purposes.
Multi-Family Residential - Water	Customer Class for multi-dwelling residential building without individual water meters for each dwelling unit
Non Residential - Wastewater	Customers who are not in the Single Family or Multi-Family customer classes for wastewater billing purposes
Operations and Maintenance (O&M) Expenses	Expenditures for daily operations and maintenance of the water or wastewater system
Other Customer Class - Water	Water system customer class for customers who are not in the Single Family, Multi-Family, or Recycled Water customer classes
Peak Demand	Demand that exceeds average demand
Plant Balance	An exercise used to estimate customer class volume and strength units of service by comparing the total units of service estimated from customer classes to the actual flows and loads measured at the plant
Pressure Zone	Portion of the water distribution system in which all premises are served through meters within a specific range of elevations and supplied by the same major facilities through an interconnected pipeline network
Private Fire Service Charge	Meter charge for water meters that supply water exclusively to private fire protection systems
Proposition 218	This constitutional amendment passed in 1996 that limits the methods by which local governments can create or increase taxes, fees and charges without taxpayer consent
Rate Revenue Requirement	The portion of annual operating, maintenance and capital-related expenses that are must be recovered from annual water and wastewater rates and charges
Reserves	District cash that is not part of current year revenues
Residential - Wastewater	Customers in the single-family residential or multi-family residential customer class for the purpose of wastewater billing
Resource Recovery	Trucked waste program
Revenue Offsets	Non water and wastewater revenue that is used to pay a portion of the annual operating, maintenance and capital related expenses
Revenue Requirement	Annual operating, maintenance, and capital-related expenses that are required to provide water and wastewater service
RFC	Raftelis Financial Consultants
Seismic Improvement Program Surcharge	Program approved in 1994 to strengthen the water system to withstand seismic events
Service Charge - Wastewater	Fixed monthly wastewater charge

Service Charge - Water	Fixed monthly water charge also known as the meter charge
Sewer Lateral	Pipe that carries waste from the plumbing in a home or business to the sanitary sewer main
Single Family Residential	Residential customers with one dwelling unit with an individual water meter
Strength - Wastewater	CODf and TSS component of a wastewater customer's discharge
Supplemental Supply	Water that is not from the District's normal water supply (Mokelumne or local runoff system)
Tier Breakpoints	Volume of water that is allowed in each water rate tier, sometimes referred to as block
Total Suspended Solids (TSS)	Measurement of solid materials, including organic and inorganic, that are suspended in wastewater expressed in mg/l
Volume - Water	Volume (ccf) for a given billing period (usually one month) that is used to calculate the water commodity rate
Volume Rate	Charge for per unit of water (ccf) consumed
Water Environment Federation (WEF)	The Water Environment Federation provides technical education and training for water quality professionals who clean water and return it safely to the environment
Wet Weather Facilities Charge	Wastewater charge collected on the property tax bill to fund the I&I expenses

1. EXECUTIVE SUMMARY

1.1 INTRODUCTION

In November 2013, East Bay Municipal Utility District (District) engaged Raftelis Financial Consultants, Inc. (RFC) to conduct a cost of service rate study (Study) for the water and wastewater utilities that could be utilized to evaluate and enhance the equity of user charges to ensure that there is a proportionate recovery of costs from the various user classes. This report documents the Study resultant findings, analyses, and proposed changes.

1.2 COST OF SERVICE PROCESS AND METHODOLOGY

With respect to the water cost of service analysis, RFC followed the Base-Extra Capacity method outlined in the American Water Works Association (AWWA) Manual M1, Principles of Water Rates, Fees, and Charges, Sixth Edition, 2012. This method separates costs into four components: "(1) base costs, (2) extra capacity costs, (3) customer costs, and (4) direct fire protection costs." American Water Works Association, Principles of Water Rates, Fees and Charges: Manual of Water Supply Practices M1 62 (6th ed. 2012). Base costs are costs that vary with the total amount of water used and also include operations and maintenance costs, capital costs under average load conditions, a portion of operations and maintenance costs associated with water supply, treatment, pumping and distributions facilities, and certain water capital cost investments. Extra capacity costs are costs associated with meeting peak demand. Customer costs are costs associated with serving customers, such as meter reading, billing, customer service, etc. Direct fire protection costs are related to the costs that apply solely to the fire protection function of a water system, such as fire hydrants and related branch mains and valves.

The water cost of service (COS) analysis consists of five major steps, as outlined below:

1. Functionalize operation and maintenance (O&M) expenses and capital costs into functional categories such as Supply, Treatment, Distribution, Elevation, Supplemental Supply, Recycled Water, Fire Protection, and Meters.
2. Allocate each functional category into cost components such as Base Demand, Peak Demand, Elevation, Supplemental Supply, Recycled Water, Fire Protection, Meter Service, and Billing and Customer Service.
3. Develop customer class characteristics by cost component.
4. Calculate the cost component unit rates by dividing the total cost in each cost component in Step 2 by the customer class characteristics in Step 3.
5. Calculate the cost by customer class by multiplying the unit cost in Step 4 by the customer class characteristics in Step 3.

With respect to the wastewater COS analysis, RFC followed the guidelines for allocating costs detailed in the Water Environment Federation (WEF) Manual of Practice No. 27, Financing and Charges for Wastewater Systems, 2004. The wastewater COS analysis consists of six major steps, as outlined below:

1. Conduct plant balance to estimate the flows and strength characteristics of each customer class
2. Functionalize O&M expenses and capital costs into functional categories such as Treatment, Billing, and, Customer Service.

3. Allocate each functional category into cost components such as Infiltration and Inflow (I&I)[1], Flow, Strength, and, Billing and Customer Service.
4. Develop customer class characteristics by cost component.
5. Calculate the cost component unit rates by dividing the total cost in each cost component in Step 3 by the customer class characteristics in Step 4.
6. Calculate the cost by customer class by multiplying the unit cost in Step 5 by the customer class characteristics in Step 4.

The COS analyses were performed using the data from the District for fiscal year 2013 (FY 2013)[2] henceforth referred to as the Test Year. This was a full year of actual functionalized expense data available at the time the study commenced and was a representative year for the District. Required adjustments were made to Test Year rates and charges based on the District FY 2016 and FY 2017 budget for development of FY 2016 and FY 2017 rates and charges presented here.

1.3 COST OF SERVICE ANALYSIS: WATER UTILITY

To calculate fair and equitable user charges (fixed or meter service charges and volume or commodity rates) so that users pay in proportion to the cost of providing service, RFC completed a cost allocation of the total revenue requirements consistent with AWWA/industry standards, as described previously. Under this method, costs are apportioned among various cost parameters to determine the costs to provide service under average conditions, meet peaking requirements, provide meter capacity, and provide customer services. Once costs to serve different customer classes are determined, user charges are then designed to equitably recover the proportionate costs of service in compliance with Proposition 218 requirements.

1.3.1 Study Objectives

In reviewing the District's existing rates and charges, RFC discussed a number of considerations with staff. In addition to the general updates of cost of service, the following items were identified as particular objectives of the study.

1. Update sunset of the Seismic Improvement Program (SIP) Surcharge
2. Review the private fire service meter cost allocation
3. Review the elevation charge
4. Establish recycled water cost allocation
5. Review Single Family Residential (SFR) tier breakpoints
6. Establish cost of service basis for tiered rates

[1] Inflow is surface water that enters the wastewater system from yard, roof and footing drains, from cross-connections with storm drains, downspouts, and through holes in manhole covers. Inflow occurs as a result of storm events such as rainfall, snowfall, and springs or snow melt that contribute to excessive sewer flows. Peak inflow can occur during heavy storm events when storm sewer systems are surcharged, resulting in hydraulic backups and local ponding. Infiltration is groundwater, or groundwater that is influenced by surface or sea water that enters sewer pipes (interceptors, collectors, manholes, or side sewers) through holes, breaks, joint failures, connection failures and other openings. Infiltration quantities often exhibit seasonal variation in response to groundwater levels. Storm events can trigger a rise in groundwater levels and increase infiltration flows. The highest infiltration flows generally are observed following significant storm events or following prolonged periods of precipitation.

[2] The District's fiscal year begins on July 1st and ends on June 30th. "FY 2013" refers to the 12-months ending June 30, 2013.

7. Validate methodology and calculation of drought surcharges

1.3.2 Cost of Service Results

Through the COS analysis process described above, the significant outcomes of the water COS analysis are as follows:

1. Current analysis of private fire protection costs results in reduced private fire protection charges.
2. Recycled water rates are calculated based on the costs and benefits of the program.
3. Validation of drought surcharges are consistent with updated COS.

1.4 PROPOSED WATER RATES

Based on our review, RFC recommends that the District retain its current water user charge structure, which includes a monthly meter service charge that varies by meter size for all customer classes, a three-tiered commodity rate for SFR customers, and a uniform commodity rate for multi-family residential (MFR) customers and other customers. The current rate structure is consistent with industry standards, equitable and familiar to customers, and encourages conservation, while providing some revenue stability to the District.

Table 1-1 shows the proposed monthly meter charge for regular and private fire service meters with the COS adjustments for FY 2016 and FY 2017. The proposed water user charges reflect the required rate adjustments from the Test Year and the 8 percent proposed rate increase for FY 2016 over FY 2015. FY 2017 requires an additional 7 percent increase.

Table 1-1
Proposed FY 2016 and FY 2017 Water Rates – Monthly Service Charge

	FY 2016	FY 2017
Monthly Water Service Charge		
Meter Size		
5/8 and 3/4 inch	$19.34	$20.69
1 inch	$29.20	$31.24
1 1/2 inch	$53.88	$57.65
2 inch	$83.48	$89.32
3 inch	$162.42	$173.79
4 inch	$251.24	$268.83
6 inch	$497.92	$532.77
8 inch	$793.95	$849.53
10 inch	$1,139.32	$1,219.07
12 inch	$1,583.38	$1,694.22
14 inch	$2,027.42	$2,169.34
16 inch	$2,570.15	$2,750.06
18 inch	$3,112.86	$3,330.76
Monthly Private Fire Service Charge		
Meter Size		
5/8 and 3/4 inch	$10.29	$11.01
1 inch	$14.13	$15.12
1 1/2 inch	$23.70	$25.36
2 inch	$35.20	$37.66
3 inch	$65.86	$70.47
4 inch	$100.34	$107.36
6 inch	$196.14	$209.87
8 inch	$311.09	$332.87
10 inch	$445.21	$476.37
12 inch	$617.63	$660.86
14 inch	$790.07	$845.37
16 inch	$1,000.83	$1,070.89
18 inch	$1,211.58	$1,296.39

Table 1-2 shows the proposed FY 2016 and FY 2017 commodity rate and elevation surcharge; both in dollars per hundred cubic feet (ccf) of metered water use. The District's commodity rate for SFR customers has 3 tiers (Tier 1: 0-7 ccf/month (mo), Tier 2: 8-16 ccf/mo and Tier 3: 16+ ccf/mo). MFR, recycled water, and other (all customers not in the SFR and MFR and recycled water customer categories) have uniform rates.

Table 1-2
Proposed FY 2016 and FY 2017 Water Rates – Commodity Rate and Elevation Surcharge

		FY 2016	FY 2017
Commodity Rates ($/ccf)			
SFR			
Tier 1	0 -7 ccf	$2.95	$3.16
Tier 2	8 - 16 ccf	$4.06	$4.34
Tier 3	16 + ccf	$5.36	$5.74
MFR		$4.17	$4.46
All Other Water Use		$4.15	$4.44
Recycled Water		$3.23	$3.46
Elevation Surcharge ($/ccf)			
Band 1		$0.00	$0.00
Band 2		$0.60	$0.64
Band 3		$1.24	$1.33

1.4.1 Customer Impacts

Table 1-3 shows the SFR bill impacts at various levels of water usage for FY 2016. Bill impacts for FY 2017 are approximately 7 percent more than those shown below.

Table 1-3
SFR Water Bill Impacts for FY 2016

Use Level	Monthly Use (ccf)	FY 2015 Current Bill	FY 2016 Proposed Bill	Difference ($)	Difference (%)
Very Low	4	$29.07	$31.14	$2.07	7.1%
Low	7	$37.80	$39.99	$2.19	5.8%
Average	10	$48.60	$52.17	$3.57	7.3%
High	16	$70.20	$76.53	$6.33	9.0%
Very High	30	$132.08	$151.57	$19.49	14.8%

Note: Current bill includes SIP surcharge. All bill calculations assume 5/8" or 3/4" meter.
SIP surcharge is being phased out and will not be part of the water service rates beginning in FY 2016.
The Study calculates the rates assuming there is no SIP surcharge.

Table 1-4 shows the MFR bill impacts at various levels of water usage for FY 2016. Bill impacts for FY 2017 are approximately 7 percent more than those shown below.

Table 1-4
MFR Water Bill Impacts for FY 2016

Use Level	Monthly Use (ccf)	FY 2015 Current Bill	FY 2016 Proposed Bill	Difference ($)	Difference (%)
Very Low	15	$88.74	$91.75	$3.01	3.4%
Low	20	$107.14	$112.60	$5.46	5.1%
Average	42	$188.10	$204.34	$16.24	8.6%
High	60	$254.34	$279.40	$25.06	9.9%
Very High	100	$401.54	$446.20	$44.66	11.1%

Note: Current bill includes SIP surcharge. All bill calculations assume 1" meter.
SIP surcharge is being phased out and will not be part of the water service rates beginning in FY 2016.
The Study calculates the rates assuming there is no SIP surcharge.

Table 1-5 shows the Other (non-residential) bill impacts at various levels of water usage for FY 2016. Bill impacts for FY 2017 are approximately 7 percent more than those shown below.

Table 1-5
Other Water Bill Impacts for FY 2016

Use Level	Monthly Use (ccf)	FY 2015 Current Bill	FY 2016 Proposed Bill	Difference ($)	Difference (%)
Very Low	20	$145.88	$166.48	$20.60	14.1%
Low	50	$264.68	$290.98	$26.30	9.9%
Average	84	$399.32	$432.08	$32.76	8.2%
High	100	$462.68	$498.48	$35.80	7.7%
Very High	200	$858.68	$913.48	$54.80	6.4%

Note: Current bill includes SIP surcharge. All bill calculations assume 2" meter.
SIP surcharge is being phased out and will not be part of the water service rates beginning in FY 2016.
The Study calculates the rates assuming there is no SIP surcharge.

1.5 COST OF SERVICE ANALYSIS: WASTEWATER UTILITY

To calculate fair and equitable rates so that users pay in proportion to the cost of providing service, RFC allocated the total revenue requirements to wastewater flow, filtered chemical oxygen demand (CODf) and total suspended solids (TSS) consistent with the previously identified WEF/industry guidelines. Increased loadings will increase operating costs and directly impact capital costs as long as there is capacity in the plant to handle the higher loadings. Since wastewater flow or volumes are not directly measured for each customer, District staff estimated the wastewater flows and loadings (flow, CODf and TSS) for each customer class through a plant balance analysis, which is used to estimate and validate the wastewater loadings (flow and strength) generated by each customer class. Unit costs are calculated for flow, CODf and TSS and cost responsibility assigned to various customer classes in proportion to their loadings. Costs to serve different customer classes are determined; rates are then designed to proportionately recover the costs in compliance with Proposition 218 requirements.

1.5.1 Study Objectives

In reviewing the District's existing rates and charges, RFC discussed a number of considerations with staff. In addition to the general updates of cost of service, the following items were identified as particular objectives of the study.

1. Review domestic strength concentration to reflect reduced flows at plant
2. Review allocation of wet weather costs to reflect the costs of I&I into the plant

1.5.2 Cost of Service Results

Through the cost of service analysis process described above, the significant outcomes of the wastewater COS analysis are as follows:

1. The proposed wet weather facilities charge is based on a lot size basis to better reflect the potential amount of infiltration and inflow (I&I) entering into the wastewater system from a customer's lot. Three categories of lot size were used to calculate the wet weather facilities charge.
2. There is an increase to the treatment charge for non-residential customers who are billed at the domestic strength.

1.6 PROPOSED WASTEWATER RATES

Based on our review, RFC recommends that the District retain its current wastewater user charge structure, which includes monthly fixed service and strength charges and a flow charge per ccf with a maximum of 9 ccf per month for residential customers, and a monthly fixed service charge and a flow charge per ccf for all other customers. Residential customers consist of SFR and MFR up to a fourplex. The current rate structure is equitable and familiar to customers, and encourages conservation while providing revenue stability to the District.

Tables 1-6 and 1-7 show the proposed wastewater rate for residential and non-residential customers, respectively, with the COS adjustments for FY 2016 and FY 2017. The proposed wastewater rates reflect the required rate adjustments from the Test Year and the 5 percent proposed rate increase for FY 2016 over FY 2015. FY 2017 requires an additional 5 percent increase.

Table 1-6
Proposed FY 2016 and FY 2017 Wastewater User Charges – Residential

	FY 2016	FY 2017
Service Charge (per account)	$5.29	$5.55
Strength Charge (per dwelling unit)	$7.28	$7.64
Minimum monthly charge per household	$12.57	$13.19
Plus: A flow charge per hcf (maximum of 9 ccf)	$1.04	$1.09
Minimum monthly charge at 0 ccf	$0.00	$0.00
Maximum monthly charge at 9 ccf	$9.36	$9.81
Total Residential Charge		
Minimum monthly charge	$12.57	$13.19
Maximum monthly charge	$21.93	$23.00
Average monthly charge at 6 ccf	$18.81	$19.73

Table 1-7
Proposed FY 2016 and FY 2017 Wastewater User Charges – Non-Residential

	FY 2016	FY 2017
Monthly service charge (per meter)	$5.29	$5.55
Treatment charge including flow processing (per ccf of sewage discharge)		
Meat Products	$6.78	$7.12
Slaughterhouses	$6.85	$7.19
Dairy Product Processing	$5.37	$5.64
Fruit and Vegetable Canning	$4.36	$4.58
Grain Mills	$4.48	$4.70
Bakeries (including Pastries)	$7.62	$8.00
Sugar Processing	$4.17	$4.38
Rendering Tallow	$13.66	$14.34
Beverage Manufacturing & Bottling	$3.22	$3.38
Specialty Foods Manufacturing	$13.81	$14.50
Pulp and Paper Products	$3.85	$4.04
Inorganic Chemicals Mfgr.	$5.12	$5.38
Synthetic Material Manufacturing	$1.18	$1.24
Drug Manufacturing	$2.40	$2.52
Cleaning and Sanitation Products	$4.87	$5.11
Paint Manufacturing	$9.51	$9.99
Ink and Pigment Manufacturing	$3.35	$3.52
Leather Tanning and Finishing	$13.01	$13.66
Earthenware Manufacturing	$2.79	$2.93
Primary Metals Manufacturing	$2.22	$2.33
Metal Products Fabricating	$1.27	$1.33
Drum and Barrel Manufacturing	$13.14	$13.80
Metal Coating	$1.38	$1.45
Air Transportation	$1.79	$1.88
Food Service Establishments	$4.71	$4.95
Apartment Buildings (5 or more units)	$2.36	$2.48
Hotels, Motels with Food Service	$3.42	$3.59
Commercial Laundries	$2.98	$3.13
Coin Operated Laundromats	$2.25	$2.36
Industrial Laundries	$8.24	$8.65
Laboratories	$1.62	$1.70
Automobile Washing and Polishing	$2.15	$2.26
Hospitals	$2.09	$2.19
Schools	$1.52	$1.60
All Other (includes dischargers of only segregated domestic wastes from sanitary conveniences)	$2.36	$2.48

The wet weather facilities charge funds capital expenses for the I&I facilities that are required to handle the wet weather flows that enter the wastewater system. The capital facilities are sized to meet the peak wet weather flows. The amount of wet weather flows that enter the wastewater system is proportional to the size of the collection system to serve each property. Due to data constraints, lot size is used as a proxy to estimate the size of the collection system to serve each property. Larger lots will have potential for more wet weather flows that could enter the wastewater system than smaller lots. The proposed wet weather facilities charge is based on median lot size for all customers. Customers will fall within the three generalized lot sizes (or bins): 0 to 5,000 square feet (sq ft), 5,001 to 10,000 sq ft, and over 10,001 sq ft.

Table 1-8 shows the proposed FY 2016 and FY 2017 wet weather facilities charge, based on median lot size for each lot size bin.

Table 1-8
Proposed FY 2016 and FY 2017 Wet Weather Facilities Charge

Lot Size (sq ft)	FY 2016	FY 2017
0-5000	$89.60	$94.10
5,001-10,000	$140.00	$147.00
over 10,001	$320.00	$336.00

1.6.1 Customer Impacts

Table 1-9 shows the bill impacts for different customers with typical water usage for FY 2016. Bill impacts for FY 2017 are approximately 5 percent more than those shown below.

Table 1-9
Typical Customers Wastewater Bill Impacts for FY 2016

Customer Class	Monthly Flow (ccf)	FY 2015 Current Bill	FY 2016 Proposed Bill	Difference ($)	Difference (%)
SFR	6	$19.05	$18.81	($0.24)	-1%
MFR - Fourplex	25	$55.61	$60.41	$4.80	9%
Commercial - Office	50	$100.13	$123.29	$23.16	23%
Commercial - Restaurant	50	$224.13	$240.79	$16.66	7%
Industrial - Food Manufacturing	500	$6,552.13	$6,910.29	$358.16	5%

Note: Bill does not include Pollution Prevention Charge

Table 1-10 shows the impacts resulting from the proposed wet weather facilities charge compared to the FY 2015 wet weather facilities charge, which is a fixed charge based on customer class. Bill impacts for FY 2017 are approximately 5 percent more than those shown below.

Table 1-10
Wet Weather Facilities Charge Impacts for FY 2016

Customer Class	Median Lot Size (sq ft)	FY 2015 Current Bill	FY 2016 Proposed Bill	Difference ($)	Difference (%)
SFR	4,800	$89.34	$89.60	$0.26	0%
Duplex	4,500	$178.68	$89.60	($89.08)	-50%
Triplex	5,130	$268.02	$140.00	($128.02)	-48%
Fourplex	5,400	$357.36	$140.00	($217.36)	-61%
Apartment	7,400	$446.70	$140.00	($306.70)	-69%
All Other	14,284	$134.00	$320.00	$186.00	139%

1.7 PROPOSED FY 2016 AND FY 2017 WATER DROUGHT SURCHARGES

As part of the scope of work, RFC reviewed and validated the COS methodology for the drought surcharges, which are consistent with industry standards and the COS methodology for the District's water rates. The District's proposed staged system of drought surcharges is designed to address the financial aspects of a limited or restricted water supply situation. The proposed stages link to the District's Urban Water Management Plan which contains a Water Shortage Contingency Plan with the elements contained below with respect to demand reduction and purchase of supplemental supplies as water shortage becomes more severe. Table 1-11 shows the District's proposed drought stages.

Table 1-11
Proposed Drought Stages

Stage	0	1	2	3	4
Demand Reduction		Voluntary 0-15%	Voluntary 0-15%	Mandatory up to 15%	Mandatory ≥ 15%
Supplemental Supplies			Up to 35,000 acre feet	35,000-65,000 acre feet	> 65,000 acre feet
Rates and Charges	Normal rates	Normal rates	Normal rates + Up to 8% surcharge	Normal rates + Up to 20% surcharge	Normal rates + Up to 25% surcharge

Table 1-12 shows the proposed maximum drought surcharges that may be implemented during each drought stage for FY 2016 and FY 2017. The proposed surcharges recover the drought-related costs associated with each drought stage, as identified by District staff. Those costs include costs to purchase, pump, and treat supplemental water supplies, increased personnel costs related to customer service and water conservation programs, and projected revenues lost as a result of reductions in water use.

Table 1-12
Proposed Maximum Drought Surcharges for Declared Drought Stages for FY 2016 and FY 2017

FY 2016	FY 2016 Volume Rate ($/ccf)	Drought Variable Volume Surcharge Rate	Drought Variable Volume Surcharge ($/ccf)	Drought Customer Related Surcharge ($/ccf)	Total Drought Surcharge ($/ccf)	% of FY 2016 Rate
Stage 2						
SFR Tier 1	$2.95	6.9%	$0.20	$0.03	$0.23	7.8%
SFR Tier 2	$4.06	6.9%	$0.28	$0.03	$0.31	7.6%
SFR Tier 3	$5.36	6.9%	$0.37	$0.03	$0.40	7.5%
MFR	$4.17	6.9%	$0.29	$0.03	$0.32	7.7%
OTHER	$4.15	6.9%	$0.29	$0.03	$0.32	7.7%
Stage 3						
SFR Tier 1	$2.95	18.4%	$0.54	$0.05	$0.59	20.0%
SFR Tier 2	$4.06	18.4%	$0.75	$0.05	$0.79	19.5%
SFR Tier 3	$5.36	18.4%	$0.99	$0.05	$1.03	19.2%
MFR	$4.17	18.4%	$0.77	$0.05	$0.81	19.4%
OTHER	$4.15	18.4%	$0.76	$0.05	$0.81	19.5%
Stage 4						
SFR Tier 1	$2.95	23.3%	$0.69	$0.05	$0.73	24.7%
SFR Tier 2	$4.06	23.3%	$0.94	$0.05	$0.99	24.4%
SFR Tier 3	$5.36	23.3%	$1.25	$0.05	$1.30	24.3%
MFR	$4.17	23.3%	$0.97	$0.05	$1.02	24.5%
OTHER	$4.15	23.3%	$0.97	$0.05	$1.01	24.3%

FY 2017	FY 2017 Volume Rate ($/hcf)	Drought Variable Volume Surcharge Rate	Drought Variable Volume Surcharge ($/hcf)	Drought Customer Related Surcharge ($/hcf)	Total Drought Surcharge ($/hcf)	% of FY 2016 Rate
Stage 2						
SFR Tier 1	$3.16	6.9%	$0.22	$0.03	$0.25	7.9%
SFR Tier 2	$4.34	6.9%	$0.30	$0.03	$0.33	7.6%
SFR Tier 3	$5.74	6.9%	$0.40	$0.03	$0.43	7.5%
MFR	$4.46	6.9%	$0.31	$0.03	$0.34	7.6%
OTHER	$4.44	6.9%	$0.31	$0.03	$0.34	7.7%
Stage 3						
SFR Tier 1	$3.16	18.6%	$0.59	$0.05	$0.63	19.9%
SFR Tier 2	$4.34	18.6%	$0.81	$0.05	$0.85	19.6%
SFR Tier 3	$5.74	18.6%	$1.07	$0.05	$1.12	19.5%
MFR	$4.46	18.6%	$0.83	$0.05	$0.88	19.7%
OTHER	$4.44	18.6%	$0.83	$0.05	$0.87	19.6%
Stage 4						
SFR Tier 1	$3.16	23.5%	$0.74	$0.05	$0.79	25.0%
SFR Tier 2	$4.34	23.5%	$1.02	$0.05	$1.07	24.7%
SFR Tier 3	$5.74	23.5%	$1.35	$0.05	$1.40	24.4%
MFR	$4.46	23.5%	$1.05	$0.05	$1.10	24.7%
OTHER	$4.44	23.5%	$1.05	$0.05	$1.09	24.5%

2. OVERVIEW

2.1 INTRODUCTION

In November 2013, the East Bay Municipal Utility District (District) engaged Raftelis Financial Consultants, Inc. (RFC) to develop a long-term financial plan and conduct a cost of service rate study (Study) for the water and wastewater utilities that could be utilized to evaluate and enhance the equity of user charges for the District's water and wastewater services to ensure that there is a proportionate recovery of costs from the various user classes. This report documents the resultant findings, analyses, and proposed changes.

The District's water system supplies approximately 1.3 million customers and spans a 332-square-mile area in Alameda and Contra Costa counties, extending from Crockett in the north, southward to San Lorenzo, eastward from San Francisco Bay to Walnut Creek, and south through the San Ramon Valley. The District's primary water supply is from the Mokelumne River. Local runoff to District reservoirs supplements that supply, and Sacramento River water is available when needed during dry years. The District's six water treatment plants are capable of filtering and processing a combined total of more than 415 million gallons of water daily. The Orinda Water Treatment Plant is the largest, with a peak capacity of 200 million gallons per day (MGD). The other water treatment plants include Lafayette, Upper San Leandro, Sobrante, Walnut Creek, and San Pablo, which is currently on standby mode. The water distribution network includes approximately 4,100 miles of pipe, 129 pumping plants and 171 neighborhood reservoirs (tanks storing treated drinking water) having a total storage capacity of 636 million gallons. The District's service area is divided into more than 120 water pressure zones. Pressure zones range in elevation from sea level to 1,450 feet. Approximately 60 percent of the treated water is distributed to customers by gravity.

The District's wastewater service area is smaller, covering an 88-square-mile area of Alameda and Contra Costa counties along the Bay's east shore, extending from Richmond in the north to Oakland in the south. It serves approximately 650,000 customers. Approximately 63 MGD of wastewater is treated on average at the Main Wastewater Treatment Plant. The wastewater utility is also responsible for the operation and maintenance of 5 wastewater pumping stations, 29 miles of concrete interceptor sewers, and 8 miles of force mains. Each of the cities within the District's wastewater service area operates a sewer collection system that discharges into the District's intercepting sewers.

The major objectives of the study include the following:

1. Review current water and wastewater rate structures
2. Develop a cost-of-service analysis for water and wastewater
3. Develop fair and equitable water and wastewater user charges
4. Demonstrate the impacts of the proposed water and wastewater user charges on typical customer bills
5. Validate the methodology and calculation of drought surcharges

This Report provides an overview of the Study and includes findings and recommendations for water, including drought surcharges, recycled water and wastewater user charges.

