City of Modesto

WATER RATE AND FEE STUDY

FINAL REPORT
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SECTION 1: INTRODUCTION AND EXECUTIVE SUMMARY

1.1 Background

The City of Modesto provides water service to over 73,000 accounts throughout the City of Modesto, Salida, Empire, Grayson, Del Rio, and portions of Ceres (Walnut Manor) and Turlock. The City recently sold the water system serving Hickman and Waterford to the City of Waterford. The City of Modesto's water sources are groundwater and treated surface water purchased from the Modesto Irrigation District. In 2014, about two thirds of water use was supplied via groundwater and about one third was supplied via surface water.

The City last conducted an in-depth cost of service rate study in 2004, which was approved and implemented by the City via Resolution No. 2004-627. Resolution No. 2004-627 established rates through fiscal year (FY) 2008/09 followed by inflationary annual rate increases thereafter. The last rate change occurred July 1, 2013. The City engaged Bartle Wells Associates (BWA) to conduct a comprehensive cost of service review of the water rates and charges. A rate update is needed due to operating cost increases, infrastructure improvements, and drought conditions.

1.2 Study Overview

This rate study provides a financial plan reviewing the City's operating and capital costs, reserve targets, and funding mechanisms and develops the Water Fund revenue requirements. The revenue requirement is allocated between customer service, demand costs, and commodity costs. The unit costs of customer service, commodity, and demand are developed into proposed rates for the next five-year period.

1.3 Procedural Requirements of Proposition 218

Proposition 218, the "Right to Vote on Taxes Act", was approved by California voters in November 1996 and is codified as Articles XIIIC and XIIID of the California Constitution. Proposition 218 establishes requirements for imposing any new or increasing any existing property-related fees and charges. For many years, there was no legal consensus on whether water and sewer service fees met the definition of "property-related fees." In July 2007, the California Supreme Court essentially confirmed that Proposition 218 applies to water service fees.

The City must follow the procedural requirements of Proposition 218 for all water rate increases. These requirements include:

1. **Noticing Requirement** – The City must mail a notice of the proposed rate increases to all affected property owners or ratepayers. The notice must specify the amount of the fee, the basis upon which it was calculated, the reason for the fee, and the date/time/location of a public rate hearing at which the proposed rates will be considered/adopted.

2. **Public Hearing** – The City must hold a public hearing prior to adopting the proposed rate increases. The public hearing must be held not less than 45 days after the required notices are mailed.
3. **Rate Increases Subject to Majority Protest** - At the public hearing, the proposed rate increases are subject to majority protest. If more than 50% of affected property owners or ratepayers submit written protests against the proposed rate increases, the increases cannot be adopted.

Proposition 218 also established a number of substantive requirements that apply to water rates and charges, including:

1. **Cost of Service** - Revenues derived from the fee or charge cannot exceed the funds required to provide the service. In essence, fees cannot exceed the "cost of service".

2. **Intended Purpose** - Revenues derived from the fee or charge can only be used for the purpose for which the fee was imposed.

3. **Proportional Cost Recovery** - The amount of the fee or charge levied on any customer shall not exceed the proportional cost of service attributable to that customer.

4. **Availability of Service** - No fee or charge may be imposed for a service unless that service is used by, or immediately available to, the owner of the property.

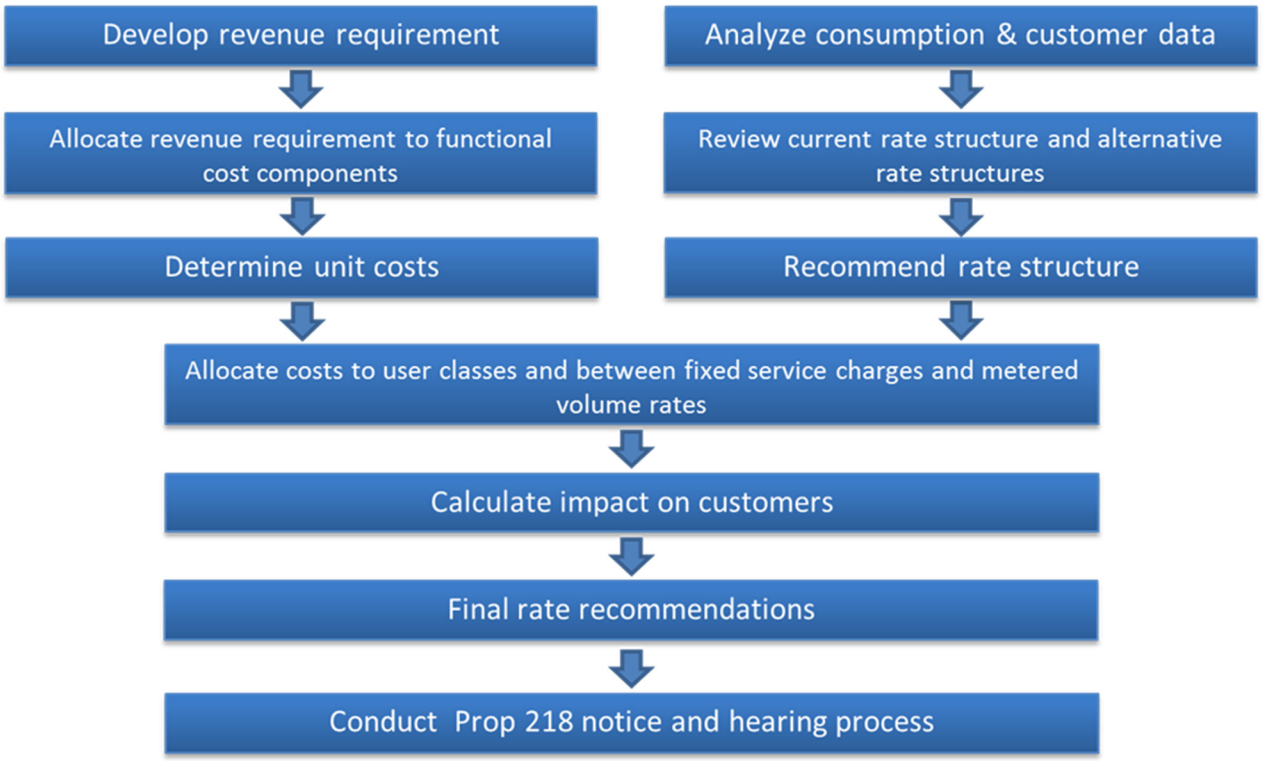
5. **General Government Services** - No fee or charge may be imposed for general governmental services where the service is available to the public at large.

Charges for water, sewer, and refuse collection are exempt from additional voting requirements of Proposition 218, provided the charges do not exceed the cost of providing service and are adopted pursuant to procedural requirements of Proposition 218.

1.4 Rate Study Process

This section details the development of the City of Modesto's water rates and compliance with Proposition 218 through a comprehensive cost of service and rate design study process as shown in the following figure.

Figure 1: Comprehensive Water Cost of Service Study Process



The following is a brief description of the water rate study process:

- **Revenue Requirements** - Revenue requirements are analyzed through as financial plan developed from the Water Fund budget. Based on the best information currently available, the financial plan incorporates projected operation and maintenance costs, capital expenditures, debt service, and growth to estimate annual revenue requirements. The plan serves as a roadmap for funding the City's future operating and capital programs while maintaining long-term fiscal stability. The financial plan projections determine the annual water revenue requirements to be recovered through water rates and other revenue sources.

- **Cost of Service Allocation** - The cost of service process builds on the financial plan analysis and assigns water system costs to functional cost components (customer service, commodity, and demand). This process is intended to proportionately allocate costs to each customer based on how he or she takes water service.

- **Rate Design** - Rate design involves developing a rate structure that proportionately recovers costs from water system customers. Final rate recommendations are designed to (a) fund the utility's short- and long-term costs of providing service; (b) proportionately allocate costs to all customers and customer classes; and (c) comply with the substantive requirements of Proposition 218.

1.5 Findings and Recommendations

The findings and recommendations presented in this report were developed with substantial input and overview from City staff. The rate recommendations include modifications to cost of service allocations and water rates. Rates are designed to recover the water utility's cost of service and proportionately recover costs from customers. The major financial challenges of the water fund over the next five years will be to maintain debt service coverage and to stabilize revenues during prolonged drought conditions.

1.5.1 Cost Allocation and Rate Design

BWA finds the cost allocation and rate design developed in the City's prior rate study to be fair, reasonable, and comply with industry standard practice. The prior rate study and this 2016 rate study allocate costs to customer service, demand/capacity costs, and commodity cost categories. BWA proposes to maintain the City's rate structure consisting of fixed monthly meter charges, a single volume rate charged to all metered water use, and fixed charges for unmetered customers. All City service areas are proposed to be charged the same rates. Prior to 2004, the City's rate structure included zonal charges based on service area.

This 2016 Water Rate Study provides recommended drought and non-drought scenario rates. The non-drought rates recover water commodity costs from normal year water consumption. In consultation with staff, BWA established normal year water consumption as a permanent 25% reduction in water use from 2013 levels (19.4 hundred cubic feet (ccf) monthly for a typical single family home). The drought scenario rates recover the City's water commodity costs from projected drought-level water use. Drought-level water use consists of a 33% reduction in water use compared to 2013 water use. The drought water rate is higher than the non-drought water rate. The fixed meter charges are the same under drought and non-drought conditions.

Bartle Wells Associates also developed two capital funding rate options. Option 1 is a rate plan that provides funding for high priority capital improvements. The Option 2 rate plan provides funding for all capital improvement projects (CIPs) identified by City staff. Both Option 1 and Option 2 include drought and non-drought rates.

1.5.2 Proposed Rates

A summary of the current and proposed water rates for Option 1 and Option 2 are provided below. Also provided below are sample single family residential monthly water bills for each option under drought and non-drought conditions. The typical single family residential customer is served by a 1 inch meter. The typical customer is projected to consume 13.0 ccf monthly under drought conditions and 14.6 ccf under non-drought conditions. The typical bills are approximately the same under drought and non-drought conditions. Under drought conditions, customers pay a higher water rate but consume less, thereby mitigating bill impacts.

Table 1-1: Option 1 Proposed Rates
City of Modesto
Water Rate and Fee Study

		Proposed				
Meter Size	**Current**	**FY2016/17**	**FY2017/18**	**FY2018/19**	**FY2019/20**	**FY2020/21**
Fixed Meter Charges ($/month)						
5/8 inch	$15.03	$20.49	$20.90	$22.72	$24.74	$26.99
3/4 inch	$15.03	$20.49	$20.90	$22.72	$24.74	$26.99
1 inch	$21.33	$28.80	$29.45	$32.45	$35.77	$39.48
1.5 inch	$36.90	$49.59	$50.81	$56.76	$63.36	$70.72
2 inch	$55.68	$74.53	$76.45	$85.94	$96.46	$108.20
3 inch	$105.80	$153.50	$157.65	$178.35	$201.27	$226.88
4 inch	$162.13	$269.89	$277.30	$314.52	$355.74	$401.79
6 inch	$318.47	$548.39	$563.61	$640.36	$725.36	$820.32
8 inch	$506.20	$1,005.62	$1,033.68	$1,175.33	$1,332.19	$1,507.45
10 inch	$725.56	$1,587.55	$1,631.95	$1,856.20	$2,104.52	$2,381.98
12 inch	$1,350.92	$2,086.35	$2,144.75	$2,439.80	$2,766.52	$3,131.58
Water Rate ($/ccf)						
Drought	$1.40	$1.91	$1.98	$2.08	$2.18	$2.28
Non-drought	$1.40	$1.74	$1.82	$1.93	$2.05	$2.18
DROUGHT Unmetered Fixed Charge ($/month) based on lot size						
PRO1 - 0 to 5,000 sq ft	$40.81	$48.09	$49.45	$53.46	$57.79	$62.51
PRO2 - 5,001 to 7,000 sq ft	$46.38	$55.92	$57.57	$61.99	$66.73	$71.86
PRO3 - 7001 to 11,000 sq ft	$55.04	$71.39	$73.60	$78.83	$84.38	$90.32
PRO4 - 11,001 to 17,000 sq ft	$58.43	$94.50	$97.56	$104.00	$110.76	$117.91
PRO5 - Over 17,000 sq ft	$68.69	$106.16	$109.64	$116.69	$124.06	$131.82
NON-DROUGHT Unmetered Fixed Charge ($/month) based on lot size						
PRO1 - 0 to 5,000 sq ft	$40.81	$46.37	$47.83	$51.94	$56.48	$61.50
PRO2 - 5,001 to 7,000 sq ft	$46.38	$53.51	$55.29	$59.86	$64.88	$70.44
PRO3 - 7001 to 11,000 sq ft	$55.04	$67.60	$70.04	$75.49	$81.49	$88.09
PRO4 - 11,001 to 17,000 sq ft	$58.43	$88.66	$92.06	$98.84	$106.29	$114.47
PRO5 - Over 17,000 sq ft	$68.69	$99.27	$103.16	$110.62	$118.80	$127.77
TUR - Turlock Fire Charge	$4.19	$4.19	$4.19	$4.19	$4.19	$4.19

ccf – hundred cubic foot; one ccf is 748 gallons

Table 1-2: Option 1 Typical Single Family Residential Monthly Bills

City of Modesto
Water Rate and Fee Study

		Proposed				
Charges	**Current**	**FY2016/17**	**FY2017/18**	**FY2018/19**	**FY2019/20**	**FY2020/21**
Drought						
Fixed Charge (1 inch)	$21.33	$28.80	$29.45	$32.45	$35.77	$39.48
Water Use Charges (13 ccf)	$18.20	$24.83	$25.74	$27.04	$28.34	$29.64
Total Monthly Bill	$39.53	$53.63	$55.19	$59.49	$64.11	$69.12
Non-drought						
Fixed Charge (1 inch)	$21.33	$28.80	$29.45	$32.45	$35.77	$39.48
Water Use Charges (14.6 ccf)	$20.44	$25.40	$26.57	$28.18	$29.93	$31.83
Total Monthly Bill	$41.77	$54.20	$56.02	$60.63	$65.70	$71.31

