



Final Report

# Water Rate Study

City of Garden Grove  
Public Works  
Water Services Division



March 2018

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FINAL

# Water Rate Study

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Prepared for  
City of Garden Grove  
Public Works Department  
Water Services Division  
13802 Newhope St., Garden Grove, CA 92843  
March 6, 2018

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## List of Abbreviations

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AF	Acre-Foot or Acre-Feet
AFY	Acre-Feet per Year
AWWA	American Water Works Association
AWWA M1 Manual	AWWA Ratemaking Manual
CIMIS	California Irrigation Management Information System
COS	Cost-of-Service
DSCR	Debt Service Coverage Ratio
ET	Evapotranspiration
ETAF	Evapotranspiration Adjustment Factor
GPM	Gallons per Minute
cf	cubic feet
hcf	hundred cubic feet
CFP	Capital Facilities Plan
CIP	Capital Improvement Program
CPI	Consumer Price Index
FG Solutions	FG Solutions, LLC
FTE	full-time equivalent
FY	fiscal year (July 1–June 30)
hcf	hundred cubic feet
kgal	thousand gallon(s)
mgd	million gallons per day
O&M	operations and maintenance
HP	Horsepower
MG	Million Gallons
MGD	Million Gallons per Day
MWD	Metropolitan Water District
MWDOC	Municipal Water District of Orange County
OCWD	Orange County Water District
RA	Replenishment Assessment
SAWPA	Santa Ana Watershed Project Authority
SWRCB	State Water Resources Control Board
T&D	Transmission and distribution

# Executive Summary

The Garden Grove Public Works Department Water Services Division (“Division”) owns and operates the water system that provides water services throughout the city. The Division operates 17 total water production facilities, 13 wells, 5 pump stations, 8 reservoirs that hold approximately 53 million gallons of water, and 433 miles of pipe. As part of its ongoing management of the water system, the Division has recognized the need to evaluate expenditures, revenues, and water rates to ensure that the Division can continue to provide safe and reliable service.

The Division is conducting a Water Rate Study that is intended to:

- Summarize the projected water revenue requirements for the five year study period for fiscal years (FY) 17/18 thru FY 21/22.
- Show a proposed schedule of water rates effective for FY 17/18 through FY 21/22 for the Division’s consideration. These proposed rates include minimum charges, commodity charges, capital improvement charges, and private fire service rates. All rates shown, unless otherwise indicated, are charged on a bi-monthly basis.
- Outline potentially changing conditions with financial implications, such as water conservation, the drought, and recommendations for ongoing monitoring of these items.
- Support the goal of Water Services Section: To provide sufficient and safe water at the lowest possible cost to the City’s residents.

The Rate Study was initiated in November 2016. The Rate Study was discussed during four Council Study Sessions held throughout 2017, and a Public Workshop was held in December 2017.

A key part of this Rate Study was developing a Capital Facilities Plan, which outlines the improvements to the water system. There are many high priority projects identified in the Division’s 2008 Water Master Plan that are not yet completed, and the Division has been deferring capital investments in recent years due to funding constraints.

A series of immediate priority capital needs was identified as part of this Rate Study, consisting primarily of reservoir improvements and repair/replacement projects. The reservoir improvements are a response to a recent condition assessment which identified mechanical, structural, and security deficiencies. These improvements are needed to keep the reservoirs in service and maintain reliable water service.

The proposed rate structure is shown in the tables below and is intended to meet the following goals:

1. Increase fixed charges (the Minimum Charge and the Capital Improvement Charge) to provide better revenue stability for the utility. Transition by FY 21/22 to collect 25% of revenues from fixed charges.
2. The higher fixed charges will cause financial impacts to rate payers, particularly low-income rate payers. To address this:
  - Retain the existing low water user discount, where residential customers using 6 hundred cubic feet (“hcf”) or less per billing period do not pay Commodity Charges.
  - Propose a new Low Income/Senior Discount of \$10 per billing period
3. Increase the Capital Improvement Charge to pay for more of the capital costs
4. Simplify the Commodity Charge structure by creating a new two-tiered Commodity Charge that replaces the current four-tier structure. The first tier is based on the cost of locally-produced groundwater, and the second tier is based on the cost of imported water.

**Table ES-1: Proposed Bi-Monthly Minimum Charges**

Line No	Meter Size	Meter Equivalent Ratio	Current	Proposed Bi-Monthly Minimum Charges				
				FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22
1	5/8 x 3/4"	1.0	\$12.74	\$18.02	\$28.15	\$29.63	\$31.95	\$33.85
2	1"	2.5	\$33.99	\$38.11	\$46.03	\$47.18	\$49.00	\$50.48
3	1 1/2"	5.0	\$65.82	\$68.92	\$74.86	\$75.72	\$77.09	\$78.20
4	2"	8.0	\$99.79	\$102.71	\$108.30	\$109.12	\$110.40	\$111.45
5	3"	16.0	\$165.62	\$174.25	\$190.83	\$193.24	\$197.04	\$200.15
6	4"	25.0	\$229.32	\$246.97	\$280.86	\$285.80	\$293.57	\$299.92
7	6"	50.0	\$524.45	\$537.61	\$562.87	\$566.55	\$572.34	\$577.08
8	8"	80.0	\$819.60	\$842.12	\$885.35	\$891.66	\$901.56	\$909.67
9	10"	120.0	\$1,114.73	\$1,174.33	\$1,288.76	\$1,305.45	\$1,331.67	\$1,353.13

**Table ES-2: Proposed Bi-Monthly Capital Improvement Charge**

Line No	Meter Size	Meter Equivalent Ratio	Current Charge	Proposed Bi-Monthly Capital Improvement Charge				
				FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22
1	5/8 x 3/4"	1.0	\$1.47	\$3.00	\$4.00	\$5.00	\$6.00	\$7.00
2	1"	2.5	\$2.07	\$7.50	\$10.00	\$12.50	\$15.00	\$17.50
3	1 1/2"	5.0	\$2.64	\$15.00	\$20.00	\$25.00	\$30.00	\$35.00
4	2"	8.0	\$4.27	\$24.00	\$32.00	\$40.00	\$48.00	\$56.00
5	3"	16.0	\$16.19	\$48.00	\$64.00	\$80.00	\$96.00	\$112.00
6	4"	25.0	\$20.60	\$75.00	\$100.00	\$125.00	\$150.00	\$175.00
7	6"	50.0	\$30.90	\$150.00	\$200.00	\$250.00	\$300.00	\$350.00
8	8"	80.0	\$42.68	\$240.00	\$320.00	\$400.00	\$480.00	\$560.00
9	10"	120.0	\$54.45	\$360.00	\$480.00	\$600.00	\$720.00	\$840.00
10	Note: Proposed Minimum Charges rounded off to the nearest \$0.01.							

**Table ES-3: Proposed Commodity Charges and Estimated Pass-Through Charge**

Line No		Two-Tier Commodity Delivery Charge, \$/ccf				
		FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22
1	Tier 1 Commodity Charge, Excluding Pass Through	\$2.94	\$2.94	\$2.92	\$2.89	\$2.86
2	Tier 1 Estimated Pass Through		\$0.07	\$0.15	\$0.20	\$0.29
3	Tier 2 Commodity Charge, Excluding Pass Through	\$3.65	\$4.06	\$4.15	\$4.28	\$4.40
4	Tier 2 Estimated Pass Through		\$0.08	\$0.17	\$0.25	\$0.28
5						
6	Note: Commodity Charges are rounded to the nearest \$0.01.					

The Division must pay others for water supply costs, which are approximately half of the costs for providing water service. 25% of the City's water is imported from the Metropolitan Water District of Southern California, and 75% of the City's water supply is locally produced groundwater. Using locally produced groundwater comes with an obligation to pay the Orange County Water District a Replenishment Assessment. The City has no control over water supply costs, and currently passes through increases in water supply costs. The City will retain this ability in the future, and the estimated pass-through costs are shown in Table ES-3 above.

During the five-year Rate Study Planning Period, the City will continue to monitor the financial condition of its water system, paying particular attention to:

- Water demands
- Water supply costs
- Capital project costs
- Inflation rates



- Interest rates

Differences in these parameters from the projections made in this Rate Study will have financial impacts. The Division will monitor these items on an ongoing basis and make necessary adjustments to its operations and/or financial plans in future years.



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## Section 1

# Background and Report Organization

## 1.1 Introduction

The Garden Grove Public Works Department Water Services Division (“Division”) provides water services to approximately 36,762<sup>1</sup> connections throughout the City of Garden Grove. The Division is governed by the 7 member Garden Grove City Council. The Division is part of the Public Works Department and is responsible for providing safe and reliable water to the City of Garden Grove. In addition, it is responsible for maintaining wells, reservoirs, and imported water connections. It also provides ongoing maintenance and repair to the water delivery system.

The Division operates 17 total water production facilities, 13 wells, 5 pump stations, 8 reservoirs that hold approximately 53 million gallons of water, and 433 miles of pipe. Within this water system, the Division has an ongoing operation and maintenance program to ensure the continued provision of water conveyance and delivery services.

As part of its ongoing management of the water system, the Division has recognized the need to evaluate expenditures, revenues, and water rates to ensure that the Division can continue to provide safe and reliable service.

This Water Rate Study is funded in part by a grant from the Santa Ana Watershed Project Authority (SAWPA). As a component of the grant, budget-based rates, also known as conservation rates, were evaluated as a potential rate structure for the Division. More detail about budget-based rates and the analysis can be found in Appendix F.

The Division is conducting a Water Rate Study that is intended to:

- Summarize the projected water revenue requirements for the five-year study period for fiscal years (FY) 17/18 thru FY 21/22<sup>1</sup>.
- Show a proposed schedule of water rates effective for FY 17/18 through FY 21/22 for the Division’s consideration. These proposed rates include minimum charges, commodity charges, capital improvement charges, and private fire service rates. All rates shown, unless otherwise indicated, are charged on a bi-monthly basis.
- Outline potentially changing conditions with financial implications, such as water conservation, the drought, and recommendations for ongoing monitoring of these items.
- Support the goal of Water Services Section: To provide sufficient and safe water at the lowest possible cost to the City’s residents.

Historical and budgeted financial and operational data were provided by the Division and used by FG Solutions to develop the projected revenue requirement for the five-year study period. The revenue requirement analysis was an iterative process and draft versions were revised based on comments and input provided by Division staff and the Finance department. Next, the revenue requirement was compared with the revenues generated by the existing rates to generate additional revenues needed from rate increases.

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<sup>1</sup>Including approximately 31,556 single-family residential connections, 1,923 residential units in multi-family residential connections, and 3,283 non-residential connections

<sup>2</sup> The Division’s fiscal year begins on July 1. FY 17/18 refers to the period between July 1, 2017 and June 30, 2018.

Key assumptions used in the Revenue Requirement analysis are summarized in Section 2. Additional assumptions are provided in the printout of the Revenue Requirement calculations that comprise Appendix A.

There are six appendices to this report. Appendix A contains the Revenue Requirement. Appendix B is the water system Cost-of-Service Analysis. Appendix C contains calculations associated with the Rate Design. Appendix D contains the proposed Capital Facilities Plan (CFP), which summarizes the capital improvements the Division has designated as immediate priorities. Appendix E contains the Fire Service rate calculations. Appendix F contains the analysis of Budget-based rates and detailed calculations of this analysis.

## 1.2 Existing Rates and Rate Structure

The current water rate structure has the following components, all charged on a bi-monthly basis; a) a minimum charge; b) a Capital Improvement Charge; and c) a Commodity Charge, per hundred cubic feet (hcf) consumed during the billing period, in a four-tier rate structure. Table 1-1 shows the bi-Monthly Minimum Charges and the Capital Improvement charges for each water meter size. All rates are current, as of February 1, 2018.

**Table 1-1. Existing Bi-Monthly Minimum Charge and Capital Improvement Charge**

Line No.	Meter Size (inches)	Minimum Charge	Capital Improvement Charge
1	5/8 x 3/4"	\$12.74	\$1.47
2	1"	\$33.99	\$2.07
3	1-1/2"	\$65.82	\$2.64
4	2"	\$99.79	\$4.27
5	3"	\$165.62	\$16.19
6	4"	\$229.32	\$20.60
7	6"	\$524.45	\$30.90
8	8"	\$819.60	\$42.68
9	10"	\$1,114.73	\$54.45

The Division currently has four rate tiers. Table 1-2 shows the existing Commodity Charges, per tier.

**Table 1-2. Existing Commodity Charges**

Line No.	Usage, units of water (hcf)	Commodity Charge, \$/hcf		
		Commodity Pass-Through	Balance	Total
1	0-36	\$0.82	\$2.25	\$3.07
2	37-250	\$0.82	\$2.33	\$3.15
3	251-500	\$0.82	\$2.42	\$3.24
4	>500	\$0.82	\$2.51	\$3.33

The Division charges Private Fire Service customers a Bi-Monthly Fire Service charge, based on the connection meter size, plus the Capital Improvement Fee. Private Fire Services are customers with Fire Service connections that have a separate meter that is connected only to the customer's fire sprinkler system. Table 1-3 shows these fees in detail.

**Table 1-3. Existing Private Fire Service Rates**

Connection Size (in)	Current Rates Fire Service	Current Capital	
		Improvement Charge	Current Rates Total
5/8 x 3/4"	\$11.00	\$1.47	\$12.47
1"	\$11.00	\$2.07	\$13.07
1 1/2"	\$11.00	\$2.64	\$13.64
2"	\$11.00	\$4.27	\$15.27
3"	\$14.00	\$16.19	\$30.19
4"	\$19.00	\$20.60	\$39.60
6"	\$29.00	\$30.90	\$59.90
8"	\$38.00	\$42.68	\$80.68
10"	\$48.00	\$54.45	\$102.45

### 1.3 Water Rate Study Process

The rate study kicked off in November 2016. In order to communicate with City Council and the public, the Division and the consultant team attended four Study Sessions, plus one public workshop. The first Council Study Session was held in January 2017, where an introduction to the water system was discussed, as was an overview of the 2017 financial status of the utility was presented.

A Study Session was held in April 2017 that focused on the Capital Facilities Plan and the preliminary revenue requirement analysis.

A Study Session was held in August 2017 that discussed Rate Structure Alternatives.

A Study Session was held in September 2017, where preliminary rate structures were presented to Council.

A Public Workshop was held in December 2017. The intent of this workshop was to have an open and transparent discussion with the public about the upcoming rate increase, and to assist customers in developing an understanding of what their water bill will be.

Figure 1-1 shows the overall approach and methodology used to complete the scope of services for this water rate study.

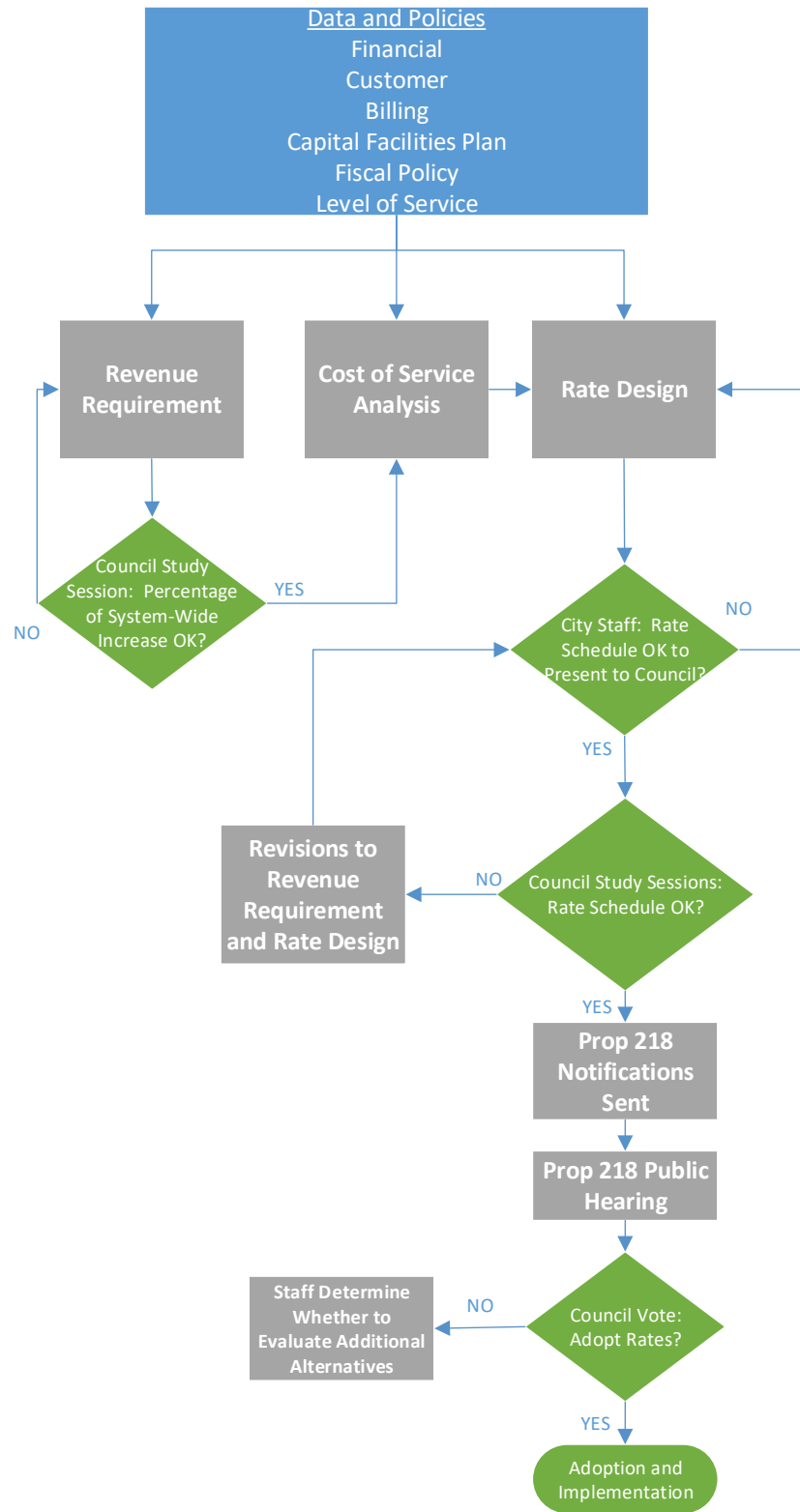


Figure 1-1 Overview of Methodology (To be revised)

## Section 2

# Revenue Requirement Analysis

## 2.1 Introduction

To provide for the continued operation of a utility on a sound financial basis, revenues must be sufficient to meet the cash requirements for operation and maintenance (O&M) expense, debt service requirements, debt service coverage requirements, reserves, and cash-funded capital expenditures not financed with debt. The sum of these cost components for a given year is referred to as a utility's Revenue Requirement.

Historical and budgeted financial and operational data were provided by the Division and used by FG Solutions to develop the projected revenue requirement for the five-year study period. The revenue requirement analysis was an iterative process and draft versions were revised based on comments and input provided by Division staff. Next, the revenue requirement was compared with the revenues generated by the existing rates to generate additional revenues needed from rate increases. The reserve requirement, described below, are met in the later years of the five-year projection period as the proposed rates were developed to generate these reserve levels over time. Revenue projections are a critical part of the revenue requirement analysis. The three aspects of revenue projections described in the sections below are non-rate revenues, rate revenues under the current rate schedule, and rate revenues from proposed rate increases.

Key assumptions used in the Revenue Requirement analysis are listed below. Additional assumptions are provided in the printout of the Revenue Requirement calculations that comprise Appendix A.

## 2.2 Revenues

### 2.2.1 Key Assumptions

Revenue projections are a critical part of the revenue requirement analysis. The three aspects of revenue projections described in the sections below are non-rate revenues, rate revenues under the current rate schedule, and rate revenues from proposed rate increases.

FY 17/18 revenues are based on FY 15/16 actual revenues, adjusted for changes in water use, between FY 15/16 and the projected FY 17/18 value.

Another key assumption is that no customer growth is projected through FY 21/22. For the purposes of these rate calculations, customer growth in the water service area is projected to be negligible.

### 2.2.2 Non-Rate Revenues

The key sources of water revenues other than rate revenues are predominantly late fees, with some non-rate revenues from interest income.

### 2.2.3 Rate Revenues under Current Rates

Rates that are currently effective are shown in Tables 1-1, 1-2, and 1-3. These rates were used to project the revenues shown in Table 2-1. Revenue estimates under current rates shown in Table 2-1 for FY 18/19 through FY 21/22 are projected to remain at FY 17/18 values. Late fee revenues are not included after 1/1/18 because it is anticipated that the late fee revenues will be used to fund the proposed low-income/senior discount, which will be discussed further in Section 3. This discount has not yet been approved by City Council.

**Table 2-1: Historical and Projected Revenues Under Existing Rates**

Line No	DESCRIPTION	Fund	Actual			Estimate			
			FY 15/16	FY 16/17	FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22
<b>1</b>	<b>OPERATING REVENUES</b>								
2	WATER-METERED	601	\$21,805,999	\$22,208,411	\$29,801,011	\$29,801,011	\$29,801,011	\$29,801,011	\$29,801,011
3	WATER-FLAT RATE	601	147,878	79,000	79,000	79,000	79,000	79,000	79,000
4	WATER PROC FEE	601	0	0	0	0	0	0	0
5	LATE FEE (4)	601	347,843	300,000	150,000	0	0	0	0
6	AFTER HRS SERV CHG	601	1,014	500	500	500	500	500	500
7	WATER COSTS (5)	601	6,320,543	6,320,543	0	0	0	0	0
8	NSF FEE	601	6,600	4,000	4,000	4,000	4,000	4,000	4,000
9	CAPITAL RECOVERY	602	433,732	353,000	353,000	353,000	353,000	353,000	353,000
10	SERVICE INSTALL FEES	602	44,774	39,000	39,000	39,000	39,000	39,000	39,000
11	FRONTAGE ASSMT FEE	602	13,409	6,000	6,000	6,000	6,000	6,000	6,000
12	ACREAGE ASSMT FEE	602	10,564	4,000	4,000	4,000	4,000	4,000	4,000
<b>13</b>	<b>WATER SALES</b>		<b>\$29,132,355</b>	<b>\$29,314,453</b>	<b>\$30,436,511</b>	<b>\$30,286,511</b>	<b>\$30,286,511</b>	<b>\$30,286,511</b>	<b>\$30,286,511</b>

Estimated revenues from Water Metered and Water Flat Rate are expected to remain the same through the end of the planning period. Water Metered includes all water revenues from water rates. Line 7, Water Costs, include the pass-through charges. Pass-through charges are the portion of the Commodity Charge that is adjusted annually by the Division, based on actual changes in water supply costs. For the purposes of this rate study, water costs revenues for FY 17/18 and subsequent years are included in Line 2, Water-Metered. For more detail, refer to Table A4 in Appendix A.

## 2.2.4 Rate Revenues from Proposed Rate Increases

Rate revenues resulting from proposed rate increases are shown later in this report.

## 2.3 Expenses

### 2.3.1 Key Assumptions

FY 17/18 O&M expenses are primarily based on the Division's FY 17/18 budget. In subsequent years, expenses are escalated for inflation. For the purposes of this rate study, General inflation was assumed to be 2.5%, Salaries and Wages Escalation is assumed to be 4%, and the rate of escalation for any Capital Improvements is assumed to be 2.5%. All percentages are assumed to remain constant through the end of the planning period, FY 21/22.

O&M expenses for FY 16/17 were obtained from the Division, as was the FY 17/18 budget. These records, along with conversations with Division staff, were used to identify significant deviations in O&M expenses compared with the Division's FY 17/18 budget.

Water production expenses are the single largest component of the Division's expenditures. A key assumption is that 75% of future water supply is locally produced groundwater, with the remaining 25% future water supply coming from imported water.

Projected annual water production, a combination of both locally produced groundwater and imported water, is assumed to be 23,000 acre-feet (AF) per year, for the entire planning period. This number takes water conservation and the drought into consideration.

Table 2-2 shows projected O&M expenses for the Study period. Additional detail is included in Appendix A, Table A-5.



**Table 2-2: Projected O&M Expenses**

Line No	PKG-NAME	Estimated				
		FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22
1	Total Salaries and Wages	\$5,776,453	\$6,007,511	\$6,247,812	\$6,497,724	\$6,757,633
2	Total Contractual Services	\$7,557,919	\$7,927,772	\$7,583,182	\$7,742,477	\$7,905,754
3	Total Materials and Supplies	\$709,906	\$727,654	\$745,845	\$764,491	\$783,603
4	Total Water Production Expenses	\$15,246,121	\$16,036,877	\$16,972,643	\$17,736,364	\$18,067,013
5	<b>Total O&amp;M Expenses</b>	<b>\$29,290,399</b>	<b>\$30,699,814</b>	<b>\$31,549,481</b>	<b>\$32,741,056</b>	<b>\$33,514,003</b>

For the 25% of water production that is imported water, the primary cost is the imported water charge from Metropolitan Water District (MWD). For the 75% of water that is locally produced, the primary expenses are energy costs for pumping water, and the recharge assessment from the Orange County Water District (OCWD). More detail can be found in Appendix A.

### 2.3.2 Capital Facilities Plan

A key aspect of any rate study is defining the anticipated level of capital improvements over the planning period. Part of the scope of work of this rate study is the compilation and prioritization of a summary of known capital projects into a single Capital Facilities Plan (CFP). A review of the Division's 2008 Water Master Plan shows that some of the projects outlined were completed, however there are many high priority projects that remain.

The City of Garden Grove's water CFP projects were prioritized based on balancing several key factors and criteria, such as planning, engineering, operations, and affordability to the City. The Consultant Team reviewed the 2008 Water Master Plan and conducted numerous discussions with Division staff regarding water system priorities. The agreed approach was to distribute proposed CFP project costs as equally as possible into three categories ranked by priority, that correspond with three five-year planning periods. The first planning period is from 2017-2022, these are the Immediate Priority Projects that are outlined in Table 2-3. The second planning period is from 2022-2027, which covers the Second Priority Projects. The third planning period is from 2027-2032. Projects were prioritized from a reliability and sustainability perspective, by the Division and the Consultant Team.

**Table 2-3: Priority Phase, Dates and Total Cost**

Priority Phase/Date	Total Cost (\$)
Immediate Priority Projects (2017-2022)	\$36,643,066
Secondary Priority Projects (2022-2027)	41,378,105
Third Priority Projects (2027-2032)	98,507,944
<b>TOTAL</b>	<b>\$176,529,115</b>

Through discussions with Division staff, the highest priority was placed on water storage. Booster Pump Replacements/Upgrades and critical Existing System Fire Flow pipeline projects were given second highest priority. The remaining lesser critical distribution system improvements were given third highest priority.

The City of Garden Grove's water system has a total of eight reservoirs at five sites. Four reservoirs, which include Magnolia, West Garden Grove, West Haven East, and West Haven West, are underground. Four reservoirs, which include Trask East, Trask West, Lampson East, and Lampson West, are partially aboveground. Designs to address reservoir deficiencies have been completed for the underground West Haven Reservoirs rehabilitation project. Phase 1 of this project is ready to move forward but lacks the required funding for construction implementation. The rehabilitation of the remaining reservoirs, including those partially aboveground, has not been designed. Phase 2 is scheduled after the completion immediately following the Phase 1 West Haven Reservoir rehabilitations.

Reservoir Rehabilitations were determined to be a top priority, as a recent condition assessment identified improvements to eight reservoirs, addressing mechanical, structural, and security deficiencies. Reservoir rehabilitation is needed to maintain reliable water service with the current storage capacity volume.

Supervisory Control and Data Acquisition (SCADA) improvements at manually operated wells were also considered a high priority. In addition to potential to mechanical and electrical improvements, SCADA system limitations will also need to be addressed.

Although the first phase of SCADA improvements has been completed, the remaining SCADA improvements at manually operated wells are considered a high priority. Currently, O&M staff are required to visit the well sites to make necessary control adjustments at each well site in order to operate portions of the water system. The SCADA improvements will allow the O&M staff to operate the whole water system automatically and collect historical pumping data for future master planning efforts.

Table 2-4 are the items that were determined to be of immediate priority, and their costs, in 2016 dollars.

**Table 2-4: Capital Facilities Plan Immediate Priority Cost Summary**

<b>Capital Improvement/Facilities Plan: Immediate Priority Cost Summary (2017-2022)</b>		
<b>Category</b>	<b>Project Name</b>	<b>Cost (2016 dollars)</b>
Recurring Replacements	Service Lines, Fire Hydrants, Meters, Valves, and Appurtenances	\$17,537,415
Wells	Well Condition Assessment & Rehabilitation	\$933,257
Reservoirs	Reservoir Rehabilitations	\$16,272,538
Boosters	Portable Back-up Generators	\$1,047,510
Studies	Master Plan Update	\$450,000
Studies	Asset Management Study	\$227,347
Studies	Cyber Security	\$175,000
<b>TOTAL</b>		<b>\$36,643,066</b>

These are the projects that the Division plans to complete within the next five years, by 2022. Recurring replacements which are items like replacing pipes, fire hydrants, water meters, valves, and other appurtenances. This line item is estimated at approximately \$17.5M. The next largest item in Table 2-4 are the reservoir rehabilitations.

Projected project costs for all projects except for the reservoir rehabilitations are based on the costs provided in the 2008 Water Master Plan. The Consultant Team escalated the 2008 Water Master Plan to 2016 costs in two different ways. It used changes in the Turner Building Cost index between 2008 and 2016, and used changes in the Consumer Price Index (CPI) Utility and Public Transportation Category Index between 2008 and 2016. Of these two methods, the Turner Building Cost index produced the higher 2016 estimated costs, and this was used for the purposes of this analysis. The 2016 escalated cost was then further escalated to future (FY 17/18 thru FY 21/22) costs based on an assumed 3% annual inflation rate to generate the cost estimates used in the Rate Study.

Costs for the reservoir rehabilitation projects were based on the proposed costs presented in the City of Garden Grove Condition Assessment of Eight Concrete Reservoirs, prepared by Kleinfelder and Simon Wong in December 2013. The Capital Facilities Plan Assessment and Prioritization can be found in Appendix D, along with a complete list of all CFP projects and their costs, in 2016 dollars.

### 2.3.3 Existing and Future Debt

The Division currently has existing revenue bond debt. Table 2-5 describes the existing revenue bond principal and interest payments per fiscal year for the planning period. More detail is shown in Appendix A, Table A-9.

**Table 2-5: Existing Revenue Bond Debt Service**

Line No	Existing Revenue Bond Debt Service	FY 16/17	FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22
1	Revenue Bond 2010A	\$910,163	\$918,638	\$914,263	\$906,913	\$909,413	\$905,038
2	Revenue Bond 2010B (Balloon 12/15/28 \$4.125M)	258,349	258,349	258,349	258,349	258,349	258,349
3	Revenue Bond 2010C (Balloon 12/15/30 \$3.195M)	204,129	204,129	204,129	204,129	204,129	204,129
4	Revenue and Refunding Bonds 2015	1,003,850	1,006,350	998,550	1,010,350	1,001,750	1,002,850
5	2010 Bonds Premium Amortization	4,853	4,853	4,853	4,853	4,853	4,853
6	2015 Bonds Premium Amortization	11,135	14,847	14,847	14,847	14,847	14,847
7	<b>Total</b>	<b>\$2,392,478</b>	<b>\$2,407,164</b>	<b>\$2,394,989</b>	<b>\$2,399,439</b>	<b>\$2,393,339</b>	<b>\$2,390,064</b>

The Division plans to issue new revenue bond debt in FY 18/19. The debt issuance is planned to ensure that the Division's Capital Facilities Plan can be implemented. At the same time, new debt reduces the amount of required revenue from rates, and from a rate increase. Below in Table 2-6, the amount of new revenue bond debt and the total principal and interest payments are shown for the planning period.

**Table 2-6: Proposed Revenue Bond Debt Service**

Line No	Proposed Debt Service	Issue Date	Issuance Amount	Interest Rate	Total Principal and Interest Payment				
					FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22
1	Revenue Bond FY 17/18	17/18	\$0	5.0%	\$0	\$0	\$0	\$0	\$0
2	Revenue Bond FY 18/19	18/19	\$15,375,000	5.0%		1,120,634	1,120,634	1,120,634	1,120,634
3	<b>Total</b>				<b>\$0</b>	<b>\$1,120,634</b>	<b>\$1,120,634</b>	<b>\$1,120,634</b>	<b>\$1,120,634</b>

The Division also has an outstanding Intercity Loan with the City's General Fund. This debt has been in existence since the mid-1990s. The outstanding balance, as of FY 16/17 is \$13,374,978. The interest rate has been 6.5%. The Intercity Loan recognizes the cost of street damages related to the provision of water services until the mid-1990s. Since the mid-1990s, the Division has paid an annual street damage charge to the General Fund. This annual street damage charge is included in the O&M expenses shown in Table 2-2. Currently, the Division has been making annual interest payments, but has not been paying down principal.