2.2 LEGAL REQUIREMENTS AND RATE SETTING METHODOLOGY

2.2.1 Legal Requirements

There are two Constitutional provisions that govern and impact water rates — Article X, Section 2 (Article X) and Article XIII D, Section 6 (Article XIII D). Article X was added to the California Constitution in 1928 as former Article XIV, Section 3, and amended in 1976. Article X provides that:

> *"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."*

In November 1996, California voters approved Proposition 218, which amended the California Constitution by adding Article XIII C and Article XIII D. Article XIII D placed substantive limitations on the use of the revenue collected from property-related fees and on the amount of the fee that may be imposed on each parcel. Additionally, it established procedural requirements for imposing new, or increasing existing, property-related fees. The California Supreme Court has determined that water and wastewater service fees are property-related fees.

In accordance with these provisions, a property-related fee must meet all of the following requirements: (1) revenues derived from the fee must not exceed the funds required to provide the property-related service; (2) revenues from the fee must not be used for any purpose other than that for which the fee is imposed; (3) the amount of a fee imposed upon any parcel or person as an incident of property ownership must not exceed the proportional cost of the service attributable to the parcel; (4) the fee may not be imposed for a service, unless the service is actually used by, or immediately available to, the owner of the property subject to the fee. A fee based on potential or future use of a service is not permitted, and stand-by charges must be classified as assessments subject to the ballot protest and proportionality requirements for assessments; (5) no fee may be imposed for general governmental services, such as police, fire, ambulance, or libraries, where the service is available to the public in substantially the same manner as it is to property owners. The five substantive requirements in Article XIII D are structured to place limitations on (1) the use of the revenue collected from property-related fees and (2) the allocation of costs recovered by such fees to ensure that they are proportionate the cost of providing the service attributable to each parcel.

For the District's water service charges, this Rate Study was prepared to comply with the requirements of Article X to maximize the beneficial use of water and the cost-of-service requirements of Article XIII D.

2.2.2 Rate Setting Process

Revenue Requirements. The Study used the revenue requirements method for allocating costs of service. This methodology is consistent with industry standards established by the American Water Works Association (AWWA), Principles of Water Rates, Fees and Charges: Manual of Water Supply Practices M1 (the M1 Manual). The revenue requirements 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."[3]

Cost of Service. After determining a utility's revenue requirements, the next step in the analysis is determining the cost of service. The Study functionalized the costs, expenses, and assets of the water system by major operating functions to determine the cost of service. After the assets and the costs of operating those assets were properly categorized by function, the Study classified them and allocated the revenue requirements to the various customer classes (e.g., single-family residential, multi-family residential, recycled water, and other) by determining the characteristics of those classes and the customer class' contribution to the incurred costs, such as peaking factors or different delivery costs, and service characteristics and demand patterns. This analysis included a review of such matters as system operations and water usage data—e.g., capacity (peak demand)[4], commodity (average demand)[5], number of customers[6], customer service[7], equivalent meter size, and public fire protection services[8]. The impact that these matters have on system operations determined how the costs were allocated among the various customer classes.

Rate Design. The final part of the analysis was the rate design. Rate design involves developing a rate structure that proportionately recovers costs from customers. The final rate structure and rate recommendations were based on the District's existing rate design and updated to fund the utility's long-term projected costs of providing service, proportionally allocate costs to all customers, provide a reasonable and prudent balance of revenue stability while encouraging conservation, and comply with the substantive requirements of Article XIII D.

2.3 ORGANIZATION OF THE REPORT

This Report includes six sections in addition to the Executive Summary and this Overview. A brief description of the remaining sections follows.

- ***Section 3 – Cost of Service Analysis: Water Utility*** describes the findings and results of the water COS study. It includes a description of the water cost of service methodology, the user classifications, the determination of annual revenues required from user charges, and a detailed discussion of the Cost of Service, which includes the allocation of costs to water parameters and the determination of unit costs.
- ***Section 4 – Proposed Water User Charges*** includes a detailed discussion of the proposed water user charges and the customer impacts resulting from the proposed user charges.

[3] American Water Works Association, Principles of Water Rates, Fees and Charges: Manual of Water Supply Practices M1 (6th ed. 2012).
[4] System capacity is the system's ability to supply water to all delivery points at the time 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. Both the operating costs and the capital assets related costs incurred to accommodate the peak flows are allocated to each customer class based upon the class' contribution to the peak day event.
[5] Commodity refers to the amount of metered water usage over a specific time period, typically a twelve-month period.
[6] Some operating and administrative costs vary directly with the number of customers.
[7] Some customer classes may require more effort and time to provide customer services.
[8] This refers to the need to increase the size of mainlines to provide public fire protection requirements.

- ***Section 5 – Cost of Service Analysis: Wastewater Utility*** describes the findings and results of the wastewater rate study. It includes a description of the wastewater system, the wastewater cost of service methodology, the user classifications, the determination of annual revenues required from user charges, and a detailed discussion on the Cost of Service, which includes allocation of costs to wastewater parameters and the determination of unit costs.
- ***Section 6 – Proposed Wastewater User Charges*** includes a detailed discussion of the proposed wastewater user charges and the customer impacts resulting from the proposed user charges.
- ***Section 7 – Proposed FY 2016 and FY 2017 Water and Wastewater User Charges*** documents the development of the FY 2016 and FY 2017 water and wastewater user charges based on the proposed FY 2016 and FY 2017 budget, combining the revenue requirement increase for FY 2016 and FY 2017 with the adjustments from the cost of service.
- ***Section 8 – Cost of Service Analysis and Proposed FY 2016 and FY 2017 Water Drought Surcharges*** documents the methodology and development of the drought surcharge for FY 2016 and FY 2017.
- ***Appendix*** includes reproduced versions of some tables throughout the report for readability.

2.4 ACKNOWLEDGEMENTS

This Report was a team effort among the District's Project Team and the RFC Team. We would like to thank the individuals listed below who contributed their time, expertise, and support to make this project a success. Throughout the project the input and direction provided by the District Project Team was critical to addressing the numerous issues and topics enumerated in this report.

- Richard Lou – Principal Management Analyst
- Sophia Skoda – Treasury Manager

3. COST OF SERVICE ANALYSIS: WATER UTILITY

This section of the Report discusses the allocation of operating and capital costs to the appropriate parameters consistent with industry standards and the determination of unit costs. In this Study, water rates were calculated for FY 2013 as this was a full year of actual functionalized expense data available at the time the study commenced and was a representative year for the District, and accordingly FY 2013 is defined as the Test Year. Test Year revenue requirements are used in the cost allocation process.

To allocate the cost of service (COS) among the different customer classes, costs first need to be allocated to the appropriate water parameters. The following sections describe the allocation of the O&M and capital costs of service to the appropriate parameters of the water system.

The total cost of water service is analyzed by system function in order to equitably distribute costs of service to the various classes of customers. For this analysis, water utility costs of service are assigned under the Base-Extra Capacity method to three basic functional cost components including base costs, extra capacity or peaking costs and customer service related costs as described in the M1 Manual, published by AWWA. This method is widely used in the water industry to serve retail customers.

The water COS analysis consists of five major steps, as outlined below:

1. Functionalize O&M and capital costs into functional categories such as Supply, Treatment, Distribution, Elevation, Supplemental Supply, Recycled Water, Fire Protection, and Meters.
2. Allocate each functional category into cost components such as Base Demand, Peak Demand, Elevation, Supplemental Supply, Recycled Water, Fire Protection, Meter Service, and Billing and Customer Service.
3. Develop customer class characteristics by cost component.
4. Calculate the cost component rates by dividing the total cost in each cost component in Step 2 by the customer class characteristics in Step 3.
5. Calculate the cost by customer class by multiplying the unit cost in Step 4 by the customer class characteristics in Step 3.

3.1 WATER STUDY OBJECTIVES

In reviewing the District's existing rates and charges, RFC discussed a number of considerations with staff. In addition to the general updates of cost of service, the following items were identified as particular objectives of the study.

1. Address the sunset of the Seismic Improvement Program (SIP) Surcharge
2. Update the private fire service meter cost allocation
3. Review the elevation charge
4. Establish recycled water cost allocation
5. Review SFR tier breakpoints
6. Establish cost of service basis for tiered rates
7. Validate the methodology and calculation of drought surcharges

3.2 ALLOCATION OF REVENUE REQUIREMENTS BY FUNCTION

The water utility is comprised of various facilities, each designed and operated to fulfill a given function. In order to provide adequate service to its customers at all times, the utility must be capable of not only providing the total amount of water used, but also supplying water at peak, or maximum rates, of demand. The separation of costs by function allows the allocation of such costs to the functional cost components. Table 3-1 shows different functional cost components of the water system.

Table 3-1
Functional Cost Components

Function	Explanation	Example
Supply	Source facilities that provide and support water supply	Pardee and Camanche reservoirs, fish facilities, etc.
Raw Water	Facilities that move water from the source to treatment	Aqueducts and pumping plants, terminal reservoirs, etc.
Treatment	Treatment plants	Treatment plants
Reservoir Distribution	Reservoirs within the distribution system that store treated water	Treated water reservoirs
Distribution with Fire Protection	Distribution system components that include capacity for fire flows	Water mains
Distribution without Fire Protection	Distribution system components that do not include capacity for fire flows	Pressure regulators, valves, control systems
Hydrant	Fire Hydrants	Fire Hydrants
Recycled Water	Recycled Water facilities	Treatment and distribution facilities
Supplemental Supply	Capital investments that supplement the District's water supply in times of need	Freeport Supplemental Supply
Elevation	Distribution system and pumping plants that serve customers at higher elevation	Pumping plants
Meters	Water meters that measure the amount of water customers use	Water meters
Customer	Costs that are incurred to provide billing and customer service	Billing and customer service costs
General	Costs that cannot be functionalized into the above categories	Buildings, support services

Table 3-2 shows the Test Year O&M expenses by the different categories, which are then classified by functions such as supply, recycled water, treatment, etc.

Table 3-2
Allocation of O&M Expenses

	Function/Allocation Basis	Test Year
Power Generation	General	$1,740,578
Source of Supply/Water Rights	Supply	$7,898,456
Recycled Water	Recycled Water	$4,949,517
Raw Water	Raw Water	$16,061,109
Recreation	Supply	$5,224,746
Treatment	Treatment	$22,966,265
Reservoir Distribution	Reservoir	$4,890,158
Pumping Plants Distribution	Elevation	$12,146,246
Distribution Network	Distribution	$36,703,507
Meters	Meters	$8,930,738
Hydrants	Hydrants	$1,093,697
Other Work	General	$1,757,020
Admin	General	$66,305,185
Customer Service	Customer	$18,477,415
Supplemental Supply	Supplemental	$2,087,683
Capital A&G	General	$0
TOTAL O&M		**$211,232,321**

Table 3-3 shows the book value of the total water assets for the Test Year (at year-end) by the different asset classes, which are then classified by functions similar to the O&M expenses. Book value reflects the historic asset costs less accumulated depreciation and were obtained from District's financial records. Using the book value method for the COS results in a user charge structure that is weighted more heavily on recently constructed capital assets rather than older assets.

Table 3-3
Allocation of Water Assets – Test Year Book Value

	Function/Allocation Basis	Total
Distribution Hydrants	Hydrants	$33,006,364
Auto Control System	Distribution w/o Fire	$17,715,434
Distribution Mains	Distribution	$893,756,486
Distribution Aqueducts	Distribution w/o Fire	$73,801,415
Pressure Regulators	Distribution w/o Fire	$26,792,696
Venturi Meters and Cath Protect	Distribution w/o Fire	$3,230,813
Distribution Pumping	Elevation	$101,435,840
Distribution Reserviors	Reservoir	$259,070,425
Hydroelectric Power Generation	General	$18,431,747
General Plant Structures	General	$130,813,114
Equipment - Transp & Const	General	$14,788,079
Equipment - office	General	$1,091,174
Equipment -Eng/Lab	General	$130,518
Equipment -Tools/Work	General	$684,424
Equipment -Stores	General	$0
Equipment - Shop	General	$218,892
Unallocated As Built Costs	General	$580,593
Deferred Softwasre costs	General	$28,683,971
Deferred EB watershed MP	General	$1,453,672
Deffered Lab Expansion Costs	General	$4,176,676
Deffered Solids Receiving Costs	General	$163,978
Preliminary Eng & Environ Costs	General	$28,529,755
Land Distribution	Reservoir	$7,928,007
Land Misc	General	$1,737,088
Misc Land	General	$1,169,815
Misc Land	General	$52,184
Land General Plan	General	$7,714,529
Land Raw Water Trans	Raw Water	$3,710,592
ROW Raw Water Trans	Raw Water	$1,229,538
Land Terminal Reservoirs	Supply	$18,931,841
Land Source of Supply	Supply	$7,832,091
Land Water Treatment	Treatment	$2,974,390
Raw Wt Transmission	Raw Water	$203,971,440
Raw Wt Trans pumping	Raw Water	$23,370,807
Terminal Reservoirs	Supply	$130,191,157
Rec Facilities	Supply	$264,045
Rec Facilities	Supply	$32,762,410
Meters	Meters	$336,206,241
Large Meters	Meters	$45,289,343
Source of wate supply	Supply	$58,981,416
well equipment	Supplemental	$2,486,672
raw water trans	Supplemental	$167,296,019
raw water pump	Supplemental	$154,423,375
terminal resv	Supplemental	$53,159
Non Potable	Recycled Water	$65,568,297
Water Treat	Supplemental	$19,950,478
Water Conserv	Supplemental	$17,895,581
Studies Non Pot	Recycled Water	$1,590,311
Studies Supply	Supplemental	$19,832,015
Studies Supply	Supplemental	$2,293,703
Land Non Pot	Recycled Water	$2,174,793
SYS	Supplemental	$229,036,567
Water Treatment		$0
Bayside Total	Supplemental	$12,808,404
Briones Total		$3,060,483
Lafay Total		$14,994,670
Orinda Total		$42,947,561
SanPablo Total		$13,889,787
Sobrante Total		$42,802,559
USL Total		$36,928,638
WC Total		$70,297,989
TOTAL ASSETS		**$3,443,204,062**

3.3 ALLOCATION OF FUNCTIONAL COSTS TO COST COMPONENTS

To determine how costs should be allocated to average and peak (Max Day and Max Hour) demands, the allocation percentages assigned to each of the cost components needs to be determined. Allocation percentages were derived from actual historical District data. RFC completed the following steps to derive the allocation percentages for apportioning the District's O&M expenses and capital costs.

The first step is to determine system peaking factors. Peaking factors are based on the District's usage characteristics. Table 3-4 shows the peaking factors of the whole system. These system peaking factors were confirmed in a 2009 analysis of the max day and max hour peaking of the water distribution system that was completed by District Engineering staff.

To determine the relative proportion of costs to assign to Base, Max Day and Max Hour, allocations are calculated based on these factors. Cost components that are solely Base related and provide average day demand would include such system functions as source of supply, which is allocated 100 percent to Base. Cost components that are designed to meet Max Day peaks, such as reservoirs and transmission facilities, are allocated to Base and Max Day factors. Since facilities such as distribution reservoirs and distribution systems are also designed to handle fire flow, an allocation is also provided for fire flow. As provided in the 2009 analysis, the Max Day factor of the District's system is 2.10, which means that Max Day facilities are designed to provide 210 percent of the average day capacity. In other words, 110 out of 210, or 52 percent (110/210) represents the "extra capacity" portion required to meet Max Day requirements. Therefore the Max Day facilities are designed 52 percent larger than required to meet average usage conditions to meet Max Day requirements.

Base:	48%	=	(1.00 / 2.10) x 100
Max Day:	52%	=	(2.10 - 1.00) / 2.10 x 100

Cost components such as those related to the distribution system that are designed for Max Hour peaks are allocated similarly. The Max Hour factor is 4.20, so Max Hour facilities are designed to provide 420 percent of the average day capacity. Out of this 420, 100 represents the base capacity, 110 represents the Max Day requirement and the remainder of 210 represents the Max Hour requirement. This means that the Max Hour capacity represents 210 out of 420, or 50 percent (210/420), the Max Day represents 110 out of 240, or 26 percent (110/420), and the remaining 100 out of 420 represents the base capacity of the facilities designed for average day. The allocation of Max Hour facilities is shown below:

Base:	24%	=	(1.00 / 4.20) x 100
Max Day:	26%	=	(2.10 - 1.00) / 4.20 x 100
Max Hour:	50%	=	(4.20 - 2.10) / 4.20 x 100

Table 3-4 shows the system peaking factors and the resulting allocations to Max Day and Max Hour.

Table 3-4
System Peaking Factors

System Peaking Factors		Base	Max Day	Max Hour
Base	1.00	100%		
Max Day	2.10	48%	52%	0%
Max Hour	4.20	24%	26%	50%
Average		36%	39%	25%

In addition to system peaking characteristics, the District operates five water treatment plants. Table 3-5 shows the peaking characteristics for District's water treatment plants, based on the Base, Maximum 6 Months, and Maximum Day production of each water treatment plant. The treatment plant allocation factors represent the weighted average of the different peaking at the various treatment plants.

Table 3-5
Treatment Plants Peaking Factors

Treatment Plant Allocations	Base	Max 6 Months	Max Day
Lafayette WTP Production (MGD)	8.94	15.46	22.94
Orinda WTP Production (MGD)	112.13	118.74	147.00
USL WTP Production (MGD)	5.83	14.57	50.10
WC WTP Production (MGD)	43.99	58.26	85.67
Sobrante WTP Production (MGD)	15.01	26.20	47.54
Total Coincident Peaking (MGD)	185.89	223.18	280.44
Treatment Plant Peaking Factor	**1.00**	**1.20**	**1.51**
Treatment Plant Allocation	66%	13%	20%

The primary differentiator of rates among the different customer classes is based on the demand that each class places on the system. This demand is expressed in terms of the Base, Max Day and Max Hour factors. The maximum day and hour demands are expressed as a multiple of the average or base demands of the customer class.

Table 3-6 shows the different peaking factors for each customer class. The Max Day factor for each customer class is estimated based on the maximum month demands so that the ratios of the Max Day factor for each customer class, compared to the SFR Max Day factor, is equal to the maximum month ratio. For example, the maximum month ratio for MFR to SFR is 0.82 (1.13/1.38), the Max Day ratio for MFR to SFR is also 0.82 (1.85/2.25). The ratio of the Max Hour and Max Day for the whole system is used to estimate the Max Hour factor for each customer class. For example, the Max Hour to Max Day ratio is 2 (4.2/2.1), the Max Hour to Max Day ratio is also 2 for all customer classes – for SFR, 4.5 is 2 times 2.25. The peaking factors, shown in Table 3-6, were determined for each customer class.

Table 3-6
Customer Class Peaking Factors

Peaking Factor By Customer Class	Base	Max Day	Max Hour	Max Month
SFR	1.00	2.25	4.50	1.38
MFR	1.00	1.85	3.70	1.13
All Other	1.00	2.30	4.60	1.40
Recycled Water	1.00	2.30	4.60	1.40

These percentages are used to allocate the operating and capital improvement costs among Base, Max Day, and Max Hour parameters for COS calculations, which is explained in detail in the following sections.

The total cost of water service is analyzed by system function in order to equitably and proportionately distribute costs of service to the various classes of customers. For this analysis, water utility costs are assigned to three basic functional cost components including Base costs, extra capacity costs (Max Day and Max Hour) and customer-service related costs.

Base costs are those operating and capital costs of the water system associated with serving customers at a constant average rate of use. Extra capacity costs represent those costs incurred to meet customer peak demands for water in excess of average day usage. Total extra capacity costs are subdivided into costs associated with maximum day (Max Day) and maximum hour (Max Hour) demands and are explained below.

Customer service costs include customer-related and meter-related costs. Customer costs are uniform for all customers and include such costs as meter reading, billing, collecting, and accounting. Meter service costs include maintenance and capital costs associated with meters and capacity related costs. These costs are assigned based on meter size using equivalent meter capacity.

The allocation of costs of service into these principal components provides the means for determining the costs to the various customer classes on the basis of their respective base, extra capacity and customer requirements for service.

Projected net operating expenses for the Test Year are allocated on the basis of the design criteria of the facilities in the listing that follows:

- Water supply costs are allocated to base
- Raw water costs are allocated to base
- Treatment costs are allocated to base, max day, and max 6 months
- Storage or reservoir costs are allocated to base, max day, and fire protection
- Distribution system costs are allocated to base, max day, and max hour
- Distribution system costs that are sized for fire protection are allocated to base, max day, max hour and fire protection
- Hydrants are allocated to fire protection
- Recycled water cost is allocated to its own cost component as does supplemental supply
- Elevation costs are allocated to elevation cost component with a portion to base and max day
- Costs related to meter maintenance are allocated to meters
- Billing and customer service costs are allocated to customer service
- Other/general costs such as administration are allocated to general

Administration and general expenses are related to total system operations and cannot be specifically allocated to individual functions such as storage or distribution, etc. These expenses are therefore allocated in the same proportion as all the remaining operating expenses. The resulting allocation of O&M expense serves as the basis for allocating the Test Year net operating costs (shown in Table 3-10) to the base, extra capacity and customer costs functions.

In addition to capacity to serve the District's potable water demand, the reservoirs of the water distribution system provide fire protection capacity. The water distribution pipelines are sized to provide fire flow capacity beyond what is required to meeting potable water demands. An analysis conducted by District Engineering and Finance staff determined that the cost of the extra capacity for

firefighting flows is about 14 percent of the total water distribution costs[9]. The water distribution reservoirs also are sized and operated to have sufficient flow to provide emergency flows for fire flows, emergency pipeline breaks and pump/power failures. The amount of the distribution reservoir costs associated with the fire flows used in the COS is 10 percent.

Table 3-7 shows the different allocations to the cost components such has Base, Max 6 Months, Max Day, Max Hour, etc. of each functional cost category. The Supply and Raw Water Functions only provide service for Base demands so there are no allocations for Max Day and Max Hour demands. The Treatment Function is allocated based on the Base, Max 6 months and Max Day peaking factors for the Treatment Plants in Table 3-5. The Distribution System without Fire Protection follows the Base, Max Day, Max Hour peaking factors from water system peaking factors in Table 3-4. The allocations for the Distribution System with Fire Protection include an adjustment for the 14 percent allocated to Fire Protection. The Distribution Reservoir allocation is based on providing Base and Max Day demands with an adjustment for the 10 percent of the reservoir costs assigned to Fire Protection. Hydrant costs are assigned to fire protection. Meters, Customer, Supplemental Supply, and Recycled Water functions are assigned directly to their respective cost components. General Costs are assigned to the General Cost component which, as described later in this Report, are spread proportionally back to the remaining costs components.

Table 3-7
Allocation to Cost Components

Category	Base	Max 6 Months	Max Day	Max Hour	Elevation	Supplemental Supply	Recycled Water	Fire Protection	Meters	Customer	General	Total
Supply	100%											100%
Raw Water	100%											100%
Treatment	66%	13%	20%									100%
Reservoir	43%		47%	0%				10%				100%
Elevation	2%		3%	0%	95%							100%
Distribution	20%		23%	43%				14%				100%
Distribution w/o Fire	24%		26%	50%				0%				100%
Meters									100%			100%
Hydrants								100%				100%
Customer										100%		100%
Supplemental						100%						100%
Recycled Water							100%					100%
General											100%	100%

Table 3-8 shows the allocation of O&M expenses in Table 3-2 to the different cost components based on the allocation percentages shown in Table 3-7.

[9] According to District's Engineering staff, based upon past hydraulic model studies, existing 6-inch/8-inch distribution pipelines would be sized 4-inch and 10-inch/12-inch distribution pipelines would be sized 6 inches without sizing for fire flow. Larger diameter pipelines are generally backbone and transmission mains, and are sized based on demands with little to no influence from fire flow. The estimated current net book value of the District's distribution mains under 12-inch is $788.7 million, which represents 81.5 percent of the total distribution mains assets. With the reduced sizing without fire flow, the net book value of the distribution mains under 12-inch would have been $659.3 million. The current net book value of the District's distribution mains over 12-inch remains the same at $105.1 million. Thus, the total net book value with the reduced sizing is $764.4 million ($659.3 million + $105.1 million), which is 86 percent of the current value ($893.8 million). Therefore, distribution mains costs that can be allocated to fire protection is 14 percent.

Table 3-8
Allocation of O&M Expenses to Cost Components

	Base	Max 6 Months	Max Day	Max Hour	Elevation	Supplemental Supply	Recycled Water	Fire Protection	Meters	Customer	General	Test Year
Power Generation	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,740,578	$1,740,578
Source of Supply/Water Rights	$7,898,456	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$7,898,456
Recycled Water	$0	$0	$0	$0	$0	$0	$4,949,517	$0	$0	$0	$0	$4,949,517
Raw Water	$16,061,109	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$16,061,109
Recreation	$5,224,746	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$5,224,746
Treatment	$15,223,585	$3,053,385	$4,689,296	$0	$0	$0	$0	$0	$0	$0	$0	$22,966,265
Reservoir Distribution	$2,095,782	$0	$2,305,360	$0	$0	$0	$0	$489,016	$0	$0	$0	$4,890,158
Pumping Plants Distribution	$289,196	$0	$318,116	$0	$11,538,934	$0	$0	$0	$0	$0	$0	$12,146,246
Distribution Network	$7,515,480	$0	$8,267,028	$15,782,508	$0	$0	$0	$5,138,491	$0	$0	$0	$36,703,507
Meters	$0	$0	$0	$0	$0	$0	$0	$0	$8,930,738	$0	$0	$8,930,738
Hydrants	$0	$0	$0	$0	$0	$0	$0	$1,093,697	$0	$0	$0	$1,093,697
Other Work	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,757,020	$1,757,020
Admin	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$66,305,185	$66,305,185
Customer Service	$0	$0	$0	$0	$0	$0	$0	$0	$0	$18,477,415	$0	$18,477,415
Supplemental Supply	$0	$0	$0	$0	$0	$2,087,683	$0	$0	$0	$0	$0	$2,087,683
Capital A&G	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
TOTAL O&M	**$54,308,354**	**$3,053,385**	**$15,579,800**	**$15,782,508**	**$11,538,934**	**$2,087,683**	**$4,949,517**	**$6,721,204**	**$8,930,738**	**$18,477,415**	**$69,802,783**	**$211,232,321**
% allocation	25.7%	1.4%	7.4%	7.5%	5.5%	1.0%	2.3%	3.2%	4.2%	8.7%	33.0%	100.0%

Capital costs include capital improvements financed from annual revenues, debt service and other sources. Capital costs related to specific facilities will vary significantly from year to year. Allocating these costs based on the functions of these specific facilities could cause the rates to the different customer classes to change from year-to-year. A reasonable method of assigning capital costs to functional components, widely practiced in the industry, is to allocate such costs on the basis of net plant investment, recognizing that over a period of time these allocations will provide costs to be passed on to customers equitably and proportionately.

As shown in Table 3-3, net plant investment, or book value, is represented by the total assets value of water utility facilities less accumulated depreciation. The estimated fiscal year net plant investment in water facilities consists of net plant in service as of the Test Year.

Costs are allocated based on the design criteria of each facility. For example, treatment facilities are allocated to Max Day since these facilities are designed to handle the maximum day demand. The investment in general plant is allocated to each cost component on the basis of all other plant investment. The resulting allocation of net plant investment serves as the basis for allocating the capital costs shown in Table 3-10.

Table 3-9 shows the allocation of the water assets to the different cost components based on the allocation percentages shown in Table 3-7.