Table 1-3: Option 2 Proposed Rates
City of Modesto
Water Rate and Fee Study

		Proposed				
Meter Size	**Current**	**FY2016/17**	**FY2017/18**	**FY2018/19**	**FY2019/20**	**FY2020/21**
Fixed Meter Charges ($/month)						
5/8 inch	$15.03	$20.79	$21.72	$23.63	$25.75	$28.14
3/4 inch	$15.03	$20.79	$21.72	$23.63	$25.75	$28.14
1 inch	$21.33	$29.30	$30.82	$33.97	$37.45	$41.40
1.5 inch	$36.90	$50.58	$53.57	$59.80	$66.72	$74.56
2 inch	$55.68	$76.11	$80.86	$90.81	$101.84	$114.35
3 inch	$105.80	$156.98	$167.29	$188.98	$213.04	$240.35
4 inch	$162.13	$276.14	$294.66	$333.66	$376.92	$426.03
6 inch	$318.47	$561.28	$599.44	$679.85	$769.06	$870.34
8 inch	$506.20	$1,029.42	$1,099.82	$1,248.22	$1,412.88	$1,599.80
10 inch	$725.56	$1,625.23	$1,736.66	$1,971.61	$2,232.28	$2,528.21
12 inch	$1,350.92	$2,135.93	$2,282.53	$2,591.66	$2,934.63	$3,323.99
Water Rate ($/ccf)						
Drought	$1.40	$1.97	$2.02	$2.12	$2.22	$2.32
Non-drought	$1.40	$1.79	$1.86	$1.97	$2.10	$2.22
DROUGHT Unmetered Fixed Charge ($/month) based on lot size						
PRO1 - 0 to 5,000 sq ft	$40.81	$49.20	$51.22	$55.38	$59.87	$64.83
PRO2 - 5,001 to 7,000 sq ft	$46.38	$57.27	$59.50	$64.07	$68.97	$74.34
PRO3 - 7001 to 11,000 sq ft	$55.04	$73.23	$75.87	$81.25	$86.96	$93.14
PRO4 - 11,001 to 17,000 sq ft	$58.43	$97.07	$100.31	$106.90	$113.82	$121.21
PRO5 - Over 17,000 sq ft	$68.69	$109.09	$112.63	$119.83	$127.36	$135.36
NON-DROUGHT Unmetered Fixed Charge ($/month) based on lot size						
PRO1 - 0 to 5,000 sq ft	$40.81	$47.38	$49.61	$53.87	$58.66	$63.82
PRO2 - 5,001 to 7,000 sq ft	$46.38	$54.72	$57.23	$61.94	$67.27	$72.92
PRO3 - 7001 to 11,000 sq ft	$55.04	$69.22	$72.30	$77.90	$84.28	$90.91
PRO4 - 11,001 to 17,000 sq ft	$58.43	$90.88	$94.80	$101.74	$109.69	$117.77
PRO5 - Over 17,000 sq ft	$68.69	$101.80	$106.15	$113.76	$122.50	$131.31
TUR - Turlock Fire Charge	$4.19	$4.19	$4.19	$4.19	$4.19	$4.19

ccf – hundred cubic foot; one ccf is 748 gallons

Table 1-4: Option 2 Typical Single Family Residential Monthly Bills

City of Modesto
Water Rate and Fee Study

		Proposed				
Charges	**Current**	**FY2016/17**	**FY2017/18**	**FY2018/19**	**FY2019/20**	**FY2020/21**
Drought						
Fixed Charge (1 inch)	$21.33	$29.30	$30.82	$33.97	$37.45	$41.40
Water Use Charges (13 ccf)	$18.20	$25.61	$26.26	$27.56	$28.86	$30.16
Total Monthly Bill	$39.53	$54.91	$57.08	$61.53	$66.31	$71.56
Non-drought						
Fixed Charge	$21.33	$29.30	$30.82	$33.97	$37.45	$41.40
Water Use Charges (14.6 ccf)	$20.44	$26.13	$27.16	$28.76	$30.66	$32.41
Total Monthly Bill	$41.77	$55.43	$57.98	$62.73	$68.11	$73.81

SECTION 2: CURRENT WATER RATES

The City last conducted a Proposition 218 public hearing regarding water service charges on November 23, 2004. The rates were not subject to majority protest and were approved by City Council in Resolution No. 2004-627. Resolution No. 2004-627 provided a five-year rate plan that extended through FY2008/09. FY2009/10 to FY2013/14, the City adopted inflationary rate increases as permitted in Resolution No. 2009-299. The City did not raise the water service rates in FY2014/15 and FY2015/16.

The City provides water service to approximately 73,130 connections throughout the contiguous service area (Modesto, Salida, Empire, and portions of Ceres) and the outlying service areas of Del Rio, Grayson, and a portion of the City of Turlock, which Modesto serves. The outlying service areas are relatively small, consisting of about 1,040 water service connections. The outlying service areas not non-contiguous, i.e. not interconnected, with the City of Modesto's water transmission pipelines. Instead, the outlying areas are served via groundwater wells within each area. All customers in Del Rio and Grayson are metered. About three quarters of customers in Turlock are unmetered. The City of Modesto's contiguous service area consists of about 72,090 connections. About 10,800 connections remain unmetered. The City is engaged in a water meter installation program and intends to meter all connections by 2022.

2.1 Metered Rates

Metered water customers pay fixed meter charges based on the size of the connection in addition to a volume rate billed to each hundred cubic foot (ccf) of water consumed. The City serves meter sizes ranging from 5/8 inches to 12 inches. The most common meter size is 1 inch, which is the standard residential size based on the plumbing code. The 5/8 inch and 3/4 inch meter charges are the same. Customers pay fixed meter charges regardless of the amount of water consumed. As described in the City's prior water rate report, the meter charges are intended to recover the costs of customer service and demand related costs such as a majority of capital planning costs. The current volume rate is $1.40 per ccf of metered water use. The current volume rate recovers commodity related costs such well improvements, water quality, and the majority of surface water costs.

2.2 Unmetered Rates

As of January 2016, the City's water utility provides service to a total of about 11,100 unmetered customers in the contiguous and non-contiguous service areas. The unmetered customer charges vary based on lot size and are intended to recover unmetered customers' proportional share of estimated commodity, demand, and customer service costs. The most common unmetered customer is the 5,001 to 7,000 square foot lot.

In addition to the unmetered domestic customers described above, the City charges about 309 customers within the City of Turlock a fire protection service charge of $4.19 per month, referred to as the TUR rate. The TUR rate was approved in Resolution No. 98-535 by Modesto City Council on October

6, 1998. There are two areas in the Turlock service area where fire lines are provided without any customers taking domestic water service from the system. The only service provided is fire protection. The City developed the TUR rate to recover the replacement costs of the water line, valves, and fire hydrants.

2.3 Current Rates and Rate Revenues

The City's current rate schedule is provided in Table 2-1. Table 2-1 also estimates FY2015/16 rate revenues. Due to drought conditions, the City has lost metered water rate (volumetric) revenue. For FY2015/16, it is projected that about $24.4 million in rate revenue, about 51%, will be collected from fixed meter charges and unmetered customer charges. About $23.1 million in rate revenue, about 49%, is projected to be recovered from the metered water use rate. In total, the water utility is projected to collect about $47.5 million in rate revenue in FY2015/16.

Table 2-1: FY2015/16 Current Rates and Estimated Revenues
City of Modesto
Water Rate and Fee Study

Meter Size	Connections	Current Monthly Rate	FY2015/16 Estimated Annual Revenue
5/8 inch	128	$15.03	$23,151
3/4 inch	10,042	$15.03	$1,811,163
1 inch	48,039	$21.33	$12,295,987
1.5 inch	1,160	$36.90	$513,633
2 inch	2,078	$55.68	$1,388,279
3 inch	115	$105.80	$145,531
4 inch	276	$162.13	$537,601
6 inch	136	$318.47	$519,594
8 inch	62	$506.20	$377,288
10 inch	12	$725.56	$104,437
12 inch	1	$1,350.92	$16,211
PRO1 - 0 to 5,000 sq ft	1,083	$40.81	$530,464
PRO2 - 5,001 to 7,000 sq ft	5,118	$46.38	$2,848,562
PRO3 - 7001 to 11,000 sq ft	4,053	$55.04	$2,676,660
PRO4 - 11,001 to 17,000 sq ft	448	$58.43	$314,237
PRO5 - Over 17,000 sq ft	380	$68.69	$313,487
TUR - Turlock Fire Charge	309	$4.19	$15,537
Total Annual Fixed Charge Revenue			**$24,431,823**
Total FY2016 Estimated consumption (ccf)			16,489,312
Total Volumetric Revenue @ $1.40 / ccf			**$23,085,037**
Total FY2015/16 Service Revenue			**$47,516,860**

SECTION 3: REVENUE REQUIREMENT

This section develops the Water Fund revenue requirement for the next five years. The revenue requirement is the financial plan for the water utility projecting operating and capital expenses and calculating the revenue needed to fund these expenses. A portion of water service costs are offset by non-rate revenues, bond collateral, and the use of reserves; the remainder must be funded by water service charges.

3.1 Current Revenues

The City's audited financial statements for FY2014/15 indicate that the Water Fund generated approximately $59.6 million in revenue last year. Approximately $54.8 million was collected from service charges and approximately $4.8 million was collected from non-rate revenue sources, as shown below. The FY2014/15 rate revenues include service charges collected from the Waterford and Hickman service areas. The Waterford and Hickman systems were sold by the City on July 1, 2015 as authorized in Resolution No. 2015-217. The FY2015/16 estimated revenues do not include any rate revenues from Waterford and Hickman customers but do include $2.6 million in proceeds from the sale.

Table 3-1: Revenue Sources
City of Modesto
Water Rate and Fee Study

Category	FY2014/15 (Actual)	FY2015/16 (Estimated)
Rate Revenue	$54,779,417	$47,516,860
Sale of Waterford/Hickman	$0	$2,600,000
Interest earnings	$308,761	$130,000
Rental Income	$44,544	$40,000
Interfund Charges (Service Credit Labor)	$3,033,487	$2,698,735
Miscellaneous (Development Fees & Other)	$1,070,622	$739,073
Transfers In	$340,800	$53,500
Total	$59,577,631	$53,778,168

3.2 Base Operating Expenses

The City's operating expenses consist of ongoing annual costs including staffing, materials, supplies, power, chemicals, water quality, surface water treatment and delivery, and maintenance of wells, tanks, and meters. City of Modesto customers are supplied by both groundwater and surface water purchased from the Modesto Irrigation District Surface Water Treatment Plant. Salida, Empire, and Ceres customers are served by the contiguous system and benefit from the availability of surface water as a groundwater pumping offset. For FY2015/16, the water operating expenses are budgeted at $36.4 million. The water utility's single largest operating cost is surface water treatment and delivery budgeted at $10.9 million in FY2015/16. This expense is projected to increase to $13.56 million in FY2016/17. In

addition, the City will incur new expenses of about $500,000 annually for surface water capital improvements and $1.2 million for the water fund's share of Citywide stormwater pumping and discharge conveyance beginning in FY2016/17. Besides these operating cost adjustments, adjustments for the sale of the Waterford and Hickman systems, and adjustments for drought, most operating cost categories are projected to increase by 2% annually. The water utility also funds $765,000 annually as transfers out for stormwater costs and building services.

3.3 Operating Adjustments

The City's FY2015/16 budget was developed in Spring 2016, before the sale of the Waterford and Hickman systems was finalized and did not fully reflect drought conditions. For ratemaking purposes, BWA uses the FY2016/17 as the operating test year and adjusts FY2016/17 projected non-rate revenues and expenses to reflect drought conditions and the sale of the Waterford and Hickman systems, see Table 3-2. Transfers out and debt service costs are not impacted by drought or system sales and are thus excluded.

3.3.1 Drought Adjustments

BWA adjusted the base FY2016/17 projected non-rate revenues and operating expenses to reflect drought conditions. In drought conditions, the City's surface water allocation is reduced and a greater portion of the City's water is supplied via groundwater. The operating expense for wells and tanks is projected to increase by $340,000 due to additional pumping and chlorine costs. The City will also incur an additional $215,000 in expenses for water waste patrols and water conservation public relations costs. In total, the City's operating costs are projected to increase by about $555,000 due to drought. The FY2016/17 projected surface water cost of $13.6 million is based on recent projections from MID and reflects existing drought conditions.

BWA and the City reviewed potential areas of cost savings due to drought. Although groundwater pumping and conservation program costs increase, surface water costs would theoretically decrease due to the shift in supply towards groundwater. BWA and the City reviewed historical and projected total MID surface water costs and fixed and variable cost categories. The vast majority of the surface water costs are fixed costs that do not depend on the amount of water consumed. From water year 2015 to 2016[1], the City is projected to save about $346,000 from decreases in raw water, chemicals, and electricity costs. The savings of $346,000 represents about 3% of the City's total surface water annual cost. Although the surface water costs are proposed to decrease in FY2015/16, costs are proposed to increase significantly by $2.65 million in FY2016/17. It is projected that any future cost savings from the drought will be more than offset by future surface water maintenance and capital cost increases.

3.3.2 Sale of Waterford and Hickman

[1] The water year begins in May.

BWA also adjusted the FY2016/17 projected non-rate revenues and operating costs for the sale of the Waterford and Hickman systems. In January 1997, the City and the former Del Este water systems came to a settlement related to water quality issues caused by pesticides. The Waterford and Hickman portion of annual settlement revenues was about $20,000. The City has lost this revenue source as a result of the sale.

The City estimates Waterford and Hickman annual operating costs of about $401,000, see Appendix A. The operation of the Waterford and Hickman wells is estimated to cost about $225,000 annually consisting of electricity, chlorine, granulated activated carbon filter replacements, and property taxes on well sites. Maintenance costs for the Waterford and Hickman systems are estimated to be about $176,000 annually consisting of sampling, leak repairs, valve turning, site maintenance (weed abatement), flushing, and backflow checks.

The City reviewed its staffing and service levels in light of the system sales. Budgeted expenses have not decreased. At this time, it is unclear how these budgeted items may be adjusted into the future reflecting changes in the City's service areas.

Table 3-2: **Operating Adjustments**
City of Modesto
Water Rate and Fee Study

	FY2016/17 Base	Drought Adjustment	Drought Adjusted	Waterford/ Hickman Adjustment	Adjusted FY2016/17
Non-rate Revenues					
Misc Revenue	26,000	0%	26,000	0%	26,000
Refunds, Damages, Other	205,000	0%	205,000	10%	185,000
Water Development Fees	346,000	0%	346,000	0%	346,000
Interest Income	132,000	0%	132,000	0%	132,000
Rental Income	42,000	0%	41,000	0%	41,000
Service credits	2,726,000	0%	2,726,000	0%	2,726,000
General Fund Loan Repayments	53,500	0%	54,000	0%	54,000
Total Non-rate Revenues	**3,529,000**	**0**	**3,530,000**	**20,000**	**3,510,000**
Operating Expenses					
12460 FIN Cashiering	621,000	0%	621,000	0%	621,000
12470 FIN Utilities & Collections	1,990,000	0%	1,990,000	0%	1,990,000
12480 FIN Customer Service Admin	222,000	0%	222,000	0%	222,000
41010 UPP Administration	519,000	0%	519,000	0%	519,000
41410 UPP Water General	520,000	0%	520,000	0%	520,000
41420 UPP Water Billing & Collections	145,000	0%	145,000	0%	145,000
42100 UPP Water PCE Litigation	98,000	0%	98,000	0%	98,000
43010 UPP Ground Water Mgmt Plan	351,000	0%	351,000	0%	351,000
43020 UPP Water System Analysis	203,000	0%	203,000	0%	203,000
43030 UPP Urban Water Mgmt Plan	50,000	0%	50,000	0%	50,000
43040 UPP Water Quality Study	31,000	0%	31,000	0%	31,000
43060 UPP Capital Planning	605,000	0%	605,000	0%	605,000
43070 UPP Water Rate Analysis	214,000	0%	214,000	0%	214,000
43080 UPP Sphere of Influence	81,000	0%	81,000	0%	81,000
45020 UPP Systems Maintenance	3,160,000	0%	3,160,000	-6%	2,984,000
45010 UPP Water Services Admin	1,328,000	0%	1,328,000	0%	1,328,000
45040 UPP Construction	5,223,000	0%	5,223,000	0%	5,223,000
45050 UPP Wells & Tanks	7,049,000	+5%	7,389,000	-3%	7,164,000
45060 UPP Service & Meters	2,554,000	0%	2,554,000	0%	2,554,000
45065 UPP Water Quality	558,000	+39%	773,000	0%	773,000
45070 UPP MID Surface Water	13,560,000	0%	13,560,000	0%	13,560,000
Stormwater	1,200,000	0%	1,200,000	0%	1,200,000
New Modesto Irrigation District Capital	500,000	0%	500,000	0%	500,000
Total Operating Expenses	**40,783,000**	**555,000**	**41,337,000**	**401,000**	**40,936,000**

3.4 Debt Service

The City of Modesto currently has several outstanding debt obligations. 2007F and 2013G Revenue Bonds were issued through the Modesto Irrigation District Financing Authority for surface water infrastructure improvements. The 2007F bonds were issued under a swap agreement and the City projects level annual debt service of about $4.1 million through FY2022/23. Thereafter, the City estimates annual debt service of $8.3 million through FY2036/37. The final payment is due September 1, 2037 and is projected to be about $12.1 million. In FY2016/17, the City will receive about $20 million in collateral originally posted to support the 2007F bonds. The City will use these funds for water system improvements. The increase in the 2007F bonds debt service in FY2022/23 corresponds with the final maturity of the 2013G bonds. The 2013G bonds annual debt service payment is about $6.0 million.