Per conversations with City Council during the Council Study Sessions, the Division has taken two actions: 1) it will begin to repay principal over a 15 year period, and 2) the interest rate will be adjusted to a more current, competitive interest rate. For the purposes of this report, the interest rate will be revised to 4.10%. Table 2-6 shows the change in interest rate and the principal and interest payments for the planning period.

**Table 2-7: Proposed Intercity Loan Debt Service**

Line No	Intercity Loan Debt Service	FY 16/17	FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22
1	Outstanding Principal Beginning year	\$13,374,978	\$13,374,978	\$12,711,965	\$12,021,769	\$11,303,274	\$10,555,322
2	Interest Rate (1)	6.50%	4.10%	4.10%	4.10%	4.10%	4.10%
3	Interest Payment	\$869,374	\$548,374	\$521,191	\$492,893	\$463,434	\$432,768
4	Principal Payment	0	663,013	690,196	718,494	747,953	778,619
5	Outstanding Principal, End of Year	\$13,374,978	\$12,711,965	\$12,021,769	\$11,303,274	\$10,555,322	\$9,776,703

## 2.4 Operating Statement

Water utility revenues and expenses are tracked in three funds: 1) Fund 601 (Water Operations); 2) Fund 602 (Water Capital); and 3) Fund 603 (Water Replacement). This section shows the revenues and expenses in each fund.

### 2.4.1 Fund 601 (Water Operations)

Table 2-8 and Table 2-9 are the Operating Statement for the Water Fund 601. Table 2-8 shows the sources of funds in Water Fund 601, which includes rate revenues and other income, including non-rate revenues. The total sources of funds is the sum of the beginning year fund balance, plus rate revenues and other income. Lines 7 thru 11 show the projected percentage rate increases in overall water rate revenues in each fiscal year. Water rate revenue increases were determined to pay the Division's expenses through FY 21/22, and meet the minimum reserve and debt service coverage ratio targets.

Proposed rate increases would be effective on January 1 of each year. Although the FY 17/18 rate increase, if adopted, would become effective in May 2018, the projections shown in Table 2-8 were made in the fall of 2017 and are based on a January 1, 2018 rate increase instead of the proposed May 1, 2018 rate increase. This Operating Statement shows the two month lag between the effective date of the rate increase, and when the Division receives revenues from the rate increase.

**Table 2-8: Sources of Funds, Fund 601**

Line No	SOURCES OF FUNDS			FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22
FUND 601 (WATER OPERATIONS)								
1	Beginning of Year Balance, Fund 601			\$8,610,247	\$8,427,620	\$7,312,240	\$7,308,926	\$8,443,710
2	Rate Revenues							
3	Water Sales Revenues under Existing Rates			\$29,880,011	\$29,880,011	\$29,880,011	\$29,880,011	\$29,880,011
4	Additional Revenues From Rate Increases							
5		Percent	Months					
6	Fiscal Year	Increase	of Revenue					
7	FY 17/18	12.40%	4	1,235,040	3,705,121	3,705,121	3,705,121	3,705,121
8	FY 18/19	11.30%	4		1,265,040	3,795,120	3,795,120	3,795,120
9	FY 19/20	3.50%	4			436,103	1,308,309	1,308,309
10	FY 20/21	3.50%	4				451,367	1,354,100
11	FY 21/22	3.50%	4					467,164
12	Total Additional Revenues			\$1,235,040	\$4,970,161	\$7,936,344	\$9,259,917	\$10,629,814
13	Total Rate Revenues			\$31,115,051	\$34,850,172	\$37,816,355	\$39,139,928	\$40,509,825
14	Other Income							
15	Other Water Sales Revenue			\$154,500	\$4,500	\$4,500	\$4,500	\$4,500
16	Other Revenues			25,000	25,000	25,000	25,000	25,000
17	Non-Operating Revenues			220,385	220,385	220,385	220,385	220,385
18	Total Other Income			\$399,885	\$249,885	\$249,885	\$249,885	\$249,885
19	<b>Total Revenues</b>			<b>\$31,514,936</b>	<b>\$35,100,057</b>	<b>\$38,066,240</b>	<b>\$39,389,813</b>	<b>\$40,759,710</b>
20	Total Sources of Funds			\$40,125,183	\$43,527,677	\$45,378,480	\$46,698,739	\$49,203,420

Table 2-9 shows Water Fund 601 Uses of Funds. This table shows the payment of O&M Expenditures from Fund 601, along with Debt Service and transfers to Fund 603, which will be discussed later in the report.

**Table 2-9: Uses of Funds, Fund 601**

Line No	USES OF FUNDS			FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22
FUND 601 (WATER OPERATIONS)								
1	O&M Expenditures							
2	Salaries & Wages			\$5,776,453	\$6,007,511	\$6,247,812	\$6,497,724	\$6,757,633
3	Contractual Services			7,557,919	7,927,772	7,583,182	7,742,477	7,905,754
4	Materials & Supplies			709,906	727,654	745,845	764,491	783,603
5	Water Production Expenses			15,246,121	16,036,877	16,972,643	17,736,364	18,067,013
6	Subtotal O&M Expenditures			\$29,290,399	\$30,699,814	\$31,549,481	\$32,741,056	\$33,514,003
7								
8	Subtotal Debt Service			\$2,407,164	\$3,515,623	\$3,520,073	\$3,513,973	\$3,510,698
9								
10	Transfer to Fund 602			\$0	\$0	\$0	\$0	\$0
11	Transfer to Fund 603			\$0	\$2,000,000	\$3,000,000	\$2,000,000	\$2,000,000
12	<b>Total Uses of Funds</b>			<b>\$31,697,563</b>	<b>\$36,215,438</b>	<b>\$38,069,554</b>	<b>\$38,255,030</b>	<b>\$39,024,701</b>
13								
14	End of Year Balance, Fund 601			\$8,427,620	\$7,312,240	\$7,308,926	\$8,443,710	\$10,178,719

## 2.4.2 Fund 602 (Water Capital)

Revenues in Fund 602, (Water Capital), are funded from the Capital Improvement Charge, and by revenue bond proceeds (see Table 2-8). Table 2-10 shows revenues for the Division's Water Capital fund. CFP expenses are both funded and paid for within Fund 602.

**Table 2-10: Sources of Funds, Fund 602**

Line No	SOURCES OF FUNDS			FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22
No	FUND 602 (WATER CAPITAL)							
1	Beginning of Year Balance, Fund 602			\$8,744,205	\$5,395,365	\$15,465,650	\$11,195,978	\$6,941,942
2	Capital Improvement Charge							
3	Revenues Under Existing Rates			\$353,000	\$353,000	\$353,000	\$353,000	\$353,000
4	Additional Rate Revenues							
5			Months					
6	Fiscal Year	% Increase	of Revenue					
7	FY 17/18	12.40%	4	\$14,591	\$43,772	\$43,772	\$43,772	\$43,772
8	FY 18/19	11.30%	4		14,945	44,835	44,835	44,835
9	FY 19/20	3.50%	4			5,152	15,456	15,456
10	FY 20/21	3.50%	4				5,332	15,997
11	FY 21/22	3.50%	4					5,519
12	Total Additional Revenues Required			\$14,591	\$58,717	\$93,759	\$109,395	\$125,579
13								
14	Other Revenues			\$104,699	\$104,699	\$104,699	\$104,699	\$104,699
15	CIEDB Debt Proceeds			0	0	0	0	0
16	Revenue Bond Debt Proceeds			0	15,375,000	0	0	0
17	Transfer From Fund 601			0	0	0	0	0
18	Total Sources of Funds, 602			\$9,216,495	\$21,286,781	\$16,017,108	\$11,763,072	\$7,525,220

Table 2-10, lines 7-11, Revenues from Rate Increases are shown as percentage increases over current Capital Improvement Charge revenues and do not reflect the proposed rate structure shown in Section 3.

Table 2-11 shows the expenditures from Fund 602. The expenditures are capital improvements, and a transfer to the Division's Fund 603.

**Table 2-11: Uses of Funds, Fund 602**

Line No	USES OF FUNDS			FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22
No	FUND 602 (WATER CAPITAL)							
1	Capital Improvements			\$3,821,130	\$3,821,130	\$3,821,130	\$3,821,130	\$3,821,130
2	Transfer to Fund 603			0	2,000,000	1,000,000	1,000,000	1,000,000
3	Capitalized Labor			0	0	0	0	0
4	Total Use of Funds			\$3,821,130	\$5,821,130	\$4,821,130	\$4,821,130	\$4,821,130
5	Ending Year Fund Balance, Fund 602			\$5,395,365	\$15,465,650	\$11,195,978	\$6,941,942	\$2,704,089

Table 2-11, Line 1, Capital Improvements, is shown as a five-year capital cost estimate of \$19,105,650, spread evenly over the five-year period.

### 2.4.3 Fund 603 (Water Replacement)

Table 2-12, Sources of Funds, Fund 603, (Water Replacement), pays for replacements, such as pipes, meters, valves, and hydrants. Fund 603 is funded by transfers from Fund 601, (Water Operations), and Fund 602, (Water Capital).

**Table 2-12: Sources of Funds, Fund 603**

Line No	SOURCES OF FUNDS			FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22
No	FUND 603 (WATER REPLACEMENT)							
1	Beginning of Year Balance, Fund 603			\$3,588,879	\$113,295	\$637,712	\$1,162,129	\$686,545
2	Other Revenues (Interest)			\$31,900	\$31,900	\$31,900	\$31,900	\$31,900
3	Transfer From Fund 601			0	2,000,000	3,000,000	2,000,000	2,000,000
4	Transfer From Fund 602			0	2,000,000	1,000,000	1,000,000	1,000,000
5	Total Sources of Funds, 603			\$3,620,778	\$4,145,195	\$4,669,612	\$4,194,028	\$3,718,445

Table 2-13, Uses of Funds, Fund 603 (Water Replacement), shows that Replacement Expenditures are projected to be \$3,507,483 for each year in the five-year planning period.

**Table 2-13: Uses of Funds, Fund 603**

Line No	USES OF FUNDS FUND 603 (WATER REPLACEMENT)	FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22
1	Replacement Expenditures	\$3,507,483	\$3,507,483	\$3,507,483	\$3,507,483	\$3,507,483
2	Capitalized Labor	0	0	0	0	0
3	Total Use of Funds	\$3,507,483	\$3,507,483	\$3,507,483	\$3,507,483	\$3,507,483
4						
5	Ending Year Fund Balance, Fund 603	\$113,295	\$637,712	\$1,162,129	\$686,545	\$210,962

#### 2.4.4 Financial Performance Indicators

The Financial Performance Indicators used to evaluate water utility revenues are: 1) End of Year Reserve Balance; 2) Debt Service Coverage Ratio. Table 2-14 shows these Financial Performance Indicators for each year in the five year planning period.

The Division's reserve policy is that reserves must exceed the sum of:

1. Two months of O&M expenses
2. \$500,000 for contingencies
3. 5% of the net plant value

Table 2-14 shows that this policy is met in each of the five years in the planning period. Table 2-14 also shows the Debt Service Coverage Ratio (DSCR) calculation. A DSCR of at least 1.75 is maintained throughout the five-year planning period. This DSCR exceeds the requirement of the City's Revenue Bond Ordinances, and was used to improve the financial position of the utility. The DSCR criteria of 1.75 was used because it will give the City an advantage when it goes to the bond market in FY 18/19 to borrow money.

**Table 2-14: Financial Performance Indicators**

Line No	FINANCIAL PERFORMANCE INDICATORS	FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22
1	End of Year (EOY) Reserve Balance Criteria					
2	Criteria: Total combined fund 601,602,603 Reserves					
3	Combined EOY 601,602,603 Balance	\$13,936,280	\$23,415,602	\$19,667,032	\$16,072,197	\$13,093,770
4	Target Reserve Balance					
5	2 months O&M Expenses	4,881,733	5,116,636	5,258,247	5,456,843	5,585,667
6	Plus \$500,000 for Contingencies	500,000	500,000	500,000	500,000	500,000
7	Plus 5% of Net Plant (3)	6,940,000	6,940,000	6,940,000	6,940,000	6,940,000
8	Subtotal	\$12,321,733	\$12,556,636	\$12,698,247	\$12,896,843	\$13,025,667
9	Exceeds Target?	Yes	Yes	Yes	Yes	Yes
10	Available Reserves for Capital Projects	\$1,614,547	\$10,858,966	\$6,968,786	\$3,175,354	\$68,103
11	Debt Service Coverage Ratio					
12	Gross Revenue	\$32,019,126	\$35,648,373	\$38,649,598	\$39,988,807	\$41,374,888
13	Less O&M Expenses	(\$27,797,246)	(\$29,488,427)	(\$30,338,094)	(\$31,529,669)	(\$32,302,616)
14	Revenue Available for Debt Service	\$4,221,880	\$6,159,946	\$8,311,504	\$8,459,138	\$9,072,272
15						
16	Revenue Bond Debt Service	\$2,407,164	\$3,515,623	\$3,520,073	\$3,513,973	\$3,510,698
17	Debt Service Coverage Ratio	1.75	1.75	2.36	2.41	2.58

Line 13 shows O&M expenses subtracted from gross revenues. For purposes of debt service coverage calculation, our calculations do not include intercity loan interest and intercity loan principal. The O&M expenses in the debt service calculation will differ from the O&M expense in Table 2-2 above.

## Section 3

# Rate Structure Development

This section outlines the proposed water rate structure. The rate structure is developed using a Cost of Service Analysis, completed consistently with industry standards. This Cost of Service analysis used methodology from the American Water Works Association’s M1 Manual, Principles of Water Rates, Fees, and Charges (7<sup>th</sup> Edition).

### 3.1 Cost-of-Service Analysis

The first step in a Cost-of-Service analysis is functionalization, where water system expenses are grouped according to the functions of a water system. Water functions include pumping, storage, transmission and distribution (T&D), customer, meter, and administration. Table 3-1 shows the functionalization of the Division’s O&M expenses for FY 17/18. Additional detail is available in Appendix B.

Some of the key aspects of the functionalization calculations are:

1. Labor costs were functionalized based on a review, with division staff, of the job responsibilities of Water Division employees.
2. All source of supply expenses are included in Table 3-1 in the Rate Tier Calculations.
3. The City Street Damage Fee and the Intercity Loan was functionalized 50% to T&D, and 50% on a per customer basis.

**Table 3-1: Water System Cost-of-Service Analysis, FY 17/18 - Functionalization of O & M Expenditures**

Line No.	FY 17/18 Total	Pumping	Storage	T&D	Customer	Meter	Admin	Rate Tier Calculations	Fire Protection	
1	Total Salaries and Wages Expenditures	\$5,776,453	\$650,263	\$472,348	\$1,954,359	\$781,400	\$108,779	\$1,030,016	\$758,915	\$20,372
2	Total Contractual Services	7,557,919	240,220	106,744	1,819,453	1,990,605	40,185	3,072,827	280,358	7,526
3	Total Materials & Supplies	709,906	111,723	26,755	310,188	108,659	18,690	0	130,391	3,500
4	Total Water Production Expenses	15,246,121	439,147	0	0	0	0	0	14,806,974	0
5	Total	\$42,624,771	\$2,331,836	\$1,184,939	\$7,857,812	\$5,652,669	\$316,618	\$8,205,686	\$17,015,911	\$59,296

Table 3-2 shows the Functionalization of the Phase 1 Capital Facilities Plan. Forty six percent of the Phase 1 CFP cost are related to water storage, 32% of these costs are service line and meter replacements, which are functionalized to meters.

**Table 3-2: Water System Cost-of-Service Analysis - Functionalization of Phase 1 CFP**

Line	Project	Total Phase 1							Rate Tier Calculation	Fire Protection
		Capital Spending	Pumping	Storage	T&D	Customer	Meter	Admin		
1	Replace Misc. Distribution System Appurtenances	\$286,232			100%					
2	Service Line Replacements	7,068,075					100%			
3	Fire Hydrant Replacements	1,866,270								100%
4	Meter Replacements	5,141,311					100%			
5	Gate Valve Replacements	3,175,527			100%					
6	Site Modifications to Place Manually Operated Wells on SCADA	628,506	25%	25%	25%					25%
7	Portable Back-up Power Units	1,047,510	100%							
8	Reservoir Rehabilitations_ Near Term West Haven Reservoir Projects	4,599,808		100%						
9	Reservoir Rehabilitations_Trask Reservoirs Medium and High Priorities	1,055,106		100%						
10	Reservoir Rehabilitations_Trask Reservoirs Low Priorities	1,943,366		100%						
11	Trast Reservoir Site Mechanical and Security - High and Medium Priority	183,763		100%						
12	Reservoir Rehabilitations - Magnolia Reservoir Medium and High Priorities	549,598		100%						
13	Reservoir Rehabilitations Magnolia Reservoir Low Priorities	1,691,723		100%						
14	Magnolia Reservoir Site Mechanical and Security - High and Medium Priority	113,874		100%						
15	Magnolia Reservoir Site Mechanical and Security - Low Priority	3,383		100%						
16	Reservoir Rehabilitations West Garden Grove Reservoir Medium and High Priorities	988,389		100%						
17	Reservoir Rehabilitations West Garden Grove Reservoir Low Priorities	3,171,980		100%						
18	West Garden Grove Reservoir Site Mechanical and Security - High & Medium Priority	64,708		100%						
19	Reservoir Rehabilitations Lampson Reservoir Medium and High Priorities	1,513,246		100%						
20	Reservoir Rehabilitations_ Lampson Reservoir Low Priorities	338,345		100%						
21	Lampson Reservoir Site Mechanical and Security - High & Medium Priority	55,247		100%						
22	Exhaust Stack Corrections	22,129	100%							
23	West GG Sumps	511,840	100%							
24	Underground Vault Rehabilitation	785,633		100%						
25	Asset Management Study	327,347	25%	25%	25%					25%
26	Masterplan Update	550,000	25%	25%	25%					25%
27	Cyber Security	175,000	25%	25%	25%					25%
28	Total	\$37,857,916	\$2,001,692	\$17,478,382	\$3,881,972	\$0	\$12,209,386	\$0	\$0	\$2,286,483
29	As Percent		5%	46%	10%	0%	32%	0%	0%	6%

Table 3-3 shows the Functionalization of the Rate Revenue Requirement, for FY 17/18. Included in the rate revenue requirement are O&M expenditures, debt service payments, capital improvements and replacement expenditures. In FY 17/18, these expenditures are partially offset by non-rate revenues and use of reserves.

**Table 3-3: Functionalization of Rate Revenue Requirement**

Line No.		FY 17/18 Total	Pumping	Storage	T&D	Customer	Meter	Admin	Rate Tier Calculations	Fire Protection
1	O&M Expenses									
2	Water Production Expenses	\$15,246,121	\$439,147	\$0	\$0	\$0	\$0	\$0	\$14,806,974	\$0
3	Other	14,044,278	1,002,206	605,847	4,084,000	2,880,664	167,654	4,102,843	1,169,664	31,398
4	Debt Service	2,407,164	209,837	1,003,283	767,958	0	211,319	0	175,192	39,574
5	Capital Improvements	3,821,130	202,038	1,764,154	391,821	0	1,232,336	0	0	230,783
6	Replacement Expenditures	3,507,483	185,454	1,619,348	359,659	0	1,131,183	0	0	211,839
7	Less Other Revenues									
8	601 Fund	(399,885)	(7,138)	(62,327)	(13,843)	(154,000)	(43,538)	(110,885)	0	(8,154)
9	602 Fund	(104,699)	0	0	0	(39,000)	0	(65,699)	0	0
10	603 Fund	(31,900)	0	0	0	0	0	(31,900)	0	0
11	Change in Fund Balance	(7,007,051)	(370,489)	(3,235,041)	(718,507)	0	(2,259,812)	0	0	(423,201)
12										
13	Rate Revenue Requirement	\$31,482,642	\$1,661,055	\$1,695,264	\$4,871,088	\$2,687,664	\$439,142	\$3,894,359	\$16,151,830	\$82,239

The next step in a Cost of Service Analysis is allocation, where functionalized expenses are allocated to water system characteristics of average day demand, peak day demand, peak hour demand, and customer and water meter size.



In addition, source of supply costs are carried through the allocation step to be used in the rate tier calculations described later in this section. Table 3-4 shows the Allocation of FY 17/18 Rate Revenue Requirement.

**Table 3-4: Allocation of FY 17/18 Rate Revenue Requirement**

Line No.	FY 17/18 Projection	Extra Capacity			Customer		Rate Tier Calculations	Private Fire Protection
		Base	Max Day (2)	Max Hour(2)	Customer	Meter		
1	Water System Expenses							
2	Pumping	\$1,661,055	\$1,145,555	\$515,500	\$0	\$0	\$0	\$0
3	Storage	\$1,695,264	\$1,088,287	\$473,405	\$0	\$0	\$0	\$133,573
4	T&D	\$4,871,088	\$1,535,713	\$691,071	\$890,713	\$0	\$0	\$1,753,592
5	Customer	\$2,687,664	\$0	\$0	\$0	\$2,687,664	\$0	\$0
6	Meter	\$439,142	\$0	\$0	\$0	\$0	\$439,142	\$0
7	Administration (3)	\$3,894,359	\$1,283,615	\$572,068	\$303,307	\$915,208	\$149,537	\$0
8	Rate Tier Calculations	\$16,151,830	\$0	\$0	\$0	\$0	\$0	\$16,151,830
9	Fire Protection	\$82,239	\$0	\$0	\$0	\$0	\$0	\$82,239
10	Reallocate Public FP (4)	\$0	\$0	\$0	\$0	\$0	\$2,230,825	(\$2,230,825)
11	Total	\$31,482,642	\$5,053,170	\$2,252,044	\$1,194,020	\$3,602,872	\$2,819,504	\$16,151,830
12	Percent of Total	100%	16%	7%	4%	11%	9%	51%

Some of the key aspects of the allocation calculations are:

1. Pumping and storage costs are allocated to base (also referred to as average day) demand and maximum day demand. This is because pumping and reservoirs are sized to meet peak day demands, and they also are in use every day on a 24/7 basis.
2. A portion of storage costs are attributed to providing fire protection, based on an assessment of the amount of reservoir storage that is needed for fire protection, as described in the City's 2008 Water Master Plan.
3. Transmission and distribution system expenses are allocated to base, maximum day, and maximum hour demands because sizing of pipes also considers maximum hour demands. A portion of transmission and distribution expenses is also allocated to fire protection, recognizing that pipes are sized to provide fire flows.
4. Water supply costs are carried through to the rate tier calculations. In the Commodity Charge calculations described below, the charges for each rate tier are based on water supply costs.
5. Administrative expenses are allocated based on a weighted average of all other expenses.
6. Fire protection expenses, and the reallocation of public fire protection expenses, are discussed in further detail in Section 5 of this report.

Table 3-5 defines terms and clarifies the relationship between Water Service Characteristics and how costs are recovered in the proposed rate structure. The terms base, max-day, and max-hour demand are used in the industry standard publication, AWWA M1 Manual, Principals of Water Rates, Fees, and Charges, 7<sup>th</sup> Edition. Fixed charges refer to the Bi-Monthly Minimum Charge and the Capital Improvement Charge.

**Table 3-5: Relationship Between Water Service Characteristics and Rate Structure**

Water Service Characteristics	How Costs are Recovered in Rate Structure
Base Demand	Mostly through Commodity Charges, partially through Fixed Charges
Max Day and Max Hour	Commodity Charges
Customer and Meter	Fixed Charges
Rate Tier Calculations	Commodity Charges
Private Fire Protection	Fire Service Costs

## 3.2 Proposed Rate Schedule

The proposed rate structure was developed collaboratively by the Consultant and the Division, with input from City Council that was obtained during the four study sessions that occurred in 2017. The proposed rate structure is based on the following goals:

1. Balance revenue stability of higher fixed charges with financial impacts to rate payers that occur when fixed charges are raised.
2. Transition by FY 21/22 to collect 25% of revenues from fixed charges
3. Increasing the Capital Improvement Charge to pay for more of the capital costs
4. Simplify the Commodity Charge structure.
5. Restructuring Private Fire Service rates (see Section 5)
6. Two-tiered increasing block structure. The first tier includes locally produced groundwater, the second tier is imported water, at a 75%/25% ratio
7. Retaining the Low-Water User discount
8. Adding a proposed Low Income/Senior discount

The Division's proposed rate structure retains the Bi-Monthly Minimum Charge, but increases it to provide a more financially stable utility. Table 3-6 shows the proposed charges for each meter size.

**Table 3-6: Proposed Bi-Monthly Minimum Charges**

Line No	Meter Size	Meter	Proposed Bi-Monthly Minimum Charges					
		Equivalent Ratio	Current	FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22
1	5/8 x 3/4"	1.0	\$12.74	\$18.02	\$28.15	\$29.63	\$31.95	\$33.85
2	1"	2.5	\$33.99	\$38.11	\$46.03	\$47.18	\$49.00	\$50.48
3	1 1/2"	5.0	\$65.82	\$68.92	\$74.86	\$75.72	\$77.09	\$78.20
4	2"	8.0	\$99.79	\$102.71	\$108.30	\$109.12	\$110.40	\$111.45
5	3"	16.0	\$165.62	\$174.25	\$190.83	\$193.24	\$197.04	\$200.15
6	4"	25.0	\$229.32	\$246.97	\$280.86	\$285.80	\$293.57	\$299.92
7	6"	50.0	\$524.45	\$537.61	\$562.87	\$566.55	\$572.34	\$577.08
8	8"	80.0	\$819.60	\$842.12	\$885.35	\$891.66	\$901.56	\$909.67
9	10"	120.0	\$1,114.74	\$1,174.34	\$1,288.76	\$1,305.45	\$1,331.67	\$1,353.13
10	Note: Proposed Minimum Charges rounded off to the nearest \$0.01.							

Currently, the Division charges a Bi-Monthly Capital Improvement Charge, based on meter size. Table 3-7 shows the current and proposed charges, for each meter connection size. The Capital Improvement Charge is increased to provide additional funds to complete the CFP. However, even at the proposed FY 21/22 charges, the Capital Improvement Charge does not fully fund the CFP; a portion of the other water rate revenues will also provide the needed revenue. This is evidenced by the continued transfers from Fund 601 (Water Operations) to Fund 603 (Water Replacement), and by the use of revenue bond proceeds in Fund 602 (Water Capital) (see Tables 2-9 and 2-10).

**Table 3-7: Proposed Bi-Monthly Capital Improvement Charge**

Line No	Meter Size	Meter Equivalent Ratio	Current Charge	Proposed Bi-Monthly Capital Improvement Charge				
				FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22
1	5/8 x 3/4"	1.0	\$1.47	\$3.00	\$4.00	\$5.00	\$6.00	\$7.00
2	1"	2.5	\$2.07	\$7.50	\$10.00	\$12.50	\$15.00	\$17.50
3	1 1/2"	5.0	\$2.64	\$15.00	\$20.00	\$25.00	\$30.00	\$35.00
4	2"	8.0	\$4.27	\$24.00	\$32.00	\$40.00	\$48.00	\$56.00
5	3"	16.0	\$16.19	\$48.00	\$64.00	\$80.00	\$96.00	\$112.00
6	4"	25.0	\$20.60	\$75.00	\$100.00	\$125.00	\$150.00	\$175.00
7	6"	50.0	\$30.90	\$150.00	\$200.00	\$250.00	\$300.00	\$350.00
8	8"	80.0	\$42.68	\$240.00	\$320.00	\$400.00	\$480.00	\$560.00
9	10"	120.0	\$54.45	\$360.00	\$480.00	\$600.00	\$720.00	\$840.00

Table 3-8 shows the proposed Commodity Charges. The current rate structure is a four-tier structure, with a single pass-through charge applied to all water consumption. The proposed rate structure has two tiers, and each tier has a pass-through charge.

**Table 3-8: Proposed Commodity Charges and Estimated Pass-Through Charge**

	Two-Tier Commodity Delivery Charge, \$/ccf				
	FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22
Tier 1 Commodity Charge, Excluding Pass Through	\$2.94	\$2.94	\$2.92	\$2.89	\$2.86
Tier 1 Estimated Pass Through		\$0.07	\$0.15	\$0.20	\$0.29
Tier 2 Commodity Charge, Excluding Pass Through	\$3.65	\$4.06	\$4.15	\$4.28	\$4.40
Tier 2 Estimated Pass Through		\$0.08	\$0.17	\$0.25	\$0.28

Tier 1 is based on the cost of locally-produced groundwater. Tier 2 is based on the cost of imported water. Additional detail on rate tier calculations is included in Appendix C. Table 3-9 defines the amount of water in the first tier, for each meter connection size. The Division uses a 75% locally produced ground water and 25% imported water ratio. The amount of water included in Tier 1 was determined with the intent of having 75% of metered water consumption fall into Tier 1. The remaining 25% of water consumption would fall in Tier 2.

**Table 3-9: Define Amount of Water in First Tier**

Line No	Meter Size	Meter Equivalent Ratio	hcf Included in First Tier, per Billing Period
1	5/8 x 3/4"	1.0	33
2	1"	2.5	83
3	1 1/2"	5.0	165
4	2"	8.0	264
5	3"	16.0	528
6	4"	25.0	825
7	6"	50.0	1,650
8	8"	80.0	2,640
9	10"	120.0	3,960

The consumption data was then used to develop the 75%/25% two tier rate structure. The proposed rate structure is intended to be consistent with the requirements of Proposition 218.

### 3.3 Low Income/Senior Discount and Low Water User Discount

The Division currently has a Low-Water User Discount in place. Currently, customers that use 3 hcf or less per month, or 6 hcf or less per billing period, only pay the minimum charge. They do not pay the Commodity Charge or the

Capital Improvement Fee. The Low-Water User Discount program will be retained, and customers using 6 hcf or less per billing period will not pay Commodity Charges. However, the program is being modified to require the Low-Water Use customer to pay the Capital Improvement Charge.

The Division has proposed a Low-Income/Senior Discount, intended to partially mitigate the financial impacts of the higher fixed charges. This proposed discount program would have the following eligibility criteria:

1. Resident must live at the billing address
2. The water bill must be in the resident's name
3. The resident must be 65 years of age or older
4. The resident must be enrolled in Southern California Edison's CARE program

Initially, if adopted by City Council, the \$10 per billing period discount would be offered. The Low-Income/Senior Discount program would be funded using non-rate revenues, such as late fees.

## Section 4

# Example Monthly Water Bill Comparison

### 4.1 Introduction

In this Section, Example Monthly Water Bills are shown for the typical single-family household consuming 15 hcf per month, or 30 hcf per billing period. An example bill for a high water user with a 5/8" x 3/4" meter connection.

Table 1-1 in Section 1 shows existing Bi-Monthly Minimum Charges and Capital Recovery Charge. All rates are based on meter connection size. A Bi-Monthly water bill includes a minimum charge, a Capital Recovery charge, plus a Commodity Pass-Through Charge, per number of hcf used per billing period. All rates are current, as of July 1, 2017.

All example bills are shown using the proposed rate schedules in Section 3. Table 3-6, Proposed Bi-Monthly Minimum Charges, Table 3-7 Proposed Bi-Monthly Capital Improvement Charge, and Table 3-8, Proposed Two-Tier Commodity Delivery Charges, \$/hcf. Table 3-9 Define Amount of Water in First Tier is also used to show the number of hcf to be included in the first tier, per billing period.

### 4.2 Example Bill for a typical 5/8" x 3/4" Meter Connection

Table 4-1 shows proposed Bi-Monthly rates that include the Minimum Charge, Capital Recovery Charge, and Commodity Charges, for a typical 5/8" x 3/4" meter connection.

**Table 4-1. Proposed Rate Structure for a Typical 5/8" x 3/4" Meter**

Line No		Current	5/1/2018	1/1/2019	1/1/2020	1/1/2021	1/1/2022
1	Proposed Monthly Rates						
2	Bi-Monthly Min Charge	\$12.74	\$18.02	\$28.15	\$29.63	\$31.95	\$33.85
3	Bi-Monthly Capital Recovery Charge	\$1.47	\$3.00	\$4.00	\$5.00	\$6.00	\$7.00
4	Commodity Charge, \$/hcf						
5	1st Tier	\$3.07	\$2.94	\$2.94	\$2.92	\$2.89	\$2.86
6	Estimated 1st Tier Pass-Through		\$0.00	\$0.07	\$0.15	\$0.20	\$0.29
7	2nd Tier	\$3.15 - \$3.33	\$3.65	\$4.06	\$4.15	\$4.28	\$4.40
8	Estimated 2nd Tier Pass-Through		\$0.00	\$0.08	\$0.17	\$0.25	\$0.28

Table 4-2 shows an example water bill for a single-family customer with a 5/8" x 3/4" meter, using 15 hcf per month, or 30 hcf per bi-monthly billing period. For a customer that uses approximately 15 hcf per month, all of the commodity charges will be in the first tier.

