



## COMPREHENSIVE SEWER RATE STUDY REPORT

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## TABLE OF CONTENTS

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TABLE OF CONTENTS .....	1
TABLE OF FIGURES .....	1
SECTION 1. EXECUTIVE SUMMARY .....	2
A. BACKGROUND AND PURPOSE .....	2
B. KEY FINDINGS .....	2
C. STUDY RECOMMENDATIONS .....	3
D. FREQUENTLY ASKED QUESTIONS ABOUT THE RATE STUDY .....	3
SECTION 2. SEWER RATE STUDY METHODOLOGY .....	5
A. RATE STUDY METHODOLOGY .....	5
B. FINANCIAL AND PLANNING ASSUMPTIONS .....	5
C. CAPITAL IMPROVEMENT PROGRAM .....	6
D. REVENUE REQUIREMENTS .....	7
E. SEWER CUSTOMER CHARACTERISTICS .....	8
F. SEWER COST OF SERVICE ANALYSIS .....	13
G. RATE DESIGN ANALYSIS .....	14
H. CURRENT VS. PROPOSED SEWER RATES .....	17
SECTION 3. RECOMMENDATIONS AND NEXT STEPS .....	19
A. CONSULTANT RECOMMENDATIONS .....	19
B. NEXT STEPS .....	19
C. PRINCIPAL ASSUMPTIONS AND CONSIDERATIONS .....	19
APPENDIX A – ABBREVIATIONS AND ACRONYMS .....	20
APPENDIX B – SEWER RATE ANALYSIS .....	21

## TABLE OF FIGURES

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Figure 1. Primary Components of a Rate Study .....	5
Figure 2. Annual Capital Improvement Expenditures .....	6
Figure 3. Summary of Sewer Revenue Requirements .....	8
Figure 4. Summary of Sewer Reserve Funds <sup>1</sup> .....	8
Figure 5. Summary of Estimated Effluent Generation by Class .....	9
Figure 6. Summary of Average Residential Winter Water Use by Class in FY 2014/15 .....	10
Figure 7. Summary of Average Residential Winter Water Use by Class in FY 2015/16 .....	10
Figure 8. Summary of Annual Flow and BOD Strength by Customer Class .....	11
Figure 9. Summary of Annual Flow and TSS Strength by Customer Class .....	12
Figure 10. Number of Accounts and Billing Units by Customer Class .....	12
Figure 11. Summary of Sewer Rate Revenue Requirements by Customer Class .....	13
Figure 12. Summary of Rate Design Alternatives .....	15
Figure 13. Bill Comparison for the Single-Family Customer Class .....	16
Figure 14. Bill Comparison for the Commercial (Office/Retail) Customer Class .....	16
Figure 15. Bill Comparison for the Commercial (Restaurant) Customer Class .....	17
Figure 16. Current vs. Recommended Sewer Rates (Alternative #2) .....	18

## SECTION 1. EXECUTIVE SUMMARY

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### A. BACKGROUND AND PURPOSE

**Background** – In 2007 and 2008, following the recommendation of the Natural Resources Commission (NRC), the City of Davis (“the City”) implemented a new sewer rate structure based on average winter water use primarily for the purpose of improving equity among residential customers. This approach better characterized the costs of service, for example, for a single-person household vs. one with four or five occupants, as well as non-residential customers. Subsequent to this, the City concluded that more than 1,200 residential customers had winter water consumption that resulted in bills that were too high and, therefore, decided to implement a “cap” of twice the normal flat-rate charge.

**Purpose** – The overall purpose of this study is to review and either confirm or recommend modifications to the City’s sewer rates. More specific study objectives include evaluating the sewer utility’s financial plan, ensuring that rates accurately reflect customer characteristics and promote long-term revenue stability, and that rates incorporate changes related to the City’s new wastewater treatment facility. NBS believes the rates developed in this study meet the requirements of Proposition 218 (Prop 218), commonly referred to as the “right to vote on new taxes” act<sup>1</sup>, and were developed based on accepted industry standards. This report is provided as part of the City’s effort to communicate transparently with the residential and commercial sewer customers.