The City also issued Water Refunding Certificates of Participation in 2008. The annual debt service payment is about $2.5 million through FY2023/24. In FY2024/25, the annual debt service payments will increase to about $4.2 million.

In FY2011/12, the City received a loan through the California Department of Public Health to fund water improvements to meet safe drinking water standards. 50% of project costs were paid via a grant and do not require repayment. The remaining project costs were funded via a 20-year loan issued at an interest rate of about 2.5%. The annual debt service payment is $36,000.

In FY2015/16 the City will pay about $13.0 million in debt service costs. This includes the debt service payments described above in addition to about $265,000 for the final payment of a loan assumed by the City when it originally acquired the Del Este Water Company.[2] To fund future capital improvements, the City may issue new debt which will increase the total annual debt service payment.

3.5 Capital Expenses

City staff developed two water system capital improvement options. Option 1 is a limited capital funding plan that includes only high priority projects. Option 2 is a fully funded capital plan that includes all water infrastructure projects identified by staff. Under Option 1, lower priority projects are delayed until later years and/or removed from the funding plan. Option 1 includes $130.5 million of projects to be completed over the next five years with an annual average cost of $26.1 million. Option 2 includes about $159.8 million of projects over the next five years with an annual average cost of $32.0 million.

The largest single category of capital improvement projects is “strengthen and replace water system”, which consists of pipeline replacements. The second largest category is water meter replacements. The City projects an expenditure of $5 million annually (2016 dollars) to fully meter all connections by 2022. Those two project categories makeup about 43% of the five-year capital plan of Option 1 and 47% of the five-year capital plan of Option 2. For a detailed listing of project costs please see Appendix B and C. A

[2] The City purchased the Del Este Water Company in July 1995 and acquired the water service areas of Salida, Waterford, Empire, Hickman, Grayson, and parts of Turlock, Ceres, and Del Rio.

listing of the five largest individual projects scheduled over the next five years under Option 2 is provided in Table 3-3. These projects total $63.3 million in present dollars. The five-year capital plans for Option 1 and Option 2 are provided in Table 3-4 and Table 3-5, respectively.

Table 3-3: Option 2 Five Largest Projects Over the Next Five Years
City of Modesto
Water Rate and Fee Study

Project Name	Project Cost ($2016)
Water Meters	25,000,000
4 MG Industrial Tank/12 mgd Booster Pump Station (MRWTP)	10,500,000
New Corporation Yard On-site Improvements	9,500,000
La Loma Neighborhood El Vista to Riverside (strengthen and replace)	9,200,000
La Loma Phase 2 and 3 (strengthen and replace)	9,100,000
Total	63,300,000

MG – million gallons; mgd – million gallons per day

Table 3-4: Option 1 (Limited) Summary Capital Improvement Plan
City of Modesto
Water Rate and Fee Study

Category	FY2016/17	FY2017/18	FY2018/19	FY2019/20	FY2020/21	5-Year Total
City-Side Downstream Improvements to MRWTP Phase Two Expansion	3,100,000	5,150,000	4,774,000	0	833,000	13,857,000
Improvements for South Modesto	45,000	46,000	859,000	0	0	950,000
Water Quality Related Studies	30,000	31,000	32,000	33,000	34,000	160,000
SCADA System Upgrades	50,000	258,000	265,000	765,000	1,688,000	3,026,000
New Corporation Yard	1,500,000	2,060,000	2,122,000	2,185,000	2,251,000	10,118,000
Existing Tank Improvements	700,000	309,000	361,000	372,000	383,000	2,125,000
Extend Water Mains	0	2,060,000	212,000	3,169,000	2,138,000	7,579,000
Strengthen & Replace Water System	4,150,000	6,283,000	8,169,000	4,480,000	6,843,000	29,925,000
Install New Wells	3,050,000	2,678,000	1,591,000	546,000	2,589,000	10,454,000
Wellhead Treatment	1,250,000	1,700,000	1,750,000	1,803,000	1,857,000	8,360,000
Purchase & Install New Generators	370,000	381,000	393,000	404,000	416,000	1,964,000
Security Enhancements	200,000	206,000	212,000	219,000	225,000	1,062,000
Groundwater Management Program	300,000	515,000	424,000	328,000	225,000	1,792,000
Urban Water Management Plan	0	0	0	109,000	0	109,000
Water Master Plan	0	0	1,591,000	0	0	1,591,000
Water System Evaluation	150,000	155,000	159,000	164,000	169,000	797,000
New Water Tanks	3,400,000	2,112,000	0	0	1,688,000	7,200,000
Water Meters	5,000,000	5,150,000	5,305,000	5,464,000	5,628,000	26,547,000
New or Replacement Pumps	450,000	464,000	477,000	492,000	506,000	2,389,000
Utility Cuts	100,000	103,000	106,000	109,000	113,000	531,000
Total	23,845,000	29,661,000	28,802,000	20,642,000	27,586,000	130,536,000

Note: costs escalated by 3% annually to the year of construction

Table 3-5: Option 2 (Full) Summary Capital Improvement Plan
City of Modesto
Water Rate and Fee Study

Category	FY2016/17	FY2017/18	FY2018/19	FY2019/20	FY2020/21	5-Year Total
City-Side Downstream Improvements to MRWTP Phase Two Expansion	3,100,000	5,150,000	5,559,000	3,278,000	4,119,000	21,206,000
Improvements for South Modesto	45,000	46,000	859,000	0	1,362,000	2,312,000
Water Quality Related Studies	30,000	31,000	32,000	33,000	34,000	160,000
SCADA System Upgrades	50,000	258,000	265,000	765,000	1,688,000	3,026,000
New Corporation Yard	1,500,000	4,120,000	4,244,000	0	0	9,864,000
Existing Tank Improvements	700,000	309,000	361,000	372,000	383,000	2,125,000
Extend Water Mains	0	2,060,000	212,000	3,169,000	2,138,000	7,579,000
Strengthen & Replace Water System	8,150,000	8,910,000	10,874,000	10,326,000	10,051,000	48,311,000
Install New Wells	3,050,000	5,047,000	1,910,000	2,513,000	338,000	12,858,000
Wellhead Treatment	1,250,000	1,700,000	1,750,000	1,803,000	1,857,000	8,360,000
Purchase & Install New Generators	370,000	381,000	393,000	404,000	416,000	1,964,000
Security Enhancements	200,000	206,000	212,000	219,000	225,000	1,062,000
Groundwater Management Program	300,000	515,000	424,000	328,000	225,000	1,792,000
Urban Water Management Plan	0	0	0	109,000	0	109,000
Water Master Plan	0	0	1,591,000	0	0	1,591,000
Water System Evaluation	150,000	155,000	159,000	164,000	169,000	797,000
New Water Tanks	3,400,000	2,112,000	0	0	1,688,000	7,200,000
Water Meters	5,000,000	5,150,000	5,305,000	5,464,000	5,628,000	26,547,000
New or Replacement Pumps	450,000	464,000	477,000	492,000	506,000	2,389,000
Utility Cuts	100,000	103,000	106,000	109,000	113,000	531,000
Total	27,845,000	36,717,000	34,733,000	29,548,000	30,940,000	159,783,000

Note: costs escalated by 3% annually to the year of construction

3.6 Financing Plan and Policies

The City's financial reserve policies include a reserve target and debt coverage goal. The City intends to maintain a cash reserve equal to 25% of its operating costs. For FY2015/16, the reserve fund target is $9.3 million and will increase to $11.2 million by FY2020/21 due to operating cost increases.

To mitigate impacts on ratepayers, the City funds capital improvements through a combination of rate revenues, cash reserves, connection fees from new development, and debt. The use of rate revenues, cash reserves, and connection fees is referred to as "pay as you go" or "pay go" funding. An additional funding source is nearly $20 million in collateral posted from the 2007F bonds. The collateral has been released from the trustee and will be available to the City in FY2016/17 to fund projects. It is assumed that any new debt issued will be financed over a thirty-year term via municipal revenue bonds. The City will pursue grants and low cost financing where possible. Municipal bond financing acts as a "worst case" financing scenario for the purpose of determining rates.

Most municipal debt requires that the issuer generate net operating revenues of 1.25 times the total annual debt service payment or greater. This is referred to as "debt service coverage". To support a

strong credit rating and good financial health, the current City policy requires a debt coverage ratio of 1.5 times the annual payment or greater.

BWA reviewed the City's capital funding needs, debt capacity, and impacts on ratepayers. Based on these factors, BWA developed financing plans for rate Option 1 and 2, see Table 3-6 and Table 3-7. Option 1 includes a financing of $35 million in FY2017/18 which will fully fund the FY2017/18 capital costs and a portion of the FY2018/19 capital costs. It is assumed that debt repayment will begin in FY2018/19, the year following the issuance. The new additional debt service cost is estimated at $2.2 million annually. Option 1 consists of pay-go funding of about $75.5 million of the total $130.5 million of capital costs through FY2020/21.

Table 3-6: Option 1 Financing Plan
City of Modesto
Water Rate and Fee Study

Service Area	FY2016/17	FY2017/18	FY2018/19	FY2019/20	FY2020/21	5-year Total
Beginning Balance	**$0**	**$0**	**$5,339,000**	**$0**	**$0**	
2007 Bond Collateral	20,009,000	0	0	0	0	20,009,000
Debt Proceeds	0	35,000,000	0	0	0	35,000,000
Capital Projects	(23,845,000)	(29,661,000)	(28,802,000)	(20,642,000)	(27,586,000)	(130,536,000)
Net	(3,836,000)	5,339,000	(23,463,000)	(20,642,000)	(27,586,000)	(75,527,000)
Pay go CIP	3,836,000	0	23,463,000	20,642,000	27,586,000	75,527,000
Ending Balance	**$0**	**$5,339,000**	**$0**	**$0**	**$0**	
New Debt Service (payments begin the year after issuance)						
Annual Debt Service	0	0	2,161,000	2,161,000	2,161,000	

Debt Service Estimate	**FY2017/18**
Project Cost	35,000,000
Issuance Costs	200,000
Total Financing	35,200,000
Term	30
Rate	4.50%
Annual Debt Service	$2,161,000

Due to higher capital costs, the Option 2 financing plan includes two debt issuances, a $40 million issuance in FY2017/18 and a $20 million issuance in FY2020/21. The new additional annual debt service cost is projected to be about $2.5 million in FY2018/19 through FY2020/21 and will increase to $3.7 million in FY2021/22 (one year beyond the five-year rate period).

Table 3-7: Option 2 Financing Plan
City of Modesto
Water Rate and Fee Study

Service Area	FY2016/17	FY2017/18	FY2018/19	FY2019/20	FY2020/21	5-year Total
Beginning Balance	**$0**	**$0**	**$3,283,000**	**$0**	**$0**	
2007 Bond Collateral	20,009,000	0	0	0	0	20,009,000
Debt Proceeds	0	40,000,000	0	0	20,000,000	60,000,000
Capital Projects	(27,845,000)	(36,717,000)	(34,733,000)	(29,548,000)	(30,940,000)	(159,783,000)
Net	(7,836,000)	3,283,000	(31,450,000)	(29,548,000)	(10,940,000)	(79,774,000)
Pay go CIP	7,836,000	0	31,450,000	29,548,000	10,940,000	79,774,000
Ending Balance	**$0**	**$3,283,000**	**$0**	**$0**	**$0**	
New Debt Service (payments begin the year after issuance)						
FY2017/18 Issuance	0	0	2,468,000	2,468,000	2,468,000	
FY2020/21 Issuance	0	0	0	0	0	
Total	0	0	2,468,000	2,468,000	2,468,000	

Debt Service Estimate	**FY2017/18**	**FY2020/21**
Project Cost	40,000,000	20,000,000
Issuance Costs	200,000	200,000
Total Financing	40,200,000	20,200,000
Term	30	30
Rate	4.50%	4.50%
Annual Debt Service	$2,468,000	$1,240,000

3.7 Water Fund Cash Flow

Table 3-8 provides the water fund cash flow under rate Option 1. To meet the City's financial goal of covering operating, capital and debt service costs while maintaining reserves and providing strong debt service coverage, the proposed rate revenue increases consist of a nearly 23% increase in FY2016/17 followed by 9% annual increases. This significant first year increase is needed to recover revenue lost due to the drought and to improve the water utility's debt coverage ratio. Over the next five-year period, total revenues (rate and non-rate revenues) are projected to increase from $53.8 million to $86.2 million. The proposed rate Option 1 increases the estimated water utility debt service coverage ratio of about 1.28 in FY2016/17 to above the 1.5 target in FY2017/18. As shown in Table 3-8, the FY2015/16 beginning retained earnings balance is $39.5 million. This reserve is projected to be spent down slightly to $31.3 million in FY2020/21 to fund water system infrastructure. The Option 1 rate plan is projected to maintain reserves over the minimum target of 25% of operating costs in each of the next five years.

The Option 2 cash flow is provided in Table 3-9. The proposed rate revenue increases consist of 25% in FY2016/17, 11% in FY2017/18, and 9% annual increases thereafter. Total water utility rate revenues are proposed to increase to about $89.1 million by FY2020/21. Option 2 funds more capital improvement projects than Option 1 and, as a result, retained earnings are projected to decrease to a low of about $19.2 million in FY2019/20, and then increase to about $37.3 million by the end of FY2020/21. Rate Option 2 is projected to provide sufficient revenues to exceed the

reserve target of 25% of operating costs and the minimum debt coverage ratio target of 1.5 in each of the next five years.

Over the next five years, the City conservatively projects water development fee revenue of $300,000 to $350,000 annually, although revenue might be higher depending upon the pace of development. Water development fees (also called connection fees or capacity fees) are one-time fees paid by new customers connecting to the system. Public agencies are legally required to use development fee revenues to fund capital improvements that benefit growth, including paying for capital improvements that have already been constructed at the time that new development is required to pay the fee. Development fees cannot be used to fund operating costs or repair and replacement projects that solely benefit existing customers.

The City has identified a number of capacity expansion projects that are triggered by growth such as the extension of water mains and new wells. In anticipation of new development, the City will construct projects to expand capacity for new customers. The City will initially fund these projects via capital reserves and/or municipal debt. As new customers connect to the water system and pay their development fees, the City will utilize the fee revenue to replenish its capital reserve and/or make debt service payments. To the extent feasible, capacity expansion projects are funded from development fee revenue over time, using expansion project reserves or fees collected as new customers connect.