**Table 4-2. Example Water Bill for a 5/8" x 3/4" Meter, 30 hcf Typical Customer**

	Single Family, 30 hcf Bi-Monthly Water Use						5-Year Cumulative
Current	5/1/2018	1/1/2019	1/1/2020	1/1/2021	1/1/2022		
\$106.31	\$109.22	\$120.35	\$122.23	\$124.65	\$126.65	\$20.34	
% Change	2.7%	10.2%	1.6%	2.0%	1.6%	19.1%	

(does not include estimated pass-thru charges)

Table 4-3 shows an example water bill for a single-family customer with a 5/8" x 3/4" meter, using 30 hcf per month, or 60 hcf per bi-monthly billing period. This customer would be considered a high water user. For this customer, some of the commodity charges will be in Tier 1, and some in Tier 2. Refer to Table 3-8 and 3-9.

**Table 4-3. Example Water Bill for a 5/8" x 3/4" Meter, High Water Use Customer**

Current	Single Family, 60 hcf Bi-Monthly Water Use					5-Year
	5/1/2018	1/1/2019	1/1/2020	1/1/2021	1/1/2022	Cumulative
\$200.33	\$216.47	\$238.07	\$241.94	\$247.64	\$251.80	\$51.47
% Change	8.1%	10.0%	1.6%	2.4%	1.7%	25.7%

(does not include estimated pass-thru charges)

Table 4-4 shows an example bill for a Multi-Family customer with a 3" meter. This example is for a 50 unit building, where each unit consumes 12 hcf per unit. On a bi-monthly bill, this comes to 600 hcf per month, or 1,200 hcf per billing period.

**Table 4-4. Example Water Bill for a 3" Meter, Multi-Family Water Customer**

Current	Multi-Family 50-Units, 12 hcf/month per unit					5-Year
	5/1/2018	1/1/2019	1/1/2020	1/1/2021	1/1/2022	Cumulative
\$4,107.53	\$4,227.37	\$4,535.47	\$4,603.80	\$4,695.12	\$4,779.03	\$671.50
% Change	2.9%	7.3%	1.5%	2.0%	1.8%	16.3%

(does not include estimated pass-thru charges)

Table 4-5 shows an example bill for typical Commercial customer with a 2" meter, using 500 hcf per bi-monthly billing period. For this customer, 500 hcf per billing period is divided into two tiers. Tier 1 water use is 264 hcf and Tier 2 water use is 236 hcf.

**Table 4-5. Example Water Bill for a 2" Meter, Commercial Water Customer**

Current	Example Commercial, 500 hcf Bi-Monthly Water Use					5-Year
	5/1/2018	1/1/2019	1/1/2020	1/1/2021	1/1/2022	Cumulative
\$1,698.68	\$1,764.27	\$1,874.62	\$1,899.40	\$1,931.44	\$1,960.89	\$262.21
% Change	3.9%	6.3%	1.3%	1.7%	1.5%	15.4%

(does not include estimated pass-thru charges)

### 4.3 Comparison with Other Utilities

Figure 2 shows a comparison of monthly water bills for Garden Grove and six other local utilities. This graph shows the water bill for a single-family residence with a 5/8" x 3/4" water meter, at monthly consumption ranging from 0 to 30 hcf/month. This graph shows that Garden Grove's water rates are in the middle of the pack, compared with these six other utilities.

Proposed water bills are not shown in Figure 2. This is because it can be misleading to compare future rates with other utilities current rates. Additionally, some utilities are in the process of revising rates. For example, the City of Orange adopted a rate increase in December 2017, and the City of Santa Ana is expected to begin a Water Rate Study in 2018.

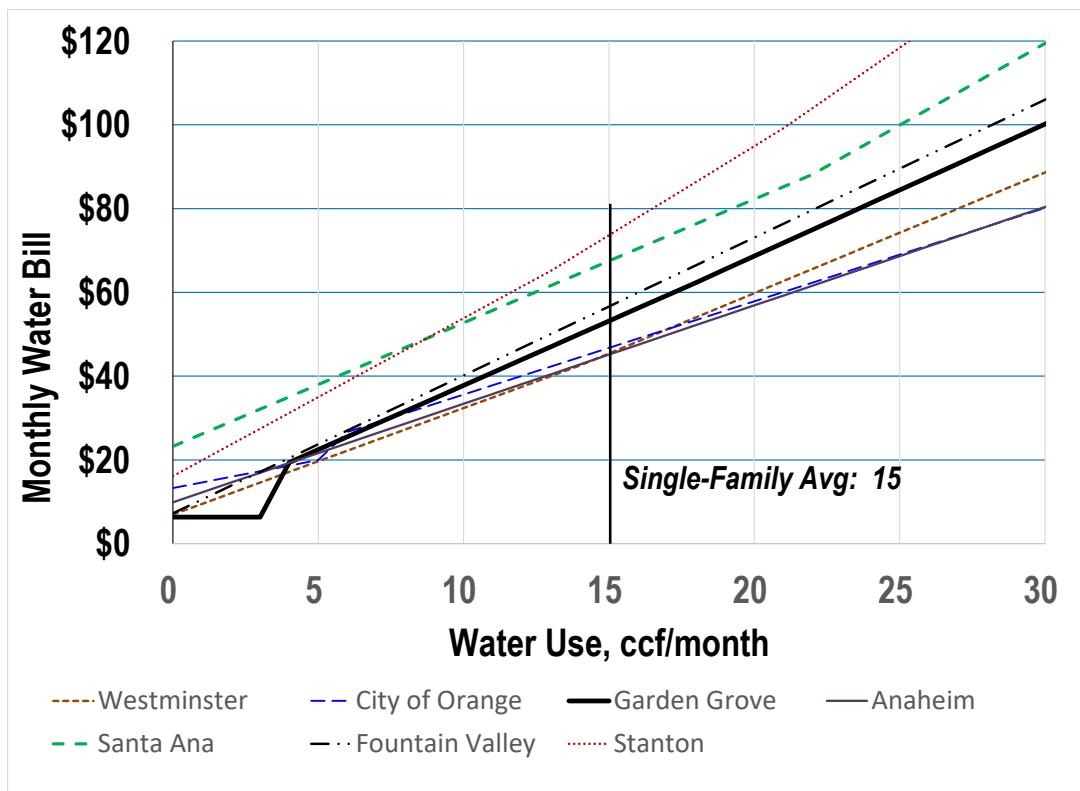


Figure 2: Water Bill Comparison of Local Utilities





## Section 5

# Fire Service Rates

## 5.1 Introduction

Fire Service rates are charged to private fire service connections. Updating Fire Service rates was done to equitably distribute the costs of providing fire protection. The methodology for revising Fire Service rates is discussed in the AWWA M1 Manual.

## 5.2 Existing Fire Service Rates

Table 5-1 shows the existing Fire Service rates for each meter size. The majority of Fire Service customers have a 4", 6", or 8" meter. Currently, Fire Service customers also pay the Capital Improvement Charge. Table 5-1 shows the total paid, per meter size, for both the bi-monthly rate and the Capital Improvement Charge.

**Table 5-1: Existing Bi-Monthly Fire Service Rates**

Connection Size (in)	Current Capital		
	Current Rates Fire Service	Improvement Charge	Current Rates Total
5/8 x 3/4"	\$11.00	\$1.47	\$12.47
1"	\$11.00	\$2.07	\$13.07
1 1/2"	\$11.00	\$2.64	\$13.64
2"	\$11.00	\$4.27	\$15.27
3"	\$14.00	\$16.19	\$30.19
4"	\$19.00	\$20.60	\$39.60
6"	\$29.00	\$30.90	\$59.90
8"	\$38.00	\$42.68	\$80.68
10"	\$48.00	\$54.45	\$102.45

## 5.3 Proposed Fire Service Rates

The Cost-of-Service analysis described in Section 3 includes an assessment of the cost to provide Fire Service. Table 3-4 in Section 3 shows the key aspects of defining the costs of providing Fire Service. It shows that a portion of storage and transmission and distribution costs are assigned to Fire Service, recognizing that an important function of reservoirs and pipes is providing sufficient quantities of water throughout the system for fire protection.

The total cost to provide fire protection is approximately \$2.6M in FY 17/18. This cost is split between public fire services, (i.e. fire hydrants) and private fire service connections by a size-weighted tabulation of "equivalent fire service connections" (see Appendix C for more detail).

In Table 3-4, the cost associated with public fire protection is recovered from water system customers on a per-meter equivalent basis.

Table 5-2 shows the proposed Fire Service Rates. These proposed rates increase with increasing connection size proportional to the Hazen-Williams equation for flow through pressure conduits, as described in the AWWA M1 Manual, 7<sup>th</sup> Edition, page 162.

**Table 5-2: Proposed Bi-Monthly Fire Service Rates**

Line No	Connection Size (in)	Demand Factor	Proposed Bi-Monthly Fire Service Rate				
			FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22
1	5/8 x 3/4"	1.00	\$0.84	\$0.93	\$0.96	\$0.99	\$1.02
2	1"	1.00	\$0.84	\$0.93	\$0.96	\$0.99	\$1.02
3	1 1/2"	2.90	\$2.43	\$2.70	\$2.79	\$2.89	\$2.99
4	2"	6.19	\$5.17	\$5.75	\$5.95	\$6.16	\$6.38
5	3"	17.98	\$15.02	\$16.72	\$17.31	\$17.92	\$18.55
6	4"	38.32	\$32.01	\$35.63	\$36.88	\$38.17	\$39.51
7	6"	111.31	\$93.00	\$103.51	\$107.13	\$110.88	\$114.76
8	8"	237.21	\$198.18	\$220.57	\$228.29	\$236.28	\$244.55
9	10"	426.58	\$356.40	\$396.67	\$410.55	\$424.92	\$439.79

With these proposed Fire Service rates, Private Fire Service customers will no longer pay a Capital Improvement Charge. The cost of capital improvements attributable to fire protection is already included in the proposed Fire Service changes.

## Section 6

# Ongoing Considerations

This Rate Study and the projected rate schedule shown in Section 3 cover a Rate Study planning period through FY 21/22. There are a number of factors that will change over the next few years that have financial implications. The extent to which these factors change will influence the financial condition of the water system and the Division's next review of water rates.

The Department should continue to monitor its financial status on an ongoing basis, and should continue to monitor the following:

- Water consumption patterns. Financial projections are based on an overall water demand of 23,000 acre-feet per year. Changes in water demand patterns will affect revenues and the overall financial condition of the utility. If water demands differ from 23,000 acre-feet per year, the Division will need to make appropriate adjustments to capital project scheduling, debt issuance, and/or rates.
- Customer growth. This Rate Study assumes no customer growth through FY 21/22. Customer growth increases the size of the customer base and customer growth would result in higher rate revenues.
- Changes in regional water supply availability and pricing. The projected Commodity Pass-Through Charge incorporates anticipated increases in the cost of purchased water and increases in OCWD's Recharge Assessment associated with locally-produced groundwater. The Division will need to monitor these costs and continue to adjust the Commodity Pass-Through Charge on an annual basis.
- Capital project cost certainty. The Capital Facilities Plan contains estimates of future project costs. The actual costs will not be known until the projects are designed, bid, and built.
- Inflation rates. The projected rates are based on a 2.5 percent annual inflation rate for most items, and a 4.0 percent annual inflation rate for salaries and wages. Deviations in inflation rates from these values will have financial implications.
- Interest rates. Interest rates on the proposed Revenue Bond debt that differ from assumptions used in this Study will have financial implications.

Low-Income Senior Discount participation. The Division has dedicated non-rate revenues as the funding source for the proposed Low-Income Senior Discount, if adopted by Council. After the program is implemented, the Division will need to monitor the participation rate and make appropriate adjustments (if needed) to the amount of the discount and/or the funding source.



## Section 7

# Appendix A: Revenue Requirement

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## Appendix B: Cost-of-Service Analysis

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## Appendix C: Rate Design

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## Appendix D: Capital Facilities Plan

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## Appendix E: Not Used

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## Appendix F: Budget-Based Rate Structure Analysis

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**Table A-1**  
**City of Garden Grove - Water Division**  
**Water Rate Study**

**General Assumptions and Parameters**

Line No	General Assumptions and Parameters		FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22	FY 22/23	FY 23/24	FY 24/25	FY 25/26	FY 26/27
1	Round	-1										
2	Water System Replacement Value, \$M (Placeholder)	\$300										
3												
4												
5	General Inflation		2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
6	Salaries and Wages Escalation (1)		4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%
7	CIP Escalation (7)		2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
8	Change in per capital water consumption		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
9												
10												
11	<b>Water supply in Acre-feet, per Fiscal Year</b>											
12	FY 13/14	26,000										
13	FY 14/15	24,062										
14	FY 15/16	21,518										
15	FY 16/17	22,000										
16	FY 17/18	23,000										
17	FY 18/19	23,000										
18	FY 19/20	23,000										
19	FY 20/21	23,000										
20	FY 21/22	23,000										
21	FY 22/23	23,000										
22	FY 23/24	23,000										
23												
24	<b>Intercity Loan Repayment</b>											
25	Repayment Period (Years)	15										
26												
27	<b>Debt Issuance Terms</b>											
28	CIEDB											
29	Annual Interest Rate (%)											
30	Repayment Period (Years)											
31	Capitalized Bond Reserves (% of Principal)											
32	Annual Loan Fee Rate (% of outstanding principal)											
33	Cost of Issuance (%)											
34	Revenue Bond											
35	Annual Interest Rate (%)											
36	Repayment Period (Years)											
37	Capitalized Bond Reserve (% of Proceeds)											
38	Cost of Issuance (%)											



**Table A-2  
City of Garden Grove  
Water Division - Water Rate Study**

**Customer Data FY 15/16**

Line No		July	August	September	October	November	December	January	February	March	April	May	June	Total
1	Total Consumption, ccf													
2	Residential													
3	Duplex	3,557	6,483	3,375	7,534	2,607	4,258	4,087	7,219	3,065	6,265	3,363	6,131	57,944
4	Landscape	11,903	14,292	11,058	16,639	9,188	9,912	9,451	8,849	5,811	10,691	10,748	10,295	128,837
5	Multi-unit	200,241	113,834	207,571	123,459	186,900	86,413	217,169	129,200	182,420	109,685	196,361	89,994	1,843,247
6	Sewer/Septic	201	556	215	578	215	461	274	611	207	431	337	367	4,453
7	Single family home	393,106	395,065	359,186	407,142	317,027	231,850	381,414	354,986	274,844	353,927	335,443	369,540	4,173,530
8	Townhome	631	860	121	769	60	241	661	857	71	861	243	663	6,038
9	Commercial													
10	Agriculture	72	152	33	201	132		0	65	0	123	48	0	826
11	Car wash	714	1,569	597	2,451	209	1,714	632	1,380	448	1,864	1,539	1,254	14,371
12	Church	3,307	2,253	2,001	2,439	1,847	730	3,126	2,329	1,945	2,630	1,875	2,250	26,732
13	Commercial	110,990	76,459	107,767	75,922	102,632	52,861	106,975	96,573	93,347	72,246	95,284	64,620	1,055,676
14	Hospital	9,116	1,891	9,773	1,951	8,853	2,034	8,948	2,168	8,090	1,962	7,542	2,056	64,384
15	Hotel/Motel	39,198	1,831	45,202	1,445	37,344	1,174	38,829	1,520	38,059	1,328	40,521	1,063	247,514
16	Industrial	65,888	4,415	67,955	4,556	66,707	617	55,186	16,353	66,240	4,172	61,596	3,827	417,512
17	Landscape	16,757	6,750	17,210	7,348	14,630	4,356	8,726	5,193	8,382	3,643	11,326	5,095	109,416
18	Laundromat	3,521	1,940	3,315	1,729	3,152	1,054	3,361	2,800	3,620	1,713	3,817	1,728	31,750
19	Private school	2,818	1,144	3,359	959	3,249	456	2,321	837	1,837	876	2,490	908	21,254
20	Public school	92,248		107,482		93,851		50,658		29,924		81,837		456,000
21	Public school other	3,234		3,586		2,708		2,432		1,582		1,808		15,350
22	Total, ccf	957,502	629,494	949,806	655,122	851,311	398,131	894,250	630,940	719,892	572,417	856,178	559,791	8,674,834
23														
24	Sum of Indoor Tier ccf													
25	Residential													
26	Duplex	2,858	5,098	2,525	5,882	1,939	3,197	3,326	5,621	2,398	5,045	2,556	4,850	45,295
27	Landscape	1,033	1,519	939	1,510	918	1,103	1,004	1,462	775	1,505	985	1,156	13,909
28	Multi-unit	139,406	84,489	145,074	89,500	131,390	62,446	153,581	100,128	132,891	82,484	140,748	66,576	1,328,713
29	Sewer/Septic	64	358	72	364	90	312	88	391	72	310	181	203	2,503
30	Single family home	254,627	235,861	227,124	247,824	212,941	146,247	275,714	249,007	204,292	239,083	227,536	221,618	2,741,872
31	Townhome	558	750	98	732	60	200	649	778	71	781	199	626	5,502
32	Commercial													
33	Agriculture	72	152	33	156	122		0	65	0	117	48	0	765
34	Car wash	695	1,387	566	2,056	209	1,406	549	1,106	413	1,348	1,048	1,080	11,863
35	Church	3,162	2,166	1,959	2,373	1,719	671	2,663	2,132	1,758	2,170	1,777	2,017	24,566
36	Commercial	100,499	69,087	98,321	68,396	90,636	48,421	94,882	85,429	83,808	63,583	86,288	57,046	946,396
37	Hospital	8,375	1,873	9,183	1,917	8,328	1,886	8,535	2,076	7,593	1,920	7,256	1,878	60,819
38	Hotel/Motel	38,513	1,499	41,399	1,389	34,775	1,112	37,403	1,440	35,501	1,227	39,266	1,002	234,527
39	Industrial	59,681	4,061	61,324	4,170	59,311	533	51,177	14,283	51,929	3,769	55,560	3,418	369,217
40	Landscape	0	0	0	0	0	0	0	0	0	0	0	0	0
41	Laundromat	2,980	1,802	2,843	1,592	2,799	1,054	2,952	2,694	3,087	1,609	3,292	1,590	28,295
42	Private school	2,585	1,090	3,253	902	2,732	406	2,025	801	1,765	795	2,323	817	19,493
43	Public school	87,962		103,710		82,219		43,044		28,331		80,511		425,775
44	Public school other	3,234		3,586		2,589		1,940		1,342		1,801		14,492
45	Total	706,302	411,191	702,009	428,764	632,776	268,994	679,531	467,413	556,025	405,744	651,375	363,877	6,274,002
46														

**Table A-2**  
**City of Garden Grove**  
**Water Division - Water Rate Study**

**Customer Data FY 15/16**

Line No		July	August	September	October	November	December	January	February	March	April	May	June	Total
47	Sum of outdoor tier ccf													
48	Residential													
49	Duplex	384	975	525	1,021	313	413	337	519	299	678	455	794	6,712
50	Landscape	6,307	7,041	6,148	6,995	4,186	3,637	3,544	2,793	2,860	4,946	5,846	4,277	58,580
51	Multi-unit	16,803	8,933	19,557	8,621	13,097	4,333	8,927	4,251	9,745	5,999	14,789	6,323	121,378
52	Sewer/Septic	114	188	122	177	84	102	90	79	87	86	129	87	1,345
53	Single family home	109,949	130,734	107,321	122,577	73,780	55,989	60,654	58,236	47,363	83,582	82,951	115,563	1,048,700
54	Townhome	1	15	3	10	0	11	1	11	0	13	12	1	78
55	Commercial													
56	Agriculture	0	0	0	17	10		0	0	0	6	0	0	33
57	Car wash	14	68	31	156	0	143	41	65	25	74	74	115	807
58	Church	53	63	14	16	24	5	116	30	48	120	55	100	644
59	Commercial	5,419	2,530	4,377	2,156	5,501	1,445	5,104	3,223	4,328	2,173	4,110	2,015	42,379
60	Hospital	702	18	488	34	412	129	382	92	400	42	220	178	3,096
61	Hotel/Motel	406	166	619	51	622	42	545	48	609	63	807	61	4,039
62	Industrial	4,354	157	3,486	123	3,180	38	1,719	385	4,346	95	1,726	98	19,707
63	Landscape	11,569	4,919	12,611	5,052	9,529	2,594	4,646	3,088	5,234	2,610	7,841	3,720	73,413
64	Laundromat	271	89	182	74	151	0	228	8	267	0	233	91	1,594
65	Private school	69	16	68	40	142	11	79	21	35	23	51	58	613
66	Public school	1,831		2,323		5,508		2,909		922		756		14,248
67	Public school other	0		0		4		138		61		7		210
68	Total	158,245	155,912	157,873	147,121	116,543	68,890	89,461	72,849	76,630	100,511	120,061	133,481	1,397,579
69														
70	Sum of Excessive Tier ccf													
71	Residential													
72	Duplex	315	410	325	631	355	648	424	1,079	368	542	352	487	5,936
73	Landscape	4,564	5,732	3,971	8,134	4,084	5,172	4,903	4,594	2,176	4,239	3,917	4,863	56,348
74	Multi-unit	44,032	20,412	42,940	25,338	42,414	19,634	54,661	24,821	39,784	21,202	40,824	17,095	393,156
75	Sewer/Septic	24	10	21	37	40	48	96	141	48	35	28	77	605
76	Single family home	28,530	28,471	24,741	36,741	30,306	29,614	45,046	47,743	23,189	31,262	24,957	32,359	382,958
77	Townhome	72	94	20	27	0	31	12	68	0	67	32	35	458
78	Commercial													
79	Agriculture	0	0	0	28	0		0	0	0	0	0	0	28
80	Car wash	5	114	0	239	0	165	42	209	10	442	416	59	1,701
81	Church	92	24	28	50	104	54	347	167	139	340	43	133	1,522
82	Commercial	5,072	4,842	5,069	5,370	6,495	2,995	6,990	7,921	5,210	6,490	4,886	5,559	66,900
83	Hospital	39	0	102	0	113	19	31	0	98	0	66	0	469
84	Hotel/Motel	279	166	3,184	5	1,947	20	881	32	1,948	38	449	0	8,948
85	Industrial	1,854	197	3,145	262	4,216	45	2,289	1,685	9,964	308	4,310	312	28,588
86	Landscape	5,188	1,831	4,599	2,296	5,101	1,762	4,080	2,105	3,148	1,033	3,485	1,375	36,003
87	Laundromat	270	49	290	63	202	0	181	98	266	104	291	47	1,861
88	Private school	164	38	38	16	375	39	217	16	38	59	115	33	1,148
89	Public school	2,455		1,449		6,124		4,706		671		571		15,976
90	Public school other	0		0		115		354		179		0		648
91	Total	92,955	62,390	89,924	79,237	101,992	60,246	125,258	90,677	87,236	66,162	84,742	62,434	1,003,253

**Table A-3**  
**City of Garden Grove - Water Division**  
**Water Rate Study**

Existing Water Rates, as of 7/1/2017

Line	Meter Size (inches)	Bi-Monthly Charge	Min Capital Recovery Charge
1	5/8 x 3/4"	\$12.74	\$1.47
2	1"	\$33.99	\$2.07
3	1-1/2"	\$65.82	\$2.64
4	2"	\$99.79	\$4.27
5	3"	\$165.62	\$16.19
6	4"	\$229.32	\$20.60
7	6"	\$524.45	\$30.90
8	8"	\$819.60	\$42.68
9	10"	\$1,114.73	\$54.45

Effective February 1, 2017, new Commodity Pass-Through  
 Commodity Charge per ccf

Usage, units of water (ccf)	Commodity Pass-Through	Balance	Total
0-36	\$0.82	\$2.25	\$3.07
37-250	\$0.82	\$2.33	\$3.15
251-500	\$0.82	\$2.42	\$3.24
>500	\$0.82	\$2.51	\$3.33

Effective 7/1/2008 Fire Service Rates

Line	Meter Size (inches)	Bi-Monthly Rate
16	5/8"x3/4"	\$11.00
17	1"	\$11.00
18	1 1/2"	\$11.00
19	2"	\$11.00
20	3"	\$14.00
21	4"	\$19.00
22	6"	\$29.00
23	8"	\$38.00
24	10"	\$48.00
25	12"	\$58.00

Historical Commodity Charge, FY 15/16  
 Commodity Charge per ccf

Usage, units of water (ccf)	Commodity Pass-Through	Balance	Total
0-36	\$0.67	\$2.25	\$2.92
37-250	\$0.67	\$2.33	\$3.00
251-500	\$0.67	\$2.42	\$3.09
>500	\$0.67	\$2.51	\$3.18

**Table A-3A**  
**City of Garden Grove**  
**Water Division - Water Rate Study**

**Proposed Water Rates and Example Water Bill Calculation**

Line	Current	1/1/2018	1/1/2019	1/1/2020	1/1/2021	1/1/2022	
<b>Proposed Monthly Rates</b>							
1	Bi-Monthly Min Charge	\$12.74	\$18.02	\$28.15	\$29.63	\$31.95	\$33.85
2	Bi-Monthly Capital Recovery Charge	\$1.47	\$3.00	\$4.00	\$5.00	\$6.00	\$7.00
3	Commodity Charge, \$/ccf						
4	1st Tier	\$3.07	\$2.94	\$2.94	\$2.92	\$2.89	\$2.86
5	Estimated 1st Tier Pass-Through		\$0.00	\$0.07	\$0.15	\$0.20	\$0.29
6	2nd Tier	\$3.15 - \$3.33	\$3.65	\$4.06	\$4.15	\$4.28	\$4.40
7	Estimated 2nd Tier Pass-Through		\$0.00	\$0.08	\$0.17	\$0.25	\$0.28
8							
9	<b>Example Water Bill, Typical Water User</b>						
10	Example Bill Calculation, 15 ccf/month						
11	Monthly Consumption, ccf	15	15	15	15	15	15
12	Bi-Monthly Consumption, ccf	30	30	30	30	30	30
13							
14	Bi-Monthly Bill	\$106.31	\$109.22	\$122.45	\$126.73	\$130.65	\$135.35
15	Change from Previous		\$2.91	\$13.23	\$4.28	\$3.92	\$4.70
16	Monthly Bill	\$53.16	\$54.61	\$61.23	\$63.37	\$65.33	\$67.68
17	Monthly change from previous year		\$1.46	\$6.61	\$2.14	\$1.96	\$2.35
18							
19	Bi-Monthly Bill, Not Including Pass-Throughs		\$109.22	\$120.35	\$122.23	\$124.65	\$126.65
20	Monthly Bill, Not Including Pass-Throughs		\$54.61	\$60.18	\$61.12	\$62.33	\$63.33
21							
22	Amount of Pass-Throughs, Bi-Monthly		\$0.00	\$2.10	\$4.50	\$6.00	\$8.70
23	Amount of Pass-Throughs, Monthly		\$0.00	\$1.05	\$2.25	\$3.00	\$4.35
24							
25	<b>Example Water Bill, High Water User</b>						
26	Example Bill Calculation, 30 ccf/month						
27	Monthly Consumption, ccf	30	30	30	30	30	30
28	Bi-Monthly Consumption, ccf	60	60	60	60	60	60
29							
30	Bi-Monthly Bill	\$200.33	\$216.59	\$243.26	\$252.58	\$262.23	\$271.16
31	Change from Previous		\$16.26	\$26.67	\$9.32	\$9.65	\$8.93
32	Monthly Bill	\$100.17	\$108.30	\$121.63	\$126.29	\$131.12	\$135.58
33	Monthly change from previous year		\$8.13	\$13.34	\$4.66	\$4.83	\$4.47
34							
35	Bi-Monthly Bill, Not Including Pass-Throughs		\$216.59	\$238.79	\$243.04	\$248.88	\$254.03
36	Monthly Bill, Not Including Pass-Throughs		\$108.30	\$119.40	\$121.52	\$124.44	\$127.02
37							
38	Amount of Pass-Throughs, Bi-Monthly		\$0.00	\$4.47	\$9.54	\$13.35	\$17.13
39	Amount of Pass-Throughs, Monthly		\$0.00	\$2.24	\$4.77	\$6.68	\$8.57

**Table A-4  
City of Garden Grove - Water Division  
Water Rate Study**

**Historical and Projected Revenues under Existing Rates**

Line No	ACCT	DESCRIPTION	Fund	Actual (1)	Actual (1)	Actual (3)	Estimate (1,2)					FY 16/17- FY 21/22 Average Annual Growth	
				FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18	FY 18/19	FY 19/20	FY 20/21		FY 21/22
1		<b>OPERATING REVENUES</b>											
2	32601	WATER-METERED	601	\$27,813,114	\$25,494,918	\$21,805,999	\$22,208,411	\$29,801,011	\$29,801,011	\$29,801,011	\$29,801,011	\$29,801,011	6.1%
3	32603	WATER-FLAT RATE	601	98,585	98,585	147,878	79,000	79,000	79,000	79,000	79,000	79,000	0.0%
4	32630	WATER PROC FEE	601	2,947	465	0	0	0	0	0	0	0	n/a
5	32636	LATE FEE (4)	601	369,468	360,449	347,843	300,000	150,000	0	0	0	0	-100.0%
6	32638	AFTER HRS SERV CHG	601	1,225	679	1,014	500	500	500	500	500	500	0.0%
7	32640	WATER COSTS (5)	601	6,251,280	6,649,601	6,320,543	6,320,543						-100.0%
8	32855	NSF FEE	601	6,875	6,650	6,600	4,000	4,000	4,000	4,000	4,000	4,000	0.0%
9	32605	CAPITAL RECOVERY	602	440,693	443,124	433,732	353,000	353,000	353,000	353,000	353,000	353,000	0.0%
10	32650	SERVICE INSTALL FEES	602	48,387	48,817	44,774	39,000	39,000	39,000	39,000	39,000	39,000	0.0%
11	32652	FRONTAGE ASSMT FEE	602	20,014	7,297	13,409	6,000	6,000	6,000	6,000	6,000	6,000	0.0%
12	32655	ACREAGE ASSMT FEE	602	14,144	4,695	10,564	4,000	4,000	4,000	4,000	4,000	4,000	0.0%
13		<b>WATER SALES</b>		<b>\$35,066,732</b>	<b>\$33,115,278</b>	<b>\$29,132,355</b>	<b>\$29,314,453</b>	<b>\$30,436,511</b>	<b>\$30,286,511</b>	<b>\$30,286,511</b>	<b>\$30,286,511</b>	<b>\$30,286,511</b>	<b>0.7%</b>
14													
15		<b>Water Sales Subject to Rate Increases</b>		<b>\$34,162,979</b>	<b>\$32,243,103</b>	<b>\$28,274,419</b>	<b>\$28,607,953</b>	<b>\$29,880,011</b>	<b>\$29,880,011</b>	<b>\$29,880,011</b>	<b>\$29,880,011</b>	<b>\$29,880,011</b>	<b>0.9%</b>
16													
17	39012	MISC REVENUE	601	\$113,419	\$22,614	\$20,352	\$22,000	\$22,000	\$22,000	\$22,000	\$22,000	\$22,000	0.0%
18	39025	OVER/SHORT	601	(228)	(337)	90	0	0	0	0	0	0	n/a
19	39515	WRITE-OFF RECOVERY	601	6,065	7,866	4,962	3,000	3,000	3,000	3,000	3,000	3,000	0.0%
20		<b>OTHER</b>		<b>\$119,256</b>	<b>\$30,143</b>	<b>\$25,405</b>	<b>\$25,000</b>	<b>\$25,000</b>	<b>\$25,000</b>	<b>\$25,000</b>	<b>\$25,000</b>	<b>\$25,000</b>	<b>0.0%</b>
21													
22		<b>NON-OPERATING REVENUES (EXPENSES)</b>											
23	34501	INTEREST	601	\$325,662	\$229,250	\$56,385	\$56,385	\$56,385	\$56,385	\$56,385	\$56,385	\$56,385	0.0%
24	34501	INTEREST	602			55,699	55,699	55,699	55,699	55,699	55,699	55,699	
25	34501	INTEREST	603			31,900	31,900	31,900	31,900	31,900	31,900	31,900	
26													
27	34330	SALE OF SCRAP	601	28,737	22,694	14,540	22,000	22,000	22,000	22,000	22,000	22,000	0.0%
28	34340	SALE OF MATERIALS	601	12,158	7,237	44,493	7,000	7,000	7,000	7,000	7,000	7,000	0.0%
29		<b>GAIN ON DISPOSAL OF ASSETS</b>		<b>\$40,895</b>	<b>\$29,932</b>	<b>\$59,033</b>	<b>\$29,000</b>	<b>\$29,000</b>	<b>\$29,000</b>	<b>\$29,000</b>	<b>\$29,000</b>	<b>\$29,000</b>	<b>0.0%</b>
30													
31	38267	2010 FED SUBSIDY	601	\$168,871	\$168,973	\$158,654	\$135,000	\$135,000	\$135,000	\$135,000	\$135,000	\$135,000	0.0%

Notes:

- (1) Source through FY 16/17: Water Utility Revenue Expenditures.xls provided by City of Garden Grove
- (2) Projected to remain at FY 16/17 values, except water metered and water costs. Refer to Table A-5.
- (3) Source FY 15/16: Water Utility Revenue Expenditures.xls provided by City of Garden Grove 1/23/17
- (4) Late fee revenues are not included after 1/1/18 because it is anticipated that late fee revenues will be used to fund the low-income/senior discount
- (5) With proposed changes in rate structures, the pass-through charge will be reset to zero. For the purposes of this rate study, water costs revenues are included in water-metered revenues.