Table 3-9
Allocation of Water Assets to Cost Components

	Base	Max 6 Months	Max Day	Max Hour	Elevation	Supplemental Supply	Recycled Water	Fire Protection	Meters	Customer	General	Total
Distribution Hydrants	$0	$0	$0	$0	$0	$0	$0	$33,006,364	$0	$0	$0	$33,006,364
Auto Control System	$4,217,960	$0	$4,639,757	$8,857,717	$0	$0	$0	$0	$0	$0	$0	$17,715,434
Distribution Mains	$183,007,280	$0	$201,308,008	$384,315,289	$0	$0	$0	$125,125,908	$0	$0	$0	$893,756,486
Distribution Aqueducts	$17,571,766	$0	$19,328,942	$36,900,708	$0	$0	$0	$0	$0	$0	$0	$73,801,415
Pressure Regulators	$6,379,213	$0	$7,017,135	$13,396,348	$0	$0	$0	$0	$0	$0	$0	$26,792,696
Venturi Meters and Cath Protect	$769,241	$0	$846,165	$1,615,407	$0	$0	$0	$0	$0	$0	$0	$3,230,813
Distribution Pumping	$2,415,139	$0	$2,656,653	$0	$96,364,048	$0	$0	$0	$0	$0	$0	$101,435,840
Distribution Reserviors	$111,030,182	$0	$122,133,200	$0	$0	$0	$0	$25,907,042	$0	$0	$0	$259,070,425
Hydroelectric Power Generation	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$18,431,747	$18,431,747
General Plant Structures	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$130,813,114	$130,813,114
Equipment - Transp & Const	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$14,788,079	$14,788,079
Equipment - office	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,091,174	$1,091,174
Equipment -Eng/Lab	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$130,518	$130,518
Equipment -Tools/Work	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$684,424	$684,424
Equipment -Stores	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Equipment - Shop	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$218,892	$218,892
Unallocated As Built Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$580,593	$580,593
Deferred Softwasre costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$28,683,971	$28,683,971
Deferred EB watershed MP	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,453,672	$1,453,672
Deffered Lab Expansion Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$4,176,676	$4,176,676
Deffered Solids Receiving Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$163,978	$163,978
Preliminary Eng & Environ Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$28,529,755	$28,529,755
Land Distribution	$3,397,717	$0	$3,737,489	$0	$0	$0	$0	$792,801	$0	$0	$0	$7,928,007
Land Misc	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,737,088	$1,737,088
Misc Land	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,169,815	$1,169,815
Misc Land	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$52,184	$52,184
Land General Plan	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$7,714,529	$7,714,529
Land Raw Water Trans	$3,710,592	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$3,710,592
ROW Raw Water Trans	$1,229,538	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,229,538
Land Terminal Reservoirs	$18,931,841	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$18,931,841
Land Source of Supply	$7,832,091	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$7,832,091
Land Water Treatment	$1,971,626	$395,448	$607,317	$0	$0	$0	$0	$0	$0	$0	$0	$2,974,390
Raw Wt Transmission	$203,971,440	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$203,971,440
Raw Wt Trans pumping	$23,370,807	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$23,370,807
Terminal Reservoirs	$130,191,157	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$130,191,157
Rec Facilities	$264,045	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$264,045
Rec Facilities	$32,762,410	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$32,762,410
Meters	$0	$0	$0	$0	$0	$0	$0	$0	$336,206,241	$0	$0	$336,206,241
Large Meters	$0	$0	$0	$0	$0	$0	$0	$0	$45,289,343	$0	$0	$45,289,343
Source of wate supply	$58,981,416	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$58,981,416
well equipment	$0	$0	$0	$0	$0	$2,486,672	$0	$0	$0	$0	$0	$2,486,672
raw water trans	$0	$0	$0	$0	$0	$167,296,019	$0	$0	$0	$0	$0	$167,296,019
raw water pump	$0	$0	$0	$0	$0	$154,423,375	$0	$0	$0	$0	$0	$154,423,375
terminal resv	$0	$0	$0	$0	$0	$53,159	$0	$0	$0	$0	$0	$53,159
Non Potable	$0	$0	$0	$0	$0	$0	$65,568,297	$0	$0	$0	$0	$65,568,297
Water Treat	$0	$0	$0	$0	$0	$19,950,478	$0	$0	$0	$0	$0	$19,950,478
Water Conserv	$0	$0	$0	$0	$0	$17,895,581	$0	$0	$0	$0	$0	$17,895,581
Studies Non Pot	$0	$0	$0	$0	$0	$0	$1,590,311	$0	$0	$0	$0	$1,590,311
Studies Supply	$0	$0	$0	$0	$0	$19,832,015	$0	$0	$0	$0	$0	$19,832,015
Studies Supply	$0	$0	$0	$0	$0	$2,293,703	$0	$0	$0	$0	$0	$2,293,703
Land Non Pot	$0	$0	$0	$0	$0	$0	$2,174,793	$0	$0	$0	$0	$2,174,793
SYS	$0	$0	$0	$0	$0	$229,036,567	$0	$0	$0	$0	$0	$229,036,567
Water Treatment	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Bayside Total	$0	$0	$0	$0	$0	$12,808,404	$0	$0	$0	$0	$0	$12,808,404
Briones Total	$2,028,694	$406,894	$624,895	$0	$0	$0	$0	$0	$0	$0	$0	$3,060,483
Lafay Total	$5,841,997	$4,264,844	$4,887,830	$0	$0	$0	$0	$0	$0	$0	$0	$14,994,670
Orinda Total	$32,759,520	$1,932,890	$8,255,151	$0	$0	$0	$0	$0	$0	$0	$0	$42,947,561
SanPablo Total	$9,207,085	$1,846,659	$2,836,043	$0	$0	$0	$0	$0	$0	$0	$0	$13,889,787
Sobrante Total	$13,513,686	$10,073,039	$19,215,834	$0	$0	$0	$0	$0	$0	$0	$0	$42,802,559
USL Total	$4,294,925	$6,445,420	$26,188,293	$0	$0	$0	$0	$0	$0	$0	$0	$36,928,638
WC Total	$36,098,523	$11,709,361	$22,490,105	$0	$0	$0	$0	$0	$0	$0	$0	$70,297,989
TOTAL ASSETS	**$915,749,892**	**$37,074,553**	**$446,772,817**	**$445,085,468**	**$96,364,048**	**$626,075,973**	**$69,333,401**	**$184,832,115**	**$381,495,584**	**$0**	**$240,420,209**	**$3,443,204,062**
% allocation	26.6%	1.1%	13.0%	12.9%	2.8%	18.2%	2.0%	5.4%	11.1%	0.0%	7.0%	100.0%

3.4 ALLOCATION OF REVENUE REQUIREMENTS

The total revenue requirements net of revenue credits from miscellaneous sources, is by definition, the net cost of providing service as shown in Table 3-10. This value is also referred to as the net revenue requirement. This cost is then used as the basis to develop unit costs for the water parameters and to allocate costs to the various customer classes in proportion to the water services rendered. The concept of proportionate allocation to customer classes requires that allocations should take into consideration not only the average quantity of water used but, also the peak rate at which it is consumed. There are costs associated with design and construction of facilities used to meet peak demands, and these costs need to be allocated so that peaking costs can be recovered appropriately.

The total Test Year COS to be recovered from the District's water customers, shown in Table 3-10, is estimated at approximately $355.6 million, of which approximately $194.6 million is O&M expenses and the remaining $161 million is capital costs, which consists of capital expenditures and existing debt service. The COS analysis is based upon the premise that the utility must generate annual revenues adequate to meet the estimated annual revenue requirements. As part of the COS analysis, revenues from sources other than water rates and charges (e.g., revenues from miscellaneous services) are deducted from the appropriate cost elements. Additional deductions are made to reflect interest income and other non-operating income during the Test Year. Adjustments are also made to account for changes in cash balances to fund reserves and/or capital expenses to ensure adequate collection of revenue and to determine annual revenues needed from rates.

Table 3-10 shows the allocation of revenue requirements to operating and capital components to determine the revenue required from rates.

Table 3-10
Allocation of Revenue Requirements

	TEST YEAR		
	Operating	**Capital**	**Total**
Revenue Requirements			
Operating - O&M Expenses	$211,232,321		$211,232,321
Capital -Existing Debt Service		$139,679,950	$139,679,950
Capital - Proposed Debt Service		$0	$0
Capital - Admin Expenses		$38,448,917	$38,448,917
Capital - Direct Expenses		$123,734,400	$123,734,400
Total Revenue Requirements	**$211,232,321**	**$301,863,267**	**$513,095,588**
Revenue Offsets			
Total Seismic Charges Revenue		$0	$0
Supplemental Supply Surcharge	$0		$0
Taxes, less customer assistance		$25,400,000	$25,400,000
Power	$3,800,000		$3,800,000
Interest	$2,100,000		$2,100,000
SCC Applied to Debt Service		$22,700,000	$22,700,000
Operating Reimbursement	$9,200,000		$9,200,000
RARE Reimbursement	$1,500,000		$1,500,000
All Other		$17,100,000	$17,100,000
Transfer (to)/from Rate Stabilization Reserve	$0		$0
Total Revenue Offsets	**$16,600,000**	**$65,200,000**	**$81,800,000**
Adjustments			
Transfer of Cash for Capital from Other Funds	$0	($75,695,588)	($75,695,588)
Total Adjustments	**$0**	**($75,695,588)**	**($75,695,588)**
Cost of Service to be Recovered from Rates	**$194,632,321**	**$160,967,679**	**$355,600,000**

3.5 DEVELOPMENT OF UNIT COSTS OF SERVICE

In order to allocate costs of service to the different customer classes, unit costs of service need to be developed for each cost component. The unit costs of service are developed by dividing the total annual costs allocated to each parameter by the total annual service units of the respective component.

The volume related cost components are allocated based on volumetric units of one hundred cubic feet or ccf (about 748 gallons), as well as, Max Day and Max Hour customer characteristics. Customer service related cost components are based on number of accounts and meter related costs are based on equivalent meters. To allocate meter-related costs appropriately, the concept of equivalent meters needs to be utilized. By using equivalent meters instead of a straight meter count, the analysis accounts for the fact that larger meters impose larger demands on the water system and are more expensive to install, maintain, and replace than smaller meters and require greater capacity in the system.

Equivalent meters are based on meter hydraulic capacity. A ratio of hydraulic capacity is calculated by dividing large meter capacities by the base meter capacity. The base meter is the smallest meter, in this case, a 3/4-inch meter. The actual number of meters by size is multiplied by the corresponding capacity ratio to calculate equivalent meters. Table 3-11 shows the meter capacity ratio based on the meter capacity in gallons per minute (gpm) provided in the District's Engineering Standard Practice (ESP) 521.2.

Table 3-11
Equivalent Meters Ratio

Meter Size	EBMUD Capacity (gpm)	EBMUD Ratio
5/8 and 3/4 inch	30	1.00
1 inch	50	1.67
1 1/2 inch	100	3.33
2 inch	160	5.33
3 inch	320	10.67
4 inch	500	16.67
6 inch	1000	33.33
8 inch	1600	53.33
10 inch	2300	76.67
12 inch	3200	106.67
14 inch	4100	136.67
16 inch	5200	173.33
18 inch	6300	210.00

Table 3-12 shows the determination of the total annual units by customer class. The extra capacity units are determined based on the respective peaking factor for each class, as shown in Table 3-6.

Table 3-12
Customer Class Service Units

Customer Class	Annual Usage (ccf)	Max 6 Months (ccf)	Daily Usage (ccf)	Max Day Factor	Max Day Requirements	Max Day Requirements	Max Hour Factor	Max Hour Requirements	Max Hour Requirements	Equivalent Meters	No. of Bills
SFR	40,650,556	25,150,003	111,371	2.25	250,586	139,214	4.50	501,171	361,957	341,602	3,908,736
MFR	14,356,603	7,741,892	39,333	1.85	72,766	33,433	3.70	145,533	112,100	55,170	342,084
All Other	24,738,129	15,257,422	67,776	2.30	155,884	88,108	4.60	311,768	223,660	74,150	321,468
Recycled Water	2,233,016		6,118								
Private Fire Meters										191,645	74,604
TOTAL	**81,978,304**	**48,149,317**	**224,598**		**479,236**	**260,756**		**958,472**	**697,716**	**662,567**	**4,646,892**

3.5.1 Recycled Water Cost Allocation

The District's recycled water program is a water reliability program that benefits potable water users. Specifically, supplying recycled water to ratepayers who can use it displaces the demand for potable water supplies and makes those supplies available to potable water customers. Additionally, the use of recycled water directly decreases the frequency of water shortages and increases the availability of potable water during a water shortage when additional supplemental supplies may not be available. Because potable water customers directly benefit from the recycled water program and avoid costs of developing new, or acquiring supplemental, potable water supplies, they share in a portion of the costs of this program. The calculation of the recycled water COS in Table 3-13 shows the total costs of providing recycled water (capital and O&M) including a credit for the avoided costs of acquiring additional potable water supplies if the recycled water program were not implemented. The credited avoided costs are equal to the cost of acquiring an additional 8,570 acre-feet (AF) of water from the Freeport supplemental supply at $387 per AF, which would be necessary if recycled water was not a source of supply. The avoided costs credit is added to the cost of the supplemental supply paid by all potable water customers. Table 3-13 shows that the total recycled water costs of $7.3 million is offset by the avoided cost credit of $3.3 million, which represents 45.4 percent of the total recycled water costs. The $3.3 million cost is allocated to the supplemental supply cost component.

Table 3-13
Recycled Water Cost Allocation to Supplemental Supply

	Test Year
Total Recycled Water/Non-Potable Costs (a)	$7,310,815
Total Recycled Water/Non-Potable Sales (ccf) (b)	3,733,016
Cost of Freeport Water ($/AF) (c)	$387
Total Costs Allocated to Supplemental Supply (b x c) (d)	$3,316,522
Total Costs Allocated to Supplemental Supply (d / a)	45.4%
Net Recycled Water/Non-Potable Costs (a-b)	$3,994,293

3.5.2 Additional Capacity Costs Allocated to Meters

Table 3-14 shows the resulting allocation of the different cost components to rate components, such as Commodity Rate and Service Charge, after all revenue offsets and adjustments are made. The avoided cost credit for recycled water is shown by the 45.4 percent allocation of recycled water costs to the Supplemental Supply Rate Component. The table shows an allocation of 23 percent from the max day and max hour cost components to the meters cost component. This allocation recognizes that a portion of the capacity costs of the system (i.e., max day and max hour costs) are used to serve the potential capacity of the meters. Each meter size has a maximum demand capacity, and the water system has to

be sized to meet that demand[10]. The 23 percent allocation is a rate design feature, determined so that the portion of revenue collected from proposed fixed charges is equal to the revenue collected from the current fixed charges. That way, the rates maintain the same revenue stability.

Table 3-14
Allocation of Cost Components to Rate Components

		Commodity Rate								Service Charge		
COS Category	Test Year Cost	Base	Max 6 Months	Max Day	Max Hour	Supplemental Supply	Elevation	Recycled Water	Fire Protection	Meters	Customer	TOTAL
Base	$123,353,893	100.0%										100.0%
Max 6 Months	$4,841,966		100.0%									100.0%
Max Day	$45,256,340			77.0%						23.0%		100.0%
Max Hour	$45,409,055				77.0%					23.0%		100.0%
Elevation	$19,065,381						100.0%					100.0%
Supplemental Supply	$40,354,215					100.0%						100.0%
Recycled Water	$7,310,815					45.4%		54.6%				100.0%
Fire Protection	$10,184,452								100.0%			100.0%
Meters	$43,592,851									100.0%		100.0%
Customer	$16,231,031										100.0%	100.0%
TOTAL ALLOCATED COSTS	**$355,600,000**	**$123,353,893**	**$4,841,966**	**$34,847,382**	**$34,964,973**	**$43,670,737**	**$19,065,381**	**$3,994,293**	**$10,184,452**	**$64,445,892**	**$16,231,031**	**$355,600,000**

3.5.3 Allocation of Revenue Offsets

The revenue offsets are applied to the capital or operating components (Base, Max 6 months, Max Day, Max Hour, Elevation, etc.) of the revenue requirements based upon overall allocation percentages for O&M and Capital costs shown at the bottom of Tables 3-8 and 3-9, respectively, with the following exceptions.

Power revenue is assigned 25 percent to the three O&M peaking components and the elevation component to offset the power use of the peak demands. The District receives approximately $25.4 million dollars in property tax revenue that does not have specific spending restrictions. Thus, $1 million of the property taxes are used to fund the District's Customer Assistance Program (low income). The remaining property tax revenue is allocated to the water system's capital costs with an additional 3.5 percent of the property tax revenue assigned to fund the recycled water capital costs. The operating reimbursement includes $5.7 million that offsets Customer costs the District incurs for collecting wastewater fees for other agencies on the District's water bill. The remaining operating reimbursement is for Administrative and General Services that are provided to the District's wastewater system, which is a self-contained enterprise fund separate from the water system. The Richmond Advanced Recycled Expansion (RARE) is credited to the recycled water program O&M costs.

Table 3-15 shows the allocations of the revenue offsets to the different cost components as described in the previous paragraph. The percentages are applied to the revenue offsets, totaling $81.8 million and shown in Table 3-10, to determine the amount of offsets to be applied to each cost component.

[10] "Meter size is used as a proxy for the estimated demand that each customer can place on the water system. A significant portion of a water system's design and in turn, the utility's operating and capital costs are related to meeting capacity requirements." American Water Works Association, Principles of Water Rates, Fees and Charges: Manual of Water Supply Practices M1 138-139, 270-275, Appendix B (6th ed. 2012).

Table 3-15
Revenue Offsets Allocation

Revenue Offsets Allocation	Base	Max 6 Months	Max Day	Max Hour	Elevation	Supplemental Supply	Recycled Water	Fire Protection	Meters	Customer	General	Total
Total Seismic Charges Revenue									100.0%			100.0%
Supplemental Supply Surcharge						100.0%						100.0%
Taxes, less customer assistance	26.6%	1.1%	13.0%	12.9%	2.8%	18.2%	5.5%	5.4%	11.1%	0.0%	3.5%	100.0%
Power		25.0%	25.0%	25.0%	25.0%							100.0%
Interest	25.7%	1.4%	7.4%	7.5%	5.5%	1.0%	2.3%	3.2%	4.2%	8.7%	33.0%	100.0%
Sewer Capacity Charges Applied to Debt Service	26.6%	1.1%	13.0%	12.9%	2.8%	18.2%	2.0%	5.4%	11.1%	0.0%	7.0%	100.0%
Operating Reimbursement	9.8%	0.5%	2.8%	2.8%	2.1%	0.4%	0.9%	1.2%	1.6%	62.0%	15.9%	100.0%
RARE Reimbursement							100.0%					100.0%
All Other	26.6%	1.1%	13.0%	12.9%	2.8%	18.2%	2.0%	5.4%	11.1%	0.0%	7.0%	100.0%
Transfer (to)/from Rate Stabilization Reserve	100.0%											100.0%
Transfer (to)/from Supplemental Supply RSR						100.0%						100.0%
Transfer (to)/from Future Water Supply RSR						100.0%						100.0%
Revenue Offsets	**($18,779,249)**	**($1,732,929)**	**($9,822,766)**	**($9,796,185)**	**($3,080,427)**	**($11,910,589)**	**($3,833,010)**	**($3,678,013)**	**($7,460,538)**	**($5,887,696)**	**($5,818,598)**	**($81,800,000)**

3.5.4 Unit Costs

Table 3-16 shows the units of service and the development of the Test Year unit costs for each of the cost components. To ensure that the costs are appropriately shared between fixed and variable components and recognize the demands based on meter capacity, a portion of the extra capacity related costs are allocated to meters to recognize the demand that meters place on the system as described in Section 3.5.2 (shown in Table 3-16 in the row titled "Adjustment from Rates Sheet"). As the cost of providing public fire protection will be recovered via the meter service charge, the costs associated with public fire protection have been reallocated to the meters component in proportion to the capacity of the fire hydrants as compared to the total (hydrants plus private) fire capacity, leaving the private fire costs to be recovered via the private fire service meter charges. Public fire protection costs are approximately 85 percent of the total Fire Protection costs, based upon the relative capacity of the hydrants and the private fire service meters. Finally, general costs have been reallocated proportionally to the remaining cost components. The allocated costs are divided by the total number of units for each component to determine the unit costs of each component, as shown in Table 3-16. Total capital expense is the sum of existing debt service, administration of capital, and direct expenses less transfers from other funds for capital as shown on Table 3-10. The capital expense is then spread to the cost components using the percentages from Table 3-9. Operating expense by cost component is taken from Table 3-8.

Table 3-16
Development of Unit Costs

	Base	Max 6 Months	Max Day	Max Hour	Elevation	Supplemental Supply	Recycled Water	Fire Protection	Meters	Customer	General	Total
Operating Expenses	$54,308,354	$3,053,385	$15,579,800	$15,782,508	$11,538,934	$2,087,683	$4,949,517	$6,721,204	$8,930,738	$18,477,415	$69,802,783	$211,232,321
Capital Expenses	$60,151,250	$2,435,251	$29,346,379	$29,235,545	$6,329,695	$41,123,949	$4,554,181	$12,140,742	$25,058,628	$0	$15,792,059	$226,167,679
Revenue Offsets	($18,779,249)	($1,732,929)	($9,822,766)	($9,796,185)	($3,080,427)	($11,910,589)	($3,833,010)	($3,678,013)	($7,460,538)	($5,887,696)	($5,818,598)	($81,800,000)
Total Cost of Service	**$95,680,355**	**$3,755,706**	**$35,103,413**	**$35,221,868**	**$14,788,203**	**$31,301,044**	**$5,670,688**	**$15,183,933**	**$26,528,828**	**$12,589,719**	**$79,776,244**	**$355,600,000**
Allocation of General Cost	$27,673,538	$1,086,259	$10,152,927	$10,187,188	$4,277,178	$9,053,171	$1,640,128	$4,391,634	$7,672,908	$3,641,312	($79,776,244)	$0
Allocation of Public Fire Protection								($16,639,232)	$16,639,232			$0
Allocation of Private Fire Meter Maintenance								$7,248,117	($7,248,117)			$0
Allocated Cost of Service	**$123,353,893**	**$4,841,966**	**$45,256,340**	**$45,409,055**	**$19,065,381**	**$40,354,215**	**$7,310,815**	**$10,184,452**	**$43,592,851**	**$16,231,031**	**$0**	**$355,600,000**
Adjustment from Rates Sheet	$0	$0	($10,408,958)	($10,444,083)	$0	$3,316,522	($3,316,522)	$0	$20,853,041	$0		$0
												$0
Adjusted Cost of Service	**$123,353,893**	**$4,841,966**	**$34,847,382**	**$34,964,973**	**$19,065,381**	**$43,670,737**	**$3,994,293**	**$10,184,452**	**$64,445,892**	**$16,231,031**	**$0**	**$355,600,000**
Unit of Service	79,745,288	48,149,317	260,756	697,716		79,745,288	2,233,016	191,645	470,922	4,646,892		
Units	hcf	hcf	hcf/day	hcf/day		hcf	hcf	Equiv. fire/yr	Equiv. meter/yr	Bills/yr		
Unit Cost	$1.55	$0.10	$133.64	$50.11		$0.55	$1.79	$4.43	$11.40	$3.49		
	hcf	hcf	hcf/day	hcf/day		hcf	hcf	Equiv. fire/mo	Equiv. meter/mo	bill		

3.6 ALLOCATION OF COSTS TO CUSTOMER CLASS

The unit cost of each of the cost categories shown in Table 3-16 is then applied to the Test Year usage and units for each customer class to derive customer class costs. Costs are allocated to each customer class based on the respective peaking factors for each class.

3.6.1 Supplemental Supply Allocation

Table 3-17 shows the allocation of the supplemental supply costs to each customer class based on the impact of the supplemental supply on the District's drought management plan. The supplemental supply projects are designed to help meet the customer demands during dry years. When the District's water supplies are low, use reductions are required of all customer classes is required of all customers. The supplemental supply projects will reduce the amount of customer use reduction that is required during a drought. Because the District has set a policy that has specific reduction goals for different types of customers during a water shortage emergency, the supplemental supplies will most benefit the customers who have been assigned the smallest reduction goals, such as multi-family customers that generally have limited outdoor water use. By comparing the use reduction required with the supplemental supply projects, with the use reduction without the projects, the benefits of the supplemental supplies can be assigned to each customer class. From the District's 2005 and 2010 Urban Water Management Plan, the District would face drought use reductions of 28.7 percent over the 3-year design drought without its supplemental supply program. With the supplemental supply projects currently in place, mandatory District-wide use reductions are reduced to 19.2 percent over the design drought. Table 3-17 calculates the amount of supplemental supplies used by each customer class during the design drought and allocates the cost of the supplemental water supplies in proportion to each customer class's use of the supplemental water supply.

Table 3-17
Allocation of Supplemental Water Supply Costs to Customer Class

Customer Class	% of Normal	Normal Demand	Drought Reduction %	Drought Demand	Drought Supply -29%	Supplemental Supply	Allocation %	Suppl. Supply Cost
SFR	49.6%	40,650,556	22.7%	31,410,685	28,997,424	2,413,261	33.8%	$14,744,111
MFR	17.5%	14,356,603	13.9%	12,356,728	10,241,053	2,115,675	29.6%	$12,925,975
All Other	30.2%	24,738,129	18.1%	20,265,475	17,646,549	2,618,927	36.6%	$16,000,652
Recycled Water	2.7%	2,233,016	0.0%	2,233,016	2,233,016	0	0.0%	$0
TOTAL		**81,978,304**		**66,265,904**	**59,118,041**	**7,147,863**	**100.0%**	**$43,670,737**

Table 3-18 shows the allocation of costs to each customer class, based on the service units from Table 3-12, the unit cost from Table 3-16, and the supplemental water supply allocation from Table 3-17.

Table 3-18
Allocation of Costs to Customer Class

	Base	Max 6 Months	Max Day	Max Hour	Elevation	Supplemental Supply	Recycled Water	Private Fire Meters	Standard Meters	Customer	Total
SFR	$62,880,259	$2,529,121	$18,604,576	$18,138,915		$14,744,111			$46,748,424	$13,652,742	$177,298,147
MFR	$22,207,492	$778,536	$4,468,007	$5,617,693		$12,925,975			$7,550,045	$1,194,858	$54,742,607
All Other	$38,266,142	$1,534,309	$11,774,798	$11,208,365		$16,000,652			$10,147,423	$1,122,849	$90,054,537
Recycled Water						$0	$3,994,293				$3,994,293
Private Fire Meters								$10,184,452		$260,583	$10,445,035
Elevation Surcharge					$19,065,381						$19,065,381
TOTAL	**$123,353,893**	**$4,841,966**	**$34,847,382**	**$34,964,973**	**$19,065,381**	**$43,670,737**	**$3,994,293**	**$10,184,452**	**$64,445,892**	**$16,231,031**	**$355,600,000**

	Base	Max 6 Months	Max Day	Max Hour	Elevation	Supplemental Supply	Recycled Water	Private Fire Meters	Standard Meters	Customer	Total
SFR	35.5%	1.4%	10.5%	10.2%	0.0%	8.3%	0.0%	0.0%	26.4%	7.7%	49.9%
MFR	40.6%	1.4%	8.2%	10.3%	0.0%	23.6%	0.0%	0.0%	13.8%	2.2%	15.4%
All Other	42.5%	1.7%	13.1%	12.4%	0.0%	17.8%	0.0%	0.0%	11.3%	1.2%	25.3%
Recycled Water	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	1.1%
Private Fire Meters	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	97.5%	0.0%	2.5%	2.9%
Elevation Surcharge	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.4%
TOTAL	**34.7%**	**1.4%**	**9.8%**	**9.8%**	**5.4%**	**12.3%**	**1.1%**	**2.9%**	**18.1%**	**4.6%**	**100.0%**

The SFR customer class has the highest assignment of costs at $177.3 million followed by the All Other customer class at $90 million. The District's residential class, both SFR and MFR, is responsible for approximately 65.3 percent of the total cost of service. The All Other class is responsible for approximately 25.3 percent of the annual cost of service. The recycled water class accounts for 1.1 percent of the cost of service. The remaining costs- 2.9 percent and 5.4 percent- are associated with private fire service connections (i.e., private fire meters) and elevation surcharge, respectively. The elevation surcharge is paid by SFR, MFR, and All Other customers, but treated as a customer category for the Study.

Table 3-19 compares the COS allocations to each customer class compared to the Test Year revenue collected from each customer class.

Table 3-19
Comparison of COS to Current Revenue – Test Year

	Test Year COS	FY 2013 Revenue	Difference
SFR	$177,298,147	$172,982,853	2.5%
MFR	$54,742,607	$53,605,676	2.1%
All Other	$90,054,537	$91,412,102	-1.5%
Recycled Water	$3,994,293	$4,100,583	-2.6%
Private Fire Meters	$10,445,035	$14,717,954	-29.0%
Elevation Surcharge	$19,065,381	$18,997,005	0.4%
TOTAL	**$355,600,000**	**$355,816,172**	**-0.1%**

Once the customer class cost responsibility is determined, the next step is to design customer rate schedules to recover the revenues required from each customer class, which is discussed in the next section. The rate analysis will illustrate how revenues are collected within each class using the current rate structure and how they compare to costs.

4. PROPOSED WATER USER CHARGES

4.1 SETTING INDIVIDUAL COMPONENT RATES

The revenue requirements and cost of service analysis described in the preceding sections of this Report allocate the costs equitably and proportionately among the different customer classes. When calculated, the user charge or fixed charge and volume rate schedules for each customer class must be equitably and proportionately recovered from the customers in that class. This section of the report discusses the current water user charge structure and develops a schedule of water charges and rates for the District's customer classes to meet the District's objectives to proportionately allocate the costs of service and efficiently use District resources. Finally, this section analyzes the impact of the proposed cost allocations and rate design on District customers.

The primary emphasis in the setting of rate structures is ordinarily placed on achieving fairness and equity, with the objective of being able to ensure that each customer class pays its fair share of costs and to comply with State Constitution requirements that the rates not exceed, and are proportionate to, the costs of providing the service. While the current rate structure is retained, based on discussion with District staff, the individual customer class rates are determined based on the COS analysis. The following subsections discuss how each rate component is calculated.

4.2 PROPOSED MONTHLY SERVICE CHARGE

A service charge is a cost recovery mechanism that is generally included in the user charge structure to recover some of the fixed costs, including meter and customer-related costs, and, potentially, a portion of the capacity-related costs to provide a stable source of revenue independent of water consumption.

Customer-related costs are fixed expenditures that relate to operational support activities, including accounting, billing, customer service, and administrative and technical support. The customer-related costs are essentially common-to-all customers that are reasonably uniform across the different customer classes. In addition, there are capacity-related costs such as meter maintenance and peaking charges that are included based on the hydraulic capacity of the meters. Since facilities are designed to meet peaking requirements, RFC has assigned a portion of the costs related to peaking to the service charge. Increasing the fixed charge reduces the variable rates and incentives for conservation, but provides a mechanism for recovering a portion of the fixed costs and ensures a stable source of customer revenues for the utility. A good rate design seeks an appropriate balance between these objectives. A guideline used in deciding the amount of revenue that should be recovered from fixed charges is provided by the California Urban Water Conservation Council's (CUWCC) Best Management Practice #11 which states that the maximum amount of the fixed revenue should not exceed 30 percent of the total rate revenue. The District collected approximately 26 percent of the total rate revenues from the fixed service charges in the Test Year, including the seismic improvement surcharge.[11] The proposed rate design retains the 26 percent of the total rate revenues collected from fixed charges.