The City's practice is to separately account for capacity expansion projects and development fee revenue. In the event that capacity expansion reserves funds are insufficient for capacity expansion projects, the City's practice is to use other water enterprise reserve funds or debt financing for those projects. When it uses other water enterprise funds to finance capacity expansion projects, the City uses development fees collected to repay the account that advances the funds.

Table 3-8: Option 1 Cash Flow
City of Modesto
Water Rate and Fee Study

	Budget FY2015/16	Projection FY2016/17	Projection FY2017/18	Projection FY2018/19	Projection FY2019/20	Projection FY2020/21
Rate Revenue Increase	0.0%	22.64%	9.48%	9.00%	9.00%	9.00%
Revenues						
Rate Revenue	47,517,000	58,273,000	63,800,000	69,542,000	75,801,000	82,623,000
Misc. Revenue	17,000	26,000	27,000	27,000	28,000	28,000
Refunds, Damages, Other	215,000	185,000	189,000	192,000	196,000	200,000
Water Development Fees	507,000	346,000	346,000	331,000	331,000	331,000
Interest Income	130,000	132,000	132,000	132,000	132,000	132,000
Rental Income	40,000	41,000	42,000	42,000	43,000	44,000
Service credits	2,699,000	2,726,000	2,753,000	2,781,000	2,808,000	2,836,000
General Fund Loan Repaymts	54,000	54,000	54,000	54,000	54,000	54,000
Sale of Waterford/Hickman	2,600,000	0	0	0	0	0
Total Revenues	**53,779,000**	**61,783,000**	**67,343,000**	**73,102,000**	**79,395,000**	**86,249,000**
Operating Expenses [1]	**36,447,000**	**40,936,000**	**41,756,000**	**42,542,000**	**43,369,000**	**44,213,000**
Transfers Out	**765,000**	**765,000**	**765,000**	**765,000**	**765,000**	**765,000**
Total Operating Expenses	**37,212,000**	**41,701,000**	**42,520,000**	**43,306,000**	**44,133,000**	**44,977,000**
Net Operating Revenue	**16,567,000**	**20,082,000**	**24,823,000**	**29,796,000**	**35,262,000**	**41,272,000**
Debt Service						
2013G Revenue Bonds	6,038,000	5,972,000	5,965,000	5,958,000	5,959,000	5,957,000
2007F Revenue Bonds	4,112,000	4,123,000	4,123,000	4,123,000	4,123,000	4,123,000
2008 Water Rev Lease Bond	2,506,000	2,510,000	2,492,000	2,504,000	2,486,000	2,466,000
Del Este Obligation	265,000	0	0	0	0	0
2012 CDPH	36,000	36,000	36,000	36,000	36,000	36,000
New Debt	0	0	0	2,161,000	2,161,000	2,161,000
Total Debt Service	**12,957,000**	**12,641,000**	**12,616,000**	**14,782,000**	**14,765,000**	**14,743,000**
Debt Service Coverage Ratio	**1.28**	**1.59**	**1.97**	**2.02**	**2.39**	**2.80**
Retained Earnings Calculation						
Beginning Retained Earnings	39,523,000	25,133,000	28,738,000	40,945,000	32,496,000	32,351,000
Net Change	3,610,000	7,441,000	12,207,000	15,014,000	20,497,000	26,529,000
Pay as you go CIP [2]	(18,000,000)	(3,836,000)	0	(23,463,000)	(20,642,000)	(27,586,000)
Ending Retained Earnings	**25,133,000**	**28,738,000**	**40,945,000**	**32,496,000**	**32,351,000**	**31,294,000**
Minimum Reserve	9,303,000	10,425,500	10,630,250	10,826,750	11,033,500	11,244,500

1 - See Table 3-2.
2 - See Table 3-6. No projects are assumed to be cash funded (pay as you go) in FY2017/18 due to a projected financing that year.

Table 3-9: Option 2 Cash Flow
City of Modesto
Water Rate and Fee Study

	Budget FY2015/16	Projection FY2016/17	Projection FY2017/18	Projection FY2018/19	Projection FY2019/20	Projection FY2020/21
Rate Revenue Increase	0.0%	25.04%	11.08%	9.00%	9.00%	9.00%
Revenues						
Rate Revenue	47,517,000	59,415,000	66,000,000	71,940,000	78,415,000	85,472,000
Misc. Revenue	17,000	26,000	27,000	27,000	28,000	28,000
Refunds, Damages, Other	215,000	185,000	189,000	192,000	196,000	200,000
Water Development Fees	507,000	346,000	346,000	331,000	331,000	331,000
Interest Income	130,000	132,000	132,000	132,000	132,000	132,000
Rental Income	40,000	41,000	42,000	42,000	43,000	44,000
Service credits	2,699,000	2,726,000	2,753,000	2,781,000	2,808,000	2,836,000
General Fund Loan Repaymts	54,000	54,000	54,000	54,000	54,000	54,000
Sale of Waterford/Hickman	2,600,000	0	0	0	0	0
Total Revenues	**53,779,000**	**62,925,000**	**69,543,000**	**75,500,000**	**82,009,000**	**89,098,000**
Operating Expenses [1]	**36,447,000**	**40,936,000**	**41,756,000**	**42,542,000**	**43,369,000**	**44,213,000**
Transfers Out	**765,000**	**765,000**	**765,000**	**765,000**	**765,000**	**765,000**
Total Operating Expenses	**37,212,000**	**41,702,000**	**42,521,000**	**43,307,000**	**44,134,000**	**44,978,000**
Net Operating Revenue	**16,567,000**	**21,224,000**	**27,023,000**	**32,194,000**	**37,876,000**	**44,121,000**
Debt Service						
2013G Revenue Bonds	6,038,000	5,972,000	5,965,000	5,958,000	5,959,000	5,957,000
2007F Revenue Bonds	4,112,000	4,123,000	4,123,000	4,123,000	4,123,000	4,123,000
2008 Water Rev Lease Bond	2,506,000	2,510,000	2,492,000	2,504,000	2,486,000	2,466,000
Del Este Obligation	265,000	0	0	0	0	0
2012 CDPH	36,000	36,000	36,000	36,000	36,000	36,000
New Debt	0	0	0	2,468,000	2,468,000	2,468,000
Total Debt Service	**12,957,000**	**12,641,000**	**12,616,000**	**15,089,000**	**15,072,000**	**15,050,000**
Debt Service Coverage Ratio	**1.28**	**1.68**	**2.14**	**2.13**	**2.51**	**2.93**
Retained Earnings Calculation						
Beginning Retained Earnings	39,523,000	25,133,000	25,880,000	40,287,000	25,942,000	19,198,000
Net Change	3,610,000	8,583,000	14,407,000	17,105,000	22,804,000	29,071,000
Pay as you go CIP [2]	(18,000,000)	(7,836,000)	0	(31,450,000)	(29,548,000)	(10,940,000)
Ending Retained Earnings	**25,133,000**	**25,880,000**	**40,287,000**	**25,942,000**	**19,198,000**	**37,329,000**
Minimum Reserve	9,303,000	10,425,500	10,630,250	10,826,750	11,033,500	11,244,500

1 - See Table 3-2.
2 - See Table 3-7. No projects are assumed to be cash funded (pay as you go) in FY2017/18 due to a projected financing that year.

SECTION 4: COST OF SERVICE ALLOCATION

The revenue requirements detailed in the previous section determine the amount of revenue to be recovered from water rates. The cost of service allocation determines how revenues will be recovered from customers based on how customers use the water system. Proposition 218 requires that agencies

providing "property-related services" (including water utility service) set rates and charges that are based on the cost of providing those services.

4.1 Methodology

The American Water Works Association (AWWA) recommends two primary methods to classify costs among various customers: (1) the base-extra capacity method in which costs are allocated to the different customer classes proportionate to their use of the water system; and (2) the commodity-demand method in which costs are proportionately allocated to each customer class based on their peak demand. Although the two methods vary in the way that costs are allocated, both result in rates designed to recover the reasonable cost of service during periods of both average and peak demands. BWA selected the commodity-demand method for use in the City of Modesto's rate study based on prior experience with cost of service analysis for similar cities. The commodity-demand method is also the method used in the City's prior rate study.

In the commodity-demand method, costs are typically separated into four components: (a) commodity costs, (b) demand costs, (c) customer costs, and (d) direct fire-protection costs. *Commodity costs* typically vary with the quantity of water produced. Examples include chemicals, utilities, and water purchases (if bought on a unit volume basis). *Demand costs* recover the costs of facilities needed to meet the peak use, or demands, placed on the system. Examples include capital-related system costs designed to meet peak requirements and the associated operation and maintenance expenses. *Customer costs* include the fixed costs associated with serving customers. These costs are incurred regardless of the amount of water a customer consumes. Examples include billing, meter reading, customer accounting expenses, and maintenance costs for meters. *Direct fire-protection* costs comprise costs applied exclusively for fire protection. Examples include public fire hydrants and related mains and valves.

4.2 Functional Cost Components

The total cost of water service is analyzed by system function to proportionately distribute costs of service to the various customer classes. Water utility costs are proposed to be assigned to three basic functional cost components: commodity costs, demand costs, and customer administrative costs. Because the expenses related to direct fire protection were relatively small, they were combined with the demand cost component. This is consistent with the City's prior rate study.

4.2.1 Customer Service

The customer service functional cost component encompasses revenues and costs that are not dependent on the amount of water a customer uses or the demand each customer places on the system. In consultation with the City, BWA identified $7.0 million of customer service expenses from the FY2016/17 water utility operating expenses. The customer service cost allocation is the same under Option 1 and Option 2. Costs for cashiering, collections, customer service and water service

administration, water general, and system analysis are allocated to the customer service functional cost components. Half of the "water service and meter" budgeted line item is allocated to customer service. It is assumed that half of water service costs are related to responding to customer issues such as water service "turn on", "turn off", meter inspection, etc. These costs are customer service costs that do not vary based on the size of the water meter. Meter maintenance related costs are dependent on the size of the meter and the maximum flow rate of the meter. These costs are allocated to the demand functional cost component.

BWA did not allocate any debt service or capital expenses to the customer service cost component. Typically, customer service related capital projects include projects such as administrative office improvements or information technology software. The City's water debt service costs are related to the expansion of infrastructure to meet base and peak demands.

BWA evaluated the allocation of water meter installation capital costs. The cost of a water meter is dependent upon the meter size which, in turn, is dependent upon the customer's expected maximum water demand. Therefore, BWA allocates the City's water meter capital costs to the demand functional cost category.

4.2.2 Commodity and Demand

This subsection describes the cost allocation to the commodity and demand functional cost components. The commodity cost component includes costs that vary with the amount of water consumed such as water quality, treatment, and delivery costs. Demand related costs are capacity costs associated with developing and maintaining water system infrastructure to meet base and peak water use. Debt service costs for the City's existing debt is allocated to the demand function as projects were financed to expand capacity of the water system. Allocation of non-rate revenues, operating costs, and debt service costs is the same under Option 1 and 2. BWA conducted an in-depth review of the water system capital improvements over the next five years. Commodity capital costs make up about 40% of capital costs and demand related projects make up about 60%, see Table 4-1 and Table 4-2.

Table 4-1: Option 1 Capital Cost Allocation
City of Modesto
Water Rate and Fee Study

Category	5-Year Annual Average Cost	Commodity	Demand
City-Side Downstream Improvements to MRWTP Phase Two Expansion	2,771,000	0%	100%

Improvements for South Modesto	190,000	50%	50%
Water Quality Related Studies	32,000	100%	0%
SCADA System Upgrades	605,000	100%	0%
New Corporation Yard	2,024,000	50%	50%
Existing Tank Improvements	425,000	0%	100%
Extend Water Mains	1,516,000	50%	50%
Strengthen and Replace Water System	5,985,000	50%	50%
Install New Wells	2,091,000	100%	0%
Wellhead Treatment	1,672,000	100%	0%
Purchase & Install New Generators	393,000	50%	50%
Water System Security Enhancements	212,000	50%	50%
Groundwater Management Program	358,000	100%	0%
Urban Water Management Plan	22,000	100%	0%
Water Master Plan	318,000	0%	100%
Water System Evaluation	159,000	50%	50%
New Water Tanks	1,440,000	0%	100%
Water Meters	5,309,000	0%	100%
New or Replacement Pumps	478,000	50%	50%
Utility Cuts	106,000	0%	100%
Total	26,106,000	10,258,500	15,847,500
Capital Summary Allocation		39%	61%

Table 4-2: Option 2 Capital Cost Allocation
City of Modesto
Water Rate and Fee Study

Category	5-Year Annual Average Cost	Commodity	Demand
City-Side Downstream Improvements to MRWTP Phase Two Expansion	4,241,000	0%	100%
Improvements for South Modesto	462,000	50%	50%
Water Quality Related Studies	32,000	100%	0%
SCADA System Upgrades	605,000	100%	0%
New Corporation Yard	1,973,000	50%	50%
Existing Tank Improvements	425,000	0%	100%
Extend Water Mains	1,516,000	50%	50%
Strengthen and Replace Water System	9,662,000	50%	50%
Install New Wells	2,572,000	100%	0%
Wellhead Treatment	1,672,000	100%	0%
Purchase & Install New Generators	393,000	50%	50%
Water System Security Enhancements	212,000	50%	50%
Groundwater Management Program	358,000	100%	0%
Urban Water Management Plan	22,000	100%	0%
Water Master Plan	318,000	0%	100%
Water System Evaluation	159,000	50%	50%
New Water Tanks	1,440,000	0%	100%
Water Meters	5,309,000	0%	100%
New or Replacement Pumps	478,000	50%	50%
Utility Cuts	106,000	0%	100%
Total	31,955,000	12,688,500	19,266,500
Capital Summary Allocation		40%	60%

4.3 Cost Allocation Results

Table 4-3 and Table 4-4 provide the cost allocation summaries for rate Option 1 and Option 2, respectively. The cost allocation results of Option 1 and 2 are slightly different due to the capital projects funded in each option. Allocation of non-rate revenues, operating costs, and existing debt service costs are the same for both options. The total FY2016/17 cost of service under Option 1 is $76.9 million. To mitigate impacts on ratepayers, the Option 1 rate revenue requirement is $58.3 million, which reflects the issuance of debt and the use of reserves to partially fund capital costs. However, the Option 1 true cost of service of $76.9 million, which is used for cost allocation and, ultimately, rate design. The Option 1 cost allocation consists of about 9% of costs allocated to customer service, about 50% of costs allocated to the commodity category, and about 41% of costs allocated to the demand category.

The Option 2 FY2016/17 total cost of service is $82.8 million and the rate revenue requirement is $59.4 million. The Option 2 cost allocation consists of about 8.5% of costs allocated to customer service, just over 49% of costs are allocated to the commodity category, and about 41% of costs are allocated to the demand category.