**Table A-5  
City of Garden Grove - Water Division  
Water Rate Study  
Detailed Calculation of Water-Metered and Water Costs Revenues**

Line No	ACCT	DESCRIPTION	Actual		Estimate				
			FY 15/16	FY 16/17	FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22
1		"Water-Metered" Revenue Estimate							
2		Minimum Charge Revenue (5)	\$3,800,000	\$3,800,000	\$3,800,000	\$3,800,000	\$3,800,000	\$3,800,000	\$3,800,000
3		Commodity Charge Revenue	18,005,099	18,408,411	19,245,156	19,245,156	19,245,156	19,245,156	19,245,156
4		Total	\$21,805,099	\$22,208,411	\$23,045,156	\$23,045,156	\$23,045,156	\$23,045,156	\$23,045,156
5									
6		% of Annual Water Sold (6)							
7		January through April			32%	32%	32%	32%	32%
8		AF/Year Sold, January through April			1,868	1,868	1,868	1,868	1,494
9		AF/Year Sold, Remainder of Fiscal Year			3,882	3,882	3,882	3,882	3,106
10		Total AF/Year Imported			5,750	5,750	5,750	5,750	4,600
11		Total AF/Year Groundwater			17,250	17,250	17,250	17,250	18,400
12									
13		Water Pass-Through Calculation, MWD Imported Water (Tier 2 Pass-Through)							
14		MWD Purchased Water Cost			\$6,602,908	\$6,834,740	\$7,176,477	\$7,535,301	\$6,493,266
15		\$/AF			\$1,148.33	\$1,188.65	\$1,248.08	\$1,310.49	\$1,411.58
16		Change from Previous Year							
17		\$/AF				\$40.3	\$59.4	\$62.4	\$101.1
18		\$/ccf				\$0.09	\$0.14	\$0.14	\$0.23
19		Pass-Through Charge, \$/ccf				\$0.09	\$0.23	\$0.37	\$0.60
20									
21		Water Pass-Through Calculation, Groundwater (Tier 1 Pass-Through)							
22		Groundwater Costs (Including Pumping and Recharge Assessment)			\$8,643,213	\$9,202,137	\$9,796,166	\$10,201,063	\$11,573,746
23		\$/AF			\$501.06	\$533.46	\$567.89	\$591.37	\$629.01
24		Change from Previous Year							
25		\$/AF				\$32.4	\$34.4	\$23.5	\$37.6
26		\$/ccf				\$0.07	\$0.08	\$0.05	\$0.09
27		Pass-Through Charge, \$/ccf				\$0.07	\$0.15	\$0.20	\$0.29
28									
29		Water Pass-Through Calculation, Merged MWD and Groundwater							
30		MWD and Groundwater Costs			\$15,246,121	\$16,036,877	\$16,972,643	\$17,736,364	\$18,067,013
31		\$/AF			\$662.87	\$697.26	\$737.94	\$771.15	\$785.52
32		Change from Previous Year							
33		\$/AF				\$34.4	\$40.7	\$33.2	\$14.4
34		\$/ccf				\$0.08	\$0.09	\$0.08	\$0.03
35		Pass-Through Charge, \$/ccf				\$0.08	\$0.17	\$0.25	\$0.28

Notes:

- (1) Source: Oct 2016 actual multiplied by 12: as shown in Water Bill Coding doc provided by City 12/21/16.
- (2) Pass-Through charge increase in any given year is effective January 1. Revenue from pass through charge increase will be realized from water sales occurring in January through April.

**Table A-6**  
**City of Garden Grove - Water Division**  
**Water Rate Study**

**Historical and Projected O&M Expenditures**

Line No	PKG	PKG-NAME	ACCT	DESC	Actual (3)	Budget (1)	Estimate	Budget		Estimated			Notes
					FY 15/16	FY 16/17	FY 16/17	FY 17/18	FY 17/18	FY 18/19	FY 19/20	FY 20/21	
1		<b>Salaries and Wages</b>											
2	0010	CITY COUNCIL			\$2,510	\$ 6,554.00	\$6,554	12,059	12,059	\$12,541	\$13,043	\$13,565	\$14,107
3	0020	MANAGEMENT			76,222	75,720	75,720	79,985	79,985	83,184	86,512	89,972	93,571
4	0023	RESRCH/LEGISLATION			66,000	61,119	61,119	60,936	60,936	63,373	65,908	68,545	71,287
5	0030	REAL PROPERTY			0	6,804	6,804	7,473	7,473	7,772	8,083	8,406	8,742
6	0053	REPROGRAPHICS			0	0	0	0	0	0	0	0	0
7	0060	PUBLIC INFORMATION			0	0	0	0	0	0	0	0	0
8	1020	GENERAL ACCOUNTING			67,077	48,576	48,576	51,859	51,859	53,933	56,091	58,334	60,668
9	1021	FINANCIAL PLANNING			76,563	171,750	171,750	171,724	171,724	178,593	185,737	193,166	200,893
10	1030	UTILITY BILLING			442,672	456,076	456,076	481,387	481,387	500,642	520,668	541,495	563,155
11	2160	PLAN CHECK/PERMITS			35,130	29,741	29,741	33,328	33,328	34,661	36,048	37,489	38,989
12	3000	PUBL WORKS GEN ADMN			116,484	58,017	58,017	60,027	60,027	62,428	64,925	67,522	70,223
13	3010	ENVIRONMENTAL MGMT			22,884	42,839	42,839	47,469	47,469	49,368	51,342	53,396	55,532
14	3043	NPDES PROGRAM			22,330	22,917	22,917	23,769	23,769	24,720	25,709	26,737	27,806
15	3114	DRAINAGE/MISC MAINT			222,996	284,200	284,200	297,940	297,940	309,858	322,252	335,142	348,548
16	3121	TRAFFIC SIGN MAINT			81	0	0	0	0	0	0	0	0
17	3123	TRAFFIC SIG MAINT			246	0	0	0	0	0	0	0	0
17	3220	DEDICATED FAC/WTR			111,259	75,889	75,889	75,374	75,374	78,389	81,525	84,785	88,177
18	3510	GROUND MAINTENANCE			207,383	285,438	285,438	316,624	316,624	329,289	342,461	356,159	370,405
19	3610	EQ SERV OPERATIONS			0	0	0	0	0	0	0	0	0
20	3700	WATER OPERATIONS			3,398,788	3,762,312	3,762,312	4,056,499	4,056,499	4,218,759	4,387,509	4,563,010	4,745,530
21	3710	WATER PRODUCTION			0	0	0	0	0	0	0	0	0
22	6007	EMPLOYEE TRAINING			0	0	0	0	0	0	0	0	0
23	7673		41010	REGULAR SALARIES				1,745,598	0				
24	9800	GASB68 WATER FUND			(438,962)	0	0	0	0	0	0	0	0
25	9807	OPEB WATER FUND			58,780	0	0	0	0	0	0	0	0
26		OPEB ALLOC ADJ			317,045			0					
27		Total Salaries and Wages			\$4,805,488	\$ 5,387,952	\$5,387,952	\$7,522,051	\$5,776,453	\$6,007,511	\$6,247,812	\$6,497,724	\$6,757,633
28					\$4,805,488	\$0	(\$317,045)						
29		<b>Contractual Services</b>											
30	0030	REAL PROPERTY			\$60	\$92	\$92	92	92	\$94	\$97	\$99	\$102
31	0042	ELECT/VOTER ASSIST			0	15,300	15,300	0	0	0	0	0	0
32	0053	REPROGRAPHICS			0	4,600	4,600	4,600	4,600	4,715	4,833	4,954	5,078
33	0060	PUBLIC INFORMATION			25,014	11,500	11,500	11,500	11,500	11,788	12,082	12,384	12,694
34	1000	FINANCE ADMN/ANAL			1,040	2,500	2,500	2,500	2,500	2,563	2,627	2,692	2,760
35	1020	GENERAL ACCOUNTING			0	2,600	2,600	6,593	6,593	6,758	6,927	7,100	7,277
36	1021	FINANCIAL PLANNING			14,486	6,031	6,031	11,116	11,116	11,394	11,679	11,971	12,270
37	1024	ACCOUNTS PAYABLE			0	1,250	1,250	1,250	1,250	1,281	1,313	1,346	1,380
38	1030	UTILITY BILLING			318,664	423,408	423,408	427,277	427,277	437,959	448,908	460,131	471,634
39	1034	REVENUE OPERATIONS			12,026	0	0	0	0	0	0	0	0
40	2160	PLAN CHECK/PERMITS			8,160	0	0	0	0	0	0	0	0
41	3000	PUBL WORKS GEN ADMN			4,132	33,166	33,166	34,480	34,480	35,342	36,226	37,131	38,059
42	3010	ENVIRONMENTAL MGMT			9,504	921	921	964	964	988	1,013	1,038	1,064
43	3043	NPDES PROGRAM			225,069	314,475	314,475	314,475	314,475	322,337	330,395	338,655	347,122
44	3114	DRAINAGE/MISC MAINT			75,442	90,289	90,289	91,822	91,822	94,118	96,470	98,882	101,354
45	3510	GROUND MAINTENANCE			22,079	48,997	48,997	49,216	49,216	50,446	51,708	53,000	54,325
46	3610	EQ SERV OPERATIONS			0	0	0	0	0	0	0	0	0

**Table A-6**  
**City of Garden Grove - Water Division**  
**Water Rate Study**

**Historical and Projected O&M Expenditures**

Line No	PKG	PKG-NAME	ACCT	DESC	Actual (3)	Budget (1)	Estimate	Budget	Estimated				Notes	
					FY 15/16	FY 16/17	FY 16/17	FY 17/18	FY 17/18	FY 18/19	FY 19/20	FY 20/21		FY 21/22
47	3700	WATER OPERATIONS			1,723,051	1,825,966	1,825,966	1,940,746	1,940,746	1,989,265	2,038,996	2,089,971	2,142,220	
48	3710	WATER PRODUCTION			3,116	0	0	0	0	0	0	0	0	
49	3780	WTR LTD,DEPR,O/H							0					
50	3780		42000	CONTRACTUAL SERV	0	3,375	3,375	0	0	0	0	0	0	
51	3780		42544	WATER REPAIR/MAINT	0	0	0	0	0	0	0	0	0	
52	3780		42681	BANK FEES	1,604	0	0	0	0	0	0	0	0	
53	3780		44920	Overhead Fee	2,371,900	2,534,900	2,534,900	2,439,100	2,439,100	2,500,078	2,562,579	2,626,644	2,692,310	
54	3780	WTR LTD,DEPR,O/H	44950	CITY STREET DAMAGES				1,550,000						2
55	3781	WATER LTD-2010A	42000	CONTRACTUAL SERV				3,420						7
56	3781	WATER LTD-2010A	44475	LONG TERM DEBT				685,000						7
57	3781		44950	City Street Damages (Intercity Loan In	719,860	870,000	869,374		830,140	521,191	492,893	463,434	432,768	2
58	3781		44950	City Street Damages (Intercity Loan Principal)			0		663,013	690,196	718,494	747,953	778,619	2
59	3781		44950	City Street Damages		680,000	680,000		719,860	737,856	756,303	775,210	794,591	2
60	3781	WATER LTD-2010A			3,017	0	0							7
61	3782	WATER LTD-2010B			3,017	0	0	3,200						7
62	3783	WATER LTD-2010C			4,108	0	0	3,530						7
63	3784	2015 WTR REV BONDS			108,973	4,815	4,815							7
64	3784	2015 WTR REV BONDS	44475	LONG TERM DEBT				885,000						7
65	5510	LEGAL SERVICES			447	0	0		0	0	0	0	0	
66	6007	EMPLOYEE TRAINING			0	3,175	3,175	3,175	3,175	3,254	3,336	3,419	3,505	
67	6876	800MHZ P25 RDO DEP			0	1,514	1,514	1,614	1,614	1,654	1,696	1,738	1,782	
68	6877	800MHZ VEH FND DEBT			0	4,487	4,487	4,386	4,386	4,496	4,608	4,723	4,841	
69	7359	0	42620	ENGINEERING SERVICES				1,000,000						6
70	7369	0	42000	CONTRACTUAL SERV				1,000,000						6
71	7673	0	42810	DUES/MEMBERSHIPS				400						6
72	7673	0	44020	EQUIP POOL RENTALS				81,816						6
73	9983	INFORMATION SYSTEMS			0	182	182		0	0	0	0	0	
74		ALLOW FOR BAD DEBT ADJ			(12,026)	0	0		0	0	0	0	0	
75		Enterprise Resource Program								500,000				8
76		Total Contractual Services			\$5,642,742	\$6,883,543	\$6,882,917	\$10,557,272	\$7,557,919	\$7,927,772	\$7,583,182	\$7,742,477	\$7,905,754	
77														
78		<b>Materials &amp; Supplies</b>												
79			43000	COMMODITIES	\$ -	\$760,197		17,432,847						3
80			43030	SEEDS/PLANTS	\$ -	0								
81			43050	FERTILIZER	14,450	0								
82			43090	OTHER AGR SUPPLIES	50	0								
83			43110	FOOD	188	0								
84			43120	UNIFORMS	0	0								
85			43160	BOTTLED WATER	3,695	0								
86			43180	OTHER CLOTHING ITEMS	1,998	0								
87			43190	OTHER FOOD ITEMS	0	0								
88			43210	MEDICAL SUPPLIES	91	0								
89			43220	PHOTO/BLUEPRINT SUPP	292	0								
90			43230	LABORATORY CHEMICALS	81,159	0								
91			43270	BOOKS/SUBS/CASSETTES	1,068	0		950						
92			43290	OTHER PROF SUPPLIES	72	0								
93			43320	GREASE/LUBE OIL	10,520	0								



**Table A-6  
City of Garden Grove - Water Division  
Water Rate Study**

**Historical and Projected O&M Expenditures**

Line No	PKG	PKG-NAME	ACCT	DESC	Actual (3)	Budget (1)	Estimate	Budget	Estimated					Notes	
					FY 15/16	FY 16/17	FY 16/17	FY 17/18	FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22		
94			43350	MOTOR VEH PARTS	0	0									
95			43410	PAINT/DYE/LUBRICANTS	3,620	0									
96			43420	JANITORIAL SUPPLIES	687	0									
97			43430	ELECTRICAL SUPPLIES	16,469	0									
98			43440	HSHLD EQUIP/SUPPLIES	550	0									
99			43450	PIPES/APPURTENANCES	28,180	0									
100			43480	AIR COND SUPPLIES	0	0									
101			43490	OTHER MAINT ITEMS	355,813	0									
102			43510	PAPER/ENVELOPES	16,998	0									
103			43540	NETWORKING SUPPLIES	60	0									
104			43552	SOFTWARE	10,050	0									
105			43560	OFFICE SUPPLIES/EXP	9,851	0									
106			43610	GUNS/AMMUNITION	0	0									
107			43630	ENG/DRAFTING INST	0	0									
108			43635	MINOR OFFICE FURN/EQ	484	0									
109			43640	GEN PURPOSE TOOLS	6,845	0									
110			43650	MINOR FURN/EQUIP	280	0									
111			43660	SAFETY EQ/SUPPL-SB90	453	0									
112			43670	SAFETY EQ/SUPPLIES	20,494	0									
113			43690	OTHER MINOR TOOLS/EQ	10,558	0									
114			43710	ATHLETIC SUPPLIES	0	0									
115			43720	CRAFT SUPPLIES	0	0									
116			43730	AUDIO/VISUAL SUPP	0	0									
117			43760	AWARDS/TROPHIES	0	0									
118			43810	LUMBER	46	0									
119			43830	WIRE/METALS	0	0									
120			43840	HARDWARE	4,561	0									
121			43860	AGGREGATES/MASONRY	2,222	0									
122			43890	OTHER CONST SUPPLIES	667	0									
123			43910	SIGNS/FLAGS/BANNERS	958	0									
124			43980	EQUITY ASSESSMENT	0	0									
125			43990	MONITORED MINOR EQ	455	0									
126			43991	MONITORED EQUIP	0	0		18,570							
127				ALLOW FOR BAD DEBT ADJ	12,026										
128		<b>Total Materials and Supplies</b>			<b>\$615,910</b>	<b>\$760,197</b>	<b>\$615,910</b>	<b>\$17,452,367</b>	<b>\$709,906</b>	<b>\$727,654</b>	<b>\$745,845</b>	<b>\$764,491</b>	<b>\$783,603</b>	<b>3</b>	
129															
130		<b>Water Production Expenses</b>													
131			46920	GAS-WATER PROD	\$233,507	\$0									
132			46930	ELEC-WATER PROD	\$918,976	0									
133			46950	IMPORT WTR-MWDOC	\$5,536,017	14,822,600									
134			46960	IMPORT WTR-WOCWB	\$8,232	0									
135			46970	WTR PUMPING-OCWD	\$5,212,929	0									
136			46971	GOLDEN STATE WTR	\$0	0									
137				Water Production Costs, FY 17/18 Unit Costs					15,246,121	15,246,121	15,246,121	15,246,121	15,246,121		
138				Increase in Water Production Costs Recovered by Pass Thru					0	790,756	1,726,522	2,490,243	2,820,892		
139				Payments of LT Debt against Net Po: (\$1,400,000)											
140				Reverse of 45] Capital Expenditures	\$7,592,854										

**Table A-6  
City of Garden Grove - Water Division  
Water Rate Study**

**Historical and Projected O&M Expenditures**

Line No	PKG	PKG-NAME	ACCT	DESC	Actual (3)	Budget (1)	Estimate	Budget	Estimated				Notes	
					FY 15/16	FY 16/17	FY 16/17	FY 17/18	FY 17/18	FY 18/19	FY 19/20	FY 20/21		FY 21/22
141														
142														
143														
144														
145														
146			44340	AMORTIZATION	(\$43,595)	\$13,610	\$13,610	14,847	14,847	\$14,847	\$14,847	\$14,847	\$14,847	
147			44910	DEPRECIATION	3,008,256	3,150,000	3,150,000	3,244,500	3,244,500	3,244,500	3,244,500	3,244,500	3,244,500	
148														
149														
150														
151														
152														

NOTES

- (1) Source through FY 16/17: Water Utility Revenue Expenditures.xls provided by City of Garden Grove
- (2) Street repair per City staff July 28, 2017. Refer to Table A-9 for Intercity Loan interest and principal payments
- (3) FY 17/18 per the City's budget. Budget Summary spreadsheet provided by the City, July 2017, merged these costs with Water Production Costs. In this table, Water Production Costs and Commodity costs are separated
- (4) Refer to Imported Water Costs Table A-7.
- (5) Source FY 15/16: Water Utility Revenue Expenditures.xls provided by City of Garden Grove 1/23/17
- (6) This expense is funded out of Fund 602 or 603, and is not considered an Operations and Maintenance expense, for the purposes of this rate study
- (7) Long Term Debt costs are excluded from this Operation and Maintenance expense table, and are instead shown in Table A-9.
- (8) One-time expense in FY 18/19, per City staff, 7/18/17.
- (9) The FY 17/18 budget includes capital and replacement items in addition to operating expenses

**Table A-7**  
**City of Garden Grove - Water Division**  
**Water Rate Study**  
**Imported Water Costs at FY 17/18 Unit Costs**

Line No		Actual (1)			Projected (1) (2)						Notes
		FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22	
1	Water Supply										
2	Supply Allocation, AF	26,000	24,062	21,518	22,000	23,000	23,000	23,000	23,000	23,000	
3	Percent % Groundwater	70%	72%	75%	75%	75%	75%	75%	75%	75%	
4	Percent % Purchased	30%	28%	25%	25%	25%	25%	25%	25%	25%	
5	AF Groundwater	18,200	17,422	16,180	16,500	17,250	17,250	17,250	17,250	17,250	
6	AF Purchased, AF										
7	MWD Imported	5,143		3,301	5,500	5,750	5,750	5,750	5,750	5,750	
8	MWD Imported Water (July-Dec)		4,112								
9	MWD Imported Water (Jan-June)		1,816								
10	Well #28 Basin Equity Exemption	2,657									
11	MWD Conjunctive Use Program, CUP		713	2,037							
12											
13	Water Supply Unit Costs										
14	MWD Imported Water Charge, \$/AF	\$893.25		\$942.00	\$979.00	\$1,015.00	\$1,015.00	\$1,015.00	\$1,015.00	\$1,015.00	
15	MWD Imported Water Charge, \$/AF (July-Dec)		\$890.50								
16	MWD Imported Water Charge, \$/AF (Jan-June)		\$923.50								
17	Well #28 Basin Equity Exemption - \$/AF	\$644.00									
18	MWD Conjunctive Use Program CUP \$/AF		\$788.50	\$819.00							
19	RA: Pumped Water, \$/AF	\$276.00	\$294.00	\$322.00	\$402.00	\$422.10	\$422.10	\$422.10	\$422.10	\$422.10	
20	Water Pumping Costs, \$/AF	\$56.49	\$49.83	\$51.32	\$52.86	\$54.45	\$54.45	\$54.45	\$54.45	\$54.45	
21											
22	MWD Imported Water Costs										
23	MWD Imported Water Charge, \$	\$4,593,985		\$3,109,919	\$5,384,500	\$5,836,250	\$5,836,250	\$5,836,250	\$5,836,250	\$5,836,250	
24	MWD Imported Water Charge, (July-Dec)		\$3,661,291								
25	MWD Imported Water Charge, (Jan-June)		\$1,677,261								
26	Well #28 Basin Equity Exemption	\$1,711,108									
27	MWD Conjunctive Use Program, CUP		\$562,200.50	\$1,668,303.00							
28	Calculated MWD Imported Water Charge, \$	\$6,305,093	\$5,901,013	\$3,109,542	\$5,384,500	\$5,836,250	\$5,836,250	\$5,836,250	\$5,836,250	\$5,836,250	
29	MWD Readiness to Serve Charge	\$722,052	\$823,269	\$750,859	\$353,149	\$266,094	\$266,094	\$266,094	\$266,094	\$266,094	
30	MWD Capacity Charge				\$93,900	\$100,260	\$100,260	\$100,260	\$100,260	\$100,260	
31	MWD Connection Charge	\$287,330	\$358,229	\$366,263	\$367,942	\$400,304	400,304	400,304	400,304	400,304	
32	# of Connections	34,206	34,117	33,757	33,602	34,196	34,196	34,196	34,196	34,196	
33	\$/Connection	\$8.40	\$10.50	\$10.85	\$10.95	\$11.50	\$11.50	\$11.50	\$11.50	\$11.50	
34	Subtotal, MWD Imported Water Costs	\$7,314,475	\$7,082,249	\$5,895,344	\$6,199,491	\$6,602,908	\$6,602,908	\$6,602,908	\$6,602,908	\$6,602,908	
35											
36	RA Pumped Water Annual Cost	\$5,023,200	\$5,122,068	\$5,210,089	\$6,633,000	\$7,676,250	\$7,676,250	\$7,676,250	\$7,676,250	\$7,676,250	
37	Water Pumping Costs, Annual (3)	1,028,118	868,138	830,378	872,190	966,963	966,963	966,963	966,963	966,963	
38	Total Imported Water Costs	\$13,365,793	\$13,072,455	\$11,935,811	\$13,704,681	\$15,246,121	\$15,246,121	\$15,246,121	\$15,246,121	\$15,246,121	

Notes

- (1) Source: Unless noted otherwise, Projected Purchased Water Costs, FY 16/17 from the City of Garden Grove.
- (2) Data Source: Projected Purchased Water Costs\_6.5.17 from City Staff, 6/5/17.
- (3) FY 17/18 Pumping Costs are calculated so that the total Water Production Cost equals that shown in the City's FY 17/18 budget.

**Table A-8**  
**City of Garden Grove - Water Division**  
**Water Rate Study**  
**Imported Water Costs at Projected Future Unit Costs**

Line No		FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22	Notes
1	Water Supply						
2	Supply Allocation, AF	23,000	23,000	23,000	23,000	23,000	
3	Percent % Groundwater	75%	75%	75%	75%	80%	
4	Percent % Purchased	25%	25%	25%	25%	20%	
5	AF Groundwater	17,250	17,250	17,250	17,250	18,400	
6	AF Purchased, AF						
7	MWD Imported	5,750	5,750	5,750	5,750	4,600	
8							
9	Water Supply Unit Costs						
10	MWD Imported Water Charge, \$/AF	\$1,015.00	\$1,053.00	\$1,092.00	\$1,123.00	\$1,164.00	
11	RA: Pumped Water, \$/AF	\$422.10	\$443.21	\$465.37	\$488.63	\$488.63	
12	Water Pumping Costs, \$/AF	\$54.45	\$56.08	\$57.76	\$59.49	\$59.49	
13							
14	MWD Imported Water Costs						
15	Calculated MWD Imported Water Charge, \$	\$5,836,250	\$6,128,063	\$6,434,466	\$6,756,189	\$5,675,199	
16	MWD Readiness to Serve Charge	\$266,094	\$279,399	\$293,369	\$308,037	\$323,439	
17	MWD Capacity Charge	\$100,260	\$0	\$0	\$0	\$0	(2)
18	MWD Connection Charge	\$400,304	427,279	448,643	471,075	494,629	
19	# of Connections	34,196	34,196	34,196	34,196	34,197	
20	\$/Connection	\$11.50	\$12.07	\$12.68	\$13.31	\$14.31	
21	Subtotal, MWD Imported Water Costs	\$6,602,908	\$6,834,740	\$7,176,477	\$7,535,301	\$6,493,266	
22							
23	RA Pumped Water Annual Cost	\$7,676,250	\$8,211,000	\$8,780,250	\$9,159,750	\$10,506,400	
24	Water Pumping Costs, Annual (4)	966,963	991,137	1,015,916	1,041,313	1,067,346	
25	Total Imported Water Costs	\$15,246,121	\$16,036,877	\$16,972,643	\$17,736,364	\$18,067,013	
26							
27	Change from FY 17/18						
28	MWD Imported Water Costs	\$0	\$231,832	\$573,569	\$932,393	(\$109,642)	
29	Groundwater Costs	\$0	\$558,924	\$1,152,953	\$1,557,850	\$2,930,533	
30	Total	\$0	\$790,756	\$1,726,522	\$2,490,243	\$2,820,892	

Notes

- (1) Source: Unless noted otherwise, Projected Purchased Water Costs, FY 16/17 from the City of Garden Grove. MWD Imported Water Costs, in \$/AF, from 2018 forward, from MWD's 2016 Ten-Year Financial Forecast (Attachment 2 to 2016/2017 and 2017/2018 Biennial Budget.)
- (2) Capacity Charge beginning FY 18/19 projected to increase at 3% per year. This is approximately equal to the rate of inflation used in the MWD Ten-Year Financial Forecast
- (3) Data Source: Projected Purchased Water Costs\_6.5.17 from City Staff, 6/5/17.
- (4) FY 17/18 Pumping Costs are calculated so that the total Water Production Cost equals that shown in the City's FY 17/18 budget. Subsequent year pumping cost is increased by General Inflation.

**Table A-9**  
**City of Garden Grove - Water Division**  
**Water Rate Study**

**Existing and Future Debt Service**

Line No	Existing Revenue Bond Debt Service	FY 16/17	FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22	FY 22/23	FY 23/24			
1	Revenue Bond 2010A	\$910,163	\$918,638	\$914,263	\$906,913	\$909,413	\$905,038	\$911,506	\$906,550			
2	Revenue Bond 2010B (Balloon 12/15/28 \$4.125M)	258,349	258,349	258,349	258,349	258,349	258,349	258,349	258,349			
3	Revenue Bond 2010C (Balloon 12/15/30 \$3.195M)	204,129	204,129	204,129	204,129	204,129	204,129	204,129	204,129			
4	Revenue and Refunding Bonds 2015	1,003,850	1,006,350	998,550	1,010,350	1,001,750	1,002,850	1,013,450	939,300			
5	2010 Bonds Premium Amortization	4,853	4,853	4,853	4,853	4,853	4,853	4,853	4,853			
6	2015 Bonds Premium Amortization	11,135	14,847	14,847	14,847	14,847	14,847	14,847	7,424			
7	<b>Total</b>	<b>\$2,392,478</b>	<b>\$2,407,164</b>	<b>\$2,394,989</b>	<b>\$2,399,439</b>	<b>\$2,393,339</b>	<b>\$2,390,064</b>	<b>\$2,407,133</b>	<b>\$2,320,603</b>			
8												
9												
10	<b>Proposed Debt Service</b>	<b>Issue Date</b>	<b>Issuance Amount</b>	<b>Interest Rate</b>	<b>Total Principal and Interest Payment</b>							
					<b>FY 17/18</b>	<b>FY 18/19</b>	<b>FY 19/20</b>	<b>FY 20/21</b>	<b>FY 21/22</b>	<b>FY 22/23</b>	<b>FY 23/24</b>	
11	CIEDB	17/18	\$0	3.5%	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
12	CIEDB	18/19	\$0	3.5%		0	0	0	0	0	0	
13	CIEDB	19/20	\$0	3.5%			0	0	0	0	0	
14	CIEDB	20/21	\$0	3.5%				0	0	0	0	
15	CIEDB	21/22	\$0	3.5%					0	0	0	
16	CIEDB	22/23	\$0	3.5%						0	0	
17	CIEDB	23/24	\$0	3.5%							0	
18	<b>Total</b>				<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	
19												
20	Revenue Bond/Private Placement	17/18	\$0	5.0%	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
21	Revenue Bond/Private Placement	18/19	\$15,375,000	5.0%		1,120,634	1,120,634	1,120,634	1,120,634	1,120,634	1,120,634	
22	Revenue Bond/Private Placement	19/20	\$0	5.0%			0	0	0	0	0	
23	Revenue Bond/Private Placement	20/21	\$0	5.0%				0	0	0	0	
24	Revenue Bond/Private Placement	21/22	\$0	5.0%					0	0	0	
25	Revenue Bond/Private Placement	22/23	\$0	5.0%						0	0	
26	Revenue Bond/Private Placement	23/24	\$0	5.0%							0	
27	<b>Total</b>				<b>\$0</b>	<b>\$1,120,634</b>	<b>\$1,120,634</b>	<b>\$1,120,634</b>	<b>\$1,120,634</b>	<b>\$1,120,634</b>	<b>\$1,120,634</b>	
28												
29	<b>Intercity Loan Debt Service</b>				<b>FY 16/17</b>	<b>FY 17/18</b>	<b>FY 18/19</b>	<b>FY 19/20</b>	<b>FY 20/21</b>	<b>FY 21/22</b>	<b>FY 22/23</b>	<b>FY 23/24</b>
30	Outstanding Principal Beginning year				\$13,374,978	\$13,374,978	\$12,711,965	\$12,021,769	\$11,303,274	\$10,555,322	\$9,776,703	\$8,966,161
31	Interest Rate (1)				6.50%	4.10%	4.10%	4.10%	4.10%	4.10%	4.10%	4.10%
32	Interest Payment				\$869,374	\$548,374	\$521,191	\$492,893	\$463,434	\$432,768	\$400,845	\$367,613
33	Principal Payment				0	663,013	690,196	718,494	747,953	778,619	810,542	843,774
34	Outstanding Principal, End of Year				\$13,374,978	\$12,711,965	\$12,021,769	\$11,303,274	\$10,555,322	\$9,776,703	\$8,966,161	\$8,122,386

Note:

(1) Interest rate changed to 4.1% beginning FY 17/18 per City Staff 11/9/2017

**Table A-10  
City of Garden Grove - Water Division  
Water Rate Study**

**Water Utility Operating Statement**

Line No		FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22	Notes
1	<b>FUND 601 (WATER OPERATIONS) SOURCES OF FUNDS</b>						
2	Beginning of Year Balance, Fund 601	\$8,610,247	\$8,427,620	\$7,312,240	\$7,308,926	\$8,443,710	
3							
4	Rate Revenues						
5	Water Sales Revenues under Existing Rates	\$29,880,011	\$29,880,011	\$29,880,011	\$29,880,011	\$29,880,011	(1)
6							
7	Additional Revenues From Rate Increases						(7)
8							
9	<u>Fiscal Year</u> <u>Percent Increase</u> <u>Months of Revenue</u>						
10	FY 17/18      12.40%      4	1,235,040	3,705,121	3,705,121	3,705,121	3,705,121	(7)
11	FY 18/19      11.30%      4		1,265,040	3,795,120	3,795,120	3,795,120	(7)
12	FY 19/20      3.50%      4			436,103	1,308,309	1,308,309	(7)
13	FY 20/21      3.50%      4				451,367	1,354,100	(7)
14	FY 21/22      3.50%      4					467,164	(7)
15	Total Additional Revenues	\$1,235,040	\$4,970,161	\$7,936,344	\$9,259,917	\$10,629,814	
16							
17	Total Rate Revenues	\$31,115,051	\$34,850,172	\$37,816,355	\$39,139,928	\$40,509,825	(2)
18							
19	Other Income						
20	Other Water Sales Revenue	\$154,500	\$4,500	\$4,500	\$4,500	\$4,500	
21	Other Revenues	25,000	25,000	25,000	25,000	25,000	
22	Non-Operating Revenues	220,385	220,385	220,385	220,385	220,385	
23	Total Other Income	\$399,885	\$249,885	\$249,885	\$249,885	\$249,885	
24							
25	Total Revenues	\$31,514,936	\$35,100,057	\$38,066,240	\$39,389,813	\$40,759,710	
26							
27	Total Sources of Funds	\$40,125,183	\$43,527,677	\$45,378,480	\$46,698,739	\$49,203,420	
28	<b>FUND 601 USES OF FUNDS</b>						
29	O&M Expenditures						
30	Salaries & Wages	\$5,776,453	\$6,007,511	\$6,247,812	\$6,497,724	\$6,757,633	
31	Contractual Services	7,557,919	7,927,772	7,583,182	7,742,477	7,905,754	
32	Materials & Supplies	709,906	727,654	745,845	764,491	783,603	
33	Water Production Expenses	15,246,121	16,036,877	16,972,643	17,736,364	18,067,013	
34	Subtotal O&M Expenditures	\$29,290,399	\$30,699,814	\$31,549,481	\$32,741,056	\$33,514,003	(4)
35							
36	Debt Service						
37	Future CIEDB Debt Service						