The City hired NBS in June 2015 to work with City staff to evaluate these issues. Additionally, the City’s Budget and Finance Commission provided financial guidance and the City’s Utility Rate Advisory Committee (URAC) reviewed initial results and provided direction and feedback. Ultimately, the City Council is responsible for approving the proposed rates.

### B. KEY FINDINGS

**Revenue Requirements and Projected Rates** – As the City is nearing completion of its new wastewater treatment plant, the City is able to more confidently project future revenue requirements. The City’s wastewater enterprise fund has a healthy reserve fund balance, with a projected year-end balance of more than \$33 million at the end of Fiscal Year 2016/17 (FY’16/17). Because of this, there is no need to increase the amount of rate revenue collected for the next five years<sup>2</sup>. However, as noted below the study concluded that there should be changes in how costs are allocated to customer classes and total charges paid by those customer classes.

**Costs of Treatment Have Changed** – Due to the type of treatment processes now used at the new treatment plant, costs for strength-related treatment have increased<sup>3</sup>. This changes how costs are allocated to customer classes. While sewer rates have historically reflected cost allocations based almost entirely on the effluent (flow) that customers generated, the proposed rates allocate approximately 35 percent of the costs to strength-related treatment factors. As a result, customer classes with higher strength effluent will pay higher volumetric rates than they previously paid. Restaurant rates in particular have increased, while residential rates are slightly lower than they otherwise would have been.

**Sewer Rate Structure** – Other than strength related changes reflected in the proposed rates, the City has an established rate structure that is widely considered fair and equitable and which assigns appropriate costs to customers on the basis of average winter water use. This rate design is well-accepted in the community and is consistent with how many other California communities are recovering costs from sewer customers, and NBS recommends retaining this rate design. However, due to the higher strength-related costs and changes in winter average water use, there are changes in the rates related to these factors.

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<sup>1</sup> California Constitution article XIII D, Section 6 (commonly referred to as Proposition 218). NBS assumes the City will provide appropriate legal review to ensure compliance with Prop 218 from a legal perspective.

<sup>2</sup> While some individual rates do change because of updated cost-of-service cost allocations, the average revenue per customer does not increase, except for revenue coming from additional customers.

<sup>3</sup> That is, the costs of treating the biochemical oxygen demand (BOD) and total suspended solids (TSS) constituents of effluent is higher than in the City’s previous wastewater treatment system.

**Impacts on Customer Bills** – Even though the total amount of revenue collected from customers is not increasing and the basic rate design is not changing, the proposed rates will affect individual customer bills in several ways:

First, because winter water use has decreased over time due to water conservation, and adoption of stricter industry standards for lower flow rates of plumbing fixtures, proposed volumetric rates were calculated using a lower winter average, resulting in higher volumetric rates. In most customer classes, the average winter use has dropped by almost 30 percent over the past several years<sup>4</sup>. However, even though volumetric rates are higher, the total amount paid by the City's sewer customers (in total) is not significantly different to what was paid before due to the lower average winter consumption levels<sup>5</sup>.

Second, the changes in the cost allocations noted above have shifted some costs from lower-strength customers, such as office/retail and to a lesser degree residential, towards higher strength customers, such as restaurants.

Third, when comparing customer bills using “current” vs. “proposed” rates, the decreases in average winter water use should be factored in; that is, current rates assumed higher consumption levels whereas proposed rates reflect lower consumption levels.

**Summary of Average Bill Changes** – Because of the changes noted above, costs have shifted slightly from low- and average-strength customers towards higher strength customers, such as restaurants. However, individual customer bills still reflect their specific average winter water use.

## C. STUDY RECOMMENDATIONS

NBS and City staff recommend the City take the following actions:

- Adopt the long-range financial plan.
- Adopt recommend reserve fund targets.
- Retain the City's current rate design, with proposed adjustments that follow cost-of-service rate-setting principles and reflect both higher treatment costs and lower average winter water use.
- Provide the normal legal review of the recommended rates.
- Proceed with Prop 218 noticing requirements necessary for legal adoption and implementation of the proposed rates.
- Assuming no successful Prop 218 protest of the rates, adopt the rates summarized in this report.

Following the “Frequently Asked Questions” section is a more detailed discussion of the sewer rate study.