Table 4-3: Option 1 Cost Allocation
City of Modesto
Water Rate and Fee Study

	FY2016/17 Adjusted	Customer Service	Commodity	Demand
Non-rate Revenues				
Misc Revenue	26,000	0%	0%	100%
Refunds, Damages, Other	185,000	0%	0%	100%
Water Development Fees	346,000	0%	0%	100%
Interest Income	132,000	0%	0%	100%
Rental Income	41,000	0%	0%	100%
Service credits	2,726,000	0%	0%	100%
General Fund Loan Repayments	54,000	0%	0%	100%
Total Non-rate revenues	**3,510,000**	**0**	**0**	**3,510,000**
Operating Expenses				
12460 FIN Cashiering	621,000	100%	0%	0%
12470 FIN Utilities & Collections	1,990,000	100%	0%	0%
12480 FIN Customer Service Administration	222,000	100%	0%	0%
41010 UPP Administration	519,000	100%	0%	0%
41410 UPP Water General	520,000	100%	0%	0%
41420 UPP Water Billing & Collections	145,000	100%	0%	0%
42100 UPP Water PCE Litigation	98,000	0%	100%	0%
43010 UPP Ground Water Management Plan	351,000	0%	100%	0%
43020 UPP Water System Analysis	203,000	100%	0%	0%
43030 UPP Urban Water Management Plan	50,000	0%	100%	0%
43040 UPP Water Quality Study	31,000	0%	100%	0%
43060 UPP Capital Planning	605,000	0%	50%	50%
43070 UPP Water Rate Analysis	214,000	100%	0%	0%
43080 UPP Sphere of Influence	81,000	0%	0%	100%
45020 UPP Systems Maintenance	2,984,000	0%	100%	0%
45010 UPP Water Services Administration	1,328,000	100%	0%	0%
45040 UPP Construction	5,223,000	0%	50%	50%
45050 UPP Wells & Tanks	7,164,000	0%	75%	25%
45060 UPP Service & Meters	2,554,000	50%	0%	50%
45065 UPP Water Quality (NEW)	773,000	0%	100%	0%
45070 UPP MID Surface Water T & DA	13,560,000	0%	100%	0%
Stormwater	1,200,000	0%	100%	0%
New Modesto Irrigation District Capital	500,000	0%	0%	100%
Operating Expenses	**40,936,000**	**7,039,000**	**27,334,000**	**6,563,000**
Transfers Out				
Storm Drain	700,000	0%	100%	0%
Building Services	65,000	0%	0%	100%
Total Transfers Out	**765,000**	**0**	**700,000**	**65,000**
Total Operating Expenses	**41,701,000**	**7,039,000**	**28,034,000**	**6,628,000**
Total Debt Service				
2013G Revenue Bonds	5,972,000	0%	0%	100%
2007F Revenue Bonds	4,123,000	0%	0%	100%
2008 Water Rev Lease Bond	2,510,000	0%	0%	100%
Del Este Obligation	0	0%	0%	100%
2012 CDPH	36,000	0%	0%	100%
Total Debt Service	**12,641,000**	**0**	**0**	**12,641,000**
5-year Annual Average CIP	**26,106,000**	0%	39%	61%
		0	**10,258,500**	**15,847,500**
Total	**76,938,000**	**7,039,000**	**38,292,500**	**31,606,500**
Cost Allocation		**9.1%**	**49.8%**	**41.1%**

Table 4-4: Option 2 Cost Allocation
City of Modesto
Water Rate and Fee Study

	FY2016/17 Adjusted	Customer Service	Commodity	Demand
Non-rate Revenues				
Misc Revenue	26,000	0%	0%	100%
Refunds, Damages, Other	185,000	0%	0%	100%
Water Development Fees	346,000	0%	0%	100%
Interest Income	132,000	0%	0%	100%
Rental Income	41,000	0%	0%	100%
Service credits	2,726,000	0%	0%	100%
General Fund Loan Repayments	54,000	0%	0%	100%
Total Non-rate revenues	**3,510,000**	**0**	**0**	**3,510,000**
Operating Expenses				
12460 FIN Cashiering	621,000	100%	0%	0%
12470 FIN Utilities & Collections	1,990,000	100%	0%	0%
12480 FIN Customer Service Administration	222,000	100%	0%	0%
41010 UPP Administration	519,000	100%	0%	0%
41410 UPP Water General	520,000	100%	0%	0%
41420 UPP Water Billing & Collections	145,000	100%	0%	0%
42100 UPP Water PCE Litigation	98,000	0%	100%	0%
43010 UPP Ground Water Management Plan	351,000	0%	100%	0%
43020 UPP Water System Analysis	203,000	100%	0%	0%
43030 UPP Urban Water Management Plan	50,000	0%	100%	0%
43040 UPP Water Quality Study	31,000	0%	100%	0%
43060 UPP Capital Planning	605,000	0%	50%	50%
43070 UPP Water Rate Analysis	214,000	100%	0%	0%
43080 UPP Sphere of Influence	81,000	0%	0%	100%
45020 UPP Systems Maintenance	2,984,000	0%	100%	0%
45010 UPP Water Services Administration	1,328,000	100%	0%	0%
45040 UPP Construction	5,223,000	0%	50%	50%
45050 UPP Wells & Tanks	7,164,000	0%	75%	25%
45060 UPP Service & Meters	2,554,000	50%	0%	50%
45065 UPP Water Quality (NEW)	773,000	0%	100%	0%
45070 UPP MID Surface Water T & DA	13,560,000	0%	100%	0%
Stormwater	1,200,000	0%	100%	0%
New Modesto Irrigation District Capital	500,000	0%	0%	100%
Operating Expenses	**40,936,000**	**7,039,000**	**27,334,000**	**6,563,000**
Transfers Out				
Storm Drain	700,000	0%	100%	0%
Building Services	65,000	0%	0%	100%
Total Transfers Out	**765,000**	**0**	**700,000**	**65,000**
Total Operating Expenses	**41,701,000**	**7,039,000**	**28,034,000**	**6,628,000**
Total Debt Service				
2013G Revenue Bonds	5,972,000	0%	0%	100%
2007F Revenue Bonds	4,123,000	0%	0%	100%
2008 Water Rev Lease Bond	2,510,000	0%	0%	100%
Del Este Obligation	0	0%	0%	100%
2012 CDPH	36,000	0%	0%	100%
Total Debt Service	**12,641,000**	**0**	**0**	**12,641,000**
5-year Annual Average CIP	**31,955,000**	0%	40%	60%
		0	**12,688,500**	**19,266,500**
Total	**82,787,000**	**7,039,000**	**40,722,500**	**35,025,500**
Cost Allocation		**8.5%**	**49.2%**	**42.3%**

SECTION 5: RATE DESIGN

The previous section determined the cost of service allocated to the customer service, commodity, and demand functional cost categories. The allocated costs are then divided by the billing units to calculate the rates. This section also provides a discussion of rate design considerations.

5.1 Rate Design Considerations

There are many alternatives for water rate design in California that fall under AWWA recommended methodologies, meet Proposition 218 requirements, encourage the efficient use of water, and are fair and reasonable to customers. This subsection provides rate design considerations evaluated by BWA for the City of Modesto.

5.1.1 Service Area Specific Rates

Prior to 2004, the City of Modesto utilized three location-specific (zonal) rate schedules. The benefits of individualized rates for each service area are perceived fairness and potential elimination of cross-customer subsidies. Individualized rates can be developed from cost of service analyses of each service area. Because customers only pay costs for their localized water systems, individualized rates are perceived to be equitable as each area "pays its own way".

BWA reviewed service area specific rates as part of this rate study for the Del Rio, Grayson, Turlock, service areas and the Modesto contiguous service area (Modesto, Salida, Empire, and Ceres). Operationally, each service is unique. The Del Rio, Grayson, and Turlock service area ("outlying areas") are served via groundwater wells while the contiguous service area is supplied with both surface water and groundwater. The City develops individualized water quality assessments and capital plans for each area. The Grayson area has water quality issues that require costlier treatment than other areas. The Del Rio capital plan includes over $10 million in projects over the next three years consisting of a new tank and booster pump station, one replacement well, and one additional (new) well. Most of the Turlock area customers are unmetered and will need to transition to metered service in the near future to comply with Assembly Bill 2572.

Ultimately, BWA does not recommend individualized water rates for the City's service areas. Instead, BWA recommends that the City continue with its current rate structure. The City's current rate structure is based on the blended, or average, costs of all service areas. Despite some operational differences amongst the service areas, the City's water conservation and groundwater basin management activities are conducted on a utility-wide basis. Engineering, planning, administrative, and customer service staff provide support to the contiguous and outlying areas.

From a governance perspective, individualized rates would place a high cost burden on the outlying service areas and would be difficult to approve under the Proposition 218 process. To meet operating costs, develop reserves, and fund capital improvements, the Del Rio service area rates would need to more than double and the Grayson service area rates would need to increase fivefold over the next five

years if billed as individual systems. Under an individualized rate structure, each service area would have its own majority vote tabulation. With only a few hundred customers in the Del Rio and Grayson areas, these increases are unlikely to pass the majority protest process required under Proposition 218. Absent an approved rate increase, these areas would be unable to provide safe and reliable water service.

5.1.2 Conservation and Drought Rates

In response to drought conditions, on April 1, 2015 Governor Brown signed Executive Order B-29-15 which mandated water use reductions for urban water service areas. The City of Modesto's conservation mandate was to reduce water use by 33% month over month relative to 2013 use.[3] The State Water Resources Control Board has proposed an emergency rulemaking (May 12, 2016), which would allow the City of Modesto to reevaluate its conservation target. Under the proposed rulemaking, urban water suppliers would set their conservation target equal to typical dry year water supply. As this rulemaking has not yet come into effect, and given the City is in the process of completing a Water Master Plan, BWA calculated drought rates based on a conservation target of 33% relative to 2013 water use.

There are several rate design options for public agencies wishing to implement drought water rates to achieve conservation. Agencies can elect to impose excessive use charges on water use over a specific threshold or implement a surcharge on all water consumed. Excessive use charges act as a tiered rate in which higher levels of use pay a more expensive rate per unit consumed. To comply with Proposition 218 cost of service substantive requirements, public agencies must justify both the threshold of excessive use (i.e. the level of use that qualifies as "excessive") and the price of the excessive water. Excessive use charges are most appropriate for public water utilities that are forced to import water during drought conditions. The amount of water consumption that triggers the need to import water serves as the tier threshold and the excessive use rate is the cost of the imported water. Because the City of Modesto has flexibility in determining its groundwater and surface water supply portfolio, excessive use charges are not clearly cost justified under Proposition 218 cost of service requirements.

A drought surcharge encourages customers at all levels of water use to conserve, not just customers who consume in the excessive use tier. For example, a family of two people may waste water but use less than a family of five that uses water efficiently. Under this example, the family of five's water consumption might surpass the excessive use threshold while the water waster couple's consumption might fall under the threshold. Under a drought surcharge rate structure, both families would pay the drought surcharge on each hundred cubic foot of water used and thereby have incentive to conserve at all levels of use.

BWA developed drought surcharge rates and non-drought rates for both rate options. Under drought conditions, the commodity revenue requirement would be collected over a smaller base of water consumption resulting in higher rates. As discussed in Section 3.3.1, the City's commodity cost of

[3] The City's conservation mandate was adjusted to 33% on March 15, 2016.

service is not projected to decrease despite lower water use under drought conditions. To be financially cautious, BWA proposes that the City adopt drought rates. If the City determines that its dry year water supplies are adequate, the City can discontinue the drought rates and revert to the non-drought rates.

5.1.3 Unmetered Rates

The City's prior water rate study allocated demand functional costs to unmetered customers based on estimated water use. BWA proposes to change this methodology and allocate demand functional costs based on meter equivalents. Although unmetered customers are not connected to the water system via a meter, the vast majority of unmetered customers are residences that will eventually be served by 1 inch meters. Therefore, each unmetered customer can be assigned demand costs proportional to the capacity in the system used by a 1 inch meter.

The City's prior rate study excluded the costs of meter service and maintenance from the unmetered water rates. BWA assigns meter service, maintenance, and installation costs to the demand function cost component, which are proposed to be recovered from both metered and unmetered customers. Under this proposed rate structure, unmetered customers would avoid installation fees when their service connections are metered and currently metered customers would not pay replacement fees for meters at the end of their useful lives. Instead, meter costs are embedded in monthly demand charges paid by both customer groups.

5.2 Rate Design Summary

BWA proposes to maintain the City's current water rate structure in which metered customers are billed fixed charges based on the size of the water meter plus a volume rate that is charged on each unit of water consumed. Unmetered customers are billed fixed charges proportional to the estimated capacity that they occupy in the water system and estimated water use. Figure 2 provides a summary of the City's proposed water rate design. Customer service costs are proposed to be recovered from a fixed charge billed to all accounts. Commodity costs are recovered from metered and estimated unmetered water use. Demand costs are recovered from fixed charges calculated based on meter equivalents.

Figure 2: Rate Design Summary

Functional Cost Component	Unit of Service	Rate or Charge
Customer service	Number of accounts	Fixed charge
Commodity	Water use	Volume water rate
Demand	Meter equivalents	Fixed charge

5.3 Billing Units

BWA reviewed the City's water utility billing records from the past three years. Due to recent changes in water consumption attributable to the drought, BWA estimated FY2016/17 customer counts based on December 2015 and January 2016 billing records, the most recent records available. To establish drought water use, BWA reviewed actual water use from February 2015 to January 2016 and the City's conservation reporting data. During this period, the City conserved about 24.7% not including water consumed in the Waterford and Hickman service areas. The City's non-drought assumed water use is a 25% reduction from 2013 consumption, or 0.3% additional conservation from current water use. The City assumes a permanent 25% reduction based on observed behaviors. It is unlikely that water use will return to the 2013 level in the near future due to customer retrofits of plumbing fixtures and transition to efficient landscaping. For this rate study, drought water use is set as a 33% reduction from 2013 water use month over month (i.e. May 2016 water use is compared to May 2013 water use).

Assumed water use for each type of unmetered customer is provided in Table 5-1. The most common unmetered customer is a parcel sized between 5,001 and 7,000 square feet – rate code PRO2. BWA assumes this parcel size is equivalent to the City of Modesto's typical 1 inch metered residential customer. Based on a permanent non-drought conservation of 25%, the typical 1 inch customer in Modesto is projected to use 14.2 ccf per month.[4] The water use of the typical 1 inch metered customer is used as a proxy for the monthly water use for the 5,001 and 7,000 square feet unmetered parcel size. The assumed water use of the other unmetered lots is scaled based on parcel size. Because they are not directly billed for each unit of water, it is assumed that unmetered customers would not reduce water use under drought conditions.

Table 5-1: Estimated Unmetered Water Use
City of Modesto
Water Rate and Fee Study

Rate Code	Parcel Size (sq ft)	Water Use Ratio	Monthly Water Use (ccf)
PRO1	5,000	0.71	10.1
PRO2	7,000	1.00	14.2
PRO3	11,000	1.57	22.3
PRO4	17,000	2.43	34.4
PRO5 [1]	20,000	2.86	40.5

1 - The PRO5 rate code includes parcels over 17,000 square feet. BWA assumes a parcel size of 20,000 square feet for rate design.

[4] The typical residential 1 inch metered customer water use is estimated as 14.2 ccf per month based on February 2015 to January 2016 billing data. If based on 2015/16 fiscal year data, the average use is 14.6 ccf per month.