**Table A-10  
City of Garden Grove - Water Division  
Water Rate Study**

**Water Utility Operating Statement**

<b>Line No</b>		<b>FY 17/18</b>	<b>FY 18/19</b>	<b>FY 19/20</b>	<b>FY 20/21</b>	<b>FY 21/22</b>	<b>Notes</b>
38	Existing Revenue Bond Debt Service	\$2,407,164	\$2,394,989	\$2,399,439	\$2,393,339	\$2,390,064	
39	Future Revenue Bond Debt Service	0	1,120,634	1,120,634	1,120,634	1,120,634	
40	Subtotal Debt Service	\$2,407,164	\$3,515,623	\$3,520,073	\$3,513,973	\$3,510,698	
41							
42	Transfer to Fund 602	\$0	\$0	\$0	\$0	\$0	
43	Transfer to Fund 603	\$0	\$2,000,000	\$3,000,000	\$2,000,000	\$2,000,000	
44							
45	Total Uses of Funds	\$31,697,563	\$36,215,438	\$38,069,554	\$38,255,030	\$39,024,701	
46							
47	End of Year Balance, Fund 601	\$8,427,620	\$7,312,240	\$7,308,926	\$8,443,710	\$10,178,719	
48							
49	<b>FINANCIAL PERFORMANCE INDICATORS</b>						
50	End of Year (EOY) Reserve Balance Criteria #1						
51	EOY601 Fund Reserve Balance	\$8,427,620	\$7,312,240	\$7,308,926	\$8,443,710	\$10,178,719	
52	Target Reserve Balance						
53	2 Months O&M Expenses	\$4,881,733	\$5,116,636	\$5,258,247	\$5,456,843	\$5,585,667	
54	Plus \$500,000 for Contingencies	500,000	500,000	500,000	500,000	500,000	
55	Subtotal	\$5,381,733	\$5,616,636	\$5,758,247	\$5,956,843	\$6,085,667	
56	Exceeds Target?	Yes	Yes	Yes	Yes	Yes	
57							
58	End of Year (EOY) Reserve Balance Criteria #2						
59	Criteria: Total combined fund 601,602,603 Reserves						
60	Combined EOY 601,602,603 Balance	\$13,936,280	\$23,415,602	\$19,667,032	\$16,072,197	\$13,093,770	
61	Target Reserve Balance						
62	2 months O&M Expenses	4,881,733	5,116,636	5,258,247	5,456,843	5,585,667	
63	Plus \$500,000 for Contingencies	500,000	500,000	500,000	500,000	500,000	
64	Plus 5% of Net Plant (3)	6,940,000	6,940,000	6,940,000	6,940,000	6,940,000	
65	Subtotal	\$12,321,733	\$12,556,636	\$12,698,247	\$12,896,843	\$13,025,667	
66	Exceeds Target?	Yes	Yes	Yes	Yes	Yes	
67	Available Reserves for Capital Projects	\$1,614,547	\$10,858,966	\$6,968,786	\$3,175,354	\$68,103	
68							
69	Debt Service Coverage Ratio						
70	Gross Revenue	\$32,019,126	\$35,648,373	\$38,649,598	\$39,988,807	\$41,374,888	
71	Less O&M Expenses	(\$27,797,246)	(\$29,488,427)	(\$30,338,094)	(\$31,529,669)	(\$32,302,616)	(4)
72	Revenue Available for Debt Service	\$4,221,880	\$6,159,946	\$8,311,504	\$8,459,138	\$9,072,272	
73							
74	Revenue Bond Debt Service	\$2,407,164	\$3,515,623	\$3,520,073	\$3,513,973	\$3,510,698	

**Table A-10  
City of Garden Grove - Water Division  
Water Rate Study**

**Water Utility Operating Statement**

<b>Line No</b>		<b>FY 17/18</b>	<b>FY 18/19</b>	<b>FY 19/20</b>	<b>FY 20/21</b>	<b>FY 21/22</b>	<b>Notes</b>
75	Debt Service Coverage Ratio	1.75	1.75	2.36	2.41	2.58	
76							
77	<b>FUND 602 (WATER CAPITAL) SOURCES OF FUNDS</b>						
78	Beginning of Year Balance, Fund 602	\$8,744,205	\$5,395,365	\$15,465,650	\$11,195,978	\$6,941,942	
79							
80	Capital Improvement Charge						
81	Revenues Under Existing Rates	\$353,000	\$353,000	\$353,000	\$353,000	\$353,000	
82							
83	Additional Rate Revenues						(7)
84							
85	<b>Fiscal Year</b>	<b>% Increase</b>	<b>Months of Revenue</b>				
86	FY 17/18	12.40%	4	14,591	43,772	43,772	43,772 (7)
87	FY 18/19	11.30%	4		14,945	44,835	44,835 (7)
88	FY 19/20	3.50%	4			5,152	15,456 (7)
89	FY 20/21	3.50%	4			5,332	15,997 (7)
90	FY 21/22	3.50%	4			5,519	5,519 (7)
91	Total Additional Revenues Required	\$14,591	\$58,717	\$93,759	\$109,395	\$125,579	
92							
93	Other Revenues	\$104,699	\$104,699	\$104,699	\$104,699	\$104,699	
94	CIEDB Debt Proceeds	0	0	0	0	0	
95	Revenue Bond Debt Proceeds	0	15,375,000	0	0	0	
96	Transfer From Fund 601	0	0	0	0	0	
97	Total Sources of Funds, 602	\$9,216,495	\$21,286,781	\$16,017,108	\$11,763,072	\$7,525,220	
98							
99	<b>FUND 602 (WATER CAPITAL) USES OF FUNDS</b>						
100	Capital Improvements	\$3,821,130	\$3,821,130	\$3,821,130	\$3,821,130	\$3,821,130	(5)
101	Transfer to Fund 603	0	2,000,000	1,000,000	1,000,000	1,000,000	
102	Capitalized Labor	0	0	0	0	0	
103	Total Use of Funds	\$3,821,130	\$5,821,130	\$4,821,130	\$4,821,130	\$4,821,130	
104							
105	Ending Year Fund Balance, Fund 602	\$5,395,365	\$15,465,650	\$11,195,978	\$6,941,942	\$2,704,089	
106							
107	<b>FUND 603 (WATER REPLACEMENT) SOURCES OF FUNDS</b>						
108	Beginning of Year Balance, Fund 603	\$3,588,879	\$113,295	\$637,712	\$1,162,129	\$686,545	
109							
110	Other Revenues (Interest)	\$31,900	\$31,900	\$31,900	\$31,900	\$31,900	
111	Transfer From Fund 601	0	2,000,000	3,000,000	2,000,000	2,000,000	



**Table A-10  
City of Garden Grove - Water Division  
Water Rate Study**

**Water Utility Operating Statement**

<b>Line No</b>		<b>FY 17/18</b>	<b>FY 18/19</b>	<b>FY 19/20</b>	<b>FY 20/21</b>	<b>FY 21/22</b>	<b>Notes</b>
112	Transfer From Fund 602	0	2,000,000	1,000,000	1,000,000	1,000,000	
113	Total Sources of Funds, 603	\$3,620,778	\$4,145,195	\$4,669,612	\$4,194,028	\$3,718,445	
114							
115	<b>FUND 603 (WATER REPLACEMENT) USES OF FUNDS</b>						
116	Replacement Expenditures	\$3,507,483	\$3,507,483	\$3,507,483	\$3,507,483	\$3,507,483	(6)
117	Capitalized Labor	0	0	0	0	0	
118	Total Use of Funds	\$3,507,483	\$3,507,483	\$3,507,483	\$3,507,483	\$3,507,483	
119							
120	Ending Year Fund Balance, Fund 603	\$113,295	\$637,712	\$1,162,129	\$686,545	\$210,962	

Notes

- (1) Includes all revenues from the Monthly Minimum Charge and the Commodity Charge, including revenues currently labelled as "Water Costs".
- (2) Includes a portion of the Commodity Delivery Charge that is adjusted on an annual basis, based on changes in water production expenses
- (3) Five percent of Net Plant is calculated as 5% of \$138.8M, cost of original plant, per City.
- (4) O&M expenses for purposes of debt service coverage calculation do not include intercity loan interest and intercity loan principal  
The O&M expenses in the debt service calculation will differ from the O&M expense on line 35 above.
- (5) Equals five-year capital cost estimate of \$19,105,652 spread evenly over the five-year period.
- (6) Equals five-year replacement cost estimate of \$17,537,415 spread evenly over the five-year period.
- (7) Revenues from Rate Increases are shown as percentage increases over current revenues and do not reflect the proposed rate structure shown in Table C-1.

**Table B-1  
City of Garden Grove - Water Division  
Water Rate Study**

**Water System Cost-of-Service Analysis, FY 17/18 - Functionalization Factors**

Line No.	Functionalization Factors	Total	Pumping	Storage	T&D	Customer	Meter	Admin	Rate Tier Calculation	Fire Protection	Notes
1	Direct: Pumping	100.0%	100.0%								Direct: Pumping
2	Direct: Storage	100.0%		100.0%							Direct: Storage
3	Direct: T&D	100.0%			100.0%						Direct: T&D
4	Direct: Customer	100.0%				100.0%					Direct: Customer
5	Direct: Meter	100.0%					100.0%				Direct: Meter
6	Direct: Admin	100.0%						100.0%			Direct: Admin
7	Direct: Rate Tier Calculation	100.0%							100.0%		Direct: Rate Tier Calculation
8	Direct: Fire Protection	100.0%								100.0%	Direct: Fire Protection
9	Direct: Wells, Reservoirs	100.0%	50.0%		50.0%						Direct: Wells, Reservoirs
10	Direct: Water Master Plan	100.0%	25.0%	25.0%	50.0%					25.0%	Direct: Water Master Plan
11	Direct: T&D and Customer	100.0%			50.0%	50.0%					Direct: T&D and Customer
12	Debt Service: % (2)	100.0%	8.7%	41.7%	31.9%	0.0%	8.8%	0.0%	7.3%	1.6%	Debt Service
13	Recurring Capital After CA Year 5 (3)	100.0%	5.3%	46.2%	10.3%	0.0%	32.3%	0.0%	0.0%	6.0%	Recurring Capital After CA Year 5
14	Package 3700 Labor: (4)	100.0%	15.7%	3.8%	43.7%	15.3%	2.6%	0.0%	18.4%	0.5%	Package 3700 Labor
15	Package 3114 - Drainage/Misc Maintenance (5)	100.0%			50.0%	50.0%					Package 3114
16	Package 3700 Contractual Expense		12.3%	2.9%	34.2%	20.5%	2.1%	13.3%	14.4%	0.4%	Package 3700 Contractual Expense
17	Materials and Supplies, Amount	\$709,906	\$98,951	\$23,697	\$274,726	\$96,237	\$16,553	\$0	\$196,642	\$3,100	
18	Materials and Supplies, Percentage	100.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	Materials and Supplies
19	Rate Revenue Requirement	100.0%	5.3%	12.8%	14.5%	7.0%	7.0%	10.1%	42.0%	1.3%	Rate Revenue Requirement
20	Phase 1 CIP, Amount	\$37,857,916	\$2,001,692	\$17,478,382	\$3,881,972	\$0	\$12,209,386	\$0	\$0	\$2,286,483	
21	Phase 1 CIP, Percentage	100.0%	5.3%	46.2%	10.3%	0.0%	32.3%	0.0%	0.0%	6.0%	Phase 1 CIP
22	Water Production, Amount (6)	\$15,246,121	\$439,147						\$14,806,974		
23	Water Production, Percentage	100.0%	2.9%	0.0%	0.0%	0.0%	0.0%	0.0%	97.1%	0.0%	Water Production

Notes for Tables B-1 through B-5

- (1) Refer to Table B-2
- (2) Refer to Table B-3
- (3) Refer to Table B-3
- (4) Refer to Table B-10
- (5) Per City staff (7/11/17), this is miscellaneous maintenance performed by the Street Department repairing trenches and sidewalks following maintenance of water system facilities.
- (6) Per City staff (7/11/17), natural gas expenses are approximately 70% booster pumping and 30% source production, and electricity expenses are 70% source production and 30% pumping.

**Table B-3  
City of Garden Grove - Water Division  
Water Rate Study**

**Water System Cost-of-Service Analysis - Functionalization of Phase 1 CIP**

Line	Project	Total Phase 1							Rate Tier Calculation	Fire Protection	Total
		Capital Spending	Pumping	Storage	T&D	Customer	Meter	Admin			
1	Replace Misc. Distribution System Appurtenances (BO,ARV, Vac)	\$286,232			100%						100%
2	Service Line Replacements	7,068,075					100%				100%
3	Fire Hydrant Replacements	1,866,270							100%		100%
4	Meter Replacements	5,141,311					100%				100%
5	Gate Valve Replacements	3,175,527			100%						100%
6	Site Modifications to Place Manually Operated Wells on SCADA	628,506	25%	25%	25%				25%		100%
7	Portable Back-up Power Units	1,047,510	100%								100%
8	Reservoir Rehabilitations _ Near Term West Haven Reservoir Projects	4,599,808		100%							100%
9	Reservoir Rehabilitations_Trask Reservoirs Medium and High Priorities	1,055,106		100%							100%
10	Reservoir Rehabilitations_Trask Reservoirs Low Priorities	1,943,366		100%							100%
11	Trast Reservoir Site Mechanical and Security - High and Medium Prio	183,763		100%							100%
12	Reservoir Rehabilitations - Magnolia Reservoir Medium and High Prio	549,598		100%							100%
13	Reservoir Rehabilitations Magnolia Reservoir Low Priorities	1,691,723		100%							100%
14	Magnolia Reservoir Site Mechanical and Security - High and Medium P	113,874		100%							100%
15	Magnolia Reservoir Site Mechanical and Security - Low Priority	3,383		100%							100%
16	Reservoir Rehabilitations West Garden Grove Reservoir Medium and H	988,389		100%							100%
17	Reservoir Rehabilitations West Garden Grove Reservoir Low Priorities	3,171,980		100%							100%
18	West Garden Grove Reservoir Site Mechanical and Security - High & M	64,708		100%							100%
19	Reservoir Rehabilitations Lampson Reservoir Medium and High Prio	1,513,246		100%							100%
20	Reservoir Rehabilitations _ Lampson Reservoir Low Priorities	338,345		100%							100%
21	Lampson Reservoir Site Mechanical and Security - High & Medium Prio	55,247		100%							100%
22	Exhaust Stack Corrections	22,129	100%								100%
23	West GG Sumps	511,840	100%								100%
24	Underground Vault Rehabilitation	785,633		100%							100%
25	Asset Management Study	327,347	25%	25%	25%				25%		100%
26	Masterplan Update	550,000	25%	25%	25%				25%		100%
27	Cyber Security	175,000	25%	25%	25%				25%		100%
	<b>Total</b>	<b>\$37,857,916</b>	<b>\$2,001,692</b>	<b>\$17,478,382</b>	<b>\$3,881,972</b>	<b>\$0</b>	<b>\$12,209,386</b>	<b>\$0</b>	<b>\$0</b>	<b>\$2,286,483</b>	<b>\$37,857,916</b>
	As Percent		5%	46%	10%	0%	32%	0%	0%	6%	100%

Note: functionalization percentages developed by FG Solutions based on project descriptions provided by West Yost and the City, and conversations with West Yost and the City.

**Table B-4  
City of Garden Grove - Water Division  
Water Rate Study**

**Water System Cost-of-Service Analysis, FY 17/18 - Functionalization of Debt Service Payments**

Line	Debt Issuance (1)	Five Year Total, \$	Pumping	Storage	T&D	Customer	Meter	Admin	Rate Tier Calculation	Fire Protection	Total
1	Existing Debt (1)										
2	Revenue Bond 2010A	\$4,554,263	10%	40%	40%				10%		100%
3	Revenue Bond 2010B	\$1,291,744	10%	40%	40%				10%		100%
4	Revenue Bond 2010C	\$1,020,643	10%	40%	40%				10%		100%
5	Revenue and Refunding Bonds 2015	\$5,019,850	10%	40%	40%				10%		100%
6	2010 Bonds Premium Amortization	\$24,263	10%	40%	40%				10%		100%
7	2015 Bonds Premium Amortization	\$74,236	10%	40%	40%				10%		100%
8											
9	Future Debt										
10	Revenue Bond	\$4,482,536	5.3%	46.2%	10.3%	0.0%	32.3%	0.0%	0.0%	6.0%	100%
11	Total	\$16,467,533	\$1,435,508	\$6,863,513	\$5,253,641	\$0	\$1,445,642	\$0	\$1,198,500	\$270,729	
12	As Percent	100%	8.7%	41.7%	31.9%	0.0%	8.8%	0.0%	7.3%	1.6%	

Notes:

(1) Refer to Table B-11 for a description of how functionalization percentages were developed.

**Table B-5  
City of Garden Grove - Water Division  
Water Rate Study**

**Water System Cost-of-Service Analysis, FY 17/18 - Functionalization of O & M Expenses**

Line No.	FY 17/18 Total	Table B-1								Line No. Reference	Functionalization Factor	
		Pumping	Storage	T&D	Customer	Meter	Admin	Rate Tier Calculations	Fire Protection			
1	Salaries and Wages											
2	0010 - CITY COUNCIL	\$12,059	\$0	\$0	\$0	\$0	\$0	\$12,059	\$0	\$0	6	Direct: Admin
3	0020 - MANAGEMENT	79,985	0	0	0	0	0	79,985	0	0	6	Direct: Admin
4	0023 - RESRCH/LEGISLATION	60,936	0	0	0	0	0	60,936	0	0	6	Direct: Admin
5	0030 - REAL PROPERTY	7,473	0	0	0	0	0	7,473	0	0	6	Direct: Admin
6	0053 - REPROGRAPHICS	0	0	0	0	0	0	0	0	0	6	Direct: Admin
7	0060 - PUBLIC INFORMATION	0	0	0	0	0	0	0	0	0	6	Direct: Admin
8	1020 - GENERAL ACCOUNTING	51,859	0	0	0	0	0	51,859	0	0	6	Direct: Admin
9	1021 - FINANCIAL PLANNING	171,724	0	0	0	0	0	171,724	0	0	6	Direct: Admin
10	1030 - UTILITY BILLING	481,387	0	0	0	0	0	481,387	0	0	6	Direct: Admin
11	2160 - PLAN CHECK/PERMITS	33,328	0	0	0	0	0	33,328	0	0	6	Direct: Admin
12	3000 - PUBL WORKS GEN ADMN	60,027	0	0	0	0	0	60,027	0	0	6	Direct: Admin
13	3010 - ENVIRONMENTAL MGMT	47,469	0	0	0	0	0	47,469	0	0	6	Direct: Admin
14	3043 - NPDES PROGRAM	23,769	0	0	0	0	0	23,769	0	0	6	Direct: Admin
15	3114 - DRAINAGE/MISC MAINT	297,940	0	0	148,970	148,970	0	0	0	0	15	Package 3114
16	3121 - TRAFFIC SIGN MAINT	0	0	0	0	0	0	0	0	0	14	Package 3700 Labor
17	3123 - TRAFFIC SIG MAINT	0	0	0	0	0	0	0	0	0	14	Package 3700 Labor
18	3220 - DEDICATED FAC/WTR	75,374	11,862	2,841	32,934	11,537	1,984	0	13,844	372	14	Package 3700 Labor
19	3510 - GROUNDS MAINTENANCE	316,624	0	316,624	0	0	0	0	0	0	2	Direct: Storage
20	3610 - EQ SERV OPERATIONS	0	0	0	0	0	0	0	0	0	14	Package 3700 Labor
21	3700 - WATER OPERATIONS	4,056,499	638,401	152,883	1,772,455	620,893	106,795	0	745,071	20,000	14	Package 3700 Labor
22	3710 - WATER PRODUCTION	0	0	0	0	0	0	0	0	0	14	Package 3700 Labor
23	6007 - EMPLOYEE TRAINING	0	0	0	0	0	0	0	0	0	6	Direct: Admin
24	9800 - GASB68 WATER FUND	0	0	0	0	0	0	0	0	0	14	Package 3700 Labor
25	9807 - OPEB WATER FUND	0	0	0	0	0	0	0	0	0	14	Package 3700 Labor
26	- OPEB ALLOC ADJ	0	0	0	0	0	0	0	0	0	14	Package 3700 Labor
27												
28	Contractual Services											
29	0030 - REAL PROPERTY	92	0	0	92	0	0	0	0	0	3	Direct: T&D
30	0042 - ELECT/VOTER ASSIST	0	0	0	0	0	0	0	0	0	4	Direct: Customer
31	0053 - REPROGRAPHICS	4,600	0	0	0	0	0	4,600	0	0	6	Direct: Admin
32	0060 - PUBLIC INFORMATION	11,500	0	0	0	11,500	0	0	0	0	4	Direct: Customer
33	1000 - FINANCE ADMN/ANAL	2,500	0	0	0	0	0	2,500	0	0	6	Direct: Admin
34	1020 - GENERAL ACCOUNTING	6,593	0	0	0	0	0	6,593	0	0	6	Direct: Admin
35	1021 - FINANCIAL PLANNING	11,116	0	0	0	0	0	11,116	0	0	6	Direct: Admin
36	1024 - ACCOUNTS PAYABLE	1,250	0	0	0	0	0	1,250	0	0	6	Direct: Admin
37	1030 - UTILITY BILLING	427,277	0	0	0	427,277	0	0	0	0	4	Direct: Customer
38	1034 - REVENUE OPERATIONS	0	0	0	0	0	0	0	0	0	6	Direct: Admin
39	2160 - PLAN CHECK/PERMITS	0	0	0	0	0	0	0	0	0	4	Direct: Customer
40	3000 - PUBL WORKS GEN ADMN	34,480	0	0	0	0	0	34,480	0	0	6	Direct: Admin
41	3010 - ENVIRONMENTAL MGMT	964	0	0	0	0	0	964	0	0	6	Direct: Admin
42	3043 - NPDES PROGRAM	314,475	0	0	0	0	0	314,475	0	0	6	Direct: Admin
43	3114 - DRAINAGE/MISC MAINT	91,822	0	0	45,911	45,911	0	0	0	0	15	Package 3114
44	3510 - GROUNDS MAINTENANCE	49,216	0	49,216	0	0	0	0	0	0	2	Direct: Storage
45	3610 - EQ SERV OPERATIONS	0	0	0	0	0	0	0	0	0	6	Direct: Admin

46	3700 - WATER OPERATIONS	1,940,746	238,776	57,182	662,936	398,007	39,944	257,749	278,673	7,480	16	Package 3700 Contractual Expense
47	3710 - WATER PRODUCTION	0	0	0	0	0	0	0	0	0	7	Direct: Rate Tier Calculation
48	WTR LTD,DEPR,O/H											
49	CONTRACTUAL SERV	0	0	0	0	0	0	0	0	0	6	Direct: Admin
50	WATER REPAIR/MAINT	0	0	0	0	0	0	0	0	0	14	Package 3700 Labor
51	BANK FEES	0	0	0	0	0	0	0	0	0	6	Direct: Admin
52	Overhead Fee	2,439,100	0	0	0	0	0	2,439,100	0	0	6	Direct: Admin
53	City Street Damages (Intercity Loan Interest)	830,140	0	0	415,070	415,070	0	0	0	0	11	Direct: T&D and Customer
54	City Street Damages (Intercity Loan Principal)	663,013	0	0	331,506	331,506	0	0	0	0	11	Direct: T&D and Customer
55	City Street Damages	719,860	0	0	359,930	359,930	0	0	0	0	11	Direct: T&D and Customer
56												
57	WATER LTD-2010A											See Table B-4
58	WATER LTD-2010B											See Table B-4
59	WATER LTD-2010C											See Table B-4
60	2015 WTR REV BONDS											See Table B-4
61	LEGAL SERVICES	0	0	0	0	0	0	0	0	0	6	Direct: Admin
62	EMPLOYEE TRAINING	3,175	500	120	1,387	486	84	0	583	16	14	Package 3700 Labor
63	800MHZ P25 RDO DEP	1,614	254	61	705	247	42	0	296	8	14	Package 3700 Labor
64	800MHZ VEH FND DEBT	4,386	690	165	1,916	671	115	0	806	22	14	Package 3700 Labor
65	INFORMATION SYSTEMS	0	0	0	0	0	0	0	0	0	6	Direct: Admin
66	ALLOW FOR BAD DEBT ADJ	0	0	0	0	0	0	0	0	0	6	Direct: Admin
67												
68	<b>Materials &amp; Supplies</b>	709,906	111,723	26,755	310,188	108,659	18,690	0	130,391	3,500	14	Package 3700 Labor
69												
70	<b>Water Production Expenses</b>	15,246,121	439,147	0	0	0	0	0	14,806,974	0	23	Water Production
71												
72	Total	\$29,290,399	\$1,441,353	\$605,847	\$4,084,000	\$2,880,664	\$167,654	\$4,102,843	\$15,976,638	\$31,398		
73	Math Check:	\$29,290,399	this is O&M expenses									
		\$0										

**Table B-6**  
**City of Garden Grove - Water Division**  
**Water Rate Study**  
**Water System Cost-of-Service Analysis, FY 17/18 - Functionalization of Rate Revenue Requirement**

Line No.	FY 17/18 Total	Table B-1								Line No. Reference	Functionalization Factor	
		Pumping	Storage	T&D	Customer	Meter	Admin	Rate Tier Calculations	Fire Protection			
1	O&M Expenses											
2	Water Production Expenses	\$15,246,121	\$439,147	\$0	\$0	\$0	\$0	\$14,806,974	\$0	N/A	Table B-5	
3	Other	\$14,044,278	\$1,002,206	\$605,847	\$4,084,000	\$2,880,664	\$167,654	\$4,102,843	\$1,169,664	\$31,398	N/A	Table B-5
4	Debt Service	\$2,407,164	\$209,837	\$1,003,283	\$767,958	\$0	\$211,319	\$0	\$175,192	\$39,574	N/A	Percentages from Table B-4
5	Capital Improvements	\$3,821,130	202,038	1,764,154	391,821	0	1,232,336	0	0	230,783	21	Phase 1 CIP
6	Replacement Expenditures	\$3,507,483	185,454	1,619,348	359,659	0	1,131,183	0	0	211,839	21	Phase 1 CIP
7	Less Other Revenues											
8	601 Fund											
9	32630 - WATER PROC FEE	0	0	0	0	0	0	0	0	0	6	Direct: Admin
10	32636 - LATE FEE (4)	(150,000)	0	0	0	(150,000)	0	0	0	0	4	Direct: Customer
11	32638 - AFTER HRS SERV CHG	(500)	0	0	0	0	0	(500)	0	0	6	Direct: Admin
12	32855 - NSF FEE	(4,000)	0	0	0	(4,000)	0	0	0	0	4	Direct: Customer
13	- OTHER	(25,000)	0	0	0	0	0	(25,000)	0	0	6	Direct: Admin
14	34501 - INTEREST	(56,385)	0	0	0	0	0	(56,385)	0	0	6	Direct: Admin
15	34330 - SALE OF SCRAP	(22,000)	0	0	0	0	0	(22,000)	0	0	6	Direct: Admin
16	34340 - SALE OF MATERIALS	(7,000)	0	0	0	0	0	(7,000)	0	0	6	Direct: Admin
17	38267 - 2010 FED SUBSIDY	(135,000)	(7,138)	(62,327)	(13,843)	0	(43,538)	0	0	(8,154)	21	Phase 1 CIP
18	602 Fund											
19	32650 - SERVICE INSTALL FEES	(39,000)	0	0	0	(39,000)	0	0	0	0	4	Direct: Customer
20	32652 - FRONTAGE ASSMT FEE	(6,000)	0	0	0	0	0	(6,000)	0	0	6	Direct: Admin
21	32655 - ACREAGE ASSMT FEE	(4,000)	0	0	0	0	0	(4,000)	0	0	6	Direct: Admin
22	34501 - INTEREST	(55,699)	0	0	0	0	0	(55,699)	0	0	6	Direct: Admin
23	603 Fund											
24	34501 - INTEREST	(31,900)	0	0	0	0	0	(31,900)	0	0	6	Direct: Admin
25	Change in Fund Balance	(7,007,051)	(370,489)	(3,235,041)	(718,507)	0	(2,259,812)	0	0	(423,201)	21	Phase 1 CIP
26												
27	Rate Revenue Requirement	\$31,482,642	\$1,661,055	\$1,695,264	\$4,871,088	\$2,687,664	\$439,142	\$3,894,359	\$16,151,830	\$82,239		
28												
29	Math Check Rate Revenue Requirement	31,482,642										
30	Difference	0										

**City of Garden Grove - Water Division  
Water Rate Study  
Table B-7  
Water Cost-of-Service Analysis - Classification Factors**

Line No.	Classification Method	Base	Extra Capacity		Customer		Rate Tier Calculation	Fire Protection	
			Max Day	Max Hour	Customer	Meter			
1	Direct: Base	100%							Direct: Base
2	Direct: Max Day		100%						Direct: Max Day
3	Direct: Max Hour			100%					Direct: Max Hour
4	Direct: Customer				100%				Direct: Customer
5	Direct: Meters & Services					100%			Direct: Meters & Services
6	Direct: Rate Tier Calculation						100%		Direct: Rate Tier Calculation
7	Direct: Fire Protection							100%	Direct: Fire Protection
8	Direct: Purchased Source (1)	50%					50%		Direct: Purchased Source
9	Base and Max Day (gpm) (1)	14,258	6,416						
10	Base and Max Day: %	68.97%	31.03%						Base and Max Day
11	Weighted Average: %	32.96%	14.69%	7.79%	23.50%	3.84%	0.00%	17.22%	Weighted Average ex Rate Tier Calc
12	Base, Max Day, Max Hour (gpm) (1)	14,258	6,416	8,270					
13	Base, Max Day, Max Hour: %	49.26%	22.17%	28.57%					Base, Max Day, Max Hour
14	Storage (2)	64.20%	27.93%					7.88%	Storage
15	Administration (3)	32.96%	14.69%	7.79%	23.50%	3.84%	0.00%	17.22%	
16	Transmission and Distribution (4)	31.53%	14.19%	18.29%				36.00%	Transmission and Distribution

Notes:

- (1) Refer to Table B-11 for further details. Based on actual production data from FY 15/16 provided by RWS to FG Solutions in December 2016
- (2) Refer to Table B-11 for further details
- (3) Based on a Weighted Average of other items in Table B-7 below excluding Rate Tier Calculations
- (4) 36% allocated to fire protection, remainder is allocated based on the Base, Max Day, and Max Hour classification factor. See Table B-11 for calculation



**City of Garden Grove - Water Division  
Water Rate Study  
Table B-8  
Water Cost-of-Service Analysis - Allocation of Rate Revenue Requirement**

Line No.	FY 17/18 Projection	Extra Capacity			Customer		Rate Tier	Private	Table B-6
		Base	Max Day (2)	Max Hour(2)	Customer	Meter	Calculations (1)	Fire Protection	Line No. Reference
1	Water System Expenses								
2	Pumping	\$1,661,055	\$1,145,555	\$515,500	\$0	\$0	\$0	\$0	10
3	Storage	\$1,695,264	\$1,088,287	\$473,405	\$0	\$0	\$0	\$133,573	14
4	T&D	\$4,871,088	\$1,535,713	\$691,071	\$890,713	\$0	\$0	\$1,753,592	16
5	Customer	\$2,687,664	\$0	\$0	\$0	\$2,687,664	\$0	\$0	4
6	Meter	\$439,142	\$0	\$0	\$0	\$0	\$439,142	\$0	5
7	Administration (3)	\$3,894,359	\$1,283,615	\$572,068	\$303,307	\$915,208	\$149,537	\$0	\$670,625
8	Rate Tier Calculations	\$16,151,830	\$0	\$0	\$0	\$0	\$16,151,830	\$0	6
9	Fire Protection	\$82,239	\$0	\$0	\$0	\$0	\$0	\$82,239	7
10	Reallocate Public FP (4)	\$0	\$0	\$0	\$0	\$2,230,825	\$0	(\$2,230,825)	Not Applicable
11	<b>Total</b>	<b>\$31,482,642</b>	<b>\$5,053,170</b>	<b>\$2,252,044</b>	<b>\$1,194,020</b>	<b>\$3,602,872</b>	<b>\$2,819,504</b>	<b>\$16,151,830</b>	<b>\$409,204</b>
12	Percent of Total	100%	16%	7%	4%	11%	9%	51%	1%
13	Check, OS	\$31,482,642							

Notes:

- (1) Refer to Table COS-5 for Functionalization totals. In particular, purchase source refers only to source costs that are not part of the Rate Tier calculations
- (2) Peaking costs associated with Max-Day and Max-Hour extra capacity are also included in the Rate Tier Calculation in Table C1
- (3) Administrative costs are based on a weighted average of other items in this table except those allocated to the Rate Tier Calculations. They are not allocated to the Rate Tier Calculation to improve the transparency of the Rate Tier Calculation
- (4) See Table B-8

**City of Garden Grove  
Water Division - Water Rate Study  
Table B-9  
Water Cost-of-Service Analysis - Re-Allocate Public Fire Protection Costs**

Line			
1	Fire Protection Revenue Requirement	\$2,640,029	See Table B- 7, rows 1 through 9
2	Number of Fire Protection Equivalent Connections:	526,652	See Table B-11, Section 3
3	Annual Cost per Fire Protection Equivalent Connection	\$5.01	
4			
5	Number of Private Fire Protection Equivalent Connections:	81,631	See Table B-11, Section 3
6	Annual Revenue Requirement from Private Fire Protection Equivalent Connection:	\$409,204	
7			
8	Number of Public Fire Protection Equivalent Connection:	445,021	See Table B-11, Section 3
9	Annual Revenue Requirement from Public Fire Protection Equivalent Connection:	\$2,230,825	
10	This Revenue Will Be Recovered from Customers on a per-Meter Equivalent Basis:		
11			
12	Cost recovery by meter equivalent is proposed in this Rate Study because customers with larger meters typically have		
13	larger fire flow requirements. Cost recovery by meter equivalent is one method that is listed as possible in the		
14	AWWA M1 Manual, 7th Edition, pages 165 and 166 (Table IV.8-5.		