Table 4-1 shows the calculation of Test Year COS monthly meter charge for regular meters. The meter capacity ratio is based on the District's Engineering Standard Practice (ESP) 521.2 (shown in Table 3-11).

[11] The Seismic Improvement Program surcharge is being phased out and will not be part of the water service rates beginning in FY 2016. .

Table 4-1
Test Year Monthly Service Charge

Meter Size	No. of Meters	Capacity Meter Ratio	Meter Component	Customer Component	Proposed Charges ($/mo)	FY 2013 Current ($/mo)
5/8 and 3/4 inch	348,599	1.00	$11.40	$3.49	**$14.90**	$13.37
1 inch	13,812	1.67	$19.01	$3.49	**$22.50**	$22.53
1 1/2 inch	11,786	3.33	$38.01	$3.49	**$41.51**	$37.43
2 inch	4,911	5.33	$60.82	$3.49	**$64.32**	$55.48
3 inch	1,166	10.67	$121.64	$3.49	**$125.14**	$97.58
4 inch	451	16.67	$190.07	$3.49	**$193.57**	$157.69
6 inch	186	33.33	$380.14	$3.49	**$383.64**	$308.04
8 inch	86	53.33	$608.22	$3.49	**$611.72**	$488.44
10 inch	9	76.67	$874.32	$3.49	**$877.82**	$698.92
12 inch	12	106.67	$1,216.45	$3.49	**$1,219.95**	$969.50
14 inch	1	136.67	$1,558.58	$3.49	**$1,562.07**	$1,240.13
16 inch	2	173.33	$1,976.73	$3.49	**$1,980.23**	$1,570.85
18 inch	3	210.00	$2,394.88	$3.49	**$2,398.38**	$1,901.59

4.3 PROPOSED MONTHLY PRIVATE FIRE SERVICE CHARGE

Fire service charges are assessed to private fire protection meters. Based on the COS analysis discussed in the previous section, a portion of the total costs, equal to the proportional capacity needed to serve private fire service meters compared to total fire service capacity, are allocated to private fire protection. Table 4-2 shows the calculation of Test Year COS monthly meter charge for private fire service meters. The meter capacity ratio is based on the District's Engineering Standard Practice (ESP) 521.2.

Table 4-2
Test Year Monthly Private Fire Service Meter Charge

Meter Size	No. of Meters	Capacity Meter Ratio	Meter Component	Customer Component	Proposed Charges ($/mo)	FY 2013 Current ($/mo)
5/8 and 3/4 inch	34	1.00	$4.43	$3.49	**$7.93**	$11.48
1 inch	15	1.67	$7.38	$3.49	**$10.88**	$17.71
1 1/2 inch	240	3.33	$14.76	$3.49	**$18.26**	$27.91
2 inch	437	5.33	$23.62	$3.49	**$27.12**	$40.24
3 inch	3	10.67	$47.24	$3.49	**$50.74**	$68.99
4 inch	1,835	16.67	$73.81	$3.49	**$77.31**	$110.06
6 inch	2,092	33.33	$147.62	$3.49	**$151.12**	$212.74
8 inch	1,379	53.33	$236.19	$3.49	**$239.69**	$335.96
10 inch	164	76.67	$339.52	$3.49	**$343.02**	$479.74
12 inch	17	106.67	$472.38	$3.49	**$475.87**	$664.56
14 inch	0	136.67	$605.23	$3.49	**$608.73**	$849.41
16 inch	1	173.33	$767.61	$3.49	**$771.11**	$1,075.32
18 inch	0	210.00	$929.99	$3.49	**$933.49**	$1,299.43

4.4 PROPOSED VOLUME RATE

The volume or commodity rate is the dollar per hundred cubic feet of metered water use ($/ccf) – the rate – developed for each customer class to recover the District's variable volume-related costs. The volume rate is intended to recover all the costs not recovered via the monthly service charge and other charges assessed by the District. The annual Test Year revenue requirement, less annual cost-based service charge revenues (including revenues from the private fire service meter charges), are the revenues that need to be recovered through commodity rates.

Cost of service based commodity rates are developed for each customer class based on the principle of maintaining inter-class and intra-class revenue neutrality and equity. This means that each customer class would only pay its proportionate share of costs of service (refer to Table 3-18 for revenues required from each customer class), and that each account within each class would only pay its proportionate share of the customer class costs. Since a portion of the revenues required from each customer class is to be recovered through monthly service charges, commodity rates are designed to recover only that portion of revenue that is not recovered through the service charge. The commodity rates recover the base, max 6 months, max day, max hour, and supplemental supply costs for each customer class (refer to Table 3-18).

The District currently differentiates between SFR class, MFR class, and all other classes for the commodity rate design. To encourage conservation within an overall cost of service based rate design, SFR rates are tiered, i.e., the commodity rate increases as usage increases across defined usage tiers. Many agencies across the State use such a structure to encourage conservation and to proportionately allocate costs to those who place the greatest demands on the water system. RFC recommends the District retain its existing tiered rate structure to encourage conservation and proportionately allocate a greater share of the costs to those who place the greatest demand on the water system and thereby generate a greater share of the costs for the water system. Tiered rates are more practical to

implement for the individually metered SFR class because this class is a fairly homogenous class in terms of monthly water use. The SFR tier breakpoints are based on District's staff analysis of average monthly SFR water consumption. It is assumed that the SFR monthly average winter use of 7 ccf reflects the average SFR indoor use and is used as the Tier 1 breakpoint. The average summer SFR monthly water use of 16 ccf per month is used to set the breakpoint between Tier 2 and Tier 3. All remaining customers including MFR, All Other and Recycled Water customers will continue to be charged a uniform rate based on COS. These customer classes are not ideally suited for tiered rates because of their non-homogenous monthly water use patterns. While the same rate structure is used for these customer classes, the actual rate per ccf will be different based on their unique class cost of service.

Table 4-3 shows the development of the tiered rate for SFR customers for the Test Year. The Base cost represents the costs to deliver water at an average rate of demand, and is applied equally to the rate being developed for all tiers. The Peaking costs represent the peaking costs of the system, and this cost is also applied to each tier based on the estimated peaking characteristics of each tier. Tier 1 is assumed to have the lowest peaking cost because it provides indoor water usage. Tier 2 has average peaking costs because it allows for some outdoor usage. Tier 3 has the highest peaking costs because it covers outdoor usage for the largest SFR water users. Outdoor water usage is considered discretionary usage. Peaking cost allocation for each tier is based on the usage in each tier compared to Tier 2. Typically, larger residential water use represents higher peaks in the system. This method of peaking cost allocation reflects this typical trend. In order to allocate the SFR peaking costs to each SFR tier, a methodology must be used to establish what portion of the SFR peaking occurs in each SFR Tier. In general, the indoor use in Tier 1 has the least amount of peaking and heavy outdoor use in Tier 3 has the highest peaking. The District allocates the SFR peaking cost for each tier based on the SFR usage in each tier compared to Tier 2. SFR use in Tier 1, Tier 2, and Tier 3 is 7, 16 and 31 ccf per month respectively. The 31 ccf per month usage represents the average usage for SFR customers in Tier 3. The allocation of the SFR Supplemental Supply Costs to each SFR tier is based on the indoor and outdoor use reduction goals for SFR customers during a drought, per District policy. The use of supplemental supplies reduces or eliminates the need for mandatory District-wide use reductions during droughts. Without the supplemental supplies SFR indoor (Tier 1) and outdoor (Tiers 1 and 2) use would need to be reduced by 20 percent and 40 percent, respectively. These percentages are used to allocate the supplemental supply costs between the SFR tiers.

Table 4-3
Test Year SFR Commodity Rate – $/ccf

		Commodity Rate Component			Commodity Rate Component			
	Tiers (ccf/month)	Base	Peaking	Supplemental Supply	Base	Peaking	Supplemental Supply	Proposed Rate ($/ccf)
SFR								
Tier 1	0 - 7	100%	44%	20%	$1.55	$0.47	$0.25	$2.27
Tier 2	8 - 16	100%	100%	40%	$1.55	$1.07	$0.50	$3.12
Tier 3	16+	100%	194%	40%	$1.55	$2.07	$0.50	$4.12
Revenue Required		**$62,880,259**	**$39,272,612**	**$14,744,111**				
Total Applicable Usage (ccf)		40,650,556	37,088,201	11,974,586				
Unit Rate		$1.55	$1.07	$1.24				

Table 4-4 shows the calculation of the commodity rate for MFR, All Other, and Recycled Water customers for the Test Year. Since these customers have a uniform rate, their commodity rate is computed based on their annual usage revenues required and the annual volume of water usage.

Table 4-4
Test Year MFR, All Other, and Recycled Water Commodity Rate – $/ccf

Customer Class	Revenue Requirement	Usage (ccf)	Proposed Rate ($/ccf)
MFR	$45,997,704	14,356,603	**$3.21**
All Other	$78,784,265	24,738,129	**$3.19**
Recycled Water	$1,630,954	657,457	**$2.48**

4.5 PROPOSED ELEVATION SURCHARGE

The elevation surcharge recovers the costs associated with serving customers in higher elevations, which include the capital and O&M costs related to the pumping plants. The District's previous elevation charge study estimated that approximately 95 percent of the pumping related costs and facilities are used to serve customers in higher elevations. RFC retained the District's current methodology of determining the elevation surcharge[12], which is to spread the total pumping costs based on the hydraulic lift method because the pumps at lower elevations also provide the lift to the higher elevations. The Elevation Surcharges are determined by the pressure zone in which the service connection is located. The water system pressure zones are categorized into 100' elevation zones. The elevation zones are grouped into 3 Elevation Bands for the purpose of the Elevation Surcharge. Elevation Band 1 includes the elevation zones 0 through 200 feet (approximate). These elevation zones are served by gravity flow and no pumping is required. Elevation Band 2 includes elevation zones 200 through 600 feet (approximate). These elevation zones require pumping. Elevation Band 3 includes elevation zones above 600 feet (approximate). These elevation zones require considerable pumping. The allocation of elevation O&M and capital costs are shown in Tables 3-7 through 3-9. The total elevation cost is shown in Table 3-16.

Table 4-5 shows the calculation of Test Year COS elevation surcharge unit cost, which is calculated by dividing the total elevation cost of $19.1 million by the total weighted consumption in Elevation Bands 2 and 3. Weighted consumption in Table 4-5 is derived by multiplying the Zone in 100 ft value (weighting factor) times the consumption in that elevation zone.

[12] This methodology is described in the 1997 Review of Elevation Surcharge and Fire Service Charges Report, prepared by Barakat & Chamberlin, Inc.

Table 4-5
Calculation of Test Year Elevation Surcharge Unit Cost

Elevation Band (1, 2, 3)	Zone in 100 ft (weighting factor)	Consumption (ccf)	Weighted Consumption	Weighted Ratio
1	0	35,113,602	0	
1	1	12,434,953	0	
2	2	5,860,455	11,720,910	
2	3	7,029,157	21,087,471	
2	4	3,963,844	15,855,376	
2	5	10,587,181	52,935,905	
2	6	153,379	920,274	
3	7	4,294,631	30,062,417	
3	8	978,200	7,825,600	
3	9	842,664	7,583,976	
3	10	111,820	1,118,200	
3	11	494,727	5,441,997	
3	12	113,691	1,364,292	
TOTAL		**81,978,304**	**155,916,418**	
Band 1		47,548,555	0	0%
Band 2		27,594,016	102,519,936	82%
Band 3		6,835,733	53,396,482	172%
Total Elevation Costs (from Table 3-16)			**$19,065,381**	
Total Consumption in Bands 2 and 3			34,429,749	
Elevation Unit Cost			$0.55	

Table 4-6 shows the calculation of Test Year COS elevation surcharge. The surcharge for each band is calculated based the unit cost of $0.55 per ccf by the weighted ratio for each band. The weighted ratio represents the relative proportion between the weighted consumption and the actual consumption for Bands 2 and 3.

Table 4-6
Test Year Elevation Surcharge

	Weighted Ratio	Proposed Rate ($/ccf)	FY 2013 Current ($/ccf)
Band 1	0%	**$0.00**	$0.00
Band 2	82%	**$0.46**	$0.46
Band 3	172%	**$0.95**	$0.93

4.6 CUSTOMER IMPACTS OF COST OF SERVICE ADJUSTMENTS

RFC completed an analysis to evaluate the impact of the proposed user charge structure on customers with various water usage levels. The impacts of the proposed user charge structure on each user class and within the user class is discussed in the balance of this section of the Study. The results of the COS analysis are shown in comparison to the District's Test Year rates. By comparing the changes to the Test Year in this section, the customer impact attributed to the COS adjustments can be shown. The customer impacts of the FY 2016 and FY 2017 overall rate increase combined with the results of the COS adjustments are shown in Section 7. For SFR customers, who account for approximately 60 percent of the District's customer base, the bill impacts for the Test Year at various usage levels assuming a 5/8" or 3/4" meter are shown in Table 4-7. An average customer using 10 ccf per month would not see any difference in their monthly water bill.

Table 4-7
SFR Water Bill Impacts for Test Year

Use Level	Monthly Use (ccf)	Current Bill	Proposed Bill	Difference ($)	Difference (%)
Very Low	4	$26.88	$26.99	$0.11	0.4%
Low	7	$34.14	$33.80	($0.34)	-1.0%
Average	10	$43.14	$43.16	$0.02	0.0%
High	16	$61.14	$61.88	$0.74	1.2%
Very High	30	$112.66	$119.56	$6.90	6.1%

Note: Current bill includes SIP surcharge. All bill calculations assume 5/8" or 3/4" meter.
SIP surcharge is being phased out and will not be part of the water service rates beginning in FY 2016.
The Study calculates the rates assuming there is no SIP surcharge.

Table 4-8 shows the MFR bill impacts at various levels of water usage for the Test Year. An average MFR account with a 1" meter using 42 ccf per month would not see a significant difference in their monthly water bill and customers using water at the Low and Very Low level would experience a decrease in their monthly bill.

Table 4-8
MFR Water Bill Impacts for Test Year

Use Level	Monthly Use (ccf)	Current Bill	Proposed Bill	Difference ($)	Difference (%)
Very Low	15	$78.36	$75.20	($3.16)	-4%
Low	20	$93.66	$91.25	($2.41)	-3%
Average	42	$160.98	$161.87	$0.89	1%
High	60	$216.06	$219.65	$3.59	2%
Very High	100	$338.46	$348.05	$9.59	3%

Note: Current bill includes SIP surcharge. All bill calculations assume 1" meter.
SIP surcharge is being phased out and will not be part of the water service rates beginning in FY 2016.
The Study calculates the rates assuming there is no SIP surcharge.

Table 4-9 shows the All Other customer bill impacts at various levels of water usage for the Test Year. An average non-residential account with a 2" meter using 84 ccf per month would not see a significant difference in their monthly water bill.

Table 4-9
All Other Water Bill Impacts for Test Year

Use Level	Monthly Use (ccf)	Current Bill	Proposed Bill	Difference ($)	Difference (%)
Very Low	20	$132.63	$141.12	$8.49	6%
Low	50	$231.56	$236.82	$5.26	2%
Average	84	$343.68	$345.28	$1.60	0%
High	100	$396.44	$396.32	($0.12)	0%
Very High	200	$726.19	$715.32	($10.87)	-1%

Note: Current bill includes SIP surcharge. All bill calculations assume 2" meter.

SIP surcharge is being phased out and will not be part of the water service rates beginning in FY 2016.

The Study calculates the rates assuming there is no SIP surcharge.

5. COST OF SERVICE ANALYSIS: WASTEWATER UTILITY

This section of the report discusses the allocation of O&M expenses and capital costs to the appropriate parameters consistent with industry standards and the determination of unit costs. In this Study, as with water, wastewater rates were calculated for FY 2013 as this was a full year of actual functionalized expense data available at the time the study commenced and was a representative year for the District, and accordingly FY 2013 is defined as the Test Year. Test Year revenue requirements are used in the cost allocation process.

To allocate the cost of service among the different customer classes, costs first need to be allocated to the appropriate wastewater parameters. The following sections describe the allocation of the operating and capital costs of service to the appropriate parameters of the wastewater system.

The total cost of wastewater service is analyzed by system function in order to equitably distribute costs of service to the various classes of customers. For this analysis, wastewater utility costs of service are developed consistent with the guidelines for allocating costs detailed in the Water Environment Federation (WEF) Manual of Practice No. 27, Financing and Charges for Wastewater Systems, 2004.

The wastewater COS analysis consists of six major steps, as outlined below:

1. Conduct plant mass balance to estimate the flows and strength of each customer class.
2. Functionalize O&M and capital costs into functional categories such as Treatment, Billing and, Customer Service.
3. Allocate each functional category into cost components such as Infiltration and Inflow (I&I), Flow, Strength, and, Billing and Customer Service.
4. Develop customer class characteristics by cost component.
5. Calculate the cost component rates by dividing the total cost in each cost component in Step 3 by the customer class characteristics in Step 4.
6. Calculate the cost by customer class by multiplying the unit cost in Step 5 by the customer class characteristics in Step 4.

5.1 WASTEWATER STUDY OBJECTIVES

In reviewing the District's existing rates and charges, RFC discussed a number of considerations with staff. In addition to the general updates of cost of service, the following items were identified as particular objectives of the study.

1. Review domestic strength concentration to reflect reduced flows at the plant
2. Review allocation of wet weather costs to reflect the costs of I&I into the plant

5.2 PLANT BALANCE

The plant balance analysis is used to estimate and validate the wastewater loadings (flow and strength) generated by each customer class. While wastewater discharged into sewers for most users is not

metered when it enters the wastewater system, the total amount of flow and strength entering the treatment plant and treated every day is a known quantity. Additionally, non-residential and industrial customer flows can be estimated based on their water usage. Non-residential and industrial customer strengths are estimated according to industry accepted standards. The remaining loadings, net of the total less I&I and trucked waste at headworks, as well as, non-residential and industrial, are assigned to residential users.

The District bases its residential (SFR accounts and 2-4 dwelling unit MFR accounts) loadings on a fixed strength of 7.74 lbs of filtered chemical oxygen demand (CODf) per dwelling unit and 11.01 lbs of total suspended solids (TSS) per dwelling unit. This fixed strength per dwelling unit is calculated based on the average residential indoor water use of 5.51 ccf per month per dwelling unit (lowest winter average use) and the domestic strength concentrations of 225 mg/l CODf and 320 mg/l TSS. The residential and the nonresidential billed CODf and TSS strength loadings are consistent with the net loadings observed at the plant. Increased loadings will increase operating costs and directly impact capital costs as long as there is capacity in the plant to handle the higher loadings.

In addition to the fixed strength charge for residential customers, the District also assesses a variable flow charge to residential customers, but caps the flow charge at 9 ccf per month per dwelling unit to recognize that some of the billed residential water consumption is likely used for irrigation purposes that does contribute to wastewater flows and does not enter the wastewater system. Accordingly, residential billed water use above 9 ccf per month per dwelling unit is not assessed a wastewater flow charge. An analysis of the billing records shows that about 90 percent of all residential customers' winter use falls within the 9 ccf per month per dwelling unit flow cap.

The net plant loadings are balanced to the billed loadings from the wastewater treatment customers. The billed loadings by customer class are shown in Table 5-1 including the assumed CODf and TSS concentrations. The assumed CODf and TSS concentrations are based upon the several studies performed beginning in 1981 and periodically updated by the District on the waste strengths for the District's business classification code (BCC) categories. The studies included surveys of established waste strength concentrations of other agencies and sampling and inspection of District dischargers. The net plant loading analysis showed that the waste strength concentration for domestic strength should be increased by 15 percent from 190 mg/l CODf and 270 mgl/l TSS to 225 mg/l CODf and 320 mg/l TSS, which is consistent with the decrease in residential per dwelling unit flows over the last 25 years. Note that the plant flow shown is equivalent to 24.5 million ccf per year.

Table 5-1
Test Year Plant Balance

		Flow (MG/yr)	CODf (lbs/yr)	TSS (lbs/yr)
Total Plant Influent		22,290.40	50,000,000	60,000,000
Less: I&I and Trucked Waste at Headworks		3,985.02	12,035,777	9,806,409
Net Plant Influent		**18,305.38**	**37,964,223**	**50,193,591**
Non-Residential				
2010	Meat Products	5.33	106,809	18,692
2011	Slaughterhouses	0.04	343	480
2020	Dairy Product Processing	4.08	57,877	13,278
2030	Fruit and Vegetable Canning	0.00	0	0
2040	Grain Mills	9.66	54,792	62,044
2050	Bakeries	35.40	502,045	354,385
2060	Sugar Processing	2.58	34,445	646
2077	Rentering Tallow	0.00	0	0
2080	Beverage Mfgr & Bottling	94.82	1,442,598	99,532
2090	Specialty Foods Mfgr	5.12	205,021	55,527
2600	Pulp and Paper Products	4.72	61,419	180,647
2810	Inorganic Chemicals Mfgr	1.83	1,528	21,394
2820	Synthetic Material Mfgr	0.54	134	134
2830	Drug Mfgr	98.77	346,123	52,954
2840	Cleaning and Sanitation Prod	1.54	17,944	5,383
2850	Paint Mfgr	0.12	2,306	1,345
2893	Ink and Pigment Mfgr	0.13	1,215	88
3110	Leather Tanning/Finishing	0.00	0	0
3200	Earthenware Mfgr	40.56	35,150	161,105
3300	Primary Metals Mfgr	39.28	29,491	117,963
3400	Metal Prod Fabricating	14.49	9,669	3,626
3410	Drum and Barrel Mfgr	0.00	0	0
3470	Metal Coating	4.40	2,936	2,569
4500	Air Transportation	75.18	187,129	372,936
5812	Food Service Establishment	528.74	2,470,107	4,146,252
6513	Apartment Bldgs (5+ units)	4,129.07	7,750,282	11,022,624
7000	Hotels, Motels with Food	197.74	428,899	1,121,737
7210	Commercial Laundries	17.29	82,223	44,718
7215	Coin Operated Laundromats	180.86	543,171	286,673
7218	Industrial Laundries	48.92	379,606	51,178
7300	Laboratories	110.32	174,863	73,627
7542	Auto Washing and Polishing	36.63	88,609	61,110
8060	Hospitals	201.91	269,497	454,776
8200	Schools	852.25	995,352	568,773
0	All Other	2,841.86	5,312,910	7,556,003
Total Non-Residential		**9,584.18**	**21,594,494**	**26,912,197**
Residential		**8,721.19**	**16,369,730**	**23,281,393**
Total		**18,305.38**	**37,964,223**	**50,193,591**

5.3 ALLOCATION OF REVENUE REQUIREMENTS BY FUNCTION

The wastewater utility is comprised of various facilities, each designed and operated to fulfill a given function. In order to provide adequate service to its customers at all times, the utility must be capable of not only collecting the total amount of wastewater generated, but also treating and removing various nutrients (e.g., TSS and CODf) from the flow. The separation of costs by function allows allocation of such costs to the functional cost components. Table 5-2 shows the Test Year O&M expenses by the different functional categories, as classified by District staff.

Table 5-2
Allocation of Wastewater O&M Expenses

O&M Categories	Test Year
Interceptor	$2,465,010
R2	$1,791,040
Wet Weather	$1,456,955
Influent Operation	$6,130,125
Influent Maintenance	$845,801
Primary Operation	$6,152
Primary Maintenance	$512,550
Secondary Operation	$3,311,947
Secondary Maintenance	$899,087
O2	$111,671
Sludge Operation	$8,505,838
Sludge Maintenance	$944,593
Lab	$4,914,077
Permit	$1,461,918
I&I	$1,836,844
PGS	$1,794,782
Reclaimed	$773,322
Reimbursed	$270,820
Billing	$1,854,700
Overhead	$15,374,820
TOTAL O&M EXPENSES	**$55,262,051**

Table 5-3 shows the Test Year book value of the total wastewater assets by the different asset classes, which are then classified by functions similar to the O&M expenses. Book value reflects the historic asset costs less accumulated depreciation and was obtained from District's financial records. Using the book value method for the COS results in a rate structure that is weighted move heavily on recently constructed capital assets rather than older assets.

Table 5-3
Allocation of Wastewater Assets – Book Value

Assets Categories	Test Year
Mwwtp-Chlorine System	$106,598
Mwwtp-Chlorination Building	$1,717,788
Mwwtp-Outfall Land	$425,130
Mwwtp-Outfall Submarine	$3,341,023
Mwwtp-Outfall Bridge	$110,925
Mwwtp-Effluent Pump Station	$5,292,683
Mwwtp-Water Pump Station #3	$492,112
Mwwtp-Process Water Plant	$817,006
Mwwtp-Dechlorination Station	$6,312,819
Mwwtp-Filter Plant Solids Handling Facility	$16,433,698
Mwwtp-Sodium Bisulfite Area	$761,578
Mwwtp-Grounds & Improvements	$7,704,272
Mwwtp-Administration And Lab Building	$10,669,139
Mwwtp-Service Building	$0
Mwwtp-Administration And Lab Center	$12,011,010
Mwwtp-Maintenance Center	$8,729,600
Mwwtp-Piping For Plant Utilities	$5,302,703
Mwwtp-Bulk Storage Area	$1,490,994
Mwwtp-Field Services Bldg	$2,312,568
Wastewater Land - General	$14,461,026
ALL WASTEWATER PORTABLE EQUIPMENT	$5,567,447
Mwwtp-Aerated Grit Tanks	$1,998,235
Mwwtp-Grit Dewatering Station	$9,088,540
Mwwtp-Influent Pump Station	$13,229,087
North Interceptor	$30,721,163
South Interceptor	$22,133,162
Alameda Interceptor	$7,511,924
Estuary Crossing	$79,374
Central Avenue Interceptor	$7,033,509
South Foothill Interceptor	$16,131,147
Adeline Street Interceptor	$14,269,611
Powell Street Interceptor	$2,628,105
ANAS Interceptor	$2,902,592
Wood St Interceptor	$653,180
Pump Station A-Albany	$2,629,892
Pump Station B-Fernside	$3,790,342
Pump Station C-Krusi Park	$8,095,944
Pump Station D-Oak Street	$1,363,099
Pump Station E-Grand Street	$1,344,537
Pump Station F-Atlantic Avenue	$1,068,451
Pump Station G-Airport	$1,639,003
Pump Station H-Fruitvale	$8,327,381
Pump Station J-Frederick Street	$500,420
Pump Station K-7Th Street	$599,097
Pump Station L	$3,077,887
Pump Station Q- Wet Weather Page St Berkeley	$362,333
Pump Station N (new)	$5,046

Allocation of Wastewater Assets – Book Value (cont'd)

Assets Categories	Test Year
ANAS Pump Station R	$6,153,745
Pump Station M - Bridgeway	$1,117,483
Mwwtp-Reactor Deck Area-Oxygen Production	$3,343,186
Mwwtp-Secondary Treatment Facility	$31,316,892
Mwwtp-Power Generation Station	$55,749,336
Mwwtp-Scum Dewatering Station	$6,945,437
Mwwtp-Chemical Trench	$491,461
Mwwtp-Pre-Chlorination Facility	$587,337
Mwwtp-Interem Sludge Disposal Facility	$49,023
Mwwtp-Chemical Storage Building (Relocated)	$1,600,669
Mwwtp-Sludge Digestion Facilities	$47,076,603
Mwwtp-Sludge Dewatering Facilities	$26,081,499
Mwwtp-Temp Sludge Dewatering Facility	$1,274,636
Mwwtp-Odor Control At Sludge Thickener	$6,745,347
Mwwtp-Compost Area	$0
Mwwtp-Composting Facility	$1,047,061
Pt. Isabel Tp-Treatment & Pretreatment Structures	$26,639,925
Mwwtp-Mid-Plant Pump Station	$4,199,533
Mwwtp-Wet Weather Pump Station	$771,210
Mwwtp-Washdown Pump Station	$100,033
Point Richmond-Pretreatment Structure	$0
Oakport Wet Weather-Pretreatment Structure	$4,689,844
Oakport Wet Weather-Pretreatment Structure	$521,130
Mwwtp-Channel Crossing For Bypass Channel	$3,416,528
Mwwtp 90" Pipe-Primry Effluent Bypass	$1,517,340
Mwwtp 72" Pipe-Primry Influent Bypass	$1,533,171
Mwwtp-Diversion Structure	$15,020,130
Mwwtp-Bypass Inlet Structure	$5,432,968
North Interceptor Junction Storage	$242,753
Mwwtp-Bypass Outlet Structure	$348,305
Mwwtp-Final Effluent Bypass Channel	$1,590,395
Mwwtp-Storage Basin	$14,522,220
Oakport WW-Chlor System	$74,725
Oakport WW-DeChlor System	$135,478
Oakport WW-Control Bldg	$480,282
Oakport WW-Emg Gen	$237,479
Oakport WW-Drainage	$518,611
Oakport WW-Washwtr Pump Sta.	$0
Oakport WW-Storage Bldg.	$305,686
Oakport WW-Lscape/Pav/Fence	$1,578,974
San Antonio Creek Wet Weather TP	$7,925,370
San Antonio Creek Ww Dechlorination Facility	$2,264,604
San Antonio Creek Ww Outfall Structure	$1,713,386
San Antonio Creek Ww Gravity Sewer	$357,282
San Antonio Creek Ww Lake Merritt Channel Crossing	$1,015,310
San Antonio Creek Ww Outfall Subequacous Pipeline	$1,507,606
TOTAL ASSETS	**$553,483,169**

5.4 ALLOCATION OF FUNCTIONAL COSTS TO COST COMPONENTS

In order to allocate costs of service to the different user classes, unit costs of service are developed. O&M expenses and capital costs are functionalized as transmission, treatment, billing, administrative, etc. These total costs are then allocated to the flow, CODf and TSS parameters based on the design of each facility. Since treatment plants are designed to treat flow, CODf and TSS, treatment costs are allocated to those three parameters based on the design of each component of the treatment system. For example, the equipment in the primary clarifiers is designed to remove suspended solids. Along with suspended solids there is also some removal of CODf; therefore the equipment is allocated to TSS and CODf based on the removal of those two parameters. Additionally, the primary tank structure is designed for flow; therefore the structure is allocated to flow. Similarly, other components of the treatment plant are analyzed to determine the appropriate allocation to flow, CODf and TSS. Most of the wastewater systems must handle the additional loadings from wet weather flows; therefore, a portion of their system costs are allocated to the I&I parameter. Administrative costs are assigned to Other cost components (for general expenses) and then spread among the remaining costs centers proportionately.