Demand related costs are allocated to customers based on meter equivalents. The American Water Works Association developed meter equivalents or meter ratios based on the maximum flow rate of various meter sizes. Maximum flow rate is used as a proxy for demand or capacity that the service connection occupies. The City's smallest meter size, the 5/8 inch, is one meter equivalent and larger meter sizes are scaled to the capacity of the 5/8 meter. AWWA meter equivalents are provided in Table 5-2. Unmetered customers are primarily residences that will be eventually connected via a 1 inch meter. As shown below, unmetered customers are assigned the 1 inch meter equivalent.

Table 5-2: Meter Equivalents
City of Modesto
Water Rate and Fee Study

Meter Size	Maximum Flow (gallons per minute)	Equivalent
5/8 inch	30	1.00
3/4 inch	30	1.00
1 inch	50	1.67
1.5 inch	100	3.33
2 inch	160	5.33
3 inch	350	11.67
4 inch	630	21.00
6 inch	1,300	43.33
8 inch	2,400	80.00
10 inch	3,800	126.67
12 inch	5,000	166.67
PRO1	N/A	1.67
PRO2	N/A	1.67
PRO3	N/A	1.67
PRO4	N/A	1.67
PRO5	N/A	1.67

Table 5-3 provides the FY2016/17 estimated number of customers, meter equivalents, and drought and non-drought water use. BWA estimates growth of 1.3% annually in water use and customer counts. This growth rate is based on the residential growth rate determined in the City's recent Wastewater Master Plan. The City will further refine the water utility's growth rate in the upcoming Water Master Plan. The Water Master Plan will also review and refine the water use of unmetered customers.

Table 5-3: FY2016/17 Billing Units and Meter Equivalents
City of Modesto
Water Rate and Fee Study

Meter Size	Count	Meter Ratio	Meter Equivalents
Meters			
5/8 inch	128	1.00	128
3/4 inch	10,042	1.00	10,042
1 inch	48,039	1.67	80,065
1.5 inch	1,160	3.33	3,867
2 inch	2,078	5.33	11,081
3 inch	115	11.67	1,337
4 inch	276	21.00	5,803
6 inch	136	43.33	5,892
8 inch	62	80.00	4,969
10 inch	12	126.67	1,519
12 inch	1	166.67	167
Water Use (ccf)			
Drought			
Metered Use	14,672,364		
Unmetered Use	2,453,925		
Total Drought	17,126,289		
Non-drought			
Metered Use	16,424,288		
Unmetered Use	2,453,925		
Total Non-drought	18,878,213		
Unmetered Parcels			
PRO1 - 0 to 5,000 sq ft	1,083	1.67	1,805
PRO2 - 5,001 to 7,000 sq ft	5,118	1.67	8,530
PRO3 - 7001 to 11,000 sq ft	4,053	1.67	6,754
PRO4 - 11,001 to 17,000 sq ft	448	1.67	747
PRO5 - Over 17,000 sq ft	380	1.67	634
Total Meter Equivalents (does not include TUR)	73,131		143,340

5.4 Mid-Year Rate Adjustment

The City of Modesto proposes to implement the recommended rates September 1, 2016. July 1, 2016 to August 31, 2016, customers will be billed the current rate schedule. September 1, 2016 and onward, customers are proposed to be billed under one of the two proposed rate schedules. Due to this mid-year rate change, an adjustment is needed to insure that the City will collect the full revenue requirement despite only ten months of billings under the proposed rates. BWA reviewed collection of fixed service charges and water use revenues throughout the fiscal year. The estimated FY2016/17 rate revenues are weighted based on the mid-year adjustment shown in Table 5-4.

Table 5-4: Adjustment for Mid-Year Rate Change
City of Modesto
Water Rate and Fee Study

	July to August Current Rates	September to June New Rates
Fixed Charges [1]	16.7%	83.3%
Water Use [2]	23.8%	76.2%

1 - The City collects fixed meter charges and unmetered charges equally throughout the year. Thus, the months of July and August are weighted as 2 out of 12 or about 16.7%.

2 - Water use throughout the year heavily depends on weather conditions. Based on actual water consumption (February 2015 through January 2016), about 23.8% of annual water use occurs in July and August.

5.5 Option 1 Proposed Rates

Table 5-5 provides the Option 1 rate calculation. It is assumed that the Turlock fire protection service charge (TUR) will remain the same over the next five years. The TUR rate is subject to an agreement between the City of Modesto and the Turlock service area. As described throughout this report, FY2016/17 serves as the test year for cost allocation purposes. The FY2016/17 operating and capital cost allocation to customer service, commodity, and demand functional cost categories is the target cost allocation for the five-year rate plan. To mitigate impacts on customers, BWA proposes to phase-in the proposed cost allocation. The target cost allocation calculated in Table 4-3 will be achieved by FY2020/21.

It is assumed that the FY2016/17 customer service revenue requirement developed in Table 4-3 will increase by 2% annually. Customer service costs are projected to be recovered equally from each customer account except for the Turlock fire protection customers. The commodity revenue requirement is divided by the water use in Table 5-3 to calculate the drought and non-drought rates. The demand revenue requirement is reduced by the TUR rate revenue and then divided by the number of meter equivalents. The total fixed meter charge for each meter size consists of the demand charge multiplied by the meter ratio plus the customer service charge, see Table 5-6.

The Option 1 FY2016/17 unmetered water charges are calculated in Table 5-7. The estimated water use of each parcel size is multiplied by the water rate to calculate water use charges. The total unmetered charge is the sum of the customer service charge, demand charge, and water use charges.

Table 5-5: Option 1 Rate Calculation
City of Modesto
Water Rate and Fee Study

	Current	Proposed				
	FY2015/16	FY2016/17	FY2017/18	FY2018/19	FY2019/20	FY2020/21
		22.64%	9.46%	9.0%	9.0%	9.0%
Revenue Requirement	$47,517,000	$58,273,000	$63,800,000	$69,542,000	$75,801,000	$82,623,000
Allocation						
Customer Service		11%	11%	11%	10%	9%
Commodity		54%	54%	52%	51%	50%
Demand		35%	35%	37%	39%	41%
Total		100%	100%	100%	100%	100%
Customer Service		$7,040,000	$7,181,000	$7,324,000	$7,471,000	$7,620,000
Commodity		$32,773,000	$34,289,000	$36,487,000	$38,768,000	$41,089,000
Demand		$21,422,000	$22,314,000	$25,715,000	$29,547,000	$33,899,000
Total		$61,235,000	$63,784,000	$69,526,000	$75,786,000	$82,608,000
Current Rates (July & Aug)		$9,559,000				
TUR		$16,000	$16,000	$16,000	$16,000	$16,000
New Rates		$48,698,000	$63,784,000	$69,526,000	$75,785,000	$82,607,000
Total		$58,273,000	$63,800,000	$69,542,000	$75,801,000	$82,623,000
Annual Growth		1.3%	1.3%	1.3%	1.3%	1.3%
Number of Accounts		73,131	74,082	75,045	76,021	77,009
$/account		$8.02	$8.08	$8.13	$8.19	$8.25
Number of Meter Equivalents		143,134	144,995	146,880	148,789	150,724
$/month per equivalent		$12.47	$12.82	$14.59	$16.55	$18.74
Drought Water Use (ccf)		17,126,289	17,348,930	17,574,466	17,802,935	18,034,373
Drought Water Rate ($/ccf)	$1.40	$1.91	$1.98	$2.08	$2.18	$2.28
Non-Drought Water Use (ccf)		18,878,213	18,878,213	18,878,213	18,878,213	18,878,213
Non-Drought Water Rate ($/ccf)	$1.40	$1.74	$1.82	$1.93	$2.05	$2.18

Table 5-6: Option 1 FY2016/17 Proposed Metered Fixed Charges
City of Modesto
Water Rate and Fee Study

Meter Size	Customer Service $/account	Demand $/meter	Total Monthly Fixed Charge
5/8 inch	$8.02	$12.47	$20.49
3/4 inch	$8.02	$12.47	$20.49
1 inch	$8.02	$20.78	$28.80
1.5 inch	$8.02	$41.57	$49.59
2 inch	$8.02	$66.51	$74.53
3 inch	$8.02	$145.48	$153.50
4 inch	$8.02	$261.87	$269.89
6 inch	$8.02	$540.37	$548.39
8 inch	$8.02	$997.60	$1,005.62
10 inch	$8.02	$1,579.53	$1,587.55
12 inch	$8.02	$2,078.33	$2,086.35

Table 5-7: Option 1 FY2016/17 Proposed Unmetered Charges
City of Modesto
Water Rate and Fee Study

DROUGHT Charges

Rate Code	Monthly Water Use (ccf)	Drought Water Rate ($/ccf)	Water Use Charges	Customer Service	Demand Charge	Total Drought Monthly Charge
PRO1 - 0 to 5,000 sq ft	10.1	$1.91	$19.29	$8.02	$20.78	$48.09
PRO2 - 5,001 to 7,000 sq ft	14.2	$1.91	$27.12	$8.02	$20.78	$55.92
PRO3 - 7001 to 11,000 sq ft	22.3	$1.91	$42.59	$8.02	$20.78	$71.39
PRO4 - 11,001 to 17,000 sq ft	34.4	$1.91	$65.70	$8.02	$20.78	$94.50
PRO5 - Over 17,000 sq ft	40.5	$1.91	$77.36	$8.02	$20.78	$106.16

NON-DROUGHT Charges

Rate Code	Monthly Water Use (ccf)	Non-Drought Water Rate ($/ccf)	Water Use Charges	Customer Service	Demand Charge	Total Non-Drought Monthly Charge
PRO1 - 0 to 5,000 sq ft	10.1	$1.74	$17.57	$8.02	$20.78	$46.37
PRO2 - 5,001 to 7,000 sq ft	14.2	$1.74	$24.71	$8.02	$20.78	$53.51
PRO3 - 7001 to 11,000 sq ft	22.3	$1.74	$38.80	$8.02	$20.78	$67.60
PRO4 - 11,001 to 17,000 sq ft	34.4	$1.74	$59.86	$8.02	$20.78	$88.66
PRO5 - Over 17,000 sq ft	40.5	$1.74	$70.47	$8.02	$20.78	$99.27

The full Option 1 proposed rate schedule for the next five-year period is provided in Table 5-8.

Table 5-8: Option 1 Proposed Rate Schedule
City of Modesto
Water Rate and Fee Study

		Proposed				
Meter Size	**Current**	**FY2016/17**	**FY2017/18**	**FY2018/19**	**FY2019/20**	**FY2020/21**
Fixed Meter Charges ($/month)						
5/8 inch	$15.03	$20.49	$20.90	$22.72	$24.74	$26.99
3/4 inch	$15.03	$20.49	$20.90	$22.72	$24.74	$26.99
1 inch	$21.33	$28.80	$29.45	$32.45	$35.77	$39.48
1.5 inch	$36.90	$49.59	$50.81	$56.76	$63.36	$70.72
2 inch	$55.68	$74.53	$76.45	$85.94	$96.46	$108.20
3 inch	$105.80	$153.50	$157.65	$178.35	$201.27	$226.88
4 inch	$162.13	$269.89	$277.30	$314.52	$355.74	$401.79
6 inch	$318.47	$548.39	$563.61	$640.36	$725.36	$820.32
8 inch	$506.20	$1,005.62	$1,033.68	$1,175.33	$1,332.19	$1,507.45
10 inch	$725.56	$1,587.55	$1,631.95	$1,856.20	$2,104.52	$2,381.98
12 inch	$1,350.92	$2,086.35	$2,144.75	$2,439.80	$2,766.52	$3,131.58
Water Rate ($/ccf)						
Drought	$1.40	$1.91	$1.98	$2.08	$2.18	$2.28
Non-drought	$1.40	$1.74	$1.82	$1.93	$2.05	$2.18
DROUGHT Unmetered Fixed Charge ($/month)						
PRO1 - 0 to 5,000 sq ft	$40.81	$48.09	$49.45	$53.46	$57.79	$62.51
PRO2 - 5,001 to 7,000 sq ft	$46.38	$55.92	$57.57	$61.99	$66.73	$71.86
PRO3 - 7001 to 11,000 sq ft	$55.04	$71.39	$73.60	$78.83	$84.38	$90.32
PRO4 - 11,001 to 17,000 sq ft	$58.43	$94.50	$97.56	$104.00	$110.76	$117.91
PRO5 - Over 17,000 sq ft	$68.69	$106.16	$109.64	$116.69	$124.06	$131.82
NON-DROUGHT Unmetered Fixed Charge ($/month)						
PRO1 - 0 to 5,000 sq ft	$40.81	$46.37	$47.83	$51.94	$56.48	$61.50
PRO2 - 5,001 to 7,000 sq ft	$46.38	$53.51	$55.29	$59.86	$64.88	$70.44
PRO3 - 7001 to 11,000 sq ft	$55.04	$67.60	$70.04	$75.49	$81.49	$88.09
PRO4 - 11,001 to 17,000 sq ft	$58.43	$88.66	$92.06	$98.84	$106.29	$114.47
PRO5 - Over 17,000 sq ft	$68.69	$99.27	$103.16	$110.62	$118.80	$127.77
TUR - Turlock Fire Charge	$4.19	$4.19	$4.19	$4.19	$4.19	$4.19

5.6 Option 2 Proposed Rates

The Option 2 rate calculation is provided in Table 5-9. The customer service revenue requirement and rates are the same under Option 1 and Option 2. Table 5-10 provides the Option 2 meter charge calculation and Table 5-11 provides the unmetered charge calculation for FY2016/17. Table 5-12 provides the full Option 2 rate schedule.