**City of Garden Grove - Water Division  
Water Rate Study  
Table B-10  
Identification of Costs to be Included in Rate Tier Calculations**

**Step 1. Calculate Unit Cost of Production/Purchase from Each Water Source (FY 17/18)**

Line	Water Source	Production FY 17/18 AF (1)	Production FY 17/18 CCF (1,2,3)	Consumption FY 17/18 CCF (4)	FY 17/18 \$/ccf (2)	Source Water Allocated Costs
1	MWD Imported Water	5,750	2,504,700	2,226,661	\$2.97	\$6,602,908
2	Pumped Water	17,250	7,514,100	6,679,984	\$1.43	\$9,548,922
3						
4	Total	23,000	10,018,800	8,906,646		\$16,151,830

6 Notes:

- 7 (1) Refer to Table A-7 for acre-feet by source and total Water Production Cost for FY 17/18. Water production volume in ccf is calculated from the value in acre-feet.
- 8 The Source Water Production Cost equals the total water production cost less 30% of electricity costs and 70% of natural gas costs
- 9 (2) The cost for MWD Imported Water is shown in Table A-7.
- 10 (3) The cost for water pumped from the City's wells equals the total costs allocated to Rate Tier Calculations in Table B-5 minus MWD Imported Water costs.
- 11 All costs associated with the Rate Tier Calculations that are not for the purchase of MWD Imported Water are associated with production of water from local wells.
- 12 (4) The volume of metered consumption is less than the volume of source production due to non-revenue water which includes leaks. The ratio of metered consumption to
- 13 production shown in this table is calculated from the ratio of metered consumption to production observed in FY 15/16

**Step 2. Define Allocation of Water Production/Purchase Costs Among Tiers (Budget-Based Rate Alternative Only)**

Source	FY 17/18 \$/ccf	FY 17/18 ccf (2)	Indoor Tier ccf (2,3)	Outdoor Tier ccf (2)	Excessive Tier ccf (2)	Indoor Tier \$	Outdoor Tier \$	Excessive Tier \$	Total \$
MWD Imported Water	\$2.97	2,226,661	0	1,262,971	963,690	\$0	\$3,745,195	\$2,857,713	\$6,602,908
Recharge Assessment Pumped Water	\$1.43	6,679,984	6,026,591	653,393	0	8,614,908	934,014	0	9,548,922
Total			6,026,591	1,916,364	963,690	\$8,614,908	\$4,679,209	\$2,857,713	\$16,151,830

- 24 (1) This column represents production data. Subsequent columns showing ccf in each tier are metered consumption
- 25 (2) See Table C-1 for amounts of water estimated to be sold in each tier.
- 26 (3) Indoor tier ccf adjusted downward so that total water sold in three tiers equals recorded metered water sales.

**City of Garden Grove - Water Division  
Water Rate Study  
Table B-11  
Supporting Calculations for Cost-of-Service Analysis**

**1. Package 3700 - Labor Functionalization**

Line	Position	Pumping	Storage	T&D	Customer	Meter	Admin	Rate Tier Calculation	Fire Protection	FTE Weighting	Note
1	Water Production Group	50%						50%		12.00	1
2	Water Engineering Group, Capital	5.3%	46.2%	10.3%	0.0%	32.3%	0.0%	0.0%	6.0%	3.20	2
3	Water Engineering Group, Operations	15.74%	3.77%	43.69%	15.31%	2.63%	0.00%	18.37%	0.49%	3.20	2
4	Customer Service Workers				100%					3.00	
5	Meter Readers				100%					3.00	
6	Remainder of Water Distribution Group			100%						14.00	3
7	Water Quality Group			70%				30%		4.00	4
8	Management	15.74%	3.77%	43.69%	15.31%	2.63%	0.00%	18.37%	0.49%	4.00	5
9	Total	15.74%	3.77%	43.69%	15.31%	2.63%	0.00%	18.37%	0.49%	46.40	

10

11 Notes:

- 12 (1) This group operates wells and booster stations. There are 13 wells and 15 booster pump stations. City staff said the appropriate allocation would be 50% source and 50% pumping.  
 13 FTE weighting is the number of positions in the group. Source: City staff, 7/11/17  
 14 (2) 8 FTEs in this group. 80% water and 80% sewer, corresponding to the ratio of water/sewer revenues (\$36M water, \$9.5M sewer) (per City staff, 7/11/17). All salaries paid from  
 15 Package 3700. FTE weighting is  $8 \times 80\% = 6.4$ . Staff split their time between capital projects and operations projects, approximately 50/50. As an approximation, allocate the CIP portion  
 16 of the group per the allocation of the Phase 1 CIP shown in Table B-1. Allocate the operations portion of the group per the FTE-weighted average of other Water Services Division employees.  
 17 (3) The Water Distribution group includes the three customer service workers, the three meter readers, eight FTEs who work on replacement projects and charge their time to Fund 603,  
 18 and the remaining 14 FTEs that work in the water distribution system.  
 19 (4) The four employees in the Water Quality group are responsible for the City's water quality sampling and testing, and the City's backflow prevention program.  
 20 Per City staff (7/11/17), approximately 70% of their time is spent in the distribution system and 30% is associated with source production.  
 21 (5) The four employees are the Water Services Manager, the Principal Office Assistant, the Senior Administrative Analyst, and the Administrative Intern. Labor costs for these employees  
 22 are allocated based on the FTE-weighted average of other employees in the Water Services Division that charge to the 601 Fund.  
 23

24

**2. Package 3700 - Contractual Expense Functionalization**

25

Account	Amount	Pumping	Storage	T&D	Customer	Meter	Admin	Rate Tier Calculation	Fire Protection	Note
27 44020 - Equipment Pool Rentals	\$944,073	15.74%	3.77%	43.69%	15.31%	2.63%	0.00%	18.37%	0.49%	1
28 44040 - Information Systems	\$165,780				100.00%					2
29 44100 - Insurance Charges	\$257,749						100.00%			3
30 Remainder	\$573,144	15.74%	3.77%	43.69%	15.31%	2.63%	0.00%	18.37%	0.49%	4
31 Total	\$1,940,746	12.30%	2.95%	34.16%	20.51%	2.06%	13.28%	14.36%	0.39%	

32

33 Notes:

- 34 (1) Per City staff, 7/11/17, equipment pool rentals are fleet expenses and should be functionalized based on Package 3700 (Water Operations) labor expenses.  
 35 (2) Per City staff, 7/11/17, this is primarily related to billing and will be functionalized on a per-customer basis.  
 36 (3) Insurance charges, functionalized as an administrative expense  
 37 (4) The remainder of Package 3700 Contractual expenses are functionalized per Package 3700 labor expenses.

**City of Garden Grove - Water Division  
Water Rate Study  
Table B-11  
Supporting Calculations for Cost-of-Service Analysis**

38  
39 **3. FY 17/18 Average and Maximum Day Water Demand**  
40

41	<u>Average Day Demand</u>	23,000 acre-feet					
42		14,258 gpm	20.53 MG				
43							
44	Check from Metered Consumption Data, total FY 15/16	8,674,834 ccf					
45		19,914.68 acre-feet, compared with production of	21,518 acre-feet, resulting in			7.45% non-revenue water	
46							
47	<u>Maximum Day Demand/Average Day Ratio</u>						
48	MDD/ADD Peaking Factor	1.45	29.7709328 predicted by 23K AF/year times 1.45; 21.6AFY*1.45=	27.95879			
49	(1) Source: Garden Grove Water Master Plan, 2008, pg. 4-15, recommended value for planning purposes.			compare to, provided by City	23		
50					1.12022		
51	<u>Max Hour/Average Day Ratio</u>						
52	PHD/MDD ratio * MDD/ADD Peaking Factor	2.03					
53	(1) Source: Garden Grove Water Master Plan, 2008, pg. 4-17, Table 4.7, PHD/MDD value of 1.40. Multiplied PHD/MDD * MDD/ADD Peaking Factor						
54							

55 **4. Fire Protection Equivalents**

60	Connection	Demand	Projected	Projected	Total	Number of Equivalent Fire		
61	Size (in)	Factor (1)	FY 17/18	FY 17/18	Connections	Public	Private	Total
62			Public	Private				
63			(2)	(3)				
62	0.75	1.00	0	0	0	0	0	0
63	1	1.00	0	0	0	0	0	0
64	1.5	2.90	0	3	3	0	9	9
65	2	6.19	0	69	69	0	427	427
66	3	17.98	0	3	3	0	54	54
67	4	38.32	0	106	106	0	4,062	4,062
68	6	111.31	3,998	268	4,266	445,021	29,831	474,852
69	8	237.21	0	183	183	0	43,409	43,409
70	10	426.58	0	9	9	0	3,839	3,839
71	12	689.04	0	0	0	0	0	0
72	Total		3,998	641	4,639	445,021	81,631	526,652

73 Notes:  
 74 (1) AWWA M1, page 152 (7th edition page 162); demand factor = diameter ^ 2.63; exponent based on  
 75 Hazen-Williams equation for flow through pressure conduits.  
 76 (2) Source: City staff via email, 7/10/17  
 77 (3) Source: City staff via email, 7/10/17

**City of Garden Grove - Water Division  
Water Rate Study  
Table B-11  
Supporting Calculations for Cost-of-Service Analysis**

**78 5. Calculation: Fire Protection Demand (1), and Fire Protection Allocation for Supply, Storage, and T&D**

79 Fire Demand (gpm) =  $1020 * \sqrt{\text{population}} / 2 * (1 - 0.01 * \sqrt{\text{population}})$   
 80 where population is in thousands  
 81 Fire Protection Allocation =  $\text{Fire Demand} / (\text{Fire Demand} + \text{Maximum Daily Demand})$   
 82  
 83 Population for Garden Grove's Water Service Area = 176,277 (2)  
 84 Fire Demand (gpm) = 11,744  
 85 Average Daily Demand ADD (mgd) = 20.53 (4)  
 86 Ratio of Peak Hour to Average Daily Demand = 1.45 (4)  
 87 Maximum Daily Demand (mgd) = 29.77  
 88 Maximum Daily Demand (gpm) = 20,674  
 89 Therefore, Fire Protection Allocation = 36%  
 90  
 91 Fire Protection Allocation for COS 36%

92 Calculation notes:

- 93 (1) Calculation based on AWWA M1 6th edition, page 143. Calculation published by the American Insurance Association,  
 94 formerly National Fire Underwriters Association.  
 95 (2) Source: Department of Finance, State of California, population estimate 1/1/2017. <http://dof.ca.gov/Forecasting/Demographics/Estimates/E-1/>  
 96 (4) See calculation above in this worksheet  
 97

**98 6. Allocation of Storage to Average Day, Peak Day, and Fire Flow Components**

99  
 100 Methodology: Page 8-18, September 2008 Water Master Plan. Average Day Demand from FY 15/16 is used in this analysis.  
 101

102 Operational Storage, 30% of Maximum Day Demand	8.93	MG, based on Maximum Day Demand Peaking Factor of 1.45
103 Fire Flow, 4 hours at 4,000 gpm in West Zone and at 6,000 gpm in East Zone	2.52	
104 Emergency Storage, 100% of Average Day Demand	20.53	MG, based on annual demand of 23,000 acre-feet
105 Additional Surplus Storage	21.02	
106 Available Storage	53.00	

108 Storage Cost Classification	MG	Avg Day Demand	Peak Day Demand	Fireflow	Total
109 Function of Reservoir Volume (1)					
110 Operational Storage	8.93		100%		100%
111 Fire Fighting Storage	2.52			100%	100%
112 Emergency Storage	20.53	100%			100%
113 Remainder (2)	21.02	64.20%	27.93%	7.88%	100%
114 Total	53.00	64.20%	27.93%	7.88%	100.00%

**Table C-1  
City of Garden Grove - Water Division  
Water Rate Study  
Rate Design Calculations**

**Step 1. Projected Number of Customers by Meter Size**

Line	Meter Size	Current (1)	Projected (1) (2)						
		(May 2017)	FY 16/17	FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22	
1	5/8" X 3/4" meter	28,738	27,605	27,605	27,605	27,605	27,605	27,605	<b>temp calculation of ccf/month SFR in FY 15/16</b> 0.9392 # of connections adjustment 30,325 adjusted number of connections  11.47 ccf/month 8.92 indoor allocation result: ccf/month is comparatively low result: indoor allocation is most of usage
2	1" meter	3,377	3,244	3,244	3,244	3,244	3,244	3,244	
3	1 1/2" meter	869	835	835	835	835	835	835	
4	2" meter	683	656	656	656	656	656	656	
5	3" meter	60	58	58	58	58	58	58	
6	4" meter	117	112	112	112	112	112	112	
7	6" meter	44	42	42	42	42	42	42	
8	8" meter	0	0	0	0	0	0	0	
9	10" meter	0	0	0	0	0	0	0	
10	Total	33,888	32,552	32,552	32,552	32,552	32,552	32,552	

11

- 12 Notes:  
 13 (1) Number of Customers shown does not include Fire Service connections or abandoned connections  
 14 (2) Projected number of customers is adjusted to recognize that backcalculated revenues were approximately 3.6% higher than actual revenues for FY 15/16

15

**Step 2. Projected Number of Meter Equivalents by Meter Size**

17

18 All Customers Except for Fire Service Customers

20 Meter Size	Current	Projected (1) (2)						Capacity, gpm (1)	Meter Equivalent Ratio (3)
	(May 2017)	FY 16/17	FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22		
21 5/8" X 3/4" meter	28,738	27,605	27,605	27,605	27,605	27,605	27,605	20	1.00
22 1" meter	8,443	8,110	8,110	8,110	8,110	8,110	8,110	50	2.50
23 1 1/2" meter	4,345	4,174	4,174	4,174	4,174	4,174	4,174	100	5.00
24 2" meter	5,464	5,249	5,249	5,249	5,249	5,249	5,249	160	8.00
25 3" meter	960	922	922	922	922	922	922	320	16.00
26 4" meter	2,925	2,810	2,810	2,810	2,810	2,810	2,810	500	25.00
27 6" meter	2,200	2,113	2,113	2,113	2,113	2,113	2,113	1,000	50.00
28 8" meter	0	0	0	0	0	0	0	1,600	80.00
29 10" Meter	0	0	0	0	0	0	0	2,400	120.00
30 Total	53,075	50,983	50,983	50,983	50,983	50,983	50,983		

31

**Fire Service Customers Only**

35 Meter Size	Current # of Customers	Projected Number of Meter Equivalents (1) (2)						Capacity, gpm (1)	Meter Equivalent Ratio (3)
	(May 2017)	FY 16/17	FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22		
36 5/8" X 3/4" meter	0	0	0	0	0	0	0	20	1.00

**Table C-1  
City of Garden Grove - Water Division  
Water Rate Study  
Rate Design Calculations**

37	1" meter	0	0	0	0	0	0	0	50	2.50
38	1 1/2" meter	3	15	15	15	15	15	15	100	5.00
39	2" meter	69	552	552	552	552	552	552	160	8.00
40	3" meter	3	48	48	48	48	48	48	320	16.00
41	4" meter	106	2,650	2,650	2,650	2,650	2,650	2,650	500	25.00
42	6" meter	268	13,400	13,400	13,400	13,400	13,400	13,400	1,000	50.00
43	8" meter	183	14,640	14,640	14,640	14,640	14,640	14,640	1,600	80.00
44	10" Meter	9	1,080	1,080	1,080	1,080	1,080	1,080	2,400	120.00
45	Total	641	32,385	32,385	32,385	32,385	32,385	32,385		

46  
47 Notes:

48 (1) AWWA M1 Manual, Table B-2 (Seventh Edition).

49 (2) Projected number of meter equivalents is adjusted to recognize that backcalculated revenues were approximately 3.6% higher than actual revenues for FY 15/16

50 (3) Where 5/8" X 3/4" meters are assigned a meter equivalent ratio of 1.0 by definition. Rounded to nearest 0.01.

51

52 **Step 3. Define Rate Revenue Requirement if Rate Increases Were In Effect for Full Fiscal Year**

53

54

55

56 Rate Revenues Under Existing Rates

57 Rate Revenues from Rate Increases

58 Rate Revenue Requirement

59

60

61

62 Rate Revenues Under Existing Rates

63 Rate Revenues from Rate Increases

64 Rate Revenue Requirement

65 % Increase from Previous Year

66

67

68

69 Full Recovery of Capital and Replacement Expenses Requires Annual Collection of

70 Current Number of Meter Equivalents (1)

71 Full Recovery of Capital and Replacement Expenses Requires Bi-Monthly Charge of

72

73 Methodology: City to define; the amount of the Capital Improvement Charge combined with the Minimum Charge, will be determined by a separate policy

74

75

76 Proposed Charge, \$/billing period/meter equivalent

	As Proposed (Effective for 4 Months)				
	FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22
Rate Revenues Under Existing Rates	\$30,233,011	\$30,233,011	\$30,233,011	\$30,233,011	\$30,233,011
Rate Revenues from Rate Increases	1,249,631	5,028,878	8,030,103	9,369,312	10,755,393
Rate Revenue Requirement	\$31,482,642	\$35,261,889	\$38,263,114	\$39,602,323	\$40,988,404

	Full Year (Effective for 12 Months)				
	FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22
Rate Revenues Under Existing Rates	\$30,233,011	\$30,233,011	\$30,233,011	\$30,233,011	\$30,233,011
Rate Revenues from Rate Increases	3,748,893	7,588,848	8,912,613	10,282,710	11,700,759
Rate Revenue Requirement	\$33,981,904	\$37,821,859	\$39,145,624	\$40,515,721	\$41,933,770
% Increase from Previous Year		11%	3%	4%	3%

	FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22
Proposed Charge, \$/billing period/meter equivalent	\$3.00	\$4.00	\$5.00	\$6.00	\$7.00

**Table C-1  
City of Garden Grove - Water Division  
Water Rate Study  
Rate Design Calculations**

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Meter Size	Meter Equivalent Ratio	Current Charge	Proposed Bi-Monthly Capital Improvement Charge				
			FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22
5/8 x 3/4"	1.00	\$1.47	\$3.00	\$4.00	\$5.00	\$6.00	\$7.00
1" meter	2.50	\$2.07	\$7.50	\$10.00	\$12.50	\$15.00	\$17.50
1 1/2" mete	5.00	\$2.64	\$15.00	\$20.00	\$25.00	\$30.00	\$35.00
2" meter	8.00	\$4.27	\$24.00	\$32.00	\$40.00	\$48.00	\$56.00
3" meter	16.00	\$16.19	\$48.00	\$64.00	\$80.00	\$96.00	\$112.00
4" meter	25.00	\$20.60	\$75.00	\$100.00	\$125.00	\$150.00	\$175.00
6" meter	50.00	\$30.90	\$150.00	\$200.00	\$250.00	\$300.00	\$350.00
8" meter	80.00	\$42.68	\$240.00	\$320.00	\$400.00	\$480.00	\$560.00
10" meter	120.00	\$54.45	\$360.00	\$480.00	\$600.00	\$720.00	\$840.00

Meter Size	No. of Connections (1) (2)	Projected Revenues, First 8 Months of FY				
		FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22
5/8 x 3/4" meter	27,605	\$162,316	\$331,257	\$441,676	\$552,095	\$662,514
1" meter	3,244	\$26,859	\$97,315	\$129,753	\$162,192	\$194,630
1 1/2" meter	835	\$8,815	\$50,084	\$66,779	\$83,473	\$100,168
2" meter	656	\$11,206	\$62,982	\$83,976	\$104,971	\$125,965
3" meter	58	\$3,732	\$11,066	\$14,754	\$18,443	\$22,131
4" meter	112	\$9,261	\$33,716	\$44,954	\$56,193	\$67,432
6" meter	42	\$5,224	\$25,359	\$33,812	\$42,265	\$50,718
8" meter	0	\$0	\$0	\$0	\$0	\$0
10" meter	0	\$0	\$0	\$0	\$0	\$0

Meter Size	No. of Connections (1) (2)	Projected Revenues, Last 4 Months of FY				
		FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22
5/8 x 3/4" meter	27,605	\$165,628	\$220,838	\$276,047	\$331,257	\$386,466
1" meter	3,244	\$48,657	\$64,877	\$81,096	\$97,315	\$113,534
1 1/2" meter	835	\$25,042	\$33,389	\$41,737	\$50,084	\$58,431
2" meter	656	\$31,491	\$41,988	\$52,485	\$62,982	\$73,479
3" meter	58	\$5,533	\$7,377	\$9,221	\$11,066	\$12,910
4" meter	112	\$16,858	\$22,477	\$28,097	\$33,716	\$39,335
6" meter	42	\$12,679	\$16,906	\$21,132	\$25,359	\$29,585
8" meter	0	\$0	\$0	\$0	\$0	\$0
10" meter	0	\$0	\$0	\$0	\$0	\$0



**Table C-1  
City of Garden Grove - Water Division  
Water Rate Study  
Rate Design Calculations**

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Total Projected Capital Improvement Charge Revenues					
	FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22
Total Projected Revenues	\$533,301	\$1,019,631	\$1,325,520	\$1,631,409	\$1,937,299

Total Projected Revenues if Capital Improvement Charges were in Effect for 12 Months					
	FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22
Total Projected Revenues	\$917,668	\$1,223,557	\$1,529,446	\$1,835,336	\$2,141,225

Notes:  
(1) The Capital Improvement Charge calculation does not include Fire Service customers, as the cost-of-service analysis separately accounts for capital expenses allocated to Fire Service Customers  
(2) Projected number of customers is shown for FY 17/18; there is no growth projected in this Rate Study

**Step 5. Define Costs to be Recovered from Minimum Charges**

**Define Revenue Requirement from Minimum Charges for Each Year Assuming Full Year Implementation of Rates**

Policy Direction: Percent of Revenue from Minimum Charges by FY 21/22 [to be confirmed by City] **25%**

	Full Year (Effective for 12 Months)				
	FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22
Rate Revenue Requirement	\$33,981,904	\$37,821,859	\$39,145,624	\$40,515,721	\$41,933,770
25% of Rate Revenue Requirement	\$8,495,476	\$9,455,465	\$9,786,406	\$10,128,930	\$10,483,443
Less "Full Year Implementation" Capital Improvement Charge Revenue	(\$917,668)	(\$1,223,557)	(\$1,529,446)	(\$1,835,336)	(\$2,141,225)
Less Private Fire Service Cost of Service (1)	(\$409,204)	(\$455,444)	(\$471,385)	(\$487,883)	(\$504,959)
Revenue Requirement from Monthly Minimum Charges	\$7,168,604	\$7,776,464	\$7,785,575	\$7,805,712	\$7,837,259

Note:  
(1) Equals FY 17/18 Cost of Service (See Table B-8), increased by the average % increase in the Rate Revenue Requirement in future years (See Step 3 above)

**Define Customer-Related and Meter-Equivalent Related Components of Minimum Charge**

	Full Year (Effective for 12 Months)				
	FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22
Customer-Related Costs Recovered from Minimum Charge (1)	\$3,602,872	\$4,009,996	\$4,150,346	\$4,295,608	\$4,445,954
Meter-Related Costs Recovered from Minimum Charge (1)	\$2,819,504	\$3,138,108	\$3,247,942	\$3,361,620	\$3,479,276
Base Demand Costs Recovered from Bi-Monthly Minimum Charge	\$746,229	\$628,360	\$387,288	\$148,484	(\$87,971)
	\$7,168,604	\$7,776,464	\$7,785,575	\$7,805,712	\$7,837,259

**Table C-1  
City of Garden Grove - Water Division  
Water Rate Study  
Rate Design Calculations**

	FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22	
157						
158 Per-Customer Component of Minimum Charge	\$18.45	\$20.53	\$21.25	\$21.99	\$22.76	<i>customer-related costs divided by number of cust</i>
159 Per-Meter Equivalent Component of Minimum Charge	\$11.66	\$12.31	\$11.88	\$11.47	\$11.09	<i>meter-equiv and base costs divided by # of meter</i>

161 Note:

162 (1) Equals FY 17/18 Cost of Service (See Table B-8), increased by the average % increase in the Rate Revenue Requirement in future years (See Step 3 above)

163

164 **Define Minimum Charge Schedule**

165 Methodology: Policy Choice by City: Transition to FY 21/22 Value Where Fixed Charges Recover 25% of Revenues

166 Transition: Transition Minimum Charges and 2nd Tier Commodity Charges as Follows:

			FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22	
			25%	73%	80%	91%		
	Meter Equivalent		Proposed Minimum Charges					
Meter Size	Ratio	Current	FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22	
172 5/8 x 3/4" meter	1.0	\$12.74	\$18.02	\$28.15	\$29.63	\$31.95	\$33.85	
173 1" meter	2.5	\$33.99	\$38.11	\$46.03	\$47.18	\$49.00	\$50.48	
174 1 1/2" meter	5.0	\$65.82	\$68.92	\$74.86	\$75.72	\$77.09	\$78.20	
175 2" meter	8.0	\$99.79	\$102.71	\$108.30	\$109.12	\$110.40	\$111.45	
176 3" meter	16.0	\$165.62	\$174.25	\$190.83	\$193.24	\$197.04	\$200.15	
177 4" meter	25.0	\$229.32	\$246.97	\$280.86	\$285.80	\$293.57	\$299.92	
178 6" meter	50.0	\$524.45	\$537.61	\$562.87	\$566.55	\$572.34	\$577.08	
179 8" meter	80.0	\$819.60	\$842.12	\$885.35	\$891.66	\$901.56	\$909.67	
180 10" meter	120.0	\$1,114.73	\$1,174.33	\$1,288.76	\$1,305.45	\$1,331.67	\$1,353.13	

181 Note: Proposed Minimum Charges rounded off to the nearest \$0.01.

182

183 **Backcalculate Revenues from Minimum Charge, First 8 Months of FY**

		No. of Connections	Projected Revenues, First 8 Months of FY				
Meter Size	(1) (2)	FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22	
187 5/8 x 3/4" meter	27,605	\$1,406,737	\$1,989,749	\$3,108,293	\$3,271,713	\$3,527,885	
188 1" meter	3,244	\$441,031	\$494,489	\$597,254	\$612,176	\$635,791	
189 1 1/2" meter	835	\$219,768	\$230,119	\$249,952	\$252,824	\$257,398	
190 2" meter	656	\$261,875	\$269,538	\$284,208	\$286,360	\$289,719	
191 3" meter	58	\$38,181	\$40,171	\$43,993	\$44,549	\$45,425	
192 4" meter	112	\$103,090	\$111,024	\$126,259	\$128,480	\$131,973	
193 6" meter	42	\$88,663	\$90,888	\$95,159	\$95,781	\$96,760	
194 8" meter	0	\$0	\$0	\$0	\$0	\$0	
195 10" meter	0	\$0	\$0	\$0	\$0	\$0	

196

**Table C-1  
City of Garden Grove - Water Division  
Water Rate Study  
Rate Design Calculations**

197 198 199	Meter Size	No. of	Projected Revenues, Last 4 Months of FY				
		Connections (1) (2)	FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22
200	5/8 x 3/4" meter	27,605	\$994,875	\$1,554,147	\$1,635,857	\$1,763,943	\$1,868,841
201	1" meter	3,244	\$247,245	\$298,627	\$306,088	\$317,895	\$327,497
202	1 1/2" meter	835	\$115,059	\$124,976	\$126,412	\$128,699	\$130,552
203	2" meter	656	\$134,769	\$142,104	\$143,180	\$144,859	\$146,237
204	3" meter	58	\$20,085	\$21,997	\$22,274	\$22,712	\$23,071
205	4" meter	112	\$55,512	\$63,130	\$64,240	\$65,986	\$67,414
206	6" meter	42	\$45,444	\$47,579	\$47,890	\$48,380	\$48,780
207	8" meter	0	\$0	\$0	\$0	\$0	\$0
208	10" meter	0	\$0	\$0	\$0	\$0	\$0
209							
210			Total Projected Capital Improvement Charge Revenues				
211			FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22
212	Total Projected Revenues		\$4,172,336	\$5,478,538	\$6,851,059	\$7,184,357	\$7,597,342
213							
214			Total Projected Revenues if Capital Improvement Charges were in Effect for 12 Months				
215			FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22
216	Total Projected Revenues		\$4,838,969	\$6,757,677	\$7,037,823	\$7,477,425	\$7,837,176

**217 Step 6. Calculate the Uniform-Block Commodity Charge**

218		
219		
220	FY 15/16 Billed Water Sales, ccf	
221	Unadjusted	8,674,834
222	Adjusted (1)	8,332,748
223		
224	Projected FY 17/18 Water Production, acre-feet per year	23,000
225	Actual FY 15/16 Water Production, acre-feet per year	21,518
226	% Adjustment to FY 15/16 Billed Water Sales to Estimate FY 17/18	6.89%
227		
228	Estimated Billed Water Sales, ccf (2)	8,906,646

229 Notes:

- 230 (1) Projected metered consumption is adjusted to recognize that backcalculated revenues were approximately 3.6% higher than actual revenues for FY 15/16
- 231 (2) This value is projected for FY 17/18 and an overall system production of 23,000 acre-feet per year. Future years billed water sales will be adjusted according to
- 232 the projected values shown in the Dashboard and in Table A-1

233	FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22	
234						
235						
236	Full-Year Implementation Revenue Requirement	\$33,981,904	\$37,821,859	\$39,145,624	\$40,515,721	\$41,933,770

**Table C-1**  
**City of Garden Grove - Water Division**  
**Water Rate Study**  
**Rate Design Calculations**

237	Less Revenue from Capital Improvement Charge	(\$917,668)	(\$1,223,557)	(\$1,529,446)	(\$1,835,336)	(\$2,141,225)
238	Less Fire Service Cost of Service (1)	(\$409,204)	(\$419,434)	(\$429,920)	(\$440,668)	(\$451,685)
239	Less Revenue from Minimum Charge	(\$4,838,969)	(\$6,757,677)	(\$7,037,823)	(\$7,477,425)	(\$7,837,176)
240	Equals Revenue Requirement from Commodity Charges	\$27,816,064	\$29,421,191	\$30,148,436	\$30,762,293	\$31,503,685
241						
242	Calculate Uniform-Block Consumption Charge	FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22
243	Revenue Requirement from Commodity Charge	\$27,816,064	\$29,421,191	\$30,148,436	\$30,762,293	\$31,503,685
244	Less Revenue Recovered from Projected Pass-Through Charge		(\$712,532)	(\$1,514,130)	(\$2,226,661)	(\$2,493,861)
245	Adj to Match Revenue Requirement	\$0	\$0	\$0	\$0	\$0
246	Estimated Billed Water Sales, ccf	8,906,646	8,906,646	8,906,646	8,906,646	8,906,646
247	Uniform Block Consumption Charge, \$/ccf	\$3.12	\$3.22	\$3.21	\$3.20	\$3.26
248	Estimated Pass Through, \$/ccf		\$0.08	\$0.17	\$0.25	\$0.28

249

250 Note

251 (1) Private Fire Service Cost of Service projected to increase at the rate of inflation in future years

252

253 **Step 7. Calculate the Budget-Based Rates Commodity Charge**

254

255 **Compile Volume Sold in Each Tier, FY 15/16 (ccf) (1)**

256		<u>Unadjusted</u>	<u>Adjusted</u>
257	Indoor	6,274,002	6,026,591
258	Outdoor	1,397,579	1,342,466
259	Excessive	<u>1,003,253</u>	<u>963,690</u>
260	Total	8,674,834	8,332,748

261

262 Note

263 (1) Refer to data in Table A-2. Projected metered consumption is adjusted to recognize that backcalculated revenues were approximately 3.6% higher than actual revenues for FY 15/16

264 Adjusted consumption is used to establish rates; unadjusted

265

266 **Apply Adjustment to Project FY 17/18 Metered Consumption**

267 Projected FY 17/18 Metered Consumption, ccf (1) (2)

268	Indoor	6,026,591
269	Outdoor	1,916,364
270	Excessive	<u>963,690</u>

271 Total 8,906,646 = FY 15/16 consumption, adjusted to match actual FY 15/16 revenues, and adjusted again for change in demand between FY 15/16 and FY 17/18.