Table 5-4 shows the different allocations to the cost components such as the parameters for I&I, Flow, CODf, TSS, etc. of each O&M functional cost category. The allocations are calculated based on the functions of each category, provided by the District from its 2000 Wastewater Rates Cost Allocation Update prepared by Carollo Engineers. RFC has reviewed these allocations and they appear to be reasonable.

Table 5-4
Allocation to Cost Components – O&M

O&M Categories	I&I	Flow	CODf	TSS	Customer	Other	TOTAL
Interceptor	26.0%	74.0%					100.0%
R2						100.0%	100.0%
Wet Weather	100.0%						100.0%
Influent Operation	22.6%	62.7%		14.7%			100.0%
Influent Maintenance	28.0%	64.3%		7.7%			100.0%
Primary Operation	22.6%	62.7%		14.7%			100.0%
Primary Maintenance	28.0%	64.3%		7.7%			100.0%
Secondary Operation	9.0%	23.9%	33.5%	33.6%			100.0%
Secondary Maintenance	16.6%	12.8%	35.3%	35.3%			100.0%
O2	16.6%	12.8%	35.3%	35.3%			100.0%
Sludge Operation			31.3%	68.7%			100.0%
Sludge Maintenance			27.5%	72.5%			100.0%
Lab	0.0%					100.0%	100.0%
Permit	0.0%					100.0%	100.0%
I&I	100.0%					0.0%	100.0%
PGS	9.0%	20.0%	32.0%	39.0%			100.0%
Reclaimed	0.0%					100.0%	100.0%
Reimbursed	0.0%					100.0%	100.0%
Billing					100.0%		100.0%
Overhead						100.0%	100.0%

Table 5-5 shows the allocation of O&M expenses (shown in Table 5-2) to the different cost components based on the allocation percentages shown in Table 5-4.

Table 5-5
Allocation of O&M Expenses to Cost Components

O&M Categories	I&I	Flow	CODf	TSS	Customer	Other	Test Year
Interceptor	$640,903	$1,824,107	$0	$0	$0	$0	$2,465,010
R2	$0	$0	$0	$0	$0	$1,791,040	$1,791,040
Wet Weather	$1,456,955	$0	$0	$0	$0	$0	$1,456,955
Influent Operation	$1,385,408	$3,843,588	$0	$901,128	$0	$0	$6,130,125
Influent Maintenance	$236,824	$543,850	$0	$65,127	$0	$0	$845,801
Primary Operation	$1,390	$3,857	$0	$904	$0	$0	$6,152
Primary Maintenance	$143,514	$329,570	$0	$39,466	$0	$0	$512,550
Secondary Operation	$298,075	$791,555	$1,109,502	$1,112,814	$0	$0	$3,311,947
Secondary Maintenance	$149,248	$115,083	$317,378	$317,378	$0	$0	$899,087
O2	$18,537	$14,294	$39,420	$39,420	$0	$0	$111,671
Sludge Operation	$0	$0	$2,662,327	$5,843,511	$0	$0	$8,505,838
Sludge Maintenance	$0	$0	$259,763	$684,830	$0	$0	$944,593
Lab	$0	$0	$0	$0	$0	$4,914,077	$4,914,077
Permit	$0	$0	$0	$0	$0	$1,461,918	$1,461,918
I&I	$1,836,844	$0	$0	$0	$0	$0	$1,836,844
PGS	$161,530	$358,956	$574,330	$699,965	$0	$0	$1,794,782
Reclaimed	$0	$0	$0	$0	$0	$773,322	$773,322
Reimbursed	$0	$0	$0	$0	$0	$270,820	$270,820
Billing	$0	$0	$0	$0	$1,854,700	$0	$1,854,700
Overhead	$0	$0	$0	$0	$0	$15,374,820	$15,374,820
TOTAL O&M EXPENSES	**$6,329,230**	**$7,824,862**	**$4,962,720**	**$9,704,543**	**$1,854,700**	**$24,585,997**	**$55,262,051**
% allocation	11.5%	14.2%	9.0%	17.6%	3.4%	44.5%	

Capital costs include capital improvements financed from annual revenues, debt service and other sources. Capital costs related to specific facilities will vary significantly from year to year. Allocating these costs based on the functions of these specific facilities could cause the rates to the different customer classes to change from year to year. A reasonable method of assigning capital costs to functional components, widely practiced in the industry, is to allocate such costs on the basis of net plant investment recognizing that over a period of time these allocations will provide costs to be passed on to customers equitably.

Net plant investment is represented by the total asset value of wastewater utility facilities less accumulated depreciation. The estimated fiscal year net plant investment in wastewater facilities consists of the net plants in service as of the end of the Test Year.

Costs are allocated based on the design criteria of each facility. Collection costs are allocated entirely to flow. Since treatment plants are designed to treat flow, CODf and TSS, treatment costs are allocated to those three parameters: based on the design of each component of the treatment system. For example, the equipment in the primary clarifiers is designed to remove suspended solids. Along with TSS there is also some removal of CODf; therefore the equipment is allocated to TSS and CODf based on the removal of those two parameters. Additionally, the primary tank structure is designed for flow; therefore the structure is allocated to flow. Similarly other components of the treatment plant are analyzed to determine the appropriate allocation to flow, CODf and TSS.

Table 5-6 shows the different allocations to the cost components such has I&I, Flow, CODf, TSS, etc. of each capital asset. The allocations of the wastewater capital assets were developed for the District in a 2000 study[13].

[13] The allocations were based on the 2000 Wastewater Rates Cost Allocation Update Report prepared by Carollo Engineers.

Table 5-6
Allocation to Cost Components – Capital

Assets Categories	I&I	Flow	CODf	TSS	TOTAL
Mwwtp-Chlorine System	50.0%	50.0%	0.0%	0.0%	100.0%
Mwwtp-Chlorination Building	50.0%	50.0%	0.0%	0.0%	100.0%
Mwwtp-Outfall Land	50.0%	50.0%	0.0%	0.0%	100.0%
Mwwtp-Outfall Submarine	50.0%	50.0%	0.0%	0.0%	100.0%
Mwwtp-Outfall Bridge	50.0%	50.0%	0.0%	0.0%	100.0%
Mwwtp-Effluent Pump Station	50.0%	50.0%	0.0%	0.0%	100.0%
Mwwtp-Water Pump Station #3	50.0%	50.0%	0.0%	0.0%	100.0%
Mwwtp-Process Water Plant	50.0%	50.0%	0.0%	0.0%	100.0%
Mwwtp-Dechlorination Station	50.0%	50.0%	0.0%	0.0%	100.0%
Mwwtp-Filter Plant Solids Handling Facility	50.0%	50.0%	0.0%	0.0%	100.0%
Mwwtp-Sodium Bisulfite Area	45.0%	55.0%	0.0%	0.0%	100.0%
Mwwtp-Grounds & Improvements	45.0%	23.7%	11.1%	20.2%	100.0%
Mwwtp-Administration And Lab Building	45.0%	23.7%	11.1%	20.2%	100.0%
Mwwtp-Service Building	45.0%	23.7%	11.1%	20.2%	100.0%
Mwwtp-Administration And Lab Center	45.0%	23.7%	11.1%	20.2%	100.0%
Mwwtp-Maintenance Center	45.0%	23.7%	11.1%	20.2%	100.0%
Mwwtp-Piping For Plant Utilities	45.0%	23.7%	11.1%	20.2%	100.0%
Mwwtp-Bulk Storage Area	45.0%	23.7%	11.1%	20.2%	100.0%
Mwwtp-Field Services Bldg	45.0%	23.7%	11.1%	20.2%	100.0%
Wastewater Land - General	45.0%	23.7%	11.1%	20.2%	100.0%
ALL WASTEWATER PORTABLE EQUIPMENT	45.0%	23.7%	11.1%	20.2%	100.0%
Mwwtp-Aerated Grit Tanks	61.0%	0.0%	0.0%	39.0%	100.0%
Mwwtp-Grit Dewatering Station	61.0%	39.0%	0.0%	0.0%	100.0%
Mwwtp-Influent Pump Station	61.0%	39.0%	0.0%	0.0%	100.0%
North Interceptor	61.0%	39.0%	0.0%	0.0%	100.0%
South Interceptor	61.0%	39.0%	0.0%	0.0%	100.0%
Alameda Interceptor	61.0%	39.0%	0.0%	0.0%	100.0%
Estuary Crossing	61.0%	39.0%	0.0%	0.0%	100.0%
Central Avenue Interceptor	61.0%	39.0%	0.0%	0.0%	100.0%
South Foothill Interceptor	61.0%	39.0%	0.0%	0.0%	100.0%
Adeline Street Interceptor	61.0%	39.0%	0.0%	0.0%	100.0%
Powell Street Interceptor	61.0%	39.0%	0.0%	0.0%	100.0%
ANAS Interceptor	61.0%	39.0%	0.0%	0.0%	100.0%
Wood St Interceptor	61.0%	39.0%	0.0%	0.0%	100.0%
Pump Station A-Albany	68.0%	32.0%	0.0%	0.0%	100.0%
Pump Station B-Fernside	61.0%	39.0%	0.0%	0.0%	100.0%
Pump Station C-Krusi Park	40.0%	60.0%	0.0%	0.0%	100.0%
Pump Station D-Oak Street	82.0%	18.0%	0.0%	0.0%	100.0%
Pump Station E-Grand Street	86.0%	14.0%	0.0%	0.0%	100.0%
Pump Station F-Atlantic Avenue	21.0%	79.0%	0.0%	0.0%	100.0%
Pump Station G-Airport	23.0%	77.0%	0.0%	0.0%	100.0%
Pump Station H-Fruitvale	51.0%	49.0%	0.0%	0.0%	100.0%
Pump Station J-Frederick Street	22.0%	78.0%	0.0%	0.0%	100.0%
Pump Station K-7Th Street	40.0%	60.0%	0.0%	0.0%	100.0%
Pump Station L	68.0%	32.0%	0.0%	0.0%	100.0%
Pump Station Q- Wet Weather Page St Berkeley	43.0%	57.0%	0.0%	0.0%	100.0%
Pump Station N (new)	43.0%	57.0%	0.0%	0.0%	100.0%
ANAS Pump Station R	15.0%	85.0%	0.0%	0.0%	100.0%

Allocation to Cost Components – Capital (cont'd)

Assets Categories	I&I	Flow	CODf	TSS	TOTAL
Pump Station M - Bridgeway	69.0%	31.0%	0.0%	0.0%	100.0%
Mwwtp-Reactor Deck Area-Oxygen Production	0.0%	0.0%	50.0%	50.0%	100.0%
Mwwtp-Secondary Treatment Facility	6.0%	94.0%	0.0%	0.0%	100.0%
Mwwtp-Power Generation Station	0.0%	24.0%	35.0%	41.0%	100.0%
Mwwtp-Scum Dewatering Station	0.0%	0.0%	0.0%	100.0%	100.0%
Mwwtp-Chemical Trench	50.0%	50.0%	0.0%	0.0%	100.0%
Mwwtp-Pre-Chlorination Facility	50.0%	50.0%	0.0%	0.0%	100.0%
Mwwtp-Interem Sludge Disposal Facility	0.0%	21.0%	49.0%	30.0%	100.0%
Mwwtp-Chemical Storage Building (Relocated)	0.0%	0.0%	30.0%	70.0%	100.0%
Mwwtp-Sludge Digestion Facilities	0.0%	0.0%	30.0%	70.0%	100.0%
Mwwtp-Sludge Dewatering Facilities	0.0%	0.0%	30.0%	70.0%	100.0%
Mwwtp-Temp Sludge Dewatering Facility	0.0%	0.0%	30.0%	70.0%	100.0%
Mwwtp-Odor Control At Sludge Thickener	0.0%	0.0%	30.0%	70.0%	100.0%
Mwwtp-Compost Area	0.0%	0.0%	30.0%	70.0%	100.0%
Mwwtp-Composting Facility	0.0%	0.0%	30.0%	70.0%	100.0%
Pt. Isabel Tp-Treatment & Pretreatment Structures	100.0%	0.0%	0.0%	0.0%	100.0%
Mwwtp-Mid-Plant Pump Station	100.0%	0.0%	0.0%	0.0%	100.0%
Mwwtp-Wet Weather Pump Station	100.0%	0.0%	0.0%	0.0%	100.0%
Mwwtp-Washdown Pump Station	100.0%	0.0%	0.0%	0.0%	100.0%
Point Richmond-Pretreatment Structure	100.0%	0.0%	0.0%	0.0%	100.0%
Oakport Wet Weather-Pretreatment Structure	100.0%	0.0%	0.0%	0.0%	100.0%
Oakport Wet Weather-Pretreatment Structure	100.0%	0.0%	0.0%	0.0%	100.0%
Mwwtp-Channel Crossing For Bypass Channel	100.0%	0.0%	0.0%	0.0%	100.0%
Mwwtp 90" Pipe-Primry Effluent Bypass	100.0%	0.0%	0.0%	0.0%	100.0%
Mwwtp 72" Pipe-Primry Influent Bypass	100.0%	0.0%	0.0%	0.0%	100.0%
Mwwtp-Diversion Structure	100.0%	0.0%	0.0%	0.0%	100.0%
Mwwtp-Bypass Inlet Structure	100.0%	0.0%	0.0%	0.0%	100.0%
North Interceptor Junction Storage	100.0%	0.0%	0.0%	0.0%	100.0%
Mwwtp-Bypass Outlet Structure	100.0%	0.0%	0.0%	0.0%	100.0%
Mwwtp-Final Effluent Bypass Channel	100.0%	0.0%	0.0%	0.0%	100.0%
Mwwtp-Storage Basin	100.0%	0.0%	0.0%	0.0%	100.0%
Oakport WW-Chlor System	100.0%	0.0%	0.0%	0.0%	100.0%
Oakport WW-DeChlor System	100.0%	0.0%	0.0%	0.0%	100.0%
Oakport WW-Control Bldg	100.0%	0.0%	0.0%	0.0%	100.0%
Oakport WW-Emg Gen	100.0%	0.0%	0.0%	0.0%	100.0%
Oakport WW-Drainage	100.0%	0.0%	0.0%	0.0%	100.0%
Oakport WW-Washwtr Pump Sta.	100.0%	0.0%	0.0%	0.0%	100.0%
Oakport WW-Storage Bldg.	100.0%	0.0%	0.0%	0.0%	100.0%
Oakport WW-Lscape/Pav/Fence	100.0%	0.0%	0.0%	0.0%	100.0%
San Antonio Creek Wet Weather TP	100.0%	0.0%	0.0%	0.0%	100.0%
San Antonio Creek Ww Dechlorination Facility	100.0%	0.0%	0.0%	0.0%	100.0%
San Antonio Creek Ww Outfall Structure	100.0%	0.0%	0.0%	0.0%	100.0%
San Antonio Creek Ww Gravity Sewer	100.0%	0.0%	0.0%	0.0%	100.0%
San Antonio Creek Ww Lake Merritt Channel Crossing	100.0%	0.0%	0.0%	0.0%	100.0%
San Antonio Creek Ww Outfall Subequacous Pipeline	100.0%	0.0%	0.0%	0.0%	100.0%

Table 5-7 shows the allocation of the book value of the wastewater assets (shown in Table 5-3) to the different cost components based on the allocation percentages shown in Table 5-6.

Table 5-7
Allocation of Wastewater Assets to Cost Components

Assets Categories	I&I	Flow	CODf	TSS	Test Year
Mwwtp-Chlorine System	$53,299	$53,299	$0	$0	$106,598
Mwwtp-Chlorination Building	$858,894	$858,894	$0	$0	$1,717,788
Mwwtp-Outfall Land	$212,565	$212,565	$0	$0	$425,130
Mwwtp-Outfall Submarine	$1,670,511	$1,670,511	$0	$0	$3,341,023
Mwwtp-Outfall Bridge	$55,462	$55,462	$0	$0	$110,925
Mwwtp-Effluent Pump Station	$2,646,341	$2,646,341	$0	$0	$5,292,683
Mwwtp-Water Pump Station #3	$246,056	$246,056	$0	$0	$492,112
Mwwtp-Process Water Plant	$408,503	$408,503	$0	$0	$817,006
Mwwtp-Dechlorination Station	$3,156,409	$3,156,409	$0	$0	$6,312,819
Mwwtp-Filter Plant Solids Handling Facility	$8,216,849	$8,216,849	$0	$0	$16,433,698
Mwwtp-Sodium Bisulfite Area	$342,710	$418,868	$0	$0	$761,578
Mwwtp-Grounds & Improvements	$3,466,132	$1,822,372	$857,709	$1,558,060	$7,704,272
Mwwtp-Administration And Lab Building	$4,800,018	$2,523,683	$1,187,784	$2,157,654	$10,669,139
Mwwtp-Service Building	$0	$0	$0	$0	$0
Mwwtp-Administration And Lab Center	$5,403,722	$2,841,090	$1,337,173	$2,429,025	$12,011,010
Mwwtp-Maintenance Center	$3,927,425	$2,064,903	$971,857	$1,765,415	$8,729,600
Mwwtp-Piping For Plant Utilities	$2,385,672	$1,254,304	$590,344	$1,072,382	$5,302,703
Mwwtp-Bulk Storage Area	$670,794	$352,680	$165,991	$301,528	$1,490,994
Mwwtp-Field Services Bldg	$1,040,418	$547,016	$257,456	$467,678	$2,312,568
Wastewater Land - General	$6,505,978	$3,420,617	$1,609,931	$2,924,499	$14,461,026
ALL WASTEWATER PORTABLE EQUIPMENT	$2,504,780	$1,316,926	$619,818	$1,125,923	$5,567,447
Mwwtp-Aerated Grit Tanks	$1,218,923	$0	$0	$779,311	$1,998,235
Mwwtp-Grit Dewatering Station	$5,544,009	$3,544,530	$0	$0	$9,088,540
Mwwtp-Influent Pump Station	$8,069,743	$5,159,344	$0	$0	$13,229,087
North Interceptor	$18,739,910	$11,981,254	$0	$0	$30,721,163
South Interceptor	$13,501,229	$8,631,933	$0	$0	$22,133,162
Alameda Interceptor	$4,582,274	$2,929,650	$0	$0	$7,511,924
Estuary Crossing	$48,418	$30,956	$0	$0	$79,374
Central Avenue Interceptor	$4,290,441	$2,743,069	$0	$0	$7,033,509
South Foothill Interceptor	$9,840,000	$6,291,147	$0	$0	$16,131,147
Adeline Street Interceptor	$8,704,462	$5,565,148	$0	$0	$14,269,611
Powell Street Interceptor	$1,603,144	$1,024,961	$0	$0	$2,628,105
ANAS Interceptor	$1,770,581	$1,132,011	$0	$0	$2,902,592
Wood St Interceptor	$398,440	$254,740	$0	$0	$653,180
Pump Station A-Albany	$1,788,326	$841,565	$0	$0	$2,629,892
Pump Station B-Fernside	$2,312,109	$1,478,233	$0	$0	$3,790,342
Pump Station C-Krusi Park	$3,238,378	$4,857,566	$0	$0	$8,095,944
Pump Station D-Oak Street	$1,117,741	$245,358	$0	$0	$1,363,099
Pump Station E-Grand Street	$1,156,302	$188,235	$0	$0	$1,344,537
Pump Station F-Atlantic Avenue	$224,375	$844,076	$0	$0	$1,068,451
Pump Station G-Airport	$376,971	$1,262,032	$0	$0	$1,639,003
Pump Station H-Fruitvale	$4,246,964	$4,080,417	$0	$0	$8,327,381
Pump Station J-Frederick Street	$110,092	$390,328	$0	$0	$500,420
Pump Station K-7Th Street	$239,639	$359,458	$0	$0	$599,097
Pump Station L	$2,092,963	$984,924	$0	$0	$3,077,887
Pump Station Q- Wet Weather Page St Berkeley	$155,803	$206,530	$0	$0	$362,333
Pump Station N (new)	$2,170	$2,876	$0	$0	$5,046

Allocation of Wastewater Assets to Cost Components (cont'd)

Assets Categories	I&I	Flow	CODf	TSS	Test Year
ANAS Pump Station R	$923,062	$5,230,683	$0	$0	$6,153,745
Pump Station M - Bridgeway	$771,063	$346,420	$0	$0	$1,117,483
Mwwtp-Reactor Deck Area-Oxygen Production	$0	$0	$1,671,593	$1,671,593	$3,343,186
Mwwtp-Secondary Treatment Facility	$1,879,014	$29,437,879	$0	$0	$31,316,892
Mwwtp-Power Generation Station	$0	$13,379,841	$19,512,268	$22,857,228	$55,749,336
Mwwtp-Scum Dewatering Station	$0	$0	$0	$6,945,437	$6,945,437
Mwwtp-Chemical Trench	$245,731	$245,731	$0	$0	$491,461
Mwwtp-Pre-Chlorination Facility	$293,668	$293,668	$0	$0	$587,337
Mwwtp-Interem Sludge Disposal Facility	$0	$10,295	$24,021	$14,707	$49,023
Mwwtp-Chemical Storage Building (Relocated)	$0	$0	$480,201	$1,120,469	$1,600,669
Mwwtp-Sludge Digestion Facilities	$0	$0	$14,122,981	$32,953,622	$47,076,603
Mwwtp-Sludge Dewatering Facilities	$0	$0	$7,824,450	$18,257,049	$26,081,499
Mwwtp-Temp Sludge Dewatering Facility	$0	$0	$382,391	$892,245	$1,274,636
Mwwtp-Odor Control At Sludge Thickener	$0	$0	$2,023,604	$4,721,743	$6,745,347
Mwwtp-Compost Area	$0	$0	$0	$0	$0
Mwwtp-Composting Facility	$0	$0	$314,118	$732,942	$1,047,061
Pt. Isabel Tp-Treatment & Pretreatment Structures	$26,639,925	$0	$0	$0	$26,639,925
Mwwtp-Mid-Plant Pump Station	$4,199,533	$0	$0	$0	$4,199,533
Mwwtp-Wet Weather Pump Station	$771,210	$0	$0	$0	$771,210
Mwwtp-Washdown Pump Station	$100,033	$0	$0	$0	$100,033
Point Richmond-Pretreatment Structure	$0	$0	$0	$0	$0
Oakport Wet Weather-Pretreatment Structure	$4,689,844	$0	$0	$0	$4,689,844
Oakport Wet Weather-Pretreatment Structure	$521,130	$0	$0	$0	$521,130
Mwwtp-Channel Crossing For Bypass Channel	$3,416,528	$0	$0	$0	$3,416,528
Mwwtp 90" Pipe-Primry Effluent Bypass	$1,517,340	$0	$0	$0	$1,517,340
Mwwtp 72" Pipe-Primry Influent Bypass	$1,533,171	$0	$0	$0	$1,533,171
Mwwtp-Diversion Structure	$15,020,130	$0	$0	$0	$15,020,130
Mwwtp-Bypass Inlet Structure	$5,432,968	$0	$0	$0	$5,432,968
North Interceptor Junction Storage	$242,753	$0	$0	$0	$242,753
Mwwtp-Bypass Outlet Structure	$348,305	$0	$0	$0	$348,305
Mwwtp-Final Effluent Bypass Channel	$1,590,395	$0	$0	$0	$1,590,395
Mwwtp-Storage Basin	$14,522,220	$0	$0	$0	$14,522,220
Oakport WW-Chlor System	$74,725	$0	$0	$0	$74,725
Oakport WW-DeChlor System	$135,478	$0	$0	$0	$135,478
Oakport WW-Control Bldg	$480,282	$0	$0	$0	$480,282
Oakport WW-Emg Gen	$237,479	$0	$0	$0	$237,479
Oakport WW-Drainage	$518,611	$0	$0	$0	$518,611
Oakport WW-Washwtr Pump Sta.	$0	$0	$0	$0	$0
Oakport WW-Storage Bldg.	$305,686	$0	$0	$0	$305,686
Oakport WW-Lscape/Pav/Fence	$1,578,974	$0	$0	$0	$1,578,974
San Antonio Creek Wet Weather TP	$7,925,370	$0	$0	$0	$7,925,370
San Antonio Creek Ww Dechlorination Facility	$2,264,604	$0	$0	$0	$2,264,604
San Antonio Creek Ww Outfall Structure	$1,713,386	$0	$0	$0	$1,713,386
San Antonio Creek Ww Gravity Sewer	$357,282	$0	$0	$0	$357,282
San Antonio Creek Ww Lake Merritt Channel Crossing	$1,015,310	$0	$0	$0	$1,015,310
San Antonio Creek Ww Outfall Subequacous Pipeline	$1,507,606	$0	$0	$0	$1,507,606
TOTAL ASSETS	**$246,718,761**	**$148,062,207**	**$53,953,690**	**$104,748,511**	**$553,483,169**
% allocation	44.6%	26.8%	9.7%	18.9%	

5.5 ALLOCATION OF REVENUE REQUIREMENTS

The total revenue requirements net of revenue credits from miscellaneous sources, is by definition, the net revenue requirement or net cost of providing service as shown in Table 5-8. This cost is then used as the basis to develop unit costs for the wastewater parameters and to allocate costs to the various customer classes in proportion to the services rendered. The concept of proportionate allocation to customer classes requires that allocations should take into consideration not only the volume of wastewater discharge used but also strength loadings associated with the wastewater flow.

The annual revenue requirement or cost of service to be recovered from wastewater charges includes operation and maintenance expenses and other non-operating expenses costs. O&M expenses include costs directly related to the collection, treatment, and disposal of wastewater and maintenance of system facilities.

The total Test Year cost of service to be recovered from the District's wastewater customers, shown in Table 5-8, is estimated at approximately $74.3 million, of which approximately $43.1 million is operating costs and the remaining $31.2 million is capital costs, which consists of capital expenditures and existing debt service. The cost of service analysis is based upon the premise that the utility must generate annual revenues adequate to meet the estimated annual revenue requirements. As part of the cost of service analysis, revenues from sources other than wastewater rates and charges (e.g., revenues from miscellaneous services) are deducted from the appropriate cost elements. Additional deductions are made to reflect interest income and other non-operating income during the Test Year. Adjustments are also made to account for changes in cash balances to fund reserves and/or capital expenses to ensure adequate collection of revenue and to determine annual revenues needed from rates.

Table 5-8 shows the allocation of revenue requirements to operating and capital components to determine the revenue required from rates.

Table 5-8
Allocation of Revenue Requirements

	TEST YEAR		
	Operating	**Capital**	**Total**
Revenue Requirements			
O&M Expenses	$55,246,942		$55,246,942
Capital -Existing Debt Service		$33,509,888	$33,509,888
Capital - Proposed Debt Service		$0	$0
Capital - Admin Expenses		$3,391,667	$3,391,667
Capital - Direct Expenses		$28,456,000	$28,456,000
Total Revenue Requirements	**$55,246,942**	**$65,357,555**	**$120,604,497**
Revenue Offsets			
Resource Recovery	$3,500,000	$5,800,000	$9,300,000
Property Taxes, less customer assistance		$4,100,000	$4,100,000
Ad Valorem Bond Levy		$5,000,000	$5,000,000
Interest	$200,000		$200,000
Laboratory Services	$3,700,000		$3,700,000
Reimbursements	$1,300,000		$1,300,000
Permit Fees	$1,800,000		$1,800,000
Capacity Charges		$0	$0
All Other Revenue			$0
BABS REBATE		$2,500,000	$2,500,000
PSL FEES	$1,000,000		$1,000,000
PGS ENERGY SALES		$1,000,000	$1,000,000
MISC	$600,000		$600,000
Transfer (to)/from Rate Stabilization Reserve (RSR)	$0		$0
Total Revenue Offsets	**$12,100,000**	**$18,400,000**	**$30,500,000**
Adjustments			
Transfer of Cash for Capital from Other Funds		($15,804,497)	($15,804,497)
Total Adjustments	**$0**	**($15,804,497)**	**($15,804,497)**
Cost of Service to be Recovered from Rates	**$43,146,942**	**$31,153,058**	**$74,300,000**

5.6 DEVELOPMENT OF UNIT COSTS OF SERVICE

In order to allocate costs of service to the different customer classes, unit costs of service need to be developed for each cost component. The unit costs of service are developed by dividing the total annual costs allocated to each parameter by the total annual service units of the respective component.