Table 5-9: Option 2 Rate Calculation
City of Modesto
Water Rate and Fee Study

	Current	Proposed				
	FY2015/16	FY2016/17	FY2017/18	FY2018/19	FY2019/20	FY2020/21
		25.04%	11.08%	9.00%	9.00%	9.00%
Revenue Requirement	$47,517,000	$59,415,000	$66,000,000	$71,940,000	$78,415,000	$85,472,000
Allocation						
Customer Service		11%	11%	10%	10%	9%
Commodity		54%	53%	52%	50%	49%
Demand		35%	36%	38%	40%	42%
Total		100%	100%	100%	100%	100%
Customer Service		$7,040,000	$7,181,000	$7,324,000	$7,471,000	$7,620,000
Commodity		$21,945,000	$23,760,000	$27,337,000	$31,366,000	$35,998,000
Demand		$33,700,000	$35,044,000	$37,263,000	$39,563,000	$41,838,000
Total		$62,685,000	$65,985,000	$71,924,000	$78,400,000	$85,456,000
Current Rates (July & Aug)		$9,559,000				
TUR		$16,000	$16,000	$16,000	$16,000	$16,000
New Rates		$49,840,000	$65,985,000	$71,924,000	$78,400,000	$85,456,000
Total		$59,415,000	$66,000,000	$71,940,000	$78,415,000	$85,472,000
Annual Growth		1.3%	1.3%	1.3%	1.3%	1.3%
Number of Accounts		73,131	74,082	75,045	76,021	77,009
$/account		$8.02	$8.08	$8.13	$8.19	$8.25
Number of Meter Equivalents		143,134	144,995	146,880	148,789	150,724
$/month per equivalent		$12.77	$13.65	$15.50	$17.56	$19.89
Drought Water Use (ccf)		17,126,289	17,348,930	17,574,466	17,802,935	18,034,373
Drought Water Rate ($/ccf)	$1.40	$1.97	$2.02	$2.12	$2.22	$2.32
Non-Drought Water Use (ccf)		18,878,213	18,878,213	18,878,213	18,878,213	18,878,213
Non-Drought Water Rate ($/ccf)	$1.40	$1.79	$1.86	$1.97	$2.10	$2.22

Table 5-10: Option 2 FY2016/17 Proposed Metered Fixed Charges
City of Modesto
Water Rate and Fee Study

Meter Size	Customer Service $/account	Demand $/meter	Total Monthly Fixed Charge
5/8 inch	$8.02	$12.77	$20.79
3/4 inch	$8.02	$12.77	$20.79
1 inch	$8.02	$21.28	$29.30
1.5 inch	$8.02	$42.56	$50.58
2 inch	$8.02	$68.09	$76.11
3 inch	$8.02	$148.95	$156.98
4 inch	$8.02	$268.12	$276.14
6 inch	$8.02	$553.26	$561.28
8 inch	$8.02	$1,021.39	$1,029.42
10 inch	$8.02	$1,617.21	$1,625.23
12 inch	$8.02	$2,127.90	$2,135.93

Table 5-11: Option 2 FY2016/17 Proposed Unmetered Charges
City of Modesto
Water Rate and Fee Study

DROUGHT Charges

Rate Code	Monthly Water Use (ccf)	Drought Water Rate ($/ccf)	Water Use Charges	Customer Service	Demand Charge	Total Drought Monthly Charge
PRO1 - 0 to 5,000 sq ft	10.1	$1.97	$19.90	$8.02	$21.28	$49.20
PRO2 - 5,001 to 7,000 sq ft	14.2	$1.97	$27.97	$8.02	$21.28	$57.27
PRO3 - 7001 to 11,000 sq ft	22.3	$1.97	$43.93	$8.02	$21.28	$73.23
PRO4 - 11,001 to 17,000 sq ft	34.4	$1.97	$67.77	$8.02	$21.28	$97.07
PRO5 - Over 17,000 sq ft	40.5	$1.97	$79.79	$8.02	$21.28	$109.09

NON-DROUGHT Charges

Rate Code	Monthly Water Use (ccf)	Non-Drought Water Rate ($/ccf)	Water Use Charges	Customer Service	Demand Charge	Total Non-Drought Monthly Charge
PRO1 - 0 to 5,000 sq ft	10.1	$1.79	$18.08	$8.02	$21.28	$47.38
PRO2 - 5,001 to 7,000 sq ft	14.2	$1.79	$25.42	$8.02	$21.28	$54.72
PRO3 - 7001 to 11,000 sq ft	22.3	$1.79	$39.92	$8.02	$21.28	$69.22
PRO4 - 11,001 to 17,000 sq ft	34.4	$1.79	$61.58	$8.02	$21.28	$90.88
PRO5 - Over 17,000 sq ft	40.5	$1.79	$72.50	$8.02	$21.28	$101.80

Table 5-12: Option 2 Proposed Rate Schedule
City of Modesto
Water Rate and Fee Study

		Proposed				
Meter Size	**Current**	**FY2016/17**	**FY2017/18**	**FY2018/19**	**FY2019/20**	**FY2020/21**
Fixed Meter Charges ($/month)						
5/8 inch	$15.03	$20.79	$21.72	$23.63	$25.75	$28.14
3/4 inch	$15.03	$20.79	$21.72	$23.63	$25.75	$28.14
1 inch	$21.33	$29.30	$30.82	$33.97	$37.45	$41.40
1.5 inch	$36.90	$50.58	$53.57	$59.80	$66.72	$74.56
2 inch	$55.68	$76.11	$80.86	$90.81	$101.84	$114.35
3 inch	$105.80	$156.98	$167.29	$188.98	$213.04	$240.35
4 inch	$162.13	$276.14	$294.66	$333.66	$376.92	$426.03
6 inch	$318.47	$561.28	$599.44	$679.85	$769.06	$870.34
8 inch	$506.20	$1,029.42	$1,099.82	$1,248.22	$1,412.88	$1,599.80
10 inch	$725.56	$1,625.23	$1,736.66	$1,971.61	$2,232.28	$2,528.21
12 inch	$1,350.92	$2,135.93	$2,282.53	$2,591.66	$2,934.63	$3,323.99
Water Rate ($/ccf)						
Drought	$1.40	$1.97	$2.02	$2.12	$2.22	$2.32
Non-drought	$1.40	$1.79	$1.86	$1.97	$2.10	$2.22
DROUGHT Unmetered Fixed Charge ($/month)						
PRO1 - 0 to 5,000 sq ft	$40.81	$49.20	$51.22	$55.38	$59.87	$64.83
PRO2 - 5,001 to 7,000 sq ft	$46.38	$57.27	$59.50	$64.07	$68.97	$74.34
PRO3 - 7001 to 11,000 sq ft	$55.04	$73.23	$75.87	$81.25	$86.96	$93.14
PRO4 - 11,001 to 17,000 sq ft	$58.43	$97.07	$100.31	$106.90	$113.82	$121.21
PRO5 - Over 17,000 sq ft	$68.69	$109.09	$112.63	$119.83	$127.36	$135.36
NON-DROUGHT Unmetered Fixed Charge ($/month)						
PRO1 - 0 to 5,000 sq ft	$40.81	$47.38	$49.61	$53.87	$58.66	$63.82
PRO2 - 5,001 to 7,000 sq ft	$46.38	$54.72	$57.23	$61.94	$67.27	$72.92
PRO3 - 7001 to 11,000 sq ft	$55.04	$69.22	$72.30	$77.90	$84.28	$90.91
PRO4 - 11,001 to 17,000 sq ft	$58.43	$90.88	$94.80	$101.74	$109.69	$117.77
PRO5 - Over 17,000 sq ft	$68.69	$101.80	$106.15	$113.76	$122.50	$131.31
TUR - Turlock Fire Charge	$4.19	$4.19	$4.19	$4.19	$4.19	$4.19

5.7 Residential Bill Impacts

Table 5-13 and Table 5-14 provide sample single family residential monthly bills under the proposed Option 1 and Option 2 rates over the next five years. Under the drought and non-drought rates, the typical customer pays approximately the same monthly bill. Under the drought scenario, the volume rate is higher but the customer uses few units of water thereby mitigating bill impacts. Although customers are asked to conserve, the total amount collected from customers (the revenue requirement) must increase to meet operating and capital costs and to maintain a strong credit rating for the water utility.

Table 5-13: Option 1 Typical Single Family Residential Monthly Bills
City of Modesto

Water Rate and Fee Study

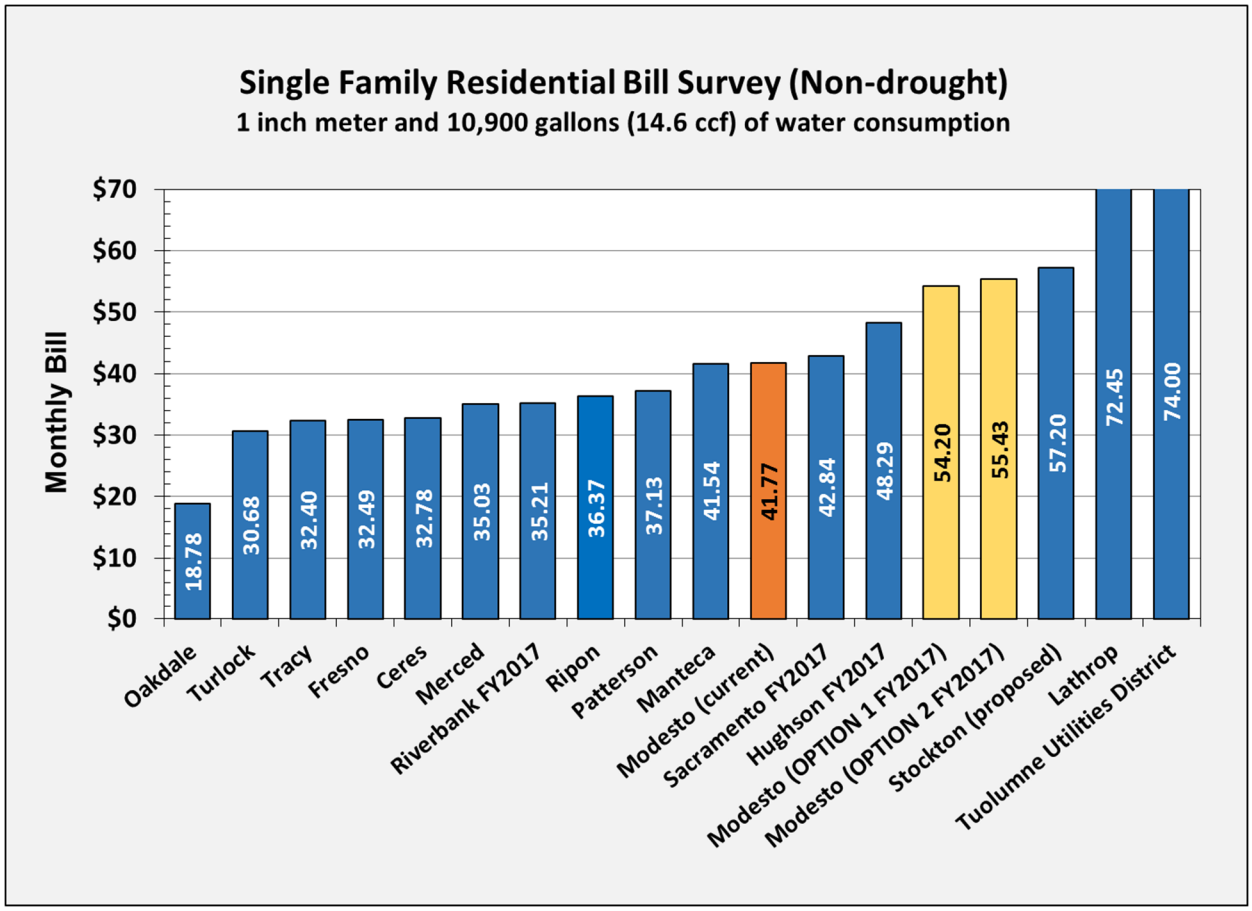
		Proposed				
Charges	**Current**	**FY2016/17**	**FY2017/18**	**FY2018/19**	**FY2019/20**	**FY2020/21**
Drought						
Fixed Charge (1 inch)	$21.33	$28.80	$29.45	$32.45	$35.77	$39.48
Water Use Charges (13 ccf)	$18.20	$24.83	$25.74	$27.04	$28.34	$29.64
Total Monthly Bill	$39.53	$53.63	$55.19	$59.49	$64.11	$69.12
Non-drought						
Fixed Charge (1 inch)	$21.33	$28.80	$29.45	$32.45	$35.77	$39.48
Water Use Charges (14.6 ccf)	$20.44	$25.40	$26.57	$28.18	$29.93	$31.83
Total Monthly Bill	$41.77	$54.20	$56.02	$60.63	$65.70	$71.31

Table 5-14: Option 2 Typical Single Family Residential Monthly Bills
City of Modesto
Water Rate and Fee Study

		Proposed				
Charges	**Current**	**FY2016/17**	**FY2017/18**	**FY2018/19**	**FY2019/20**	**FY2020/21**
Drought						
Fixed Charge (1 inch)	$21.33	$29.30	$30.82	$33.97	$37.45	$41.40
Water Use Charges (13 ccf)	$18.20	$25.61	$26.26	$27.56	$28.86	$30.16
Total Monthly Bill	$39.53	$54.91	$57.08	$61.53	$66.31	$71.56
Non-drought						
Fixed Charge (1 inch)	$21.33	$29.30	$30.82	$33.97	$37.45	$41.40
Water Use Charges (14.6 ccf)	$20.44	$26.13	$27.16	$28.76	$30.66	$32.41
Total Monthly Bill	$41.77	$55.43	$57.98	$62.73	$68.11	$73.81

Figure 3 provides a residential bill survey comparing the City of Modesto's current and proposed water bills with the bills of other local agencies. The City of Modesto bills shown in Figure 3 are the non-drought water bills. Since each agency has an individualized conservation target, it is unknown how the City of Modesto typical water use would compare. Even with the proposed rate increases under Option 1 and 2, the City of Modesto's typical bill would remain competitive with the proposed City of Stockton bill and the current City of Lathrop bill.

Figure 3: Residential Bill Comparison


Single Family Residential Bill Survey (Non-drought)
1 inch meter and 10,900 gallons (14.6 ccf) of water consumption
Monthly Bill
$70
$60
$50
$40
$30
$20
$10
$0
18.78
30.68
32.40
32.49
32.78
35.03
35.21
36.37
37.13
41.54
41.77
42.84
48.29
54.20
55.43
57.20
72.45
74.00
Oakdale
Turlock
Tracy
Fresno
Ceres
Merced
Riverbank FY2017
Ripon
Patterson
Manteca
Modesto (current)
Sacramento FY2017
Hughson FY2017
Modesto (OPTION 1 FY2017)
Modesto (OPTION 2 FY2017)
Stockton (proposed)
Lathrop
Tuolumne Utilities District

SECTION 6: CONCLUSIONS AND RECOMMENDATIONS

This Water Rate and Fee Study report presents a comprehensive review of the City of Modesto's water revenue requirement, cost allocation, and rate structure. The City last conducted a comprehensive cost of service review in 2004. Recently, the City has lost water service revenue due to drought and is engaged in long-term capital improvement planning. Moreover, the City sold the Waterford and Hickman water systems and was interested in evaluating rate options for its remaining service areas. All of these considerations were reviewed in this 2016 Water Rate Study.

BWA found the City's existing cost allocation method to be appropriate. The City's prior rate study used the commodity demand method recommended by the American Water Works Association to allocate costs for the customer service, commodity, and demand cost functions. This methodology is appropriate for the City's water utility as it reflects how costs are incurred. Administrative and billing costs are categorized as customer service related; water quality, treatment, and delivery costs are commodity related; and the majority of water infrastructure costs are demand or capacity related. The City could explore developing a fire service cost category as part of the water master plan.

Ultimately, BWA recommends that the City maintain its current rate structure consisting of fixed meter charges plus a volume water rate for metered customers and fixed charges for unmetered customers. BWA calculated drought and non-drought volume rates to provide flexibility for the City to adjust to changing conditions while maintaining revenue stability. BWA recommends that the City adopt the drought water rates until the City can reevaluate its water supply.

BWA recommends that the City continue to bill its water service areas based on a single blended rate schedule. BWA does not recommend that the City transition to individualized rate structures for the Del Rio, Grayson, and Turlock service areas. Although high level cost of service estimates have been reviewed by BWA, the City conducts management activities based on a utility-wide model. More importantly, individualized rates would significantly increase the typical bills for the Del Rio and Grayson service areas due to costly water quality issues and needed capital improvements. It is unlikely that such increases would survive the Proposition 218 noticing process. Absent rate increases, these areas would be unable to maintain safe and reliable water service.

The City should continue to monitor its cost of service in order to further develop drought vs. normal year water service costs. BWA reviewed recent increases in surface water costs as well as increases in pumping and chlorine expenses related to the drought. The City may wish to refine its non-drought cost of service as water supply conditions improve.

At minimum, BWA recommends that the City review and update its cost allocation every five years and/or concurrent with Water Master Plan Updates. Proposition 218 allows public agencies to adopt rates over a five-year planning horizon. Any further rate increases must be supported by a cost of service analysis.