272

273 Notes:

274 (1) As described above, projected FY 17/18 water production is greater than actual FY 15/16 by 6.89%

275 (2) As customers use additional water in FY 17/18, the assumption for the purposes of this Rate Study is that the increased water use is outdoors and

276 would be sold at the outdoor tier rate.

**Table C-1  
City of Garden Grove - Water Division  
Water Rate Study  
Rate Design Calculations**

277						
278	<b>Calculate Unit Costs of Water Production Cost, \$/ccf</b>					
279		\$ Allocated				
280		to Tier	ccf in Tier	\$/ccf		
281	Indoor	\$8,614,908	6,026,591	\$1.43		
282	Outdoor	\$4,679,209	1,916,364	\$2.44		
283	Excessive	\$2,857,713	963,690	\$2.97		
284	Total	\$16,151,830	8,906,646			
285						
286	<b>Define Additional Costs to be Recovered Through the Commodity Charge</b>					
287			Projected, Full Year Implementation			
288	% of Rate Revenue Recovered through Fixed Charges	FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22
289	Revenue Requirement from Commodity Charges	\$27,816,064	\$29,421,191	\$30,148,436	\$30,762,293	\$31,503,685
290	Less Revenue Recovered from Projected Pass-Through Charge					
291	Indoor and Outdoor Tier Pass-Through†	\$0	(\$556,007)	(\$1,191,443)	(\$1,588,591)	(\$2,303,457)
292	Excessive Tier Pass-Through	\$0	(\$77,095)	(\$163,827)	(\$240,923)	(\$269,833)
293	Less Revenue From Groundwater Unit Cost (Part of Indoor Tier)	(\$8,614,908)	(\$8,614,908)	(\$8,614,908)	(\$8,614,908)	(\$8,614,908)
294	Less Revenue from Mixed Groundwater/MWD (Part of Outdoor Tier)	(\$4,679,209)	(\$4,679,209)	(\$4,679,209)	(\$4,679,209)	(\$4,679,209)
295	Less Revenue from MWD Unit Cost (Part of Excessive Tier)	(\$2,857,713)	(\$2,857,713)	(\$2,857,713)	(\$2,857,713)	(\$2,857,713)
296	Revenue Requirement to be Spread Among All Customers:	\$11,664,234	\$12,636,258	\$12,641,335	\$12,780,949	\$12,778,564
297	Commodity Charge Spread Among All Customers	\$1.31	\$1.42	\$1.42	\$1.43	\$1.43
298						
299	Estimated Billed Water Sales, ccf					
300	Indoor Tier	6,026,591	6,026,591	6,026,591	6,026,591	6,026,591 Adjust future years for changes in water use
301	Outdoor Tier	1,916,364	1,916,364	1,916,364	1,916,364	1,916,364 Adjust future years for changes in water use
302	Excessive Tier	963,690	963,690	963,690	963,690	963,690 Adjust future years for changes in water use
303						
304	<b>Calculate Commodity Charge Prior to Transitioning Adjustment</b>					
305	Indoor Tier Commodity Charge, Excluding Pass Through	\$2.74	\$2.85	\$2.85	\$2.86	\$2.86
306	Indoor Tier Estimated Pass Through		\$0.07	\$0.15	\$0.20	\$0.29
307	Outdoor Tier Commodity Charge, Excluding Pass Through	\$3.75	\$3.86	\$3.86	\$3.87	\$3.87
308	Outdoor Tier Estimated Pass Through		\$0.07	\$0.15	\$0.20	\$0.29
309	Excessive Tier Commodity Charge, Excluding Pass Through	\$4.28	\$4.39	\$4.39	\$4.40	\$4.40
310	Excessive Tier Estimated Pass Through		\$0.08	\$0.17	\$0.25	\$0.28
311						
312	<b>Calculate Commodity Charge that Transitions over a Five-Year Period</b>					
313	Methodology: Transition the Outdoor Tier and Excessive Tier Commodity Charge in Over a Five-Year Period. Make up the Difference in Revenue from the Indoor Tie					
314	Transition = 20% of the difference between current 2nd Tier Commodity Charge and FY 21/22 Cost-of-Service Commodity Charge each year					
315		Current, Use				
316		2nd Tier as				

**Table C-1  
City of Garden Grove - Water Division  
Water Rate Study  
Rate Design Calculations**

	Starting Point	FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22
317						
318 Outdoor Tier Commodity Charge	\$3.15	\$3.44	\$3.68	\$3.73	\$3.81	\$3.87
319 Excessive Tier Commodity Charge	\$3.15	\$3.65	\$4.06	\$4.15	\$4.28	\$4.40
320						
321 Change in Revenue Compared with Un-Transitioned Rates:						
322 Outdoor Tier		(597,354)	(348,227)	(252,408)	(118,263)	0
323 Excessive Tier		(602,677)	(313,570)	(226,838)	(111,195)	0
324 Total		(1,200,031)	(661,797)	(479,246)	(229,458)	0
325						
326 Additional Revenue to be Collected from Indoor Tier		1,200,031	661,797	479,246	229,458	0
327 \$/ccf Added to Indoor Tier for Transition		\$0.20	\$0.11	\$0.08	\$0.04	\$0.00
328						
329 Revised (Transitioned) Indoor Tier Commodity Charge		\$2.94	\$2.96	\$2.93	\$2.90	\$2.86
330						
331 <b>Summarize Budget-Based Alternative Commodity Charges</b>						
332 Indoor Tier Commodity Charge, Excluding Pass Through		\$2.94	\$2.96	\$2.93	\$2.90	\$2.86
333 Indoor Tier Estimated Pass Through			\$0.07	\$0.15	\$0.20	\$0.29
334 Outdoor Tier Commodity Charge, Excluding Pass Through		\$3.44	\$3.68	\$3.73	\$3.81	\$3.87
335 Outdoor Tier Estimated Pass Through			\$0.07	\$0.15	\$0.20	\$0.29
336 Excessive Tier Commodity Charge, Excluding Pass Through		\$3.65	\$4.06	\$4.15	\$4.28	\$4.40
337 Excessive Tier Estimated Pass Through			\$0.08	\$0.17	\$0.25	\$0.28
338						
339						

**Step 8. Calculate the Two-Tier Increasing Block Alternative Commodity Charge**

**341 Define Tier Costs Associated with Imported Water and Groundwater, FY 17/18**

342 Methodology:

- 343 1. Charges per tier are based on the projected FY 17/18 costs for locally produced groundwater and imported MWD water
- 344 2. The amount of water included in the first tier is intended so that approximately 75% of projected water sales fall into the first tier; this percentage is consistent with the percentage of water allowed from locally produced sources
- 346 3. Among the various meter sizes, the amount of water included in the first tier is scaled by the meter equivalent ratio shown in Table B-11, Step 2 rounded up to the nearest whole number

349 1st Tier	\$1.43	Refer to Table B-10; unit cost of locally produced groundwater.
350 2nd Tier	\$2.97	Refer to Table B-10; unit cost of imported water.

351

**352 Define Amount of Water to be Included in the First Tier**

354 Meter Size	353 Meter Equivalent Ratio	353 ccf Included in First Tier, per Billing Period	353 FY 15/16 Annual Metered Consumption, ccf	
			354 1st Tier	354 2nd Tier
356 5/8x3/4" meter	1.00	33	3,633,286	448,011

**Table C-1  
City of Garden Grove - Water Division  
Water Rate Study  
Rate Design Calculations**

357	1" meter	2.50	83	732,765	174,684
358	1 1/2" meter	5.00	165	531,283	237,664
359	2" meter	8.00	264	631,637	424,038
360	3" meter	16.00	528	131,792	88,951
361	4" meter	25.00	825	454,516	354,870
362	6" meter	50.00	1,650	359,064	472,287
363	8" meter	80.00	2,640		
364	10" meter	120.00	3,960		
365	<b>Total</b>			<b>6,474,343</b>	<b>2,200,505</b>
366	As Percent			74.63%	25.37%

**368 Calculate Two-Tier Commodity Charge Prior to Transitioning Adjustment**

		Projected, Full Year Implementation					
		FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22	
371	Revenue Requirement from Commodity Charges	\$27,816,064	\$29,421,191	\$30,148,436	\$30,762,293	\$31,503,685	
372	Less Revenue Recovered from Projected Pass-Through Charge						
373	Tier 1 Pass-Through		(\$465,314)	(\$997,101)	(\$1,329,468)	(\$1,927,729)	
374	Tier 2 Pass-Through		(\$180,744)	(\$384,082)	(\$564,826)	(\$632,605)	
375	Less Revenue Recovered Groundwater Unit Cost Sales (Part of Tier 1)	(\$9,502,260)	(\$9,502,260)	(\$9,502,260)	(\$9,502,260)	(\$9,502,260)	
376	Less Revenue Recovered MWD Unit Cost Sales (Part of Tier 2)	(\$6,699,706)	(\$6,699,706)	(\$6,699,706)	(\$6,699,706)	(\$6,699,706)	
377	Revenue Requirement to be Spread Among All Customers:	\$11,614,098	\$12,573,167	\$12,565,287	\$12,666,032	\$12,741,384	
378	Commodity Charge Spread Among All Customers	\$1.30	\$1.41	\$1.41	\$1.42	\$1.43	
379							
380	Estimated Billed Water Sales, ccf						
381	Tier 1	6,647,342	6,647,342	6,647,342	6,647,342	6,647,342	Adjust future years for changes in water use
382	Tier 2	2,259,304	2,259,304	2,259,304	2,259,304	2,259,304	Adjust future years for changes in water use
383							
384	Tier 1 Commodity Charge, Excluding Pass Through	\$2.73	\$2.84	\$2.84	\$2.85	\$2.86	
385	Tier 1 Estimated Pass Through		\$0.07	\$0.15	\$0.20	\$0.29	
386	Tier 2 Commodity Charge, Excluding Pass Through	\$4.27	\$4.38	\$4.38	\$4.39	\$4.40	
387	Tier 2 Estimated Pass Through		\$0.08	\$0.17	\$0.25	\$0.28	

**389 Calculate Two-Tier Commodity Charge that Transitions over a Five-Year Period**

390 Methodology: Transition the 2nd Tier Commodity Charge in Over a Five-Year Period. Make up the Difference in Revenue from the 1st Tie

391 Transition = same as transition for Minimum Charge except 1/1/18 = 40%

		Current, Use					
		2nd Tier as					
		Starting Point	FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22
395	2nd Tier Commodity Charge	\$3.15	\$3.65	\$4.06	\$4.15	\$4.28	\$4.40

**Table C-1  
City of Garden Grove - Water Division  
Water Rate Study  
Rate Design Calculations**

397	Change in Revenue Compared with Un-Transitioned Rates:					
398	2nd Tier Commodity Charge	(\$1,390,341)	(\$712,550)	(\$509,213)	(\$238,096)	\$0
399						
400	Additional Revenue to be Collected from 1st Tier	1,390,341	712,550	509,213	238,096	0
401	\$/ccf Added to 1st Tier for Transition	\$0.21	\$0.11	\$0.08	\$0.04	\$0.00
402						
403	Revised (Transitioned) 1st Tier Commodity Charge	\$2.94	\$2.94	\$2.92	\$2.89	\$2.86
404						
405	<b>Summarize Two-Tier Increasing Block Alternative Commodity Charges</b>					
406	Tier 1 Commodity Charge, Excluding Pass Through	\$2.94	\$2.94	\$2.92	\$2.89	\$2.86
407	Tier 1 Estimated Pass Through		\$0.07	\$0.15	\$0.20	\$0.29
408	Tier 2 Commodity Charge, Excluding Pass Through	\$3.65	\$4.06	\$4.15	\$4.28	\$4.40
409	Tier 2 Estimated Pass Through		\$0.08	\$0.17	\$0.25	\$0.28

411 Note: Commodity Charges are rounded to the nearest \$0.01.

412

413 **Step 9. Backcalculation of Water Sales Revenues**

414 Existing Bi-Monthly Minimum Charge

			Annual
		Bi-Monthly	Revenues
	No. of	Minimum	Bi-Monthly
Meter Size	Connections	Charge	Min Charge
419	5/8x3/4" meter	28,738	\$2,196,733
420	1" meter	3,377	\$688,705
421	1 1/2" meter	869	\$343,185
422	2" meter	683	\$408,939
423	3" meter	60	\$59,623
424	4" meter	117	\$160,983
425	6" meter	44	\$138,455
426	8" meter	0	\$0
427	10" meter	0	\$0
428	Total	33,888	\$3,996,624

429

430 Existing Capital Improvement Charge

			Annual Revenues
			Capital
			Capital
	# Water	# Fire Service	Improvement
Meter Size	Connections	connections	Improvement
			Charge
			Charge
435	5/8x3/4" meter	28,738	\$1.47
436	1" meter	3,377	\$2.07



**Table C-1  
City of Garden Grove - Water Division  
Water Rate Study  
Rate Design Calculations**

437	1 1/2" meter	869	3	\$2.64	\$13,812
438	2" meter	683	69	\$4.27	\$19,266
439	3" meter	60	3	\$16.19	\$6,120
440	4" meter	117	106	\$20.60	\$27,563
441	6" meter	44	268	\$30.90	\$57,845
442	8" meter	0	183	\$42.68	\$46,863
443	10" meter	0	9	\$54.45	\$2,940
444	Total	33,888	641		\$469,821

445					
446	<u>Commodity Charge</u>				
447	FY 15/16 Metered Consumption, ccf				8,674,834
448	1st Tier Commodity Charge, \$/ccf				\$2.92
449	Total Calculated Commodity Charge Revenues				\$25,330,515

450

451 Existing Fire Service Rates

452					
453	Connection	No. of	Bi-Monthly	Annual	
454	Size (in)	Connections	Rate	Revenues	
455	0.75	0	\$11.00	\$0	
456	1	0	\$11.00	0	
457	1.5	3	\$11.00	198	
458	2	69	\$11.00	4,554	
459	3	3	\$14.00	252	
460	4	106	\$19.00	12,084	
461	6	268	\$29.00	46,632	
462	8	183	\$38.00	41,724	
463	10	9	\$48.00	2,592	
464				<u>\$108,036</u>	

450					
451	Total Back Calculated Water Sales Revenues, FY 15/16				\$29,435,175

- 452
- 453 Note: The first tier commodity charge is used in this calculation, recognizing that it accounts for two offsetting adjustments.
- 454 1. Some water is sold at the higher tiers, which would produce more revenue than is shown in the calculation
- 455 2. Some customers receive the City's Low Water User discount, which would result in less revenue than is shown in this calculation
- 456 3. Currently, fire service customers also pay the Capital Improvement Charge

457

458 **Step 10: Comparison of Backcalculated Water Sales Revenues with Actual FY 15/16 Revenues**

459					
460	Actual FY 15/16 Revenues				
461		<u>Account</u>	<u>Fund</u>	<u>FY 15/16 Actual</u>	

**Table C-1  
City of Garden Grove - Water Division  
Water Rate Study  
Rate Design Calculations**

462	WATER-METERED	32601	601	\$21,805,999
463	WATER-FLAT RATE	32603	601	147,878
464	WATER COSTS (5)	32640	601	6,320,543
465	Total Reported Actual			\$28,274,419
466				
467	Total Back Calculated Water Sales Revenues, FY 15/16			\$29,435,175
468	Difference			(\$1,160,756)
469	As Percent			-3.94%
470				
471	<u>Capital Improvement Charge</u>			
472	Actual	433,732		
473	Backcalculated	\$469,821		
474	Difference	(\$36,089)		
475	As Percent	-8.32%		

**Step 11. Backcalculate Revenues Under Proposed Rate Structure**

477						
478						
479						
480						
481	Applicable to All Rate Structure Alternatives					
482	Bi-Monthly Minimum Charge, First 8 Months of FY	\$2,559,346	\$3,225,979	\$4,505,118	\$4,691,882	\$4,984,950
483	Bi-Monthly Minimum Charge, Last 4 Months of FY	\$1,612,990	\$2,252,559	\$2,345,941	\$2,492,475	\$2,612,392
484						
485	Capital Improvement Charge, First 8 Months of FY	\$227,412	\$611,779	\$815,705	\$1,019,631	\$1,223,557
486	Capital Improvement Charge, Last 4 Months of FY	\$305,889	\$407,852	\$509,815	\$611,779	\$713,742
487						
488	Fire Service Rates, First 8 Months of FY	\$72,024	\$272,803	\$303,627	\$314,252	\$325,251
489	Fire Service Rates, Last 4 Months of FY	\$136,401	\$151,814	\$157,126	\$162,626	\$168,319
490						
491	Uniform Block Alternative Commodity Charges					
492	Uniform Block Alternative, First 8 Months of FY	\$18,228,935	\$18,544,043	\$19,139,106	\$19,089,537	\$19,023,754
493	Uniform Block Alternative, Last 4 Months of FY	\$9,272,021	\$9,569,553	\$9,544,769	\$9,511,877	\$9,669,941
494	Estimated Pass Throughs, First 8 Months of FY	\$0	\$0	\$475,021	\$1,009,420	\$1,484,441
495	Estimated Pass Throughs, Last 4 Months of FY	\$0	\$237,511	\$504,710	\$742,220	\$831,287
496						
497	Budget-Based Alternative Commodity Charges					
498	Budget-Based Alternative, First 8 Months of FY	\$18,228,935	\$18,546,357	\$19,199,511	\$19,199,511	\$19,258,889
499	Budget-Based Alternative, Last 4 Months of FY	\$9,273,179	\$9,599,756	\$9,599,756	\$9,629,445	\$9,629,445
500	Estimated Indoor Tier Pass Throughs, First 8 Months of FY	\$0	\$0	\$281,241	\$602,659	\$803,546

**Table C-1**  
**City of Garden Grove - Water Division**  
**Water Rate Study**  
**Rate Design Calculations**

501	Estimated Indoor Tier Pass Throughs, Last 4 Months of FY	\$0	\$140,620	\$301,330	\$401,773	\$582,570
502	Estimated Outdoor Tier Pass Throughs, First 8 Months of FY	\$0	\$0	\$89,430	\$191,636	\$255,515
503	Estimated Outdoor Tier Pass Throughs, Last 4 Months of FY	\$0	\$44,715	\$95,818	\$127,758	\$185,249
504	Estimated Excessive Tier Pass Throughs, First 8 Months of FY	\$0	\$0	\$109,218	\$160,615	\$179,889
505	Estimated Excessive Tier Pass Throughs, Last 4 Months of FY	\$0	\$25,698	\$54,609	\$80,308	\$89,944
506						
507	Two-Tier Increasing Block Alternative, First 8 Months of FY	\$18,228,935	\$18,526,429	\$19,143,972	\$19,190,899	\$19,253,759
508	Two-Tier Increasing Block Alternative, Last 4 Months of FY	\$9,263,215	\$9,571,986	\$9,595,450	\$9,626,879	\$9,650,778
509	Estimated Tier 1 Pass Throughs, First 8 Months of FY	\$0	\$0	\$310,209	\$664,734	\$886,312
510	Estimated Tier 1 Pass Throughs, Last 4 Months of FY	\$0	\$155,105	\$332,367	\$443,156	\$642,576
511	Estimated Tier 2 Pass Throughs, First 8 Months of FY	\$0	\$0	\$120,496	\$256,054	\$376,551
512	Estimated Tier 2 Pass Throughs, Last 4 Months of FY	\$0	\$60,248	\$128,027	\$188,275	\$210,868
513						
514	Three-Tier Increasing Block Alternative, First 8 Months of FY	\$18,228,935	\$18,549,574	\$19,196,790	\$19,205,697	\$19,259,137
515	Three-Tier Increasing Block Alternative, Last 4 Months of FY	\$9,274,787	\$9,598,395	\$9,602,848	\$9,629,568	\$9,663,711
516	Estimated Tier 1 Pass Throughs, First 8 Months of FY	\$0	\$0	\$270,168	\$578,932	\$771,909
517	Estimated Tier 1 Pass Throughs, Last 4 Months of FY	\$0	\$135,084	\$289,466	\$385,955	\$559,634
518	Estimated Tier 2 Pass Throughs, First 8 Months of FY	\$0	\$0	\$95,004	\$190,008	\$273,137
519	Estimated Tier 2 Pass Throughs, Last 4 Months of FY	\$0	\$47,502	\$95,004	\$136,569	\$172,195
520	Estimated Tier 3 Pass Throughs, First 8 Months of FY	\$0	\$0	\$71,253	\$151,413	\$222,666
521	Estimated Tier 3 Pass Throughs, Last 4 Months of FY	\$0	\$35,627	\$75,706	\$111,333	\$124,693
522						
523	Total Projected Revenues					
524	Uniform Block Alternative	\$32,415,019	\$35,273,892	\$38,300,938	\$39,645,698	\$41,037,634
525	Budget-Based Alternative	\$32,416,176	\$35,279,933	\$38,368,246	\$39,686,348	\$41,013,257
526	Two-Tier Increasing Block Alternative	\$32,406,212	\$35,236,554	\$38,267,854	\$39,662,643	\$41,049,056
527	Three-Tier Increasing Block Alternative	\$32,417,784	\$35,288,967	\$38,333,574	\$39,682,119	\$41,075,293
528						
529	Operating Statement	\$31,482,642	\$35,261,889	\$38,263,114	\$39,602,323	\$40,988,404
530	Operating Statement minus calculated revenues					\$185,598,374
531	Uniform Block Alternative	(\$932,376)	(\$12,002)	(\$37,824)	(\$43,375)	(\$49,230)
532	Budget-Based Alternative	(\$933,534)	(\$18,043)	(\$105,132)	(\$84,025)	(\$24,853)
533	Two-Tier Increasing Block Alternative	(\$923,570)	\$25,336	(\$4,740)	(\$60,319)	(\$60,651)
534	Three-Tier Increasing Block Alternative	(\$935,142)	(\$27,078)	(\$70,459)	(\$79,795)	(\$86,889)
535	<b>Step 13. Calculate Fire Protection Rates</b>					
536						
537	Private Fire Protection Revenue Requirement	\$409,204	See Table B-9			
538	Number of Equivalent Private Fire Protection Connections	81,631	See Table B-9			
539	Unit Cost, \$/Equivalent Connection per bi-monthly billing period	\$0.84	Annual \$/Equivalent Connection Divided by 6; See Table B-9			

**Table C-1  
City of Garden Grove - Water Division  
Water Rate Study  
Rate Design Calculations**

540 annual revenues collected from unadjusted FY 17/18 FS rates \$409,204

541	542 Connection	543 Demand	544 Proposed Bi-Monthly Fire Service Rate (1)					545 Current Rates	546 Current Capitol	547 Current Rates	548 FY 21/22
			549 Size (in)	550 Factor	551 FY 17/18	552 FY 18/19	553 FY 19/20	554 FY 20/21	555 FY 21/22	556 Fire Service	557 Improvemt Fee
560	0.75	1.00	\$0.84	\$0.93	\$0.96	\$0.99	\$1.02	\$11.00	\$1.47	\$12.47	\$7.00
561	1	1.00	\$0.84	\$0.93	\$0.96	\$0.99	\$1.02	\$11.00	\$2.07	\$13.07	\$17.50
562	1.5	2.90	\$2.43	\$2.70	\$2.79	\$2.89	\$2.99	\$11.00	\$2.64	\$13.64	\$35.00
563	2	6.19	\$5.17	\$5.75	\$5.95	\$6.16	\$6.38	\$11.00	\$4.27	\$15.27	\$56.00
564	3	17.98	\$15.02	\$16.72	\$17.31	\$17.92	\$18.55	\$14.00	\$16.19	\$30.19	\$112.00
565	4	38.32	\$32.01	\$35.63	\$36.88	\$38.17	\$39.51	\$19.00	\$20.60	\$39.60	\$175.00
566	6	111.31	\$93.00	\$103.51	\$107.13	\$110.88	\$114.76	\$29.00	\$30.90	\$59.90	\$350.00
567	8	237.21	\$198.18	\$220.57	\$228.29	\$236.28	\$244.55	\$38.00	\$42.68	\$80.68	\$560.00
568	10	426.58	\$356.40	\$396.67	\$410.55	\$424.92	\$439.79	\$48.00	\$54.45	\$102.45	\$840.00

569

570 Note

571 (1) Private Fire Service rates to increase at the same rate as overall water rate increases, through FY 21/22. See Table A10.

572

**573 Task 9B Three-Tier Increasing Block Water Rate Structure**

**574 Define Concept for Three-Tier Increasing Block Structure**

575 Tier 1: 65% of water use, based on costs of local production

576 Tier 2: 20% of water use, 50% based on the costs of local production and 50% based on the cost of imported water

577 Tier 3: 15% of water use, based on the costs of imported water

578

579 Unit cost, local production, \$/ccf \$1.43 Refer to Table B-10; unit cost of locally produced groundwater.

580 Unit cost, imported water, \$/ccf \$2.97 Refer to Table B-10; unit cost of imported water.

581

582 Tier 1 Source Production Costs, \$/ccf \$1.43 Unit cost of locally produced groundwater

583 Tier 2 Source Production Costs, \$/ccf \$2.20 Average of unit costs of locally produced groundwater and imported water

584 Tier 3 Source Production Costs, \$/ccf \$2.97 Unit cost of imported water

585

**586 Define Amount of Water to be Included in Tier 1 and Tier 2**

587	Meter	ccf Included	ccf Included	588 FY 15/16 Annual			
589	Meter Size	Equivalent Ratio	in Tier 1, per Billing Period	in Tier 2, Billing Period	Tier 1	Tier 2	Tier 3
590	5/8x3/4" meter	1.00	25	51			
591	1" meter	2.50	63	128			
592	1 1/2" meter	5.00	125	255			
593	2" meter	8.00	200	408			
594	3" meter	16.00	400	816			
595	4" meter	25.00	625	1,275			

**Table C-1**  
**City of Garden Grove - Water Division**  
**Water Rate Study**  
**Rate Design Calculations**

596	6" meter	50.00	1,250	2,550						
597	8" meter	80.00	2,000	4,080						
598	10" meter	120.00	3,000	6,120						
599	Total				5,638,651	1,734,970	1,301,227	8,674,848		
600	As Percent				65.00%	20.00%	15.00%			
601										
602	<b>Calculate Commodity Charge Prior to Transitioning Adjustment</b>									
603					Projected, Full Year Implementation					
604					FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22	
605	Revenue Requirement from Commodity Charges				\$27,816,064	\$29,421,191	\$30,148,436	\$30,762,293	\$31,503,685	
606	Less Revenue Recovered from Projected Pass-Through Charge									
607	Tier 1 Pass-Through					(\$405,252)	(\$868,398)	(\$1,157,864)	(\$1,678,903)	
608	Tier 2 Pass-Through					(\$133,600)	(\$285,013)	(\$400,799)	(\$507,679)	
609	Tier 3 Pass-Through					(\$106,880)	(\$227,119)	(\$333,999)	(\$374,079)	
610	Less Revenue from Tier 1 Water Production Related Costs				(\$8,275,733)	(\$8,275,733)	(\$8,275,733)	(\$8,275,733)	(\$8,275,733)	
611	Less Revenue from Tier 2 Water Production Related Costs				(\$3,914,353)	(\$3,914,353)	(\$3,914,353)	(\$3,914,353)	(\$3,914,353)	
612	Less Revenue from Tier 3 Water Production Related Costs				(\$3,961,745)	(\$3,961,745)	(\$3,961,745)	(\$3,961,745)	(\$3,961,745)	
613	Revenue Requirement to be Spread Among All Customers:				\$11,664,234	\$12,623,629	\$12,616,075	\$12,717,800	\$12,791,194	
614	Commodity Charge Spread Among All Customers				\$1.31	\$1.42	\$1.42	\$1.43	\$1.44	
615										
616	Estimated Billed Water Sales, ccf									
617	Tier 1				5,789,320	5,789,320	5,789,320	5,789,320	5,789,320	Adjust future years for changes in water use
618	Tier 2				1,781,329	1,781,329	1,781,329	1,781,329	1,781,329	Adjust future years for changes in water use
619	Tier 3				1,335,997	1,335,997	1,335,997	1,335,997	1,335,997	Adjust future years for changes in water use
620										
621	Tier 1 Commodity Charge, Excluding Pass Through				\$2.74	\$2.85	\$2.85	\$2.86	\$2.87	
622	Tier 1 Estimated Pass Through					\$0.07	\$0.15	\$0.20	\$0.29	
623	Tier 2 Commodity Charge, Excluding Pass Through				\$3.51	\$3.62	\$3.62	\$3.63	\$3.64	
624	Tier 2 Estimated Pass Through					\$0.08	\$0.16	\$0.23	\$0.29	
625	Tier 3 Commodity Charge, Excluding Pass Through				\$4.28	\$4.39	\$4.39	\$4.40	\$4.41	
626	Tier 3 Estimated Pass Through					\$0.08	\$0.17	\$0.25	\$0.28	
627										
628	<b>Calculate Commodity Charge that Transitions over a Five-Year Period</b>									
629	Methodology: Tier 1 Commodity Charge gradually decreases from \$3.07/ccf to FY 21/22 value of \$2.84/ccf, following same path as the two-tier									
630	Increasing Block alternative. Tier 2 Commodity Charge takes two years to get to the FY 21/22 value of \$3.61/ccf.									
631	Tier 3 Commodity Charge gradually increases to the FY 21/22 value of \$4.39/ccf in a manner to collect the Revenue Requirement									
632										
633										
634					Starting Point	FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22
635	Tier 3 Commodity Charge				\$3.15	\$3.55	\$4.00	\$4.07	\$4.26	\$4.41

**Table C-1**  
**City of Garden Grove - Water Division**  
**Water Rate Study**  
**Rate Design Calculations**

636						
637	Change in Revenue Compared with Un-Transitioned Rates:					
638	Tier 3 Commodity Charge	(\$969,112)	(\$514,873)	(\$421,353)	(\$180,874)	\$0
639						
640	Additional Revenue to be Collected from Tier 1	\$1,215,757	\$521,039	\$405,252	\$173,680	\$0
641	\$/ccf Added to Tier 1 for Transition	\$0.21	\$0.09	\$0.07	\$0.03	\$0.00
642	Revised (Transitioned) Tier 1 Commodity Charge	\$2.95	\$2.94	\$2.92	\$2.89	\$2.87
643						
644	Additional Revenue to be Collected from Tier 2	(\$246,645)	(\$6,166)	\$16,101	\$7,194	\$0
645	\$/ccf Added to Tier 2 for Transition	(\$0.14)	(\$0.00)	\$0.01	\$0.00	\$0.00
646	Revised (Transitioned) Tier 2 Commodity Charge	\$3.37	\$3.61	\$3.63	\$3.63	\$3.64
647						
648	<b>Summarize Increasing Block Alternative Commodity Charges</b>					
649	Tier 1 Commodity Charge, Excluding Pass Through	\$2.95	\$2.94	\$2.92	\$2.89	\$2.87
650	Tier 1 Estimated Pass Through		\$0.07	\$0.15	\$0.20	\$0.29
651	Tier 2 Commodity Charge, Excluding Pass Through	\$3.37	\$3.61	\$3.63	\$3.63	\$3.64
652	Tier 2 Estimated Pass Through		\$0.08	\$0.16	\$0.23	\$0.29
653	Tier 3 Commodity Charge, Excluding Pass Through	\$3.55	\$4.00	\$4.07	\$4.26	\$4.41
654	Tier 3 Estimated Pass Through		\$0.08	\$0.17	\$0.25	\$0.28
655						
656	Note: Commodity Charges are rounded to the nearest \$0.01.					

## INTRODUCTION

In the summer of 2016, the City of Garden Grove embarked on preparing a rate study to evaluate its current rate structure. A key aspect of any rate study is defining the anticipated level of capital improvements over the next five years. The five-year horizon coincides with the allowable threshold of Proposition 218. The City completed its previous water master plan in 2008, which identified several additional capital needs in subsequent years. Although some of the highest priority projects outlined in the 2008 Water Master Plan were completed, there are many high priority projects remaining. Since 2008, the condition of the more critical improvements has only worsened. In addition to the 2008 Water Master Plan, other necessary improvements have been identified by City staff.