The unit costs of service are developed by dividing the total annual costs by the appropriate service units, such as flow, CODf and TSS generated in the system and accounts for billing costs. Table 5-9

shows the service units, such as annual flow, total pounds of CODf and TSS, bills, etc. for each customer class. These service units are determined from the plant balance shown in Table 5-1.

Table 5-9
Customer Class Service Units

Customer Class		Flow (ccf)	CODf (lbs/yr)	TSS (lbs/yr)	Accounts	Bills	Parcels
Residential							
8800	Single Family (cap at 9 ccf/mo)	9,281,194	12,831,431	18,249,146	138,113	1,657,356	138,113
6514	MFR 2-4 Units (cap at 9 ccf/mo)	2,378,158	3,538,299	5,032,247	14,434	173,208	14,434
Non-Residential					17,368	208,416	17,368
2010	Meat Products	7,132	106,809	18,692		0	
2011	Slaughterhouses	55	343	480		0	
2020	Dairy Product Processing	5,456	57,877	13,278		0	
2030	Fruit and Vegetable Canning	0	0	0		0	
2040	Grain Mills	12,913	54,792	62,044		0	
2050	Bakeries	47,327	502,045	354,385		0	
2060	Sugar Processing	3,450	34,445	646		0	
2077	Rentering Tallow	0	0	0		0	
2080	Beverage Mfgr & Bottling	126,770	1,442,598	99,532		0	
2090	Specialty Foods Mfgr	6,845	205,021	55,527		0	
2600	Pulp and Paper Products	6,313	61,419	180,647		0	
2810	Inorganic Chemicals Mfgr	2,449	1,528	21,394		0	
2820	Synthetic Material Mfgr	716	134	134		0	
2830	Drug Mfgr	132,042	346,123	52,954		0	
2840	Cleaning and Sanitation Prod	2,054	17,944	5,383		0	
2850	Paint Mfgr	154	2,306	1,345		0	
2893	Ink and Pigment Mfgr	177	1,215	88		0	
3110	Leather Tanning/Finishing	0	0	0		0	
3200	Earthenware Mfgr	54,230	35,150	161,105		0	
3300	Primary Metals Mfgr	52,512	29,491	117,963		0	
3400	Metal Prod Fabricating	19,368	9,669	3,626		0	
3410	Drum and Barrel Mfgr	0	0	0		0	
3470	Metal Coating	5,882	2,936	2,569		0	
4500	Air Transportation	100,505	187,129	372,936		0	
5812	Food Service Establishment	706,876	2,470,107	4,146,252		0	
6513	Apartment Bldgs (5+ units)	5,520,144	7,750,282	11,022,624	5,614	67,368	5,614
7000	Hotels, Motels with Food	264,361	428,899	1,121,737		0	
7210	Commercial Laundries	23,117	82,223	44,718		0	
7215	Coin Operated Laundromats	241,796	543,171	286,673		0	
7218	Industrial Laundries	65,398	379,606	51,178		0	
7300	Laboratories	147,489	174,863	73,627		0	
7542	Auto Washing and Polishing	48,966	88,609	61,110		0	
8060	Hospitals	269,929	269,497	454,776		0	
8200	Schools	1,139,368	995,352	568,773		0	
0	All Other	3,799,281	5,312,910	7,556,003		0	
TOTAL		**24,472,427**	**37,964,223**	**50,193,591**	**175,529**	**2,106,348**	**175,529**

Table 5-10 shows the allocation of the revenue offsets from each miscellaneous revenue source to each cost component. The revenue offsets are applied to the capital or operating cost components (I&I, Flow, CODf, TSS... etc) of the revenue requirements based on an overall allocation percentage for O&M and Capital shown at the bottom of Tables 5-5 and 5-7, respectively, with the following exceptions:

- Resource Recovery Revenue: $579,000 of Resource Recovery (R2) revenue is assigned to CODf and $1.271 million to TSS to offset the treatment cost for R2. An additional $1.7 million of R2

revenue is assigned to the Other (general) cost component to offset the R2 program administration costs.

- Property Tax Revenue: The District receives approximately $4.4 million in property tax revenue that does not have specific spending restrictions. Thus, $300,000 of the property tax revenues are assigned to fund the District's Customer Assistance Program (low income). The remaining property tax revenue is allocated to the wastewater system's capital costs.
- Operating Reimbursements: The operating reimbursements including lab fees and permit fees and offset Other (general) costs because those program costs are assigned to the Other cost component.
- Private Sewer Lateral Fees: The Private Sewer Lateral (PSL) fees are for the required inspection of private sewer laterals. The revenue from PSL fees are used to offset the Customer cost component since the corresponding PSL expenses are charged to the I&I program, which is reallocated to the Customer cost component.

The percentages, shown in Table 5-10, are applied to the revenue offsets, totaling $30.5 million, shown in Table 5-8, to determine the amount of offsets to be applied to each cost component.

Table 5-10
Revenue Offsets Allocation

REVENUE OFFSETS ALLOCATION - OPERATING	I&I	Flow	CODf	TSS	Customer	Other	TOTAL
Resource Recovery	0.0%	0.0%	16.3%	35.8%	0.0%	47.9%	100.0%
Property Taxes, less customer assistance							0.0%
Ad Valorem Bond Levy							0.0%
Interest	0.0%	14.2%	9.0%	17.6%	14.8%	44.5%	100.0%
Laboratory Services						100.0%	100.0%
Reimbursements						100.0%	100.0%
Permit Fees						100.0%	100.0%
Capacity Charges							0.0%
All Other Revenue							0.0%
Build America Bonds Rebate							0.0%
Private Sewer Lateral Fees					100.0%		100.0%
PGS Energy Sales							0.0%
Miscellaneous	0.0%	14.2%	9.0%	17.6%	14.8%	44.5%	100.0%
Transfer (to)/from Rate Stabilization Reserve (RSR)	0.0%	14.2%	9.0%	17.6%	14.8%	44.5%	100.0%

REVENUE OFFSETS ALLOCATION - CAPITAL	I&I	Flow	CODf	TSS	Customer	Other	TOTAL
Resource Recovery	44.6%	26.8%	9.7%	18.9%	0.0%	0.0%	100.0%
Property Taxes, less customer assistance	44.6%	26.8%	9.7%	18.9%	0.0%	0.0%	100.0%
Ad Valorem Bond Levy	44.6%	26.8%	9.7%	18.9%	0.0%	0.0%	100.0%
Interest							0.0%
Laboratory Services							0.0%
Reimbursements							0.0%
Permit Fees							0.0%
Capacity Charges	44.6%	26.8%	9.7%	18.9%	0.0%	0.0%	100.0%
All Other Revenue							0.0%
Build America Bonds Rebate	44.6%	26.8%	9.7%	18.9%	0.0%	0.0%	100.0%
Private Sewer Lateral Fees							0.0%
PGS Energy Sales	44.6%	26.8%	9.7%	18.9%	0.0%	0.0%	100.0%
Miscellaneous							0.0%
Transfer (to)/from Rate Stabilization Reserve (RSR)							0.0%
Revenue Offsets	**($8,201,921)**	**($5,035,458)**	**($2,436,374)**	**($4,875,797)**	**($1,118,474)**	**($8,831,975)**	**($30,500,000)**

Table 5-11 identifies the $6.3 million cost to operate and maintain the wastewater facilities to accommodate the wet weather I&I. The O&M I&I costs are not directly related to service units of Flow, CODf, or TSS. Thus, the District assigns the I&I O&M costs to the Customer cost component where it will be equally shared by each customer in their monthly customer service charge.

The General component is spread proportionally back to the remaining costs components. The calculation of the unit cost for each component is shown at the bottom of Table 5-11. The I&I capital expense will be recovered on the Wet Weather Facilities Charge collected on the property tax bill on each property that is connected to the wastewater system. Table 5-11 shows the calculation of the unit cost for each cost component. Total capital expenses equal debt service, administration of capital, and direct expenses, less transfers from other funds for capital as shown in Table 5-8.

Table 5-11
Development of Unit Costs

	I&I	Flow	CODf	TSS	Customer	Other	TOTAL
Operating Expenses	$6,327,499	$7,822,722	$4,961,363	$9,701,890	$1,854,192	$24,579,275	$55,246,942
I&I Operating Expenses to be Recovered on Customer	($6,327,499)				$6,327,499		
Adjusted Operating Expenses	$0	$7,822,722	$4,961,363	$9,701,890	$8,181,692	$24,579,275	$55,246,942
Capital Expenses	$22,088,601	$13,255,932	$4,830,446	$9,378,079	$0	$0	$49,553,058
Revenue Offsets	($8,201,921)	($5,035,458)	($2,436,374)	($4,875,797)	($1,118,474)	($8,831,975)	($30,500,000)
Total Cost of Service	**$13,886,680**	**$16,043,196**	**$7,355,435**	**$14,204,171**	**$7,063,217**	**$15,747,300**	**$74,300,000**
Allocation of General Cost	$3,734,716	$4,314,695	$1,978,188	$3,820,103	$1,899,598	($15,747,300)	$0
Allocated Cost of Service	**$17,621,397**	**$20,357,891**	**$9,333,623**	**$18,024,275**	**$8,962,815**	**$0**	**$74,300,000**
Unit of Service	175,529	24,472,427	37,964,223	50,193,591	2,106,348		
Units	parcel	ccf	lbs/yr	lbs/yr	bills/yr		
Unit Cost	$8.37	$0.832	$0.246	$0.359	$4.255		
	$/month	$/ccf	$/lb	$/lb	$/month		

5.7 ALLOCATION OF COSTS TO CUSTOMER CLASS

The unit cost of each of the cost categories shown in Table 5-11 is then applied to the projected Test Year usage and units of each customer class to derive customer class costs.

Table 5-12 shows the allocation of costs to each customer class, based on the service units from Table 5-9 and the unit cost from Table 5-11. This includes the I&I cost component assessed to SFR, MFR with up to 4 dwelling units, apartment buildings with 5 or more units, and to non-residential overall based on the average I&I parcel unit cost.

Table 5-12
Allocation of Costs to Customer Class

Customer Class		Flow	CODf	TSS	Customer	TOTAL
Residential						
8800	Single Family	$7,720,751	$3,154,647	$6,553,180	$7,052,290	$38,346,064
6514	MFR 2-4 Units	$1,978,320	$869,902	$1,807,055	$737,025	$6,841,334
Non-Residential		$0	$0	$0	$886,840	$2,630,418
2010	Meat Products	$5,933	$26,259	$6,712	$0	$38,904
2011	Slaughterhouses	$46	$84	$173	$0	$303
2020	Dairy Product Processing	$4,539	$14,229	$4,768	$0	$23,536
2030	Fruit and Vegetable Canning	$0	$0	$0	$0	$0
2040	Grain Mills	$10,742	$13,471	$22,280	$0	$46,493
2050	Bakeries	$39,370	$123,429	$127,258	$0	$290,057
2060	Sugar Processing	$2,870	$8,468	$232	$0	$11,570
2077	Rentering Tallow	$0	$0	$0	$0	$0
2080	Beverage Mfgr & Bottling	$105,456	$354,667	$35,741	$0	$495,865
2090	Specialty Foods Mfgr	$5,694	$50,405	$19,939	$0	$76,039
2600	Pulp and Paper Products	$5,252	$15,100	$64,869	$0	$85,221
2810	Inorganic Chemicals Mfgr	$2,037	$376	$7,683	$0	$10,096
2820	Synthetic Material Mfgr	$596	$33	$48	$0	$677
2830	Drug Mfgr	$109,842	$85,095	$19,016	$0	$213,953
2840	Cleaning and Sanitation Prod	$1,709	$4,412	$1,933	$0	$8,053
2850	Paint Mfgr	$128	$567	$483	$0	$1,178
2893	Ink and Pigment Mfgr	$147	$299	$32	$0	$478
3110	Leather Tanning/Finishing	$0	$0	$0	$0	$0
3200	Earthenware Mfgr	$45,112	$8,642	$57,852	$0	$111,606
3300	Primary Metals Mfgr	$43,683	$7,250	$42,360	$0	$93,294
3400	Metal Prod Fabricating	$16,112	$2,377	$1,302	$0	$19,791
3410	Drum and Barrel Mfgr	$0	$0	$0	$0	$0
3470	Metal Coating	$4,893	$722	$923	$0	$6,538
4500	Air Transportation	$83,607	$46,006	$133,920	$0	$263,533
5812	Food Service Establishment	$588,029	$607,284	$1,488,899	$0	$2,684,212
6513	Apartment Bldgs (5+ units)	$4,592,045	$1,905,431	$3,958,171	$286,661	$11,305,898
7000	Hotels, Motels with Food	$219,914	$105,446	$402,810	$0	$728,171
7210	Commercial Laundries	$19,230	$20,215	$16,058	$0	$55,503
7215	Coin Operated Laundromats	$201,143	$133,540	$102,943	$0	$437,626
7218	Industrial Laundries	$54,403	$93,327	$18,378	$0	$166,108
7300	Laboratories	$122,692	$42,991	$26,439	$0	$192,121
7542	Auto Washing and Polishing	$40,733	$21,785	$21,944	$0	$84,462
8060	Hospitals	$224,546	$66,257	$163,308	$0	$454,111
8200	Schools	$947,807	$244,710	$204,243	$0	$1,396,760
0	All Other	$3,160,510	$1,306,196	$2,713,324	$0	$7,180,029
TOTAL COST		**$20,357,891**	**$9,333,623**	**$18,024,275**	**$8,962,815**	**$74,300,000**

The residential user class has the highest assignment of costs at $45.2 million and is responsible for 60.8 percent of the total cost of service. The non-residential user classes are responsible for the remaining 39.2 percent of the annual cost of service. I&I cost assignment is based on average I&I unit cost per parcel. The total on Table 5-12 includes I&I contribution of $17.6 million from all customer classes.

6. PROPOSED WASTEWATER USER CHARGES

6.1 SETTING INDIVIDUAL COMPONENT RATES

The revenue requirements and cost of service analyses described in the preceding sections of this report provide a basis for the design of a wastewater user charge structure. Setting rates involves the development of user charge schedules for each user class so as to recover the annual cost of service determined for each user class. This section of the report discusses the development of a schedule of wastewater rates for the District's user classes and analyzes the impact of the proposed changes in cost allocations and rate design on the user classes.

The primary emphasis in the design of rate structures is ordinarily placed on achieving fairness and equity, with the objective of being able to ensure that each customer class pays its proportionate share of costs and to comply with regulatory requirements. Since the wastewater rate structure was revised during the last rate study, the District is retaining the current rate structure. However, the individual customer class rates are determined based on the cost of service analysis. The following subsections discuss how each rate component is calculated.

6.2 PROPOSED RESIDENTIAL CHARGES

The District currently has a fixed charge plus flow charge rate structure for its residential wastewater customers. One advantage of the fixed charge plus flow charge rate structure is that the fixed component can be used to stabilize revenues and to recognize the fact that wastewater system costs are mostly fixed, while the flow or variable component can be used to encourage water conservation. The fixed charges consist of a monthly service charge, assessed per account, and a monthly strength charge, assessed per dwelling unit. The flow charge is assessed per ccf of water usage, with a maximum of 9 ccf per month.

Table 6-1 shows the Test Year COS wastewater charges for residential customers, which includes SFR and MFR up to 4 dwelling units. Apartment buildings with 5 or more dwelling units are considered non-residential customers for wastewater billing purposes because the District does not track the number of individual dwelling units in large apartment buildings. The waste strength concentration for apartments with 5 or more units is assumed to be the same as the domestic strength used for the SFR and MFR up to 4 dwelling units. The revenue requirement for the service charge is the customer cost component (refer to Table 5-12), for the strength charge is the CODf and TSS cost components, and for the flow charge is the flow component.

Table 6-1
Test Year Residential Wastewater Charges

	Revenue Requirements	Unit of Service	CODf (mg/l)	TSS (mg/l)	Test Year Proposed
Service Charge (per account)	$7,789,315	1,830,564			$4.26
Strength Charge (per dwelling unit)	$12,384,784	2,114,376	225	320	$5.86
Minimum monthly charge per household					$10.12
Plus: A flow charge per hcf (maximum of 9 ccf)	$9,699,071	11,659,352			$0.84
Minimum monthly charge at 0 ccf					$0.00
Maximum monthly charge at 9 ccf					$7.56
Total Residential Charge					
Minimum monthly charge					$10.12
Maximum monthly charge					$17.68
Average monthly charge at 6 ccf					$15.16

6.3 PROPOSED NON-RESIDENTIAL CHARGES

Similarly, the District is retaining the current rate structure and classification of customer groups based on the strength of their wastewater discharges. Non-residential customers will pay the same fixed charges as residential customers, assessed per meter, and will be charged a flow charge based on their actual water usage and their user classification.

Table 6-2 shows the Test Year COS wastewater charges for non-residential customers. The revenue requirement for the fixed charge is the customer component (refer to Table 5-12) and for the flow charge is the flow, CODf and TSS components.

Table 6-2
Test Year Non-Residential Wastewater Charges

	Revenue Requirements	Unit of Service	CODf (mg/l)	TSS (mg/l)	Test Year Proposed
Monthly service charge (per meter)	$1,173,501	275,784			$4.26
Treatment charge including flow processing (per ccf of sewage discharge)					
Meat Products	$38,904	7,132	2,400	420	$5.46
Slaughterhouses	$303	55	1,000	1,400	$5.51
Dairy Product Processing	$23,536	5,456	1,700	390	$4.32
Fruit and Vegetable Canning	$0	0	1,200	370	$3.51
Grain Mills	$46,493	12,913	680	770	$3.61
Bakeries (including Pastries)	$290,057	47,327	1,700	1,200	$6.14
Sugar Processing	$11,570	3,450	1,600	30	$3.36
Rendering Tallow	$0	0	1,500	3,500	$11.00
Beverage Manufacturing & Bottling	$495,865	126,770	960	130	$2.60
Specialty Foods Manufacturing	$76,039	6,845	4,800	1,300	$11.12
Pulp and Paper Products	$85,221	6,313	540	640	$3.10
Inorganic Chemicals Mfgr.	$10,096	2,449	100	1,400	$4.13
Synthetic Material Manufacturing	$677	716	30	30	$0.95
Drug Manufacturing	$213,953	132,042	620	70	$1.94
Cleaning and Sanitation Products	$8,053	2,054	1,400	420	$3.92
Paint Manufacturing	$1,178	154	2,400	1,400	$7.66
Ink and Pigment Manufacturing	$478	177	1,100	80	$2.70
Leather Tanning and Finishing	$0	0	3,800	1,700	$10.48
Earthenware Manufacturing	$111,606	54,230	120	550	$2.25
Primary Metals Manufacturing	$93,294	52,512	90	360	$1.78
Metal Products Fabricating	$19,791	19,368	80	30	$1.02
Drum and Barrel Manufacturing	$0	0	4,300	1,400	$10.58
Metal Coating	$6,538	5,882	80	70	$1.11
Air Transportation	$263,533	100,505	250	100	$1.44
Food Service Establishments	$2,684,212	706,876	560	940	$3.80
Apartment Buildings (5 or more units)	$10,455,647	5,520,144	225	320	$1.90
Hotels, Motels with Food Service	$728,171	264,361	260	680	$2.76
Commercial Laundries	$55,503	23,117	570	310	$2.40
Coin Operated Laundromats	$437,626	241,796	360	190	$1.81
Industrial Laundries	$166,108	65,398	2,700	740	$6.64
Laboratories	$192,121	147,489	190	80	$1.30
Automobile Washing and Polishing	$84,462	48,966	290	200	$1.73
Hospitals	$454,111	269,929	160	270	$1.68
Schools	$1,396,760	1,139,368	140	80	$1.23
All Other (includes dischargers of only segregated domestic wastes from sanitary conveniences)	$7,180,029	3,799,281	225	320	$1.90

6.4 PROPOSED WET WEATHER FACILITIES CHARGES

The wet weather facilities charge funds the capital expenses for the I&I facilities that are required to handle the wet weather flows that enter the wastewater system. The capital facilities are sized to meet the peak wet weather flows. The amount of wet weather flows that enter the wastewater system is proportional to the size of the collection system to serve each property. Due to data constraints, lot size is used as a proxy to estimate the size of the collection system to serve each property. Larger lots will have potential for more wet weather flows that could enter the wastewater system than smaller lots. The proposed wet weather facilities charge is based on median lot size for all customers. Customers will fall within the three generalized lot sizes (or bins): 0 to 5,000 square feet (sq ft), 5,001 to 10,000 sq ft, and over 10,001 sq ft.

Table 6-3 shows the calculation of the Test Year COS wet weather facilities charge, based on median lot size for all customers. The total wet weather cost is divided by the total parcel areas within the District's service area to arrive at a unit cost per 1,000 sq ft. The proposed wet weather facilities charge for each bin size is based on the unit cost multiplied by the median lot size in each bin.

Table 6-3
Test Year Wet Weather Facilities Charge

Lot Size (sq ft)	Total Parcel	Median Lot Size (sq ft)	Proposed WWFC
0-5000	104,301	4,000	$72.16
5,001-10,000	56,532	6,250	$112.75
over 10,001	14,455	14,284	$257.68
TOTAL	**175,288**		

Total Wet Weather Costs	$17,621,397
Total Area (1,000 sq ft)	977,004
Unit Cost/yr/1,000 sq ft	$18.04

6.5 CUSTOMER IMPACTS

RFC completed an analysis to evaluate the impact of the proposed rate structure on customers with various water usage levels. The results of the COS analysis are shown in comparison to the District's Test Year rates. By comparing the changes to the Test Year in this section, the customer impact attributed to the COS adjustments can be shown. The customer impacts of the FY 2016 and FY 2017 overall rate increase combined with the results of the COS adjustments are shown in Section 7.

Table 6-4 shows the bill impacts for different customers with typical water usage for the Test Year.

Table 6-4
Typical Customers Wastewater Bill Impacts for Test Year

Customer Class	Monthly Flow (ccf)	Current Bill	Proposed Bill	Difference ($)	Difference (%)
SFR	6	$16.14	$15.16	($0.98)	-6%
MFR - Fourplex	25	$47.11	$48.70	$1.59	3%
Commercial - Office	50	$84.94	$99.26	$14.32	17%
Commercial - Restaurant	50	$189.06	$194.26	$5.20	3%
Industrial - Food Manufacturing	500	$5,496.86	$5,564.26	$67.40	1%

Table 6-5 shows the impacts resulting from the Test Year proposed wet weather facilities charge compared to the Test Year wet weather facilities charge. Currently, SFR and MFR with up to 4 dwelling units are charged $75.54 per dwelling unit. Apartment buildings are charged $377.70 for 5 dwelling units and all other customers pay a fixed $113.30 per parcel based on the current wet weather facilities charge methodology.

Table 6-5
Wet Weather Facilities Charge Impacts for Test Year

Customer Class	Median Lot Size (sq ft)	Current Bill	Proposed Bill	Difference ($)	Difference (%)
SFR	4,800	$75.54	$72.16	($3.38)	-4%
Duplex	4,500	$151.08	$72.16	($78.92)	-52%
Triplex	5,130	$226.62	$112.75	($113.87)	-50%
Fourplex	5,400	$302.16	$112.75	($189.41)	-63%
Apartment	7,400	$377.70	$112.75	($264.95)	-70%
All Other	14,284	$113.30	$257.68	$144.38	127%

7. PROPOSED FY 2016 & FY 2017 WATER AND WASTEWATER USER CHARGES

To determine the FY 2016 and FY 2017 user charges, required adjustments were made to the Test Year rates and charges based on the District's FY 2016 and FY 2017 budgets for development of FY 2016 and FY 2017 rates and charges presented in this section. The COS effort resulted in some adjustments to the District's individual rates that were presented in previous sections in comparison to the District's water and wastewater user charges for the Test Year. From the District's FY 2016 and FY 2017 budgeted operating, capital and debt expenses, the FY 2016 and FY 2017 revenue requirements were established. The RFC model was used to calculate the FY 2016 and FY 2017 water and wastewater rates, combining the FY 2016 and FY 2017 increased revenue requirements with the results of the COS study. The results of the cost of service study were incorporated into the proposed FY 2016 and FY 2017 user charges by adjusting the charges from the COS analysis to yield the FY 2016 and FY 2017 revenue requirements.

The District's proposed budgets for FY 2016 and FY 2017 do not contain detailed budgeted costs by function, so the Test Year COS results are adjusted to match the FY 2016 and FY 2017 revenue requirements based on the budget. The District does not anticipate that the distribution of expenses by function for FY 2016 and FY 2017 will be significantly different than the Test Year expenses, with the exception of expenses due to the drought. The drought expenses are separated from the normal expenses in the FY 2016 and FY 2017 budgets and are recovered through the drought surcharges discussed in Section 8 of this Report.

This section documents the process and calculations made to determine the water and wastewater user charges for FY 2016 and FY 2017.

7.1 FY 2016 AND FY 2017 WATER USER CHARGES AND CUSTOMER IMPACTS

The first step is to develop the current FY 2015 water user charges based on the Test Year COS user charges. Tables 7-1 and 7-2 show the FY 2015 water user charges, using the FY 2015 revenue requirement. Since the FY 2015 revenue requirement was approximately 20 percent higher than the Test Year revenue requirement, the Test Year COS user charges were increased by the same percentage to calculate the COS adjusted FY 2015 user charges.

Table 7-1
FY 2015 Cost of Service Adjusted Water Rates – Monthly Service Charge

Meter Size	Monthly Water Service Charge	Monthly Private Fire Service Charge
5/8 and 3/4 inch	$17.91	$9.53
1 inch	$27.04	$13.08
1 1/2 inch	$49.89	$21.94
2 inch	$77.30	$32.59
3 inch	$150.39	$60.98
4 inch	$232.63	$92.91
6 inch	$461.04	$181.61
8 inch	$735.14	$288.05
10 inch	$1,054.93	$412.23
12 inch	$1,466.09	$571.88
14 inch	$1,877.24	$731.55
16 inch	$2,379.77	$926.69
18 inch	$2,882.28	$1,121.83

Table 7-2
FY 2015 Cost of Service Adjusted Water Rates – Commodity Rate and Elevation Surcharge

		FY 2015
Commodity Rates ($/ccf)		
SFR		
Tier 1	0 -7 ccf	$2.73
Tier 2	8 - 16 ccf	$3.76
Tier 3	16 + ccf	$4.96
MFR		$3.86
All Other Water Use		$3.84
Recycled Water		$2.99
Elevation Surcharge ($/ccf)		
Band 1		$0.00
Band 2		$0.56
Band 3		$1.15

Table 7-3 shows the revenue requirement for FY 2016 and FY 2017 as calculated based on the proposed FY 2016 and FY 2017 budgets for the water enterprise. Based on an updated projection of water sales for FY 2016 and FY 2017, the FY 2015 COS adjusted water user charges shown in Tables 7-1 and 7-2 need to be increased by 8 percent in FY 2016 and 7 percent in FY 2017 to meet the rate revenue requirements[14].

[14] As determined in the District's March 19, 2015 Memo to the Board of Directors on FY 2016 and FY 2017 rates.

Table 7-3
Water Revenue Requirement for FY 2016 and FY 2017

	FY 2016			FY 2017		
	Operating	**Capital**	**Total**	**Operating**	**Capital**	**Total**
Revenue Requirements						
Operating - O&M Expenses	$248,270,772		$248,270,772	$262,234,196		$262,234,196
Capital -Existing Debt Service		$165,756,527	$165,756,527		$171,610,167	$171,610,167
Capital - Proposed Debt Service		$4,132,000	$4,132,000		$8,576,000	$8,576,000
Capital - Admin Expenses		$40,000,000	$40,000,000		$40,000,000	$40,000,000
Capital - Direct Expenses		$184,466,400	$184,466,400		$196,117,600	$196,117,600
Total Revenue Requirements	**$248,270,772**	**$394,354,927**	**$642,625,699**	**$262,234,196**	**$416,303,767**	**$678,537,963**
Revenue Offsets						
Total Seismic Charges Revenue		$0	$0		$0	$0
Supplemental Supply Surcharge	$0		$0	$0		$0
Taxes, less customer assistance		$24,500,000	$24,500,000		$25,112,500	$25,112,500
Power	$3,500,000		$3,500,000	$3,500,000		$3,500,000
Interest	$1,717,586		$1,717,586	$3,346,892		$3,346,892
SCC Applied to Debt Service		$24,600,000	$24,600,000		$25,972,680	$25,972,680
Operating Reimbursement	$10,900,000		$10,900,000	$11,227,000		$11,227,000
RARE Reimbursement	$2,500,000		$2,500,000	$2,575,000		$2,575,000
All Other		$14,700,000	$14,700,000		$14,788,200	$14,788,200
Transfer (to)/from Rate Stabilization Reserve	$6,000,000		$6,000,000	$0		$0
Total Revenue Offsets	**$24,617,586**	**$63,800,000**	**$88,417,586**	**$20,648,892**	**$65,873,380**	**$86,522,272**
Adjustments						
Transfer of Cash for Capital from Other Funds	$0	($131,425,415)	($131,425,415)	$0	($139,058,385)	($139,058,385)
Total Adjustments	**$0**	**($131,425,415)**	**($131,425,415)**	**$0**	**($139,058,385)**	**($139,058,385)**
Cost of Service to be Recovered from Rates	**$223,653,186**	**$199,129,512**	**$422,782,698**	**$241,585,304**	**$211,372,002**	**$452,957,306**

Tables 7-4 and 7-5 show the proposed FY 2016 and FY 2017 monthly meter charge for regular and private fire service meters and commodity rate and elevation surcharge, respectively.