APPENDICES

Appendix A: Hickman and Waterford System Costs
Appendix B: Option 1 Capital Improvement Plan
Appendix C: Option 2 Capital Improvement Plan

Appendix A: Hickman and Waterford System Costs

Hickman (O&M) Detail	Area	Capacity (gpm)	Utilities	Chemicals (Chlorine)	GAC Change-Outs+	Generators Annual Permit per Site (SJV)^	Property Tax	Total Annual Cost
Well 272	Hickman	190	8,741.04	1,493.22			529.68	10,763.94
Well 309	Hickman	430	6,564.36	1,658.37			343.72	8,566.45
Annual State Permits per System (CDPH)	Hickman							1,152.00
Sampling = four sites x $317.34 (average cost per site)	Hickman							1,269.36
Leak Repairs = average Cost per Leak ($1150) x 3	Hickman							3,450.00
Valve Turning = one hour labor/valve; turned/flushed once a year (71 valves)	Hickman							2,463.70
Site Maintenance = Weed Abatement, Landscaping, General Maintenance (8 hours)	Hickman							256.64
PM's per site = 3 hours/site (2) per month	Hickman							2,710.80
Routine Site Checks = 139 hours/year	Hickman							4,894.50
Administer Backflow Program = (5 hours)	Hickman							178.90
Localized Flushing = approx 5/year x one hour labor	Hickman							188.25
Utility Division Service Requests = avg one hour labor x 108 requests/year	Hickman							3,747.60
Sub-total for Hickman			***15,305.40***	***3,151.59***	**-**	**-**	***873.40***	***39,642.14***

Waterford (O&M) Detail	Area	Capacity (gpm)	Utilities	Chemicals (Chlorine)	GAC Change-Outs+	Generators Annual Permit per Site (SJV)^	Property Tax	Total Annual Cost
Well 242	Waterford	500	3,226.87	126.41			2,054.82	5,408.10
Well 244	Waterford	450	6,333.62	470.08	28,000.00		1,435.24	36,238.94
Well 245	Waterford	500	16,675.66	398.98			1,559.54	18,634.18
Well 286	Waterford	875	1,350.00	71.10			1,483.96	2,905.06
Well 302	Waterford	850	18,119.83	260.72		240.00	1,487.96	20,108.51
Well 303	Waterford	500	49,963.78	1,616.55	56,000.00	117.00	59.70	107,757.03
Annual State Permits per System (CDPH)	Waterford							13,107.60
Sampling = 20 sites x $317.34 (average cost per site)	Waterford							6,346.80
Leak Repairs = average cost per leak ($1150) x 36	Waterford							41,400.00
Valve Turning = one hour labor/valve; turned/flushed once a year (589 valves)	Waterford							20,438.30
Site Maintenance = Weed Abatement, Landscaping, General Maintenance (96 hours)	Waterford							6,079.68
PM's per site = 3 hours/site (6) per month	Waterford							8,132.40
Routine Site Checks = 447 hours/year	Waterford							16,829.55
Administer Backflow Program = (25 hours)	Waterford							894.50
Localized Flushing = approx 20/year x one hour labor	Waterford							753.00
Utility Division Service Requests = avg one hour labor x 1618 requests/year	Waterford							56,144.60
Sub-total for Waterford			***95,669.76***	***2,943.84***	***84,000.00***	***357.00***	***8,081.22***	***361,178.25***

Information provided by PW-Water Division Staff (Gail B. & Karen D.)

Total Estimated Cost for Both Systems: ***$400,820.39***

Costs not included:

Capital Projects (Hickman = new well and tank) (Waterford = new tank and meter installation)
Property Appraisals and Acquisition
Overhead which could include admin support, supervisors, department director, engineering, finance, and other general services
Debt Service

Footnotes:

+ GAC change outs vary - they are done every 2 - 3 years on average - these costs are an estimated annual average cost.
^ CDPH permits are annual for each system. SJV generator permits are per well site.

Appendix B: Option 1 Capital Improvement Plan

Description	FY2016/17	FY2017/18	FY2018/19	FY2019/20	FY2020/21
Category 2: City-Side Downstream Improvements to MRWTP Phase Two Expansion					
4 MG Industrial Tank/12 mgd Booster Pump Station	1,000,000	5,000,000	4,500,000	0	0
Codoni Transmission Mains	2,100,000	0	0	0	0
Yosemite Transmission Mains (Lapham Drive to 7th & B St)	0	0	0	0	740,000
	3,100,000	**5,000,000**	**4,500,000**	**0**	**740,000**
Category 3: Improvements for South Modesto					
7th Street River Crossing to South Modesto	45,000	45,000	810,000	0	0
	45,000	**45,000**	**810,000**	**0**	**0**
Category 4: Water Quality Studies	**30,000**	**30,000**	**30,000**	**30,000**	**30,000**
Category 5: SCADA System Upgrades	**50,000**	**250,000**	**250,000**	**700,000**	**1,500,000**
Category 6: New Corporation Yard					
On-site Improvements	1,500,000	2,000,000	2,000,000	2,000,000	2,000,000
	1,500,000	**2,000,000**	**2,000,000**	**2,000,000**	**2,000,000**
Category 7: Existing Tank Improvements					
Interior & Exterior Recoats, Structural Repairs	700,000	300,000	340,000	340,000	340,000
	700,000	**300,000**	**340,000**	**340,000**	**340,000**
Category 8: Extend Water Mains					
Kiernan Water Main (Sisk - Stoddard)	0	0	100,000	1,100,000	0
Kiernan Ave (Stoddard to Dale)	0	0	100,000	1,700,000	0
Litt Road (Grogan Park to New Corp Yard)	0	2,000,000	0	0	0
Dale Rd to S. Kiernan	0	0	0	100,000	1,700,000
Bangs Rd - Dale to Carver.	0	0	0	0	100,000
Roselle - between Claribel to Claratina	0	0	0	0	100,000
	0	**2,000,000**	**200,000**	**2,900,000**	**1,900,000**
Category 9: Strengthen and Replace Water System					
La Loma Neighborhood El Vista to Riverside	0	0	0	200,000	2,000,000
Paradise/Ohio/Grimes	100,000	2,200,000	2,500,000	0	0
La Loma Phase 2 and 3	2,300,000	2,300,000	2,300,000	2,200,000	0
South Modesto Phase 3	0	0	0	200,000	2,380,000
South 9th Street Industrial Area Phase 2	0	0	0	0	200,000
SR 132 Water Main Replacement	0	100,000	1,400,000	0	0
Strengthen & Replace Water System (Ops)	1,750,000	1,500,000	1,500,000	1,500,000	1,500,000
	4,150,000	**6,100,000**	**7,700,000**	**4,100,000**	**6,080,000**

Description	FY2016/17	FY2017/18	FY2018/19	FY2019/20	FY2020/21
Category 10: Install New Wells					
Grogan Park Well (Tivoli)	1,200,000	300,000	0	0	0
Del Rio Well w/ 1,000 gpm capacity	750,000	1,550,000	0	0	0
Grayson Well 274 w/ 400 gpm capacity	1,000,000	0	0	0	0
Del Rio Replacement Well (Well 271)	100,000	750,000	1,500,000	0	0
Test Holes for New/Replacement Wells	0	0	0	500,000	2,300,000
	3,050,000	**2,600,000**	**1,500,000**	**500,000**	**2,300,000**
Category 11: Wellhead Treatment					
Chlorine and Nitrate Analyzers (Ops)	250,000	250,000	250,000	250,000	250,000
Blending Lines, Flush Lines & Regulatory Driven Upgrades	0	400,000	400,000	400,000	400,000
Wellhead Treatment & Well Rehabilitation	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
	1,250,000	**1,650,000**	**1,650,000**	**1,650,000**	**1,650,000**
Category 12: Purchase & Install New Generators					
Existing Contiguous Service Area System (Ops)	370,000	370,000	370,000	370,000	370,000
	370,000	**370,000**	**370,000**	**370,000**	**370,000**
Category 13: Water System Security Enhancements	**200,000**	**200,000**	**200,000**	**200,000**	**200,000**
Category 14: Groundwater Mgmt Program	**300,000**	**500,000**	**400,000**	**300,000**	**200,000**
Category 15: Urban Water Mgmt Plan	**0**	**0**	**0**	**100,000**	**0**
Category 16: Water Master Plan	**0**	**0**	**1,500,000**	**0**	**0**
Category 17: Water System Evaluation	**150,000**	**150,000**	**150,000**	**150,000**	**150,000**
Category 18: New Water Tanks					
Future Tank and Booster Station (South Modesto)	0	0	0	0	1,500,000
New Tank and Booster Pump Station - Del Rio	3,400,000	2,050,000	0	0	0
	3,400,000	**2,050,000**	**0**	**0**	**1,500,000**
Category 19: Water Meters	**5,000,000**	**5,000,000**	**5,000,000**	**5,000,000**	**5,000,000**
Category 21: New or Replacement Pumps	**450,000**	**450,000**	**450,000**	**450,000**	**450,000**
Category 22: Utility Cuts	**100,000**	**100,000**	**100,000**	**100,000**	**100,000**
Total Planned Capital Project Costs (Current Dollars)	**23,845,000**	**28,795,000**	**27,150,000**	**18,890,000**	**24,510,000**
Escalated to Year of Construction (+3% annually)	**23,845,000**	**29,661,000**	**28,802,000**	**20,642,000**	**27,586,000**

Appendix C: Option 2 Capital Improvement Plan

Description	FY2016/17	FY2017/18	FY2018/19	FY2019/20	FY2020/21
Category 2: City-Side Downstream Improvements to MRWTP Phase Two Expansion					
4 MG Industrial Tank/12 mgd Booster Pump Station	1,000,000	5,000,000	4,500,000	0	0
Codoni Transmission Mains	2,100,000	0	0	0	0
Yosemite Transmission Mains (Lapham Drive to 7th & B St)	0	0	740,000	3,000,000	3,660,000
	3,100,000	**5,000,000**	**5,240,000**	**3,000,000**	**3,660,000**
Category 3: Improvements for South Modesto					
Downstream Improvements for South Modesto Tank	0	0	0	0	640,000
7th Street River Crossing to South Modesto	45,000	45,000	810,000	0	0
New Transmission and River Crossing for So Modesto Tank (Morgan Rd)	0	0	0	0	570,000
	45,000	**45,000**	**810,000**	**0**	**1,210,000**
Category 4: Water Quality Studies	**30,000**	**30,000**	**30,000**	**30,000**	**30,000**
Category 5: SCADA System Upgrades	**50,000**	**250,000**	**250,000**	**700,000**	**1,500,000**
Category 6: New Corporation Yard					
On-site Improvements	1,500,000	4,000,000	4,000,000	0	0
	1,500,000	**4,000,000**	**4,000,000**	**0**	**0**
Category 7: Existing Tank Improvements					
Interior & Exterior Recoats, Structural Repairs	700,000	300,000	340,000	340,000	340,000
	700,000	**300,000**	**340,000**	**340,000**	**340,000**
Category 8: Extend Water Mains					
Kiernan Water Main (Sisk - Stoddard)	0	0	100,000	1,100,000	0
Kiernan Ave (Stoddard to Dale)	0	0	100,000	1,700,000	0
Litt Road (Grogan Park to New Corp Yard)	0	2,000,000	0	0	0
Dale Rd to S. Kiernan	0	0	0	100,000	1,700,000
Bangs Rd - Dale to Carver.	0	0	0	0	100,000
Roselle - between Claribel to Claratina	0	0	0	0	100,000
	0	**2,000,000**	**200,000**	**2,900,000**	**1,900,000**
Category 9: Strengthen and Replace Water System					
Parklawn	0	0	0	0	100,000
La Loma Neighborhood El Vista to Riverside	100,000	100,000	3,000,000	3,000,000	3,000,000
Highway Village	3,200,000	0	0	0	0
Paradise/Ohio/Grimes	100,000	2,200,000	2,500,000	0	0
La Loma Phase 2 and 3	3,000,000	3,000,000	100,000	3,000,000	0
South Modesto Phase 3	0	0	0	200,000	2,380,000
South 9th Street Industrial Area Phase 2	0	0	0	0	200,000
SR 132 Water Main Replacement	0	100,000	1,400,000	0	0
Outlying Water System Improvements (Turlock)	0	0	0	0	0
Strengthen & Replace Water System (Ops)	1,750,000	3,250,000	3,250,000	3,250,000	3,250,000
	8,150,000	**8,650,000**	**10,250,000**	**9,450,000**	**8,930,000**
Description	**FY2016/17**	**FY2017/18**	**FY2018/19**	**FY2019/20**	**FY2020/21**
Category 10: Install New Wells					

Grogan Park Well (Tivoli)	1,200,000	300,000	0	0	0
Del Rio Well w/ 1,000 gpm capacity	750,000	1,550,000	0	0	0
Grayson Well 274 w/ 400 gpm capacity	1,000,000	0	0	0	0
Del Rio Replacement Well (Well 271)	100,000	750,000	1,500,000	0	0
Well 226 Replacement Well	0	2,300,000	0	0	0
Test Holes for New/Replacement Wells	0	0	300,000	0	300,000
New/Replacement Wells	0	0	0	2,300,000	0
	3,050,000	**4,900,000**	**1,800,000**	**2,300,000**	**300,000**
Category 11: Wellhead Treatment					
Chlorine and Nitrate Analyzers (Ops)	250,000	250,000	250,000	250,000	250,000
Blending Lines, Flush Lines & Regulatory Driven Upgrades	0	400,000	400,000	400,000	400,000
Wellhead Treatment & Well Rehabilitation	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
	1,250,000	**1,650,000**	**1,650,000**	**1,650,000**	**1,650,000**
Category 12: Purchase & Install New Generators					
Existing Contiguous Service Area System (Ops)	370,000	370,000	370,000	370,000	370,000
	370,000	**370,000**	**370,000**	**370,000**	**370,000**
Category 13: Water System Security Enhancements	**200,000**	**200,000**	**200,000**	**200,000**	**200,000**
Category 14: Groundwater Mgmt Program	**300,000**	**500,000**	**400,000**	**300,000**	**200,000**
Category 15: Urban Water Mgmt Plan	**0**	**0**	**0**	**100,000**	**0**
Category 16: Water Master Plan	**0**	**0**	**1,500,000**	**0**	**0**
Category 17: Water System Evaluation	**150,000**	**150,000**	**150,000**	**150,000**	**150,000**
Category 18: New Water Tanks					
Future Tank and Booster Station (South Modesto)	0	0	0	0	1,500,000
New Tank and Booster Pump Station - Del Rio	3,400,000	2,050,000	0	0	0
	3,400,000	**2,050,000**	**0**	**0**	**1,500,000**
Category 19: Water Meters	**5,000,000**	**5,000,000**	**5,000,000**	**5,000,000**	**5,000,000**
Category 21: New or Replacement Pumps	**450,000**	**450,000**	**450,000**	**450,000**	**450,000**
Category 22: Utility Cuts	**100,000**	**100,000**	**100,000**	**100,000**	**100,000**
Total Planned Capital Project Costs (Current Dollars)	**27,845,000**	**35,645,000**	**32,740,000**	**27,040,000**	**27,490,000**
Escalated to Year of Construction (+3% annually)	**27,845,000**	**36,717,000**	**34,733,000**	**29,548,000**	**30,940,000**