## EXECUTIVE SUMMARY

As touched on above, when any water purveyor is considering increasing water rates, several competing interests come into consideration. They include revenue requirements for existing operations, water consumption, system reliability, capital improvements and what is an acceptable rate increase to the community, just to name a few. The approach to prioritizing the capital improvements weighed these considerations. However, the City and the residents of Garden Grove will bring their perspectives to reach an appropriate balance through the Proposition 218 process. The CFP projects can always be accelerated and reprioritized as determined to be necessary.

A few considerations during the Proposition 218 process are:

- City representatives and residents should consider what service the City provides to its customers and how it can be messaged. Do the customers view water purely as a volumetric commodity or a service of delivering water reliably?
  - To bring this point to greater clarity, one could consider if all residents theoretically turned off their water, the City would still be required to meet all state and federal drinking water requirements, including fire flow requirements. This is independent of consumption, but is a significant component of operational costs.
- The prioritization of projects places the highest priority on water storage. Without adequate and reliable storage, there would be no water to pump and distribute, particularly in emergencies.
- The previous 2008 Water Master Plan is will be approaching ten years old and serves as a critical planning document. The City should perform a Water Master Plan update in the High Priority Phase to ensure it reflects current conditions and plans for future demands that will be placed on the water system.
- Booster Pump Replacements/Upgrades and more critical Existing System Fire Flow pipeline projects were given the second highest priority using the same rationale.
- The remaining bulk of lesser critical distribution system improvements were given the third highest priority.

It is important to note the State Water Resources Control Board’s intent to reduce per capita demands will likely result in freed up system capacity that may reduce the number of Third Priority Projects. This will be reflected in the recommended Water Master Plan Update identified in the Immediate Priority Phase.

A summary of the Capital Facilities Plans by Priority Phase is summarized below:

<b>Capital Facilities Plans by Priority Phase Summary</b>	
<b>Priority Phase/Date</b>	<b>Total Cost (\$)</b>
Immediate Priority Projects (2017-2022)	36,643,066
Secondary Priority Projects (2022-2027)	41,378,105
Third Priority Projects (2027-2032)	98,507,944
<b>TOTAL</b>	<b>176,529,115</b>

A more detailed cost by project for each priority phase is located in Tables 1, 2 and 3 at the end of the report.

[Basis for Prioritization](#)

The City of Garden Grove’s water CFP projects were prioritized based on balancing several key factors and criteria. Many of the water system’s engineering and operational needs were outlined in the City’s 2008 Water Master Plan. While the master plan identified and previously prioritized water system deficiencies, the prioritization of those projects were based on planning, engineering and operational considerations that can vary over time. This approach is prudent with industry practices. However, when implementing a rate study and potential rate increases, other factors, such as affordability for the City comes into consideration. This serves as the backdrop for the following CFP prioritization approach.

Our team reviewed the 2008 Water Master Plan and conducted numerous discussions with City staff regarding water system improvement priorities. The agreed approach was to distribute proposed CFP project costs as equally as possible into three categories ranked by priorities. Additionally, the three priority categories can correspond to five-year planning horizons as a way to initially evaluate the financial impacts. The three separate five-year planning periods resulted in a fifteen-year total planning horizon. Immediate Priority Projects are intended to be completed in the first five-year horizon (2017 to 2022). The second five-year planning horizon (2022 to 2027) covers the Secondary Priority Projects. The basis for prioritization of the immediate and secondary projects is discussed further below. The third five-year planning horizon (2027 to 2032) includes the remaining Third Priority Projects. While these projects are important for the reliability of the City’s water system, the Immediate and Secondary Priority projects were determined by the City and West Yost to be of higher importance, from a reliability and sustainability perspective.



## **Immediate Priority Projects**

### Reservoir Rehabilitations

During several meetings and subsequent coordination with City staff, it was determined the proposed reservoir rehabilitations were a top priority, as a recent condition assessment for the City's reservoirs identified improvements to eight reservoirs to address mechanical, structural, and security deficiencies. Reservoir rehabilitation is needed to maintain reliable water service with the current storage capacity volume. A reduction in storage volume would limit the water system's ability to reliably meet demands, while maintaining minimum fire flow storage within the reservoirs. Therefore, projects to address storage needs are a higher priority than distribution system improvements.

The City of Garden Grove's water system has a total of eight reservoirs at five sites. Four reservoirs, which include Magnolia, West Garden Grove, West Haven East, and West Haven West, are underground. Four reservoirs, which include Trask East, Trask West, Lampson East, and Lampson West, are partially aboveground. Designs to address reservoir deficiencies have been completed for the underground West Haven Reservoirs rehabilitation project. Phase 1 of this project is ready to move forward but lacks the required funding for construction implementation.

Rehabilitation of the system's underground reservoirs is also a top priority due to potential for water quality issues. This could result from runoff water from outside the reservoirs percolating into the ground and infiltrating into the reservoirs. This runoff infiltrated water would not meet drinking water quality and could contaminate the drinking water system. The rehabilitation of the remaining reservoirs, including those partially above ground has not been designed. Phase 2 is scheduled after the completion immediately following the Phase 1 West Haven Reservoir rehabilitations.

### Well Evaluation and SCADA Improvements

The City of Garden Grove has requested an engineering evaluation and condition assessment of their existing wells to determine life expectancy and identify required improvements. This evaluation will include the condition of the wells as well as any necessary mechanical and electrical improvements that are required to maintain source reliability. In addition to potential to mechanical and electrical improvements Supervisory Control and Data Acquisition (SCADA) system limitations will also need to be addressed.

Although the first phase of SCADA improvements has been completed, the remaining SCADA improvements at manually operated wells are considered a high priority. Currently, O&M staff are required to visit the well sites to make necessary control adjustments at each well site in order to operate the water system. The SCADA improvements will also allow the O&M staff to collect historical pumping data for future master planning efforts.

With an ever increasing threat of computer hackings, specialized protection of a water systems SCADA controls is vital. We have included a budget for the City to perform a Cyber Security Assessment and allow some upgrades as an add-on item to the SCADA improvements proposed in this phase.

### Water Master Plan Update

A Water Master Plan Update is also considered a top priority since the most recent Water Master Plan was completed in 2008. The industry standard is to revisit the master planning process every 5-10 years with annual updates as needed, depending on how actively an agency is changing. The City of Garden Grove is nearly built out. The importance of keeping master plans up to date should not be underestimated. A masterplan gives the City its most valuable tool in determining a realistic status of the system ability to perform up to industry standards and regulatory requirements. One example is the ability to meet fire flow requirements. An up to date master plan is vital in corroborating appropriate rates to sufficiently fund necessary improvements. For example, since 2008, water conservation efforts have resulted in lower water consumption per capita. Despite recent easing of the drought, the State Water Resources Control Board has indicated a desire to implement some form of a reduced per capita per day demand statewide. This could significantly reduce the amount of pipeline improvements required in the Third Priority Phase. A more detailed discussion is included in that section.

### Other Immediate Priority Projects

An Asset Management Study was considered to be an Immediate Priority Phase project to evaluate the need for facility and pipeline replacements and to determine budgetary requirements for the next planning period. An Asset Management Study is different than a master plan in that an Asset Management Study focuses its recommendations based on the physical condition of the assets, life expectancy and maximizing life cycle benefits of the assets. An Asset Management Study can be performed in conjunction with a Water Master Plan update, or can be performed independently. Much like SCADA improvements, Asset Management is another means of management that offers a beneficial return on investment, which often leads to greater rate stabilization into the future.

This Immediate Priority Projects category also includes five years' worth of recurring projects such as service line replacements, fire hydrant replacements, meter replacements, valve replacements and other system appurtenances. The improvements will help further reduce unaccounted for water system losses and subsequent revenue reductions.

A breakdown of cost for the Immediate Priority Phase is attached in Table 1.

### **Secondary Priority Projects**

#### Fire Flow Improvements

The 2008 Water Master Plan identified areas within the City where the water system was not able to provide fire flow volumes that met the requirements for each land use types. The 2008 Water Master Plan also generated a list of water main improvements to address fire flow deficiencies. After the reservoir storage deficiencies are addressed, discussions with staff determined that addressing fire flow deficiencies are a secondary priority. These are outlined in Table 2.

#### Other Secondary Priority Projects

Based on the City staff's experience with the water system's operation, it was concluded that well replacements can be deferred until this phase. This is the result of a newly constructed transmission main, which has solved source water deficiencies in the area of the City that was previously most

deficient. Staff also indicated that cathodic protection for steel pipes is not critical at this moment due to the relatively good condition of the pipes, and could also be deferred from the Immediate to this Secondary Priority Phase. An additional group of Secondary Priority Projects are replacement to the City's existing natural gas booster pumps. Replacements of these pumps were considered secondary priorities because these facilities are currently operating sufficiently and funding reservoir rehabilitations is considered by staff to be a more critical use of available funding. However, staff anticipates replacement of the natural gas booster pumps will be necessary when the City reaches the Secondary Priority Phase timeframe.

The Second Priority Projects category also includes five years' worth of recurring projects such as service line replacements, fire hydrant replacements, meter replacements, valve replacements and other system appurtenances. The improvements will help further reduce unaccounted for water system losses and subsequent revenue reductions.

A breakdown of cost for the Immediate Priority Phase is attached in Table 2.

### **Third Priority Projects**

#### Fire Flow Improvements

The balance of pipeline projects to address existing system fire flow deficiencies, excluding those included in the Secondary Priority category, have been included in the Third Priority Projects category. These have been included in the third category based on several considerations. Each agency often considers the cost of deferred improvements against the potential for rate spikes by accelerating too many CFP projects. One significant consideration is the opportunity to reduce the number of fire flow upgrade projects. At the time of the 2008 Water Master Plan, these recommendations were based on the per capita per day water demands in 2008. Since 2008, water demands have decreased, and the upcoming Water Master Plan update will re-assess fire flow deficiencies using different (and presumably lower) water demands. This might lead to fewer remaining fire flow deficiencies. Additionally, it is expected that the State Water Resources Control Board (SWRCB) will lift the "emergency" aspects of drought regulations and the mandated reductions in consumption. However, the SWRCB has indicated their intent to reduce the per capita per day water demands from current demands. This intent will likely result in freed up system capacity that may reduce the number of Third Priority Projects identified in the upcoming Water Master Plan.

#### Other Third Priority Projects

The Third Priority Projects category also includes recurring projects such as service line replacements, fire hydrant replacements, meter replacements, valve replacements and other system appurtenances. The improvements will help further reduce unaccounted for water system losses and subsequent revenue reductions.

A breakdown of cost for the Immediate Priority Phase is attached in Table 3.

#### Proposed Project Costs

Projected project costs for all projects except the reservoir rehabilitations were based on the costs provided in the 2008 Water Master Plan. The 2008 Water Master Plan costs included a 60% total

contingency, which included 30% for construction and 30% for engineering design and construction management. West Yost escalated the 2008 Water Master Plan to 2016 costs in two different ways: (1) using changes in the Turner Building Cost index between 2008 and 2016, and (2) using changes in the CPI Utility and public transportation category index between 2008 and 2016. Of these two methods, the Turner Building Cost index produced the higher 2016 estimated cost, and it was used for the purposes of this analysis. The 2016 escalated cost was then further escalated based on an assumed 3% annual inflation rate to generate the cost estimates reported in this analysis.

The reservoir rehabilitation cost for the West Haven reservoir was based on a May 2016 average bid cost with a 30% contingency for construction and construction management. A contingency was not included for design because the bid costs were based on completed design documents. The 2016 cost with contingency was then further escalated based on an assumed 3% annual inflation rate.

Costs for the remaining reservoir rehabilitation projects was based on the proposed costs presented in the City of Garden Grove Condition Assessment of Eight Concrete Reservoirs prepared by Kleinfelder and Simon Wong in December 2013. An additional 60% total contingency, which included 30% for construction and 30% for engineering design and construction management were added to the proposed costs before escalation. West Yost escalated the December 2013 City of Garden Grove Condition Assessment of Eight Concrete Reservoirs prepared by Kleinfelder and Simon Wong to 2016 costs in two different ways: (1) using changes in the Turner Building Cost index between 2013 and 2016, and (2) using changes in the CPI Utility and public transportation category index between 2013 and 2016. Of these two methods, the Turner Building Cost index produced the higher 2016 estimated cost, and it was used for the purposes of this analysis. The 2016 escalated cost was then further escalated based on an assumed 3% annual inflation rate to generate the cost estimates reported in this analysis.

The cost estimates were considered reasonable by West Yost based on a comparison of available actual bid costs and or preliminary costs for similar projects constructed within southern California in the last five years.

**Water Rate Study  
Capital Facilities Plan Assessment & Prioritization**



Table 1 - Immediate Phase Capital Facilities Plan Projects (2017-2022)			
Category	Project CIP ID	Project Name	Cost
Reoccurring Replacements	N_RPL_01	Replace Misc. Distribution System Appurtenances (BO, ARV, Vac)	\$ 286,232
	N_RPL_02	Service Line Replacements	\$ 7,068,075
	N_RPL_03	Fire Hydrant Replacements	\$ 1,866,270
	N_RPL_04	Meter Replacements	\$ 5,141,311
	N-RPL-05	Gate Valve Replacements	\$ 3,175,527
<b>Subtotal, Replacements (603 Fund)</b>			<b>\$ 17,537,415</b>
Wells	X_FF_RLA	Well Condition Assessment	\$ 733,257
Boosters	X_RL_BCK	Portable Back-up Power Units	\$ 1,047,510
Reservoirs		Reservoir Rehabilitations _ Near Term West Haven Reservoir Projects	\$ 4,599,808
		Reservoir Rehabilitations _ Trask Reservoirs Medium and High Priorities	\$ 1,055,106
		Reservoir Rehabilitations _ Trask Reservoirs Low Priorities	\$ 1,943,366
		Trask Reservoir Site Mechanical and Security - High & Medium Priority	\$ 183,763
		Reservoir Rehabilitations _ Magnolia Reservoir Medium and High Priorities	\$ 549,598
		Reservoir Rehabilitations _ Magnolia Reservoir Low Priorities	\$ 1,691,723
		Magnolia Reservoir Site Mechanical and Security - High & Medium Priority	\$ 113,874
		Magnolia Reservoir Site Mechanical and Security - Low Priority	\$ 3,383
		Reservoir Rehabilitations _ West Garden Grove Reservoir Medium and High Priorities	\$ 988,389
		Reservoir Rehabilitations _ West Garden Grove Reservoir Low Priorities	\$ 3,171,980
		West Garden Grove Reservoir Site Mechanical and Security - High & Medium Priority	\$ 64,708
		Reservoir Rehabilitations _ Lampson Reservoir Medium and High Priorities	\$ 1,513,246
		Reservoir Rehabilitations _ Lampson Reservoir Low Priorities	\$ 338,345
		Lampson Reservoir Site Mechanical and Security - High & Medium Priority	\$ 55,247
Studies	STUDY_AM	Asset Management Study	\$ 327,347
		Masterplan Update	\$ 550,000
		Cyber Security	\$ 175,000
<b>Subtotal, Capital (602 Fund)</b>			<b>\$ 19,105,652</b>
<b>Total:</b>			<b>\$ 36,643,066</b>

**Water Rate Study  
Capital Facilities Plan Assessment & Prioritization**



Table 2 - Secondary Phase Capital Facilities Plan Projects (2022-2027)			
Category	Project CIP ID	Project Name	Cost
Reoccurring Replacements	N_RPL_01	Replace Misc. Distribution System Appurtenances (BO, ARV, Vac)	\$ 331,822
	N_RPL_02	Service Line Replacements	\$ 8,193,836
	N_RPL_03	Fire Hydrant Replacements	\$ 2,163,519
	N_RPL_04	Meter Replacements	\$ 5,960,188
	N-RPL-05	Gate Valve Replacements	\$ 3,681,306
		<b>Subtotal, Replacements (603 Fund)</b>	<b>\$ 20,330,670</b>
Wells	N_GW_RPL_01	Well 19 Rehabilitation	\$ 572,263
	N_GW_RPL_03	Well 25 Rehabilitation	\$ 789,177
	N_GW_RPL_04	Well 16 Replacement	\$ 4,220,782
Boosters	N_RPL_07	Booster Pump Replacement - Lampson	\$ 1,645,343
	N_RPL_08	Booster Pump Replacement - Magnolia	\$ 385,302
	N_RPL_09	Booster Pump Replacement - Trask	\$ 1,464,253
	N_RPL_13	Natural Gas Engine Rplc- Lampson	\$ 1,322,429
	N_RPL_14	Natural Gas Engine Rplc- Magnolia	\$ 705,386
Pipelines	X_FF_001	Existing System Fire Flow Project 001	\$ 2,793,008
	X_FF_005	Existing System Fire Flow Project 005	\$ 607,176
	X_FF_006	Existing System Fire Flow Project 006	\$ 379,485
	X_FF_008	Existing System Fire Flow Project 008	\$ 1,290,248
	X_FF_009	Existing System Fire Flow Project 009	\$ 242,870
	X_FF_012	Existing System Fire Flow Project 012	\$ 364,305
	X_FF_015	Existing System Fire Flow Project 015	\$ 637,534
	X_FF_022	Existing System Fire Flow Project 022	\$ 1,517,939
	X_FF_041	Existing System Fire Flow Project 041	\$ 561,637
	F_RDV_IW	Pipelines Added for International West Specific Plan	\$ 1,366,145
F_FF_001	Future System Fire Flow Project 001	\$ 182,153	
		<b>Subtotal, Capital (602 Fund)</b>	<b>\$ 21,047,435</b>
		<b>Totals</b>	<b>\$ 41,378,105</b>

Table 3 - Third Phase Capital Facilities Plan Projects (2027-2032)			
Category	Project CIP ID	Project Name	Cost
Reoccurring Replacements	N_RPL_01	Replace Misc. Distribution System Appurtenances (BO, ARV, Vac)	\$ 384,672
	N_RPL_02	Service Line Replacements	\$ 9,498,901
	N_RPL_03	Fire Hydrant Replacements	\$ 2,508,111
	N_RPL_04	Meter Replacements	\$ 6,909,492
	N-RPL-05	Gate Valve Replacements	\$ 4,267,643
		<b>Subtotal, Replacements (603 Fund)</b>	<b>\$ 23,568,819</b>
Wells	F_GW_A	Groundwater Well in West Pressure Zone	\$ 4,223,298
Pipelines	X_FF-002	Existing System Fire Flow Project 002	\$ 44,798,038
	X_FF-010	Existing System Fire Flow Project 010	\$ 2,422,202
	X_FF-013	Existing System Fire Flow Project 013	\$ 18,583
	X_FF-014	Existing System Fire Flow Project 014	\$ 297,320
	X_FF-016	Existing System Fire Flow Project 016	\$ 266,068
	X_FF-017	Existing System Fire Flow Project 017	\$ 478,922
	X_FF-018	Existing System Fire Flow Project 018	\$ 297,320
	X_FF-019	Existing System Fire Flow Project 019	\$ 346,874
	X_FF-020	Existing System Fire Flow Project 020	\$ 141,903
	X_FF-021	Existing System Fire Flow Project 021	\$ 173,437
	X_FF-023	Existing System Fire Flow Project 023	\$ 35,476
	X_FF-024	Existing System Fire Flow Project 024	\$ 2,412,348
	X_FF-025	Existing System Fire Flow Project 025	\$ 545,087
	X_FF-026	Existing System Fire Flow Project 026	\$ 99,107
	X_FF-027	Existing System Fire Flow Project 027	\$ 1,337,941
	X_FF-028	Existing System Fire Flow Project 028	\$ 49,553
	X_FF-029	Existing System Fire Flow Project 029	\$ 35,476
	X_FF-030	Existing System Fire Flow Project 030	\$ 297,320
	X_FF-031	Existing System Fire Flow Project 031	\$ 681,359
	X_FF-032	Existing System Fire Flow Project 032	\$ 53,214
	X_FF-033	Existing System Fire Flow Project 033	\$ 9,460
	X_FF-034	Existing System Fire Flow Project 034	\$ 212,854
	X_FF-035	Existing System Fire Flow Project 035	\$ 297,320
	X_FF-036	Existing System Fire Flow Project 036	\$ 198,213
	X_FF-037	Existing System Fire Flow Project 037	\$ 283,806
	X_FF-038	Existing System Fire Flow Project 038	\$ 212,854
	X_FF-039	Existing System Fire Flow Project 039	\$ 24,777
	X_FF-040	Existing System Fire Flow Project 040	\$ 106,427
	X_FF-042	Existing System Fire Flow Project 042	\$ 260,155
	X_FF-043	Existing System Fire Flow Project 043	\$ 24,777
	X_FF-044	Existing System Fire Flow Project 044	\$ 148,660
	X_FF-045	Existing System Fire Flow Project 045	\$ 185,825
X_FF-046	Existing System Fire Flow Project 046	\$ 70,951	
X_FF-047	Existing System Fire Flow Project 047	\$ 185,825	
X_FF-048	Existing System Fire Flow Project 048	\$ 266,068	
X_FF-049	Existing System Fire Flow Project 049	\$ 272,544	
X_FF-050	Existing System Fire Flow Project 050	\$ 173,437	

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Pipelines	X_FF-051	Existing System Fire Flow Project 051	\$ 371,650
	X_FF-052	Existing System Fire Flow Project 052	\$ 99,107
	X_FF-053	Existing System Fire Flow Project 053	\$ 49,553
	X_FF-054	Existing System Fire Flow Project 054	\$ 1,015,844
	X_FF-055	Existing System Fire Flow Project 055	\$ 74,330
	X_FF-056	Existing System Fire Flow Project 056	\$ 63,913
	X_FF-057	Existing System Fire Flow Project 057	\$ 106,427
	X_FF-058	Existing System Fire Flow Project 058	\$ 177,379
	X_FF-059	Existing System Fire Flow Project 059	\$ 37,165
	X_FF-060	Existing System Fire Flow Project 060	\$ 371,650
	X_FF-061	Existing System Fire Flow Project 061	\$ 425,708
	X_FF-062	Existing System Fire Flow Project 062	\$ 8,869
	X_FF-063	Existing System Fire Flow Project 063	\$ 193,258
	X_FF-064	Existing System Fire Flow Project 064	\$ 1,330,339
	X_FF-065	Existing System Fire Flow Project 065	\$ 247,767
	X_FF-066	Existing System Fire Flow Project 066	\$ 68,384
	X_FF-067	Existing System Fire Flow Project 067	\$ 12,388
	X_FF-068	Existing System Fire Flow Project 068	\$ 35,476
	X_FF-069	Existing System Fire Flow Project 069	\$ 163,019
	X_FF-070	Existing System Fire Flow Project 070	\$ 37,165
	X_FF-071	Existing System Fire Flow Project 071	\$ 338,945
	X_FF-072	Existing System Fire Flow Project 072	\$ 3,717
	X_FF-073	Existing System Fire Flow Project 073	\$ 53,214
	X_FF-074	Existing System Fire Flow Project 074	\$ 86,718
	X_FF-075	Existing System Fire Flow Project 075	\$ 148,660
	X_FF-076	Existing System Fire Flow Project 076	\$ 352,820
	X_FF-077	Existing System Fire Flow Project 077	\$ 85,480
	X_FF-078	Existing System Fire Flow Project 078	\$ 53,214
	X_FF-079	Existing System Fire Flow Project 079	\$ 322,097
	X_FF-080	Existing System Fire Flow Project 080	\$ 557,475
	X_FF-081	Existing System Fire Flow Project 081	\$ 470,757
	X_FF-082	Existing System Fire Flow Project 082	\$ 173,437
	X_FF-083	Existing System Fire Flow Project 083	\$ 198,213
	X_FF-084	Existing System Fire Flow Project 084	\$ 371,650
X_FF-085	Existing System Fire Flow Project 085	\$ 142,466	
X_FF-086	Existing System Fire Flow Project 086	\$ 638,563	
X_FF-087	Existing System Fire Flow Project 087	\$ 222,990	
X_FF-088	Existing System Fire Flow Project 088	\$ 76,808	
X_FF-089	Existing System Fire Flow Project 089	\$ 69,178	
X_FF-090	Existing System Fire Flow Project 090	\$ 8,869	
X_FF-091	Existing System Fire Flow Project 091	\$ 67,393	
X_FF-092	Existing System Fire Flow Project 092	\$ 35,476	
X_FF-093	Existing System Fire Flow Project 093	\$ 106,427	
X_FF-094	Existing System Fire Flow Project 094	\$ 21,285	



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Pipelines	X_FF-095	Existing System Fire Flow Project 095	\$ 124,165
	X_FF-096	Existing System Fire Flow Project 096	\$ 198,213
	X_FF-097	Existing System Fire Flow Project 097	\$ 35,476
	X_FF-098	Existing System Fire Flow Project 098	\$ 39,643
	X_FF-099	Existing System Fire Flow Project 099	\$ 212,854
	X_FF-100	Existing System Fire Flow Project 100	\$ 24,777
	X_FF-101	Existing System Fire Flow Project 101	\$ 35,476
	X_FF-102	Existing System Fire Flow Project 102	\$ 74,330
	X_FF-103	Existing System Fire Flow Project 103	\$ 61,942
	X_FF-104	Existing System Fire Flow Project 104	\$ 24,777
	X_FF-105	Existing System Fire Flow Project 105	\$ 68,136
	X_FF-106	Existing System Fire Flow Project 106	\$ 24,777
	X_FF-107	Existing System Fire Flow Project 107	\$ 2,128,542
	X_FF-108	Existing System Fire Flow Project 108	\$ 198,213
	X_FF-109	Existing System Fire Flow Project 109	\$ 247,767
		<b>Subtotal, Capital (602 Fund)</b>	<b>\$ 74,939,125</b>
		<b>Totals</b>	<b>\$ 98,507,944</b>

## Appendix F

# Budget Based Rate Structure Evaluation

## F.1 Introduction

This Appendix describes the City’s evaluation of a budget-based rate structure evaluation. During the completion of the Rate Study, the City evaluated several rate structure alternatives. One of them was budget-based rates, which are described in more detail below. This Rate Study was funded in part by grant funding from the Santa Ana Watershed Project Authority. One of the conditions of the grant was that Budget-Based Rates be evaluated. After evaluation, the City decided not to implement budget-based rates, and instead chose the rate structure shown in Rate Study Report.

Budget-Based Rates, also called Conservation Rates, use individualized water budget allocations based on the number of residents in a household, the amount of landscaped area, and daily weather. Customers who use at or below their individual water budget pay the lowest tier rates; those who exceed their allocation pay increasing rates. The structure encourages efficiency in a fair manner, for customers with different needs. There is no limit on how much water a customer can use.

The individualized allocation determines the price of the water. Indoor water use, up to the “indoor allocation”, is the least expensive water. The Budget-Based rate structure evaluated as part of this project would have three Commodity Charge Tiers:

1. Indoor Tier, for water use up to each customer’s Indoor Allocation
2. Outdoor Tier, for water use exceeding each customer’s Indoor Allocation but less than the combined Indoor and Outdoor Allocations
3. Excessive Tier, for water use exceeding each customer’s combined Indoor and Outdoor Allocations.

The indoor allocation does not mean a customer cannot use more water than the indoor allocation – it means that water use up to the indoor allocation is sold at the lowest price. Water use, even if it is indoors, above the indoor allocation, would be sold at the higher price of the outdoor tier.]

Additional detail for the Budget-Based Rate calculations is provided in Appendix C.

## F.2 Evaluation of Budget-Based Rates

### F.2.1: Revenue Requirement and Cost of Service Analysis

The Revenue Requirement is unchanged and is the same as what is shown in detail in Section 2 of the Report.

The Cost-of-Service Analysis is unchanged and is the same as what is shown in detail in Section 3 of the Report.

## F.2.2: Customer Data

In order to evaluate Budget-Based Rates, it is necessary to characterize the landscape of the parcels. This is required to generate the outdoor allocations. FG Solutions used the services of Miller Spatial Services to complete this task. Miller Spatial Services obtained available aerial imagery from SAWPA and used it to develop individualized landscape areas for each parcel.

## F.2.3: Projected Indoor Water Allocation

The City provided Miller Spatial Services a detailed extract of billing system data for FY 15/16, including, for each water meter read: the tax identification number associated with the account, customer type, water meter size, date of water meter reading, date of previous water meter reading, and consumption. For each multi-family connection, the number of multi-family units was also provided.

For the purposes of this evaluation, the Indoor Allocation for single-family residences is based on 60 gallons per person per day, and four persons per household. When a budget-based rate structure is implemented, a utility will typically establish a process to allow a customer with more than four persons in the household to receive a larger Indoor Allocation, based on the actual number of residents.

For multi-family residential customers, the Indoor Allocation was based on 60 gallons per person per day per unit. The Outdoor Allocation is based on the amount of landscaped area associated with the water meter. For non-residential connections, the Indoor Allocation was equal to the seasonally-adjusted three-year average water consumption for the account.

## F.2.4: Projected Outdoor Water Allocation

The Outdoor Allocation is developed from a formula that considers the landscape square footage and the weather. It will be different for each customer, because each customer will have a unique landscape square footage, and it will be different for each billing period because the weather changes seasonally.

The weather is incorporated into the Outdoor Water Allocation formula through a concept called “Evapotranspiration”, abbreviated ET. ET, measured by inches, is related to the amount of water needed to irrigate landscape, particularly grass. It can be measured by a weather station, and the California Irrigation Management Information System (CIMIS) operates a series of these irrigation systems statewide. FY 15/16 data from the CIMIS station in Irvine was used, along with the landscape area of each customer, to develop estimated Outdoor Water Allocations.

## F.2.5 Projected Excessive Use

Excessive Use was determined by taking the total water consumption for each water meter read, and subtracting the Indoor Allocation and Outdoor Allocation.

## F.2.6 Summary of Projected Water Use Per Tier

Table F-1 shows what the projected water consumption for each tier in FY 17/18 would be. Water Use data from FY 15/16 was used, with two adjustments:

1. Water use from FY 15/16 was decreased by 3.6% so that back-calculated revenues using water consumption data match actual revenues collected by the City.
2. Projected consumption was increased by approximately 6.9% to recognize that system wide demands in FY 17/18 were projected to exceed actual water demands in FY 15/16 as drought restrictions are partially lifted.

**Table F-1: Projected Water Use by Tier**

Tier	Projected FY 17/18	
	Water Use, hcf	Percent
Indoor	6,026,591	68%
Outdoor	1,916,364	22%
Excessive	963,690	11%
<b>Total</b>	<b>8,906,646</b>	<b>100.00%</b>

## F.2.7 Proposed Budget-Based Rate Structure

The proposed Bi-Monthly Minimum Charge and the Capital Improvement Charge would be the same as described in Section 4 of the Rate Study Report. See Tables 3-6 and 3-7.

The proposed Commodity Charges would be:

1. Indoor Tier: Equal to the proposed Tier 1 Commodity Charge described in Section 3 of the Rate Study Report. The cost, in \$/hcf, is based on the cost of locally produced groundwater. Refer to Table 3-8.
2. Excessive Tier: Equal to the proposed Tier 2 Commodity Charge described in Section 3 of the Rate Study Report. The cost, in \$/hcf, is based on the cost of imported water from MWD. Refer to Table 3-8.
3. Outdoor Tier: Higher than the Indoor Tier charge and lower than the Excessive Tier charge. The cost, in \$/hcf, blends the cost of locally produced groundwater and imported water from MWD.

Refer to Appendix C for more details.

## F.2.8 City's Decision to Not Adopt Budget Based Rates

Budget-Based rate structures were discussed with the City Council in Study Sessions 1, 2, and 3. As a result of these discussions, the City decided not to pursue the implementation of Budget-Based rates. Some of the considerations are discussed in the following paragraphs.

Most significantly, budget-based rates require a greater amount of administration than other rate structures. This is because each customer has a unique Indoor and Outdoor Allocation structure, and there are several variances that are provided. In addition to a greater number of people per household, utilities with Budget-Based rates may choose to offer variances for medical reasons, fruit growing, and swimming pools. Additionally, this is a very different rate structure than is currently used, and it will take time and effort to work with customers. The City expects it would need to hire several additional employees to administer and implement the rate structure.

One of the goals of Budget-Based rates is to encourage conservation of a limited water resource. Budget-Based rates can be effective in discouraging excessive outdoor water use, because of the higher cost associated with the Outdoor Tier and Excessive Tier. However, in Garden Grove (as shown in Table F-1) above, 72% of projected water use would be in the Indoor Tier. This is because, compared with other utilities in Southern California (particularly those in hotter areas of the Santa Ana River watershed in the Inland Empire), residential water use in Garden Grove is already comparatively low.

With the proposed rate structure in Section 3 of the Water Rate Study Report, the Division is taking steps to improve the financial stability of the utility. Increases in fixed charges are proposed, and the financial

impacts of higher fixed charges for low-income/senior customers are partially mitigated by the proposed Low-Income/Senior Discount.