Table 7-4
FY 2016 and FY 2017 Water Rates – Monthly Service Charge

	FY 2016	FY 2017
Monthly Water Service Charge		
Meter Size		
5/8 and 3/4 inch	$19.34	$20.69
1 inch	$29.20	$31.24
1 1/2 inch	$53.88	$57.65
2 inch	$83.48	$89.32
3 inch	$162.42	$173.79
4 inch	$251.24	$268.83
6 inch	$497.92	$532.77
8 inch	$793.95	$849.53
10 inch	$1,139.32	$1,219.07
12 inch	$1,583.38	$1,694.22
14 inch	$2,027.42	$2,169.34
16 inch	$2,570.15	$2,750.06
18 inch	$3,112.86	$3,330.76
Monthly Private Fire Service Charge		
Meter Size		
5/8 and 3/4 inch	$10.29	$11.01
1 inch	$14.13	$15.12
1 1/2 inch	$23.70	$25.36
2 inch	$35.20	$37.66
3 inch	$65.86	$70.47
4 inch	$100.34	$107.36
6 inch	$196.14	$209.87
8 inch	$311.09	$332.87
10 inch	$445.21	$476.37
12 inch	$617.63	$660.86
14 inch	$790.07	$845.37
16 inch	$1,000.83	$1,070.89
18 inch	$1,211.58	$1,296.39

Table 7-5
FY 2016 and FY 2017 Water Rates – Commodity Rate and Elevation Surcharge

		FY 2016	FY 2017
Commodity Rates ($/ccf)			
SFR			
Tier 1	0 -7 ccf	$2.95	$3.16
Tier 2	8 - 16 ccf	$4.06	$4.34
Tier 3	16 + ccf	$5.36	$5.74
MFR		$4.17	$4.46
All Other Water Use		$4.15	$4.44
Recycled Water		$3.23	$3.46
Elevation Surcharge ($/ccf)			
Band 1		$0.00	$0.00
Band 2		$0.60	$0.64
Band 3		$1.24	$1.33

The proposed customer water bill impacts, shown in Tables 7-6 through 7-8, reflect the increases described previously. Table 7-6 shows the SFR bill impacts at various levels of water usage for FY 2016. Bill impacts for FY 2017 are approximately 7 percent more than those shown below.

Table 7-6
SFR Water Bill Impacts for FY 2016

Use Level	Monthly Use (ccf)	FY 2015 Current Bill	FY 2016 Proposed Bill	Difference ($)	Difference (%)
Very Low	4	$29.07	$31.14	$2.07	7.1%
Low	7	$37.80	$39.99	$2.19	5.8%
Average	10	$48.60	$52.17	$3.57	7.3%
High	16	$70.20	$76.53	$6.33	9.0%
Very High	30	$132.08	$151.57	$19.49	14.8%

Note: Current bill includes SIP surcharge. All bill calculations assume 5/8" or 3/4" meter.
SIP surcharge is being phased out and will not be part of the water service rates beginning in FY 2016.
The Study calculates the rates assuming there is no SIP surcharge.

Table 7-7 shows the MFR bill impacts at various levels of water usage for FY 2016. Bill impacts for FY 2017 are approximately 7 percent more than those shown below.

Table 7-7
MFR Water Bill Impacts for FY 2016

Use Level	Monthly Use (ccf)	FY 2015 Current Bill	FY 2016 Proposed Bill	Difference ($)	Difference (%)
Very Low	15	$88.74	$91.75	$3.01	3.4%
Low	20	$107.14	$112.60	$5.46	5.1%
Average	42	$188.10	$204.34	$16.24	8.6%
High	60	$254.34	$279.40	$25.06	9.9%
Very High	100	$401.54	$446.20	$44.66	11.1%

Note: Current bill includes SIP surcharge. All bill calculations assume 1" meter.
SIP surcharge is being phased out and will not be part of the water service rates beginning in FY 2016.
The Study calculates the rates assuming there is no SIP surcharge.

Table 7-8 shows the Other (non-residential) bill impacts at various levels of water usage for FY 2016. Bill impacts for FY 2017 are approximately 7 percent more than those shown below.

Table 7-8
Other Water Bill Impacts for FY 2016

Use Level	Monthly Use (ccf)	FY 2015 Current Bill	FY 2016 Proposed Bill	Difference ($)	Difference (%)
Very Low	20	$145.88	$166.48	$20.60	14.1%
Low	50	$264.68	$290.98	$26.30	9.9%
Average	84	$399.32	$432.08	$32.76	8.2%
High	100	$462.68	$498.48	$35.80	7.7%
Very High	200	$858.68	$913.48	$54.80	6.4%

Note: Current bill includes SIP surcharge. All bill calculations assume 2" meter.
SIP surcharge is being phased out and will not be part of the water service rates beginning in FY 2016.
The Study calculates the rates assuming there is no SIP surcharge.

7.2 FY 2016 AND FY 2017 WASTEWATER USER CHARGES AND CUSTOMER IMPACTS

The first step is to develop the current FY 2015 wastewater user charges based on the Test Year COS user charges. Tables 7-9 and 7-10 show the FY 2015 wastewater user charges for residential and non-residential customers, respectively, using the FY 2015 revenue requirement. Since the FY 2015 revenue requirement was approximately 18.3 percent higher than the Test Year revenue requirement, the Test Year COS user charges were increased by the same percentage to calculate the COS adjusted FY 2015 user charges.

Table 7-9
FY 2015 Cost of Service Adjusted Wastewater Rates – Residential

	FY 2015
Service Charge (per account)	$5.04
Strength Charge (per dwelling unit)	$6.93
Minimum monthly charge per household	$11.97
Plus: A flow charge per hcf (maximum of 9 ccf)	$0.99
Minimum monthly charge at 0 ccf	$0.00
Maximum monthly charge at 9 ccf	$8.91
Total Residential Charge	
Minimum monthly charge	$11.97
Maximum monthly charge	$20.88
Average monthly charge at 6 ccf	$17.91

Table 7-10
FY 2015 Cost of Service Adjusted Wastewater Rates – Non-Residential

	FY 2015
Monthly service charge (per meter)	$5.04
Treatment charge including flow processing (per ccf of sewage discharge)	
Meat Products	$6.46
Slaughterhouses	$6.52
Dairy Product Processing	$5.11
Fruit and Vegetable Canning	$4.15
Grain Mills	$4.27
Bakeries (including Pastries)	$7.26
Sugar Processing	$3.97
Rendering Tallow	$13.01
Beverage Manufacturing & Bottling	$3.07
Specialty Foods Manufacturing	$13.15
Pulp and Paper Products	$3.67
Inorganic Chemicals Mfgr.	$4.88
Synthetic Material Manufacturing	$1.12
Drug Manufacturing	$2.29
Cleaning and Sanitation Products	$4.64
Paint Manufacturing	$9.06
Ink and Pigment Manufacturing	$3.19
Leather Tanning and Finishing	$12.39
Earthenware Manufacturing	$2.66
Primary Metals Manufacturing	$2.11
Metal Products Fabricating	$1.21
Drum and Barrel Manufacturing	$12.51
Metal Coating	$1.31
Air Transportation	$1.70
Food Service Establishments	$4.49
Apartment Buildings (5 or more units)	$2.25
Hotels, Motels with Food Service	$3.26
Commercial Laundries	$2.84
Coin Operated Laundromats	$2.14
Industrial Laundries	$7.85
Laboratories	$1.54
Automobile Washing and Polishing	$2.05
Hospitals	$1.99
Schools	$1.45
All Other (includes dischargers of only segregated domestic wastes from sanitary conveniences)	$2.25

Table 7-11 shows the FY 2015 wet weather facilities charge, using the FY 2015 revenue requirement. Since the FY 2015 revenue requirement was approximately 18.3 percent higher than the Test Year revenue requirement, the Test Year COS user charges were increased by the same percentage to calculate the COS adjusted FY 2015 user charges.

Table 7-11
FY 2015 Cost of Service Adjusted Wet Weather Facilities Charge

Lot Size (sq ft)	FY 2015
0-5000	$85.34
5,001-10,000	$133.34
over 10,001	$304.75

Table 7-12 shows the revenue requirement for FY 2016 and FY 2017 as based on the proposed FY 2016 and FY 2017 budgets for the wastewater enterprise. Based on an updated projection of treatment revenues for FY 2016 and FY 2017, the FY 2015 COS adjusted wastewater user charges, shown in Tables 7-9 through 7-11, need to be increased by 5 percent in FY 2016 and 5 percent in FY 2017 to meet the rate revenue requirements[15].

Table 7-12
Wastewater Revenue Requirement for FY 2016 and FY 2017

	FY 2016			FY 2017		
	Operating	**Capital**	**Total**	**Operating**	**Capital**	**Total**
Revenue Requirements						
O&M Expenses	$65,447,092		$65,447,092	$70,734,668		$70,734,668
Capital -Existing Debt Service		$33,661,738	$33,661,738		$33,924,928	$33,924,928
Capital - Proposed Debt Service		$80,000	$80,000		$80,000	$80,000
Capital - Admin Expenses		$3,000,000	$3,000,000		$3,000,000	$3,000,000
Capital - Direct Expenses		$35,956,000	$35,956,000		$33,741,600	$33,741,600
Total Revenue Requirements	**$65,447,092**	**$72,697,738**	**$138,144,830**	**$70,734,668**	**$70,746,528**	**$141,481,196**
Revenue Offsets						
Resource Recovery	$3,500,000	$4,500,000	$8,000,000	$3,500,000	$4,500,000	$8,000,000
Property Taxes, less customer assistance		$4,300,000	$4,300,000		$4,407,500	$4,407,500
Ad Valorem Bond Levy		$4,040,200	$4,040,200		$4,126,950	$4,126,950
Interest	$396,217		$396,217	$732,474		$732,474
Laboratory Services	$3,900,000		$3,900,000	$4,017,000		$4,017,000
Reimbursements	$1,000,000		$1,000,000	$1,030,000		$1,030,000
Permit Fees	$1,800,000		$1,800,000	$1,800,000		$1,800,000
Capacity Charges		$1,500,000	$1,500,000		$1,583,700	$1,583,700
All Other Revenue			$0			$0
BABS REBATE		$2,500,000	$2,500,000		$2,500,000	$2,500,000
PSL FEES	$1,500,000		$1,500,000	$1,500,000		$1,500,000
PGS ENERGY SALES		$1,000,000	$1,000,000		$1,000,000	$1,000,000
MISC	$700,000		$700,000	$700,000		$700,000
Transfer (to)/from Rate Stabilization Reserve (RSR)	$0		$0	($5,187,189)		($5,187,189)
Total Revenue Offsets	**$12,796,217**	**$17,840,200**	**$30,636,417**	**$8,092,285**	**$18,118,150**	**$26,210,435**
Adjustments						
Transfer of Cash for Capital from Other Funds		($18,802,927)	($18,802,927)		($22,130,000)	($22,130,000)
Total Adjustments	**$0**	**($18,802,927)**	**($18,802,927)**	**$0**	**($22,130,000)**	**($22,130,000)**
Cost of Service to be Recovered from Rates	**$52,650,875**	**$36,054,611**	**$88,705,486**	**$62,642,383**	**$30,498,378**	**$93,140,761**

[15] As determined in the District's March 19, 2015 Memo to the Board of Directors on FY 2016 and FY 2017 rates.

Tables 7-13 and 7-14 show the proposed FY 2016 and FY 2017 wastewater rate for residential and non-residential customers, respectively.

Table 7-13
FY 2016 and FY 2017 Wastewater Rates – Residential

	FY 2016	FY 2017
Service Charge (per account)	$5.29	$5.55
Strength Charge (per dwelling unit)	$7.28	$7.64
Minimum monthly charge per household	$12.57	$13.19
Plus: A flow charge per hcf (maximum of 9 ccf)	$1.04	$1.09
Minimum monthly charge at 0 ccf	$0.00	$0.00
Maximum monthly charge at 9 ccf	$9.36	$9.81
Total Residential Charge		
Minimum monthly charge	$12.57	$13.19
Maximum monthly charge	$21.93	$23.00
Average monthly charge at 6 ccf	$18.81	$19.73

Table 7-14
FY 2016 and FY 2017 Wastewater Rates – Non-Residential

	FY 2016	FY 2017
Monthly service charge (per meter)	$5.29	$5.55
Treatment charge including flow processing (per ccf of sewage discharge)		
Meat Products	$6.78	$7.12
Slaughterhouses	$6.85	$7.19
Dairy Product Processing	$5.37	$5.64
Fruit and Vegetable Canning	$4.36	$4.58
Grain Mills	$4.48	$4.70
Bakeries (including Pastries)	$7.62	$8.00
Sugar Processing	$4.17	$4.38
Rendering Tallow	$13.66	$14.34
Beverage Manufacturing & Bottling	$3.22	$3.38
Specialty Foods Manufacturing	$13.81	$14.50
Pulp and Paper Products	$3.85	$4.04
Inorganic Chemicals Mfgr.	$5.12	$5.38
Synthetic Material Manufacturing	$1.18	$1.24
Drug Manufacturing	$2.40	$2.52
Cleaning and Sanitation Products	$4.87	$5.11
Paint Manufacturing	$9.51	$9.99
Ink and Pigment Manufacturing	$3.35	$3.52
Leather Tanning and Finishing	$13.01	$13.66
Earthenware Manufacturing	$2.79	$2.93
Primary Metals Manufacturing	$2.22	$2.33
Metal Products Fabricating	$1.27	$1.33
Drum and Barrel Manufacturing	$13.14	$13.80
Metal Coating	$1.38	$1.45
Air Transportation	$1.79	$1.88
Food Service Establishments	$4.71	$4.95
Apartment Buildings (5 or more units)	$2.36	$2.48
Hotels, Motels with Food Service	$3.42	$3.59
Commercial Laundries	$2.98	$3.13
Coin Operated Laundromats	$2.25	$2.36
Industrial Laundries	$8.24	$8.65
Laboratories	$1.62	$1.70
Automobile Washing and Polishing	$2.15	$2.26
Hospitals	$2.09	$2.19
Schools	$1.52	$1.60
All Other (includes dischargers of only segregated domestic wastes from sanitary conveniences)	$2.36	$2.48

Table 7-15 shows the wet weather facilities charge for FY 2016 and FY 2017. The increases mirror those of the wastewater increases, i.e. 5 percent per year.

Table 7-15
FY 2016 and FY 2017 Wet Weather Facilities Charge

Lot Size (sq ft)	FY 2016	FY 2017
0-5000	$89.60	$94.10
5,001-10,000	$140.00	$147.00
over 10,001	$320.00	$336.00

The resulting customer bill impacts, shown in Tables 7-16 and 7-17, reflect the increases described previously. Table 7-16 shows the bill impacts for different customers with typical water usage for FY 2016. Bill impacts for FY 2017 are approximately 5 percent more than those shown below.

Table 7-16
Typical Customers Wastewater Bill Impacts for FY 2016

Customer Class	Monthly Flow (ccf)	FY 2015 Current Bill	FY 2016 Proposed Bill	Difference ($)	Difference (%)
SFR	6	$19.05	$18.81	($0.24)	-1%
MFR - Fourplex	25	$55.61	$60.41	$4.80	9%
Commercial - Office	50	$100.13	$123.29	$23.16	23%
Commercial - Restaurant	50	$224.13	$240.79	$16.66	7%
Industrial - Food Manufacturing	500	$6,552.13	$6,910.29	$358.16	5%

Note: Bill does not include Pollution Prevention Charge

Table 7-17 shows the impacts resulting from the proposed wet weather facilities charge compared to the FY 2015 wet weather facilities charge, which is a fixed charge based on customer class. Bill impacts for FY 2017 are approximately 5 percent more than those shown below.

Table 7-17
Wet Weather Facilities Charge Impacts for FY 2016

Customer Class	Median Lot Size (sq ft)	FY 2015 Current Bill	FY 2016 Proposed Bill	Difference ($)	Difference (%)
SFR	4,800	$89.34	$89.60	$0.26	0%
Duplex	4,500	$178.68	$89.60	($89.08)	-50%
Triplex	5,130	$268.02	$140.00	($128.02)	-48%
Fourplex	5,400	$357.36	$140.00	($217.36)	-61%
Apartment	7,400	$446.70	$140.00	($306.70)	-69%
All Other	14,284	$134.00	$320.00	$186.00	139%

8. COST OF SERVICE ANALYSIS & PROPOSED FY 2016 & FY 2017 WATER DROUGHT SURCHARGES

As part of the scope of work, RFC reviewed and validated the COS methodology for the drought surcharges, which are consistent with industry standards and the COS methodology for the District's water rates. The District's proposed staged system of drought surcharges is designed to address the financial aspects of a limited or restricted water supply situation. The proposed stages link to the District's Urban Water Management Plan which contains a Water Shortage Contingency Plan with the elements contained below with respect to demand reduction and purchase of supplemental supplies as a water shortage becomes more severe. This section documents the process and calculations made to determine the water drought surcharges. Table 8-1 shows the proposed drought stages.

Table 8-1
Proposed Drought Stages

Stage	0	1	2	3	4
Demand Reduction		Voluntary 0-15%	Voluntary 0-15%	Mandatory up to 15%	Mandatory ≥15%
Supplemental Supplies			Up to 35,000 acre feet	35,000-65,000 acre feet	> 65,000 acre feet
Rates and Charges	Normal rates	Normal rates	Normal rates + Up to 8% surcharge	Normal rates + Up to 20% surcharge	Normal rates + Up to 25% surcharge

This staged approach was discussed at public meetings in October and November 2014. A formal public notice process will precede the Board considering adoption of the surcharges proposed as part of the rates and charges for FY 2016 and FY 2017. This process will occur between April and June 2015 along with the FY 2016-17 budget decisions. If the drought intensifies, a Stage 3 or Stage 4 declaration could occur.

The District's long-term water supply plan relies on aggressive everyday conservation, water recycling and reasonable drought cutbacks to preserve supplies. Supplemental water supplies received through the District's Freeport facility on the Sacramento River can prevent use reductions at levels that could cripple the local economy. Conserving 35,000 AF would require 37 percent mandatory District-wide use reductions and have a $97 million budget impact to the District. As shown in Table 8-1, the drought surcharges are triggered by the costs of purchasing supplemental supply. The cost of the supplemental supplies increases as the drought becomes more severe. In addition to the purchase costs, the District also incurs additional operating expenses due to system restrictions. When additional supply is purchased, the District will need to operate additional treatment plants that would normally only be operated during peak periods. The additional O&M expense is estimated at $6.1 million for Stages 2 through 4. To increase public awareness and participation, the District projects to incur additional staffing costs for customer service and public affairs costs. These costs range from $2.3 million in Stage 2 to $4.3 million in Stage 4. Tables 8-2 through 8-4 summarize the different drought-related costs for

Stages 2 through 4. The basis for Stage 2 is water use of 155 MGD and purchase of 35,000 AF of supplemental water; the basis for Stage 3 is use of 145 MGD and purchase of 60,000 AF of supplemental water; and the basis of Stage 4 is 137 MGD and purchase of 80,000 AF of supplemental water.

Table 8-2
Revenue Requirements Drought – Stage 2

Water Drought Stage 2: 155 MGD and 35,000 AF of Supplemental Supply	FY 2016	FY 2017
Revenue Requirements		
Operating Drought - O&M Variable Volume		
Purchase, Transmission, Treatment Costs	$15,750,000	$15,750,000
Storage Costs	$6,100,000	$6,100,000
Operating Drought - Revenue Loss Variable Volume	$0	$0
Operating Drought - O&M Customer Related	$2,300,000	$2,300,000
Capital - Existing Debt Service		
Capital - Proposed Debt Service		
Capital - Admin Expenses		
Capital - Direct Expenses		
Total Revenue Requirements	**$24,150,000**	**$24,150,000**
Revenue Offsets		
Transfer (to)/from Rate Stabilization Reserve	$1,500,000	$0
Total Revenue Offsets	**$1,500,000**	**$0**
Adjustments		
Transfer of Cash for Capital from Other Funds	$0	$0
Total Adjustments	**$0**	**$0**
Cost of Service to be Recovered from Drought Surcharge	**$22,650,000**	**$24,150,000**
Amount of Drought Surcharge for Variable Volume Related Costs	**$20,350,000**	**$21,850,000**
Amount of Drought Surcharge for Customer Related Costs	**$2,300,000**	**$2,300,000**

Table 8-3
Revenue Requirements Drought – Stage 3

Water Drought Stage 3: 145 MGD and 60,000 AF of Supplemental Supply	FY 2016	FY 2017
Revenue Requirements		
Operating Drought - O&M Variable Volume		
Purchase, Transmission, Treatment Costs	$42,412,500	$42,412,500
Storage Costs	$6,100,000	$6,100,000
Operating Drought - Revenue Loss Variable Volume	$10,595,131	$11,289,804
Operating Drought - O&M Customer Related	$3,250,000	$3,250,000
Capital - Existing Debt Service		
Capital - Proposed Debt Service		
Capital - Admin Expenses		
Capital - Direct Expenses		
Total Revenue Requirements	**$62,357,631**	**$63,052,304**
Revenue Offsets		
Transfer (to)/from Rate Stabilization Reserve	$8,500,000	$5,000,000
Total Revenue Offsets	**$8,500,000**	**$5,000,000**
Adjustments		
Transfer of Cash for Capital from Other Funds	$0	$0
Total Adjustments	**$0**	**$0**
Cost of Service to be Recovered from Drought Surcharge	**$53,857,631**	**$58,052,304**
Amount of Drought Surcharge for Variable Volume Related Costs	**$50,607,631**	**$54,802,304**
Amount of Drought Surcharge for Customer Related Costs	**$3,250,000**	**$3,250,000**

Table 8-4
Revenue Requirements Drought – Stage 4

Water Drought Stage 4: 137 MGD and 80,000 AF of Supplemental Supply	FY 2016	FY 2017
Revenue Requirements		
Operating Drought - O&M Variable Volume		
Purchase, Transmission, Treatment Costs	$55,800,000	$55,800,000
Storage Costs	$6,100,000	$6,100,000
Operating Drought - Revenue Loss Variable Volume	$28,881,545	$30,770,799
Operating Drought - O&M Customer Related	$3,250,000	$3,250,000
Capital - Existing Debt Service		
Capital - Proposed Debt Service		
Capital - Admin Expenses		
Capital - Direct Expenses		
Total Revenue Requirements	**$94,031,545**	**$95,920,799**
Revenue Offsets		
Transfer (to)/from Rate Stabilization Reserve	$30,830,000	$27,700,000
Total Revenue Offsets	**$30,830,000**	**$27,700,000**
Adjustments		
Transfer of Cash for Capital from Other Funds	$0	$0
Total Adjustments	**$0**	**$0**
Cost of Service to be Recovered from Drought Surcharge	**$63,201,545**	**$68,220,799**
Amount of Drought Surcharge for Variable Volume Related Costs	**$59,951,545**	**$64,970,799**
Amount of Drought Surcharge for Customer Related Costs	**$3,250,000**	**$3,250,000**

Table 8-5 shows changing water consumption patterns, as provided by the District's water conservation staff, as the drought becomes more severe and corresponding loss of revenue for each stage.

Table 8-5
Water Consumption and Revenue Loss by Stage

	Budgeted Non-Drought Consumption FY 2016/17 (MGD)	Pre Drought* Consumption (MGD)	Stage 2 Consumption (MGD)	Stage 2 Reduction Target	Stage 3 Consumption (MGD)	Stage 3 Reduction Target	Stage 4 Consumption (MGD)	Stage 4 Reduction Target
Single Family	73.1	85.0	75.2	*12%*	69.5	19%	65.4	*25%*
Multiple Family	27.3	30.0	27.9	*7%*	26.7	*11%*	25.2	*16%*
Other	46.0	51.7	46.9	*9%*	44.2	*15%*	41.4	*20%*
Recycled Water	4.7	4.7	4.7	*0%*	4.7	*0%*	4.7	*0%*
TOTAL	**151.1**	**171.4**	**154.7**	***10%***	**145.1**	***15%***	**136.6**	***20%***
Volume Related Revenue				***Loss***		***Loss***		***Loss***
FY 2016 Volume Revenue	$304.3 M		$315.5 M	*$0 M*	$293.7 M	*-$10.6 M*	$275.4 M	*-$28.9 M*
FY 2017 Volume Revenue	$324.2 M		$336.2 M	*$0 M*	$312.9 M	*-$11.3 M*	$293.4 M	*-$30.8 M*

*Pre drought consumption from calendar year 2013 billed consumption based on the state of CA drought reporting requirements

Table 8-6 shows the development of the variable portion of the surcharge, which consists of the supplemental supplies purchase cost and the additional O&M expense. In Stages 3 and 4, the total drought related costs also include the estimated revenue loss due to conservation. These costs will be recovered in proportion to the water rate in each tier and for each customer class reflecting the District's COS for recovery of variable volume-related costs based on the principal of maintaining inter-class and intra-class revenue neutrality and equity.

Table 8-6
Development of FY 2016 and FY 2017 Variable Surcharge Rate

FY2016	Variable Volume Drought Costs	Estimated Revenue loss	Offset from Rate Stabilization Reserves	Total	Estimated Volume* Revenue	Drought Variable Volume Surcharge on COS Volume Rate
Stage 2	$21,850,000	$0	$1,500,000	$20,350,000	295,093,324	6.9%
Stage 3	$48,512,500	$10,595,131	$8,500,000	$50,607,631	274,869,717	18.4%
Stage 4	$61,900,000	$28,881,545	$30,830,000	$59,951,545	257,807,654	23.3%

*Does not include elevation revenue

FY2017	Variable Volume Drought Costs	Estimated Revenue loss	Offset from Rate Stabilization Reserves	Total	Estimated Volume* Revenue	Drought Variable Volume Surcharge on COS Volume Rate
Stage 2	$21,850,000	$0	$0	$21,850,000	315,790,680	6.9%
Stage 3	$48,512,500	$11,289,804	$5,000,000	$54,802,304	294,151,543	18.6%
Stage 4	$61,900,000	$30,770,799	$27,700,000	$64,970,799	275,894,897	23.5%

*Does not include elevation revenue

Table 8-7 shows the development of the customer service/outreach portion of the surcharge, which consists of the additional staffing and public affairs cost. Since these costs do not link strongly to

customer class, peak use, meter, and other parameters used to develop the non-drought water COS rates, they are recovered as a uniform surcharge over each unit of water.

Table 8-7
Development of FY 2016 and FY 2017 Customer Service and Outreach Surcharge Rate

FY 2016	Customer Related Costs	Estimated Consumption (hcf)	Customer Related Surcharge ($/hcf)
Stage 2	$2,300,000	75,494,875	$0.030
Stage 3	$3,250,000	70,794,731	$0.046
Stage 4	$3,250,000	66,670,380	$0.049

FY 2017	Customer Related Costs	Estimated Consumption (hcf)	Customer Related Surcharge ($/hcf)
Stage 2	$2,300,000	75,494,875	$0.030
Stage 3	$3,250,000	70,794,731	$0.046
Stage 4	$3,250,000	66,670,380	$0.049

Table 8-8 shows the maximum proposed drought surcharges for each stage for FY 2016 and FY 2017. The drought surcharges consist of two components: a variable surcharge component (shown in Table 8-6) and a customer service/outreach component (shown in Table 8-7). The proposed surcharges recover the drought-related costs associated with each drought stage. If the demand reduction in a stage is less than the maximum demand reduction for a given stage, the surcharges as shown for each drought stage could be reduced accordingly.

Table 8-8
Proposed Maximum Drought Surcharges for FY 2016 and FY 2017

FY 2016	FY 2016 Volume Rate ($/ccf)	Drought Variable Volume Surcharge Rate	Drought Variable Volume Surcharge ($/ccf)	Drought Customer Related Surcharge ($/ccf)	Total Drought Surcharge ($/ccf)	% of FY 2016 Rate
Stage 2						
SFR Tier 1	$2.95	6.9%	$0.20	$0.03	$0.23	7.8%
SFR Tier 2	$4.06	6.9%	$0.28	$0.03	$0.31	7.6%
SFR Tier 3	$5.36	6.9%	$0.37	$0.03	$0.40	7.5%
MFR	$4.17	6.9%	$0.29	$0.03	$0.32	7.7%
OTHER	$4.15	6.9%	$0.29	$0.03	$0.32	7.7%
Stage 3						
SFR Tier 1	$2.95	18.4%	$0.54	$0.05	$0.59	20.0%
SFR Tier 2	$4.06	18.4%	$0.75	$0.05	$0.79	19.5%
SFR Tier 3	$5.36	18.4%	$0.99	$0.05	$1.03	19.2%
MFR	$4.17	18.4%	$0.77	$0.05	$0.81	19.4%
OTHER	$4.15	18.4%	$0.76	$0.05	$0.81	19.5%
Stage 4						
SFR Tier 1	$2.95	23.3%	$0.69	$0.05	$0.73	24.7%
SFR Tier 2	$4.06	23.3%	$0.94	$0.05	$0.99	24.4%
SFR Tier 3	$5.36	23.3%	$1.25	$0.05	$1.30	24.3%
MFR	$4.17	23.3%	$0.97	$0.05	$1.02	24.5%
OTHER	$4.15	23.3%	$0.97	$0.05	$1.01	24.3%

FY 2017	FY 2017 Volume Rate ($/hcf)	Drought Variable Volume Surcharge Rate	Drought Variable Volume Surcharge ($/hcf)	Drought Customer Related Surcharge ($/hcf)	Total Drought Surcharge ($/hcf)	% of FY 2016 Rate
Stage 2						
SFR Tier 1	$3.16	6.9%	$0.22	$0.03	$0.25	7.9%
SFR Tier 2	$4.34	6.9%	$0.30	$0.03	$0.33	7.6%
SFR Tier 3	$5.74	6.9%	$0.40	$0.03	$0.43	7.5%
MFR	$4.46	6.9%	$0.31	$0.03	$0.34	7.6%
OTHER	$4.44	6.9%	$0.31	$0.03	$0.34	7.7%
Stage 3						
SFR Tier 1	$3.16	18.6%	$0.59	$0.05	$0.63	19.9%
SFR Tier 2	$4.34	18.6%	$0.81	$0.05	$0.85	19.6%
SFR Tier 3	$5.74	18.6%	$1.07	$0.05	$1.12	19.5%
MFR	$4.46	18.6%	$0.83	$0.05	$0.88	19.7%
OTHER	$4.44	18.6%	$0.83	$0.05	$0.87	19.6%
Stage 4						
SFR Tier 1	$3.16	23.5%	$0.74	$0.05	$0.79	25.0%
SFR Tier 2	$4.34	23.5%	$1.02	$0.05	$1.07	24.7%
SFR Tier 3	$5.74	23.5%	$1.35	$0.05	$1.40	24.4%
MFR	$4.46	23.5%	$1.05	$0.05	$1.10	24.7%
OTHER	$4.44	23.5%	$1.05	$0.05	$1.09	24.5%

9. APPENDIX

For readability purposes, some of the tables in the text of the report are reproduced in the Appendix. The original table number is kept for easy reference.

Table 3-7
Allocation to Cost Components

Category	Base	Max 6 Months	Max Day	Max Hour	Elevation	Supplemental Supply	Recycled Water	Fire Protection	Meters	Customer	General	Total
Supply	100%											100%
Raw Water	100%											100%
Treatment	66%	13%	20%									100%
Reservoir	43%		47%	0%				10%				100%
Elevation	2%		3%	0%	95%							100%
Distribution	20%		23%	43%				14%				100%
Distribution w/o Fire	24%		26%	50%				0%				100%
Meters									100%			100%
Hydrants								100%				100%
Customer										100%		100%
Supplemental						100%						100%
Recycled Water							100%					100%
General											100%	100%

Table 3-8
Allocation of O&M Expenses to Cost Components

	Base	Max 6 Months	Max Day	Max Hour	Elevation	Supplemental Supply	Recycled Water	Fire Protection	Meters	Customer	General	FY 2013
Power Generation	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,740,578	$1,740,578
Source of Supply/Water Rights	$7,898,456	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$7,898,456
Recycled Water	$0	$0	$0	$0	$0	$0	$4,949,517	$0	$0	$0	$0	$4,949,517
Raw Water	$16,061,109	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$16,061,109
Recreation	$5,224,746	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$5,224,746
Treatment	$15,223,585	$3,053,385	$4,689,296	$0	$0	$0	$0	$0	$0	$0	$0	$22,966,265
Reservoir Distribution	$2,095,782	$0	$2,305,360	$0	$0	$0	$0	$489,016	$0	$0	$0	$4,890,158
Pumping Plants Distribution	$289,196	$0	$318,116	$0	$11,538,934	$0	$0	$0	$0	$0	$0	$12,146,246
Distribution Network	$7,515,480	$0	$8,267,028	$15,782,508	$0	$0	$0	$5,138,491	$0	$0	$0	$36,703,507
Meters	$0	$0	$0	$0	$0	$0	$0	$0	$8,930,738	$0	$0	$8,930,738
Hydrants	$0	$0	$0	$0	$0	$0	$0	$1,093,697	$0	$0	$0	$1,093,697
Other Work	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,757,020	$1,757,020
Admin	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$66,305,185	$66,305,185
Customer Service	$0	$0	$0	$0	$0	$0	$0	$0	$0	$18,477,415	$0	$18,477,415
Supplemental Supply	$0	$0	$0	$0	$0	$2,087,683	$0	$0	$0	$0	$0	$2,087,683
Z Capital A&G	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
TOTAL O&M	**$54,308,354**	**$3,053,385**	**$15,579,800**	**$15,782,508**	**$11,538,934**	**$2,087,683**	**$4,949,517**	**$6,721,204**	**$8,930,738**	**$18,477,415**	**$69,802,783**	**$211,232,321**
% allocation	25.7%	1.4%	7.4%	7.5%	5.5%	1.0%	2.3%	3.2%	4.2%	8.7%	33.0%	100.0%

Table 3-9
Allocation of Water Assets to Cost Components

	Base	Max 6 Months	Max Day	Max Hour	Elevation	Supplemental Supply	Recycled Water	Fire Protection	Meters	Customer	General	Test Year
Distribution Hydrants	$0	$0	$0	$0	$0	$0	$0	$33,006,364	$0	$0	$0	$33,006,364
Auto Control System	$4,217,960	$0	$4,639,757	$8,857,717	$0	$0	$0	$0	$0	$0	$0	$17,715,434
Distribution Mains	$183,007,280	$0	$201,308,008	$384,315,289	$0	$0	$0	$125,125,908	$0	$0	$0	$893,756,486
Distribution Aqueducts	$17,571,766	$0	$19,328,942	$36,900,708	$0	$0	$0	$0	$0	$0	$0	$73,801,415
Pressure Regulators	$6,379,213	$0	$7,017,135	$13,396,348	$0	$0	$0	$0	$0	$0	$0	$26,792,696
Venturi Meters and Cath Protect	$769,241	$0	$846,165	$1,615,407	$0	$0	$0	$0	$0	$0	$0	$3,230,813
Distribution Pumping	$2,415,139	$0	$2,656,653	$0	$96,364,048	$0	$0	$0	$0	$0	$0	$101,435,840
Distribution Reserviors	$111,030,182	$0	$122,133,200	$0	$0	$0	$0	$25,907,042	$0	$0	$0	$259,070,425
Hydroelectric Power Generation	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$18,431,747	$18,431,747
General Plant Structures	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$130,813,114	$130,813,114
Equipment - Transp & Const	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$14,788,079	$14,788,079
Equipment - office	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,091,174	$1,091,174
Equipment -Eng/Lab	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$130,518	$130,518
Equipment -Tools/Work	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$684,424	$684,424
Equipment -Stores	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Equipment - Shop	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$218,892	$218,892
Unallocated As Built Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$580,593	$580,593
Deferred Softwasre costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$28,683,971	$28,683,971
Deferred EB watershed MP	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,453,672	$1,453,672
Deffered Lab Expansion Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$4,176,676	$4,176,676
Deffered Solids Receiving Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$163,978	$163,978
Preliminary Eng & Environ Costs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$28,529,755	$28,529,755
Land Distribution	$3,397,717	$0	$3,737,489	$0	$0	$0	$0	$792,801	$0	$0	$0	$7,928,007
Land Misc	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,737,088	$1,737,088
Misc Land	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,169,815	$1,169,815
Misc Land	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$52,184	$52,184
Land General Plan	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$7,714,529	$7,714,529
Land Raw Water Trans	$3,710,592	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$3,710,592
ROW Raw Water Trans	$1,229,538	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,229,538
Land Terminal Reservoirs	$18,931,841	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$18,931,841
Land Source of Supply	$7,832,091	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$7,832,091

Table 3-9
Allocation of Water Assets to Cost Components (cont'd)

	Base	Max 6 Months	Max Day	Max Hour	Elevation	Supplemental Supply	Recycled Water	Fire Protection	Meters	Customer	General	Test Year
Land Water Treatment	$1,971,626	$395,448	$607,317	$0	$0	$0	$0	$0	$0	$0	$0	$2,974,390
Raw Wt Transmission	$203,971,440	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$203,971,440
Raw Wt Trans pumping	$23,370,807	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$23,370,807
Terminal Reservoirs	$130,191,157	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$130,191,157
Rec Facilities	$264,045	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$264,045
Rec Facilities	$32,762,410	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$32,762,410
Meters	$0	$0	$0	$0	$0	$0	$0	$0	$336,206,241	$0	$0	$336,206,241
Large Meters	$0	$0	$0	$0	$0	$0	$0	$0	$45,289,343	$0	$0	$45,289,343
Source of wate supply	$58,981,416	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$58,981,416
well equipment	$0	$0	$0	$0	$0	$2,486,672	$0	$0	$0	$0	$0	$2,486,672
raw water trans	$0	$0	$0	$0	$0	$167,296,019	$0	$0	$0	$0	$0	$167,296,019
raw water pump	$0	$0	$0	$0	$0	$154,423,375	$0	$0	$0	$0	$0	$154,423,375
terminal resv	$0	$0	$0	$0	$0	$53,159	$0	$0	$0	$0	$0	$53,159
Non Potable	$0	$0	$0	$0	$0	$0	$65,568,297	$0	$0	$0	$0	$65,568,297
Water Treat	$0	$0	$0	$0	$0	$19,950,478	$0	$0	$0	$0	$0	$19,950,478
Water Conserv	$0	$0	$0	$0	$0	$17,895,581	$0	$0	$0	$0	$0	$17,895,581
Studies Non Pot	$0	$0	$0	$0	$0	$0	$1,590,311	$0	$0	$0	$0	$1,590,311
Studies Supply	$0	$0	$0	$0	$0	$19,832,015	$0	$0	$0	$0	$0	$19,832,015
Studies Supply	$0	$0	$0	$0	$0	$2,293,703	$0	$0	$0	$0	$0	$2,293,703
Land Non Pot	$0	$0	$0	$0	$0	$0	$2,174,793	$0	$0	$0	$0	$2,174,793
SYS	$0	$0	$0	$0	$0	$229,036,567	$0	$0	$0	$0	$0	$229,036,567
Water Treatment	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Bayside Total	$0	$0	$0	$0	$0	$12,808,404	$0	$0	$0	$0	$0	$12,808,404
Briones Total	$2,028,694	$406,894	$624,895	$0	$0	$0	$0	$0	$0	$0	$0	$3,060,483
Lafay Total	$5,841,997	$4,264,844	$4,887,830	$0	$0	$0	$0	$0	$0	$0	$0	$14,994,670
Orinda Total	$32,759,520	$1,932,890	$8,255,151	$0	$0	$0	$0	$0	$0	$0	$0	$42,947,561
SanPablo Total	$9,207,085	$1,846,659	$2,836,043	$0	$0	$0	$0	$0	$0	$0	$0	$13,889,787
Sobrante Total	$13,513,686	$10,073,039	$19,215,834	$0	$0	$0	$0	$0	$0	$0	$0	$42,802,559
USL Total	$4,294,925	$6,445,420	$26,188,293	$0	$0	$0	$0	$0	$0	$0	$0	$36,928,638
WC Total	$36,098,523	$11,709,361	$22,490,105	$0	$0	$0	$0	$0	$0	$0	$0	$70,297,989
TOTAL ASSETS	**$915,749,892**	**$37,074,553**	**$446,772,817**	**$445,085,468**	**$96,364,048**	**$626,075,973**	**$69,333,401**	**$184,832,115**	**$381,495,584**	**$0**	**$240,420,209**	**$3,443,204,062**
% allocation	26.6%	1.1%	13.0%	12.9%	2.8%	18.2%	2.0%	5.4%	11.1%	0.0%	7.0%	100.0%

Table 3-12
Customer Class Service Units

Customer Class	Annual Usage (ccf)	Max 6 Months (ccf)	Daily Usage (ccf)	Max Day Factor	Max Day Requirements	Max Day Requirements	Max Hour Factor	Max Hour Requirements	Max Hour Requirements	Equivalent Meters	No. of Bills
SFR	40,650,556	25,150,003	111,371	2.25	250,586	139,214	4.50	501,171	361,957	341,602	3,908,736
MFR	14,356,603	7,741,892	39,333	1.85	72,766	33,433	3.70	145,533	112,100	55,170	342,084
All Other	24,738,129	15,257,422	67,776	2.30	155,884	88,108	4.60	311,768	223,660	74,150	321,468
Recycled Water	2,233,016		6,118								
Private Fire Meters										191,645	74,604
TOTAL	**81,978,304**	**48,149,317**	**224,598**		**479,236**	**260,756**		**958,472**	**697,716**	**662,567**	**4,646,892**

Table 3-14
Allocation of Cost Components to Rate Components

		Commodity Rate								Service Charge		
COS Category	Test Year Cost	Base	Max 6 Months	Max Day	Max Hour	Supplemental Supply	Elevation	Recycled Water	Fire Protection	Meters	Customer	TOTAL
Base	$123,353,893	100.0%										100.0%
Max 6 Months	$4,841,966		100.0%									100.0%
Max Day	$45,256,340			77.0%						23.0%		100.0%
Max Hour	$45,409,055				77.0%					23.0%		100.0%
Elevation	$19,065,381						100.0%					100.0%
Supplemental Supply	$40,354,215					100.0%						100.0%
Recycled Water	$7,310,815					45.4%		54.6%				100.0%
Fire Protection	$10,184,452								100.0%			100.0%
Meters	$43,592,851									100.0%		100.0%
Customer	$16,231,031										100.0%	100.0%
TOTAL ALLOCATED COSTS	**$355,600,000**	**$123,353,893**	**$4,841,966**	**$34,847,382**	**$34,964,973**	**$43,670,737**	**$19,065,381**	**$3,994,293**	**$10,184,452**	**$64,445,892**	**$16,231,031**	**$355,600,000**

Table 3-15
Revenue Offsets Allocation

Revenue Offsets Allocation	Base	Max 6 Months	Max Day	Max Hour	Elevation	Supplemental Supply	Recycled Water	Fire Protection	Meters	Customer	General	Total
Total Seismic Charges Revenue									100.0%			100.0%
Supplemental Supply Surcharge						100.0%						100.0%
Taxes, less customer assistance	26.6%	1.1%	13.0%	12.9%	2.8%	18.2%	5.5%	5.4%	11.1%	0.0%	3.5%	100.0%
Power		25.0%	25.0%	25.0%	25.0%							100.0%
Interest	25.7%	1.4%	7.4%	7.5%	5.5%	1.0%	2.3%	3.2%	4.2%	8.7%	33.0%	100.0%
Sewer Capacity Charges Applied to Debt Service	26.6%	1.1%	13.0%	12.9%	2.8%	18.2%	2.0%	5.4%	11.1%	0.0%	7.0%	100.0%
Operating Reimbursement	9.8%	0.5%	2.8%	2.8%	2.1%	0.4%	0.9%	1.2%	1.6%	62.0%	15.9%	100.0%
RARE Reimbursement							100.0%					100.0%
All Other	26.6%	1.1%	13.0%	12.9%	2.8%	18.2%	2.0%	5.4%	11.1%	0.0%	7.0%	100.0%
Transfer (to)/from Rate Stabilization Reserve	100.0%											100.0%
Transfer (to)/from Supplemental Supply RSR						100.0%						100.0%
Transfer (to)/from Future Water Supply RSR						100.0%						100.0%
Revenue Offsets	**($18,779,249)**	**($1,732,929)**	**($9,822,766)**	**($9,796,185)**	**($3,080,427)**	**($11,910,589)**	**($3,833,010)**	**($3,678,013)**	**($7,460,538)**	**($5,887,696)**	**($5,818,598)**	**($81,800,000)**

Table 3-16
Development of Unit Costs

	Base	Max 6 Months	Max Day	Max Hour	Elevation	Supplemental Supply	Recycled Water	Fire Protection	Meters	Customer	General	Total
Operating Expenses	$54,308,354	$3,053,385	$15,579,800	$15,782,508	$11,538,934	$2,087,683	$4,949,517	$6,721,204	$8,930,738	$18,477,415	$69,802,783	$211,232,321
Capital Expenses	$60,151,250	$2,435,251	$29,346,379	$29,235,545	$6,329,695	$41,123,949	$4,554,181	$12,140,742	$25,058,628	$0	$15,792,059	$226,167,679
Revenue Offsets	($18,779,249)	($1,732,929)	($9,822,766)	($9,796,185)	($3,080,427)	($11,910,589)	($3,833,010)	($3,678,013)	($7,460,538)	($5,887,696)	($5,818,598)	($81,800,000)
Total Cost of Service	**$95,680,355**	**$3,755,706**	**$35,103,413**	**$35,221,868**	**$14,788,203**	**$31,301,044**	**$5,670,688**	**$15,183,933**	**$26,528,828**	**$12,589,719**	**$79,776,244**	**$355,600,000**
Allocation of General Cost	$27,673,538	$1,086,259	$10,152,927	$10,187,188	$4,277,178	$9,053,171	$1,640,128	$4,391,634	$7,672,908	$3,641,312	($79,776,244)	$0
Allocation of Public Fire Protection								($16,639,232)	$16,639,232			$0
Allocation of Private Fire Meter Maintenance								$7,248,117	($7,248,117)			$0
Allocated Cost of Service	**$123,353,893**	**$4,841,966**	**$45,256,340**	**$45,409,055**	**$19,065,381**	**$40,354,215**	**$7,310,815**	**$10,184,452**	**$43,592,851**	**$16,231,031**	**$0**	**$355,600,000**
Adjustment from Rates Sheet	$0	$0	($10,408,958)	($10,444,083)	$0	$3,316,522	($3,316,522)	$0	$20,853,041	$0		$0
												$0
Adjusted Cost of Service	**$123,353,893**	**$4,841,966**	**$34,847,382**	**$34,964,973**	**$19,065,381**	**$43,670,737**	**$3,994,293**	**$10,184,452**	**$64,445,892**	**$16,231,031**	**$0**	**$355,600,000**
Unit of Service	79,745,288	48,149,317	260,756	697,716		79,745,288	2,233,016	191,645	470,922	4,646,892		
Units	hcf	hcf	hcf/day	hcf/day		hcf	hcf	Equiv. fire/yr	Equiv. meter/yr	Bills/yr		
Unit Cost	$1.55	$0.10	$133.64	$50.11		$0.55	$1.79	$4.43	$11.40	$3.49		
	hcf	hcf	hcf/day	hcf/day		hcf	hcf	Equiv. fire/mo	Equiv. meter/mo	bill		

Table 3-17
Allocation of Supplemental Supply Costs

Customer Class	% of Normal	Normal Demand	Drought Rationing %	Drought Demand	Drought Supply -29%	Supplemental Supply	Allocation %	Suppl. Supply Cost
SFR	49.6%	40,650,556	22.7%	31,410,685	28,997,424	2,413,261	33.8%	$14,744,111
MFR	17.5%	14,356,603	13.9%	12,356,728	10,241,053	2,115,675	29.6%	$12,925,975
All Other	30.2%	24,738,129	18.1%	20,265,475	17,646,549	2,618,927	36.6%	$16,000,652
Recycled Water	2.7%	2,233,016	0.0%	2,233,016	2,233,016	0	0.0%	$0
TOTAL		**81,978,304**		**66,265,904**	**59,118,041**	**7,147,863**	**100.0%**	**$43,670,737**

Table 3-18
Allocation of Costs to Customer Class

	Base	Max 6 Months	Max Day	Max Hour	Elevation	Supplemental Supply	Recycled Water	Private Fire Meters	Standard Meters	Customer	Total
SFR	$62,880,259	$2,529,121	$18,604,576	$18,138,915		$14,744,111			$46,748,424	$13,652,742	$177,298,147
MFR	$22,207,492	$778,536	$4,468,007	$5,617,693		$12,925,975			$7,550,045	$1,194,858	$54,742,607
All Other	$38,266,142	$1,534,309	$11,774,798	$11,208,365		$16,000,652			$10,147,423	$1,122,849	$90,054,537
Recycled Water						$0	$3,994,293				$3,994,293
Private Fire Meters								$10,184,452		$260,583	$10,445,035
Elevation Surcharge					$19,065,381						$19,065,381
TOTAL	**$123,353,893**	**$4,841,966**	**$34,847,382**	**$34,964,973**	**$19,065,381**	**$43,670,737**	**$3,994,293**	**$10,184,452**	**$64,445,892**	**$16,231,031**	**$355,600,000**

	Base	Max 6 Months	Max Day	Max Hour	Elevation	Supplemental Supply	Recycled Water	Private Fire Meters	Standard Meters	Customer	Total
SFR	35.5%	1.4%	10.5%	10.2%	0.0%	8.3%	0.0%	0.0%	26.4%	7.7%	49.9%
MFR	40.6%	1.4%	8.2%	10.3%	0.0%	23.6%	0.0%	0.0%	13.8%	2.2%	15.4%
All Other	42.5%	1.7%	13.1%	12.4%	0.0%	17.8%	0.0%	0.0%	11.3%	1.2%	25.3%
Recycled Water	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	1.1%
Private Fire Meters	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	97.5%	0.0%	2.5%	2.9%
Elevation Surcharge	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.4%
TOTAL	**34.7%**	**1.4%**	**9.8%**	**9.8%**	**5.4%**	**12.3%**	**1.1%**	**2.9%**	**18.1%**	**4.6%**	**100.0%**

Table 5-4
Allocation to Cost Components – O&M

O&M Categories	I&I	Flow	CODf	TSS	Customer	Other	TOTAL
Interceptor	26.0%	74.0%					100.0%
R2						100.0%	100.0%
Wet Weather	100.0%						100.0%
Influent Operation	22.6%	62.7%		14.7%			100.0%
Influent Maintenance	28.0%	64.3%		7.7%			100.0%
Primary Operation	22.6%	62.7%		14.7%			100.0%
Primary Maintenance	28.0%	64.3%		7.7%			100.0%
Secondary Operation	9.0%	23.9%	33.5%	33.6%			100.0%
Secondary Maintenance	16.6%	12.8%	35.3%	35.3%			100.0%
O2	16.6%	12.8%	35.3%	35.3%			100.0%
Sludge Operation			31.3%	68.7%			100.0%
Sludge Maintenance			27.5%	72.5%			100.0%
Lab	0.0%					100.0%	100.0%
Permit	0.0%					100.0%	100.0%
I&I	100.0%					0.0%	100.0%
PGS	9.0%	20.0%	32.0%	39.0%			100.0%
Reclaimed	0.0%					100.0%	100.0%
Reimbursed	0.0%					100.0%	100.0%
Billing					100.0%		100.0%
Overhead						100.0%	100.0%

Table 5-5
Allocation of O&M Expenses to Cost Components

O&M Categories	I&I	Flow	CODf	TSS	Customer	Other	Test Year
Interceptor	$640,903	$1,824,107	$0	$0	$0	$0	$2,465,010
R2	$0	$0	$0	$0	$0	$1,791,040	$1,791,040
Wet Weather	$1,456,955	$0	$0	$0	$0	$0	$1,456,955
Influent Operation	$1,385,408	$3,843,588	$0	$901,128	$0	$0	$6,130,125
Influent Maintenance	$236,824	$543,850	$0	$65,127	$0	$0	$845,801
Primary Operation	$1,390	$3,857	$0	$904	$0	$0	$6,152
Primary Maintenance	$143,514	$329,570	$0	$39,466	$0	$0	$512,550
Secondary Operation	$298,075	$791,555	$1,109,502	$1,112,814	$0	$0	$3,311,947
Secondary Maintenance	$149,248	$115,083	$317,378	$317,378	$0	$0	$899,087
O2	$18,537	$14,294	$39,420	$39,420	$0	$0	$111,671
Sludge Operation	$0	$0	$2,662,327	$5,843,511	$0	$0	$8,505,838
Sludge Maintenance	$0	$0	$259,763	$684,830	$0	$0	$944,593
Lab	$0	$0	$0	$0	$0	$4,914,077	$4,914,077
Permit	$0	$0	$0	$0	$0	$1,461,918	$1,461,918
I&I	$1,836,844	$0	$0	$0	$0	$0	$1,836,844
PGS	$161,530	$358,956	$574,330	$699,965	$0	$0	$1,794,782
Reclaimed	$0	$0	$0	$0	$0	$773,322	$773,322
Reimbursed	$0	$0	$0	$0	$0	$270,820	$270,820
Billing	$0	$0	$0	$0	$1,854,700	$0	$1,854,700
Overhead	$0	$0	$0	$0	$0	$15,374,820	$15,374,820
TOTAL O&M EXPENSES	**$6,329,230**	**$7,824,862**	**$4,962,720**	**$9,704,543**	**$1,854,700**	**$24,585,997**	**$55,262,051**
% allocation	11.5%	14.2%	9.0%	17.6%	3.4%	44.5%	

Table 5-10
Revenue Offsets Allocation

REVENUE OFFSETS ALLOCATION - OPERATING	I&I	Flow	CODf	TSS	Customer	Other	TOTAL
Resource Recovery	0.0%	0.0%	16.3%	35.8%	0.0%	47.9%	100.0%
Property Taxes, less customer assistance							0.0%
Ad Valorem Bond Levy							0.0%
Interest	0.0%	14.2%	9.0%	17.6%	14.8%	44.5%	100.0%
Laboratory Services						100.0%	100.0%
Reimbursements						100.0%	100.0%
Permit Fees						100.0%	100.0%
Capacity Charges							0.0%
All Other Revenue							0.0%
Build America Bonds Rebate							0.0%
Private Sewer Lateral Fees					100.0%		100.0%
PGS Energy Sales							0.0%
Miscellaneous	0.0%	14.2%	9.0%	17.6%	14.8%	44.5%	100.0%
Transfer (to)/from Rate Stabilization Reserve (RSR)	0.0%	14.2%	9.0%	17.6%	14.8%	44.5%	100.0%

REVENUE OFFSETS ALLOCATION - CAPITAL	I&I	Flow	CODf	TSS	Customer	Other	TOTAL
Resource Recovery	44.6%	26.8%	9.7%	18.9%	0.0%	0.0%	100.0%
Property Taxes, less customer assistance	44.6%	26.8%	9.7%	18.9%	0.0%	0.0%	100.0%
Ad Valorem Bond Levy	44.6%	26.8%	9.7%	18.9%	0.0%	0.0%	100.0%
Interest							0.0%
Laboratory Services							0.0%
Reimbursements							0.0%
Permit Fees							0.0%
Capacity Charges	44.6%	26.8%	9.7%	18.9%	0.0%	0.0%	100.0%
All Other Revenue							0.0%
Build America Bonds Rebate	44.6%	26.8%	9.7%	18.9%	0.0%	0.0%	100.0%
Private Sewer Lateral Fees							0.0%
PGS Energy Sales	44.6%	26.8%	9.7%	18.9%	0.0%	0.0%	100.0%
Miscellaneous							0.0%
Transfer (to)/from Rate Stabilization Reserve (RSR)							0.0%
Revenue Offsets	**($8,201,921)**	**($5,035,458)**	**($2,436,374)**	**($4,875,797)**	**($1,118,474)**	**($8,831,975)**	**($30,500,000)**

Table 5-11
Development of Unit Costs

	I&I	Flow	CODf	TSS	Customer	Other	TOTAL
Operating Expenses	$6,327,499	$7,822,722	$4,961,363	$9,701,890	$1,854,192	$24,579,275	$55,246,942
I&I Operating Expenses to be Recovered on Customer	($6,327,499)				$6,327,499		
Adjusted Operating Expenses	$0	$7,822,722	$4,961,363	$9,701,890	$8,181,692	$24,579,275	$55,246,942
Capital Expenses	$22,088,601	$13,255,932	$4,830,446	$9,378,079	$0	$0	$49,553,058
Revenue Offsets	($8,201,921)	($5,035,458)	($2,436,374)	($4,875,797)	($1,118,474)	($8,831,975)	($30,500,000)
Total Cost of Service	**$13,886,680**	**$16,043,196**	**$7,355,435**	**$14,204,171**	**$7,063,217**	**$15,747,300**	**$74,300,000**
Allocation of General Cost	$3,734,716	$4,314,695	$1,978,188	$3,820,103	$1,899,598	($15,747,300)	$0
Allocated Cost of Service	**$17,621,397**	**$20,357,891**	**$9,333,623**	**$18,024,275**	**$8,962,815**	**$0**	**$74,300,000**
Unit of Service	175,529	24,472,427	37,964,223	50,193,591	2,106,348		
Units	parcel	ccf	lbs/yr	lbs/yr	bills/yr		
Unit Cost	$8.37	$0.832	$0.246	$0.359	$4.255		
	$/month	$/ccf	$/lb	$/lb	$/month		

Table 8-5
Water Consumption and Revenue Loss by Stage

	Budgeted Non-Drought Consumption FY 2016/17 (MGD)	Pre Drought* Consumption (MGD)	Stage 2 Consumption (MGD)	Stage 2 Reduction Target	Stage 3 Consumption (MGD)	Stage 3 Reduction Target	Stage 4 Consumption (MGD)	Stage 4 Reduction Target
Single Family	73.1	85.0	75.2	*12%*	69.5	19%	65.4	*25%*
Multiple Family	27.3	30.0	27.9	*7%*	26.7	*11%*	25.2	*16%*
Other	46.0	51.7	46.9	*9%*	44.2	*15%*	41.4	*20%*
Recycled Water	4.7	4.7	4.7	*0%*	4.7	*0%*	4.7	*0%*
TOTAL	**151.1**	**171.4**	**154.7**	***10%***	**145.1**	***15%***	**136.6**	***20%***
Volume Related Revenue				***Loss***		***Loss***		***Loss***
FY 2016 Volume Revenue	$304.3 M		$315.5 M	*$0 M*	$293.7 M	*-$10.6 M*	$275.4 M	*-$28.9 M*
FY 2017 Volume Revenue	$324.2 M		$336.2 M	*$0 M*	$312.9 M	*-$11.3 M*	$293.4 M	*-$30.8 M*

*Pre drought consumption from calendar year 2013 billed consumption based on the state of CA drought reporting requirements