## D. FREQUENTLY ASKED QUESTIONS ABOUT THE RATE STUDY

**What is a rate study and why was it done?** This rate study is a comprehensive analysis of the City's wastewater rates that addresses a number of key factors such as the financial plan and revenue requirements, the cost-of-service for each customer class, and the fairness and equity of the rate design.

**How was the study conducted and who was involved?** The City selected and retained NBS in 2015 to begin evaluating the City's sewer rates. By the time this study is completed and recommendations finalized, the City's Utility Rate Advisory Committee will have reviewed the rates. After holding public hearings to discuss them, the City Council will ultimately decide on the proposed sewer rates.

**What are the benefits of conducting such a study?** First and foremost, it evaluates the fairness and equity of rates among customer classes. This is a key requirement of Prop 218. A wastewater rate model

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<sup>4</sup> Compared to pre-drought data, residential winter use has dropped by over 30 percent, while decreases in non-residential use have ranged from 12 percent to 35 percent.

<sup>5</sup> We note that some customer classes have relatively higher rates while others have relatively lower rates. The best measure of this is to compare the total percent of revenue paid by each customer class. See Appendix B for details.

was developed as a part of the study to both document the study results and ensure that City's sewer rates are properly aligned to the rate study methodology.

**What were the results of the rate study?** The study shows several things. First, no increases in the revenue requirements are needed for the next five years. Second, that the more expensive treatment costs of the new wastewater treatment plant will increase the share of overall costs borne by higher strength customers, like restaurants, and will slightly decreasing the costs borne by lower strength customers, like office/retail and residential. Third, because of water conservation and lower average winter water use, volumetric rates will, by necessity, need to increase. However, when combined with the lower consumption levels, customers -- on average -- will only see minimal changes in their bills other than those related to this shift in costs related to strength factors.

**How often will my sewer bill change?** Once the average winter water use is available (approximately in April for water use the previous winter), the City recalculates sewer bills using this new data. Those new bills go into effect on May 1<sup>st</sup> of each year.

**What new wastewater treatment plant components increased costs for higher strength customers?** The wastewater improvement project currently under construction replaces the City's existing treatment system<sup>6</sup> with a new and different treatment system<sup>7</sup> that was chosen because it can reliably meet the 2012 wastewater discharge permit water quality standards and has the ability to adapt to future permit changes. The new treatment system has higher costs for effluent strength-related components<sup>8</sup>. For example, the new system uses large electric air compressors, bigger tanks, and more powerful compressors in treating BOD and TSS constituents.

For rate setting purposes, wastewater is divided into four components – Flow, Biochemical Oxygen Demand (BOD), Total Suspended Solids (TSS), and Customer Service (CS). In 2008, the City concluded that the operational costs of the existing plant for Flow/BOD/TSS/CS were roughly 80%/10%/6%/4%. This study concluded that the new plant's costs are approximately 65%/15%/15%/5%, thereby increasing the costs allocated to customers with higher-strength effluent, such as restaurants.

**How has lower average winter water use affected my bill?** Monthly sewer bills are recalculated each year based on each customer's average winter water use. Periodically, the City prepares a rate study that adjusts the sewer rates to reflect the most current cost factors, including winter water use. As average winter water use has decreased the last several years, collecting the same amount of revenue from volumetric rates requires that volumetric charges increase (same revenue must be collected from fewer units of winter water use). Customers with average reductions in water use should have very similar monthly bills, while customers who do not decrease their average winter water use will see slightly higher sewer bills.

**How and when will the recommended rate changes be implemented?** In order to implement the new rates, the City will need to issue written notices of the proposed rate adjustments to customers, as mandated by Proposition 218, and hold a public hearing to adopt and implement the new rates. Assuming there is no successful challenge during the Prop 218 balloting, new rates would be implemented by June 2017.

**When will the City evaluate and adjust sewer rates again?** The City typically re-examines sewer bills, using a cost-of-service rate study, about every five years, although these studies are sometimes done more frequently if there are significant changes in revenue requirements and/or cost-allocation factors.

**How can someone learn more about the rate study and the URAC's and NRC' recommendations?** The City's website<sup>9</sup> provides useful information about the rate study report and the presentations made to the URAC on this topic.

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<sup>6</sup> The existing system is a biological pond and overland flow secondary treatment system.

<sup>7</sup> The new technology is a conventional biological activated sludge treatment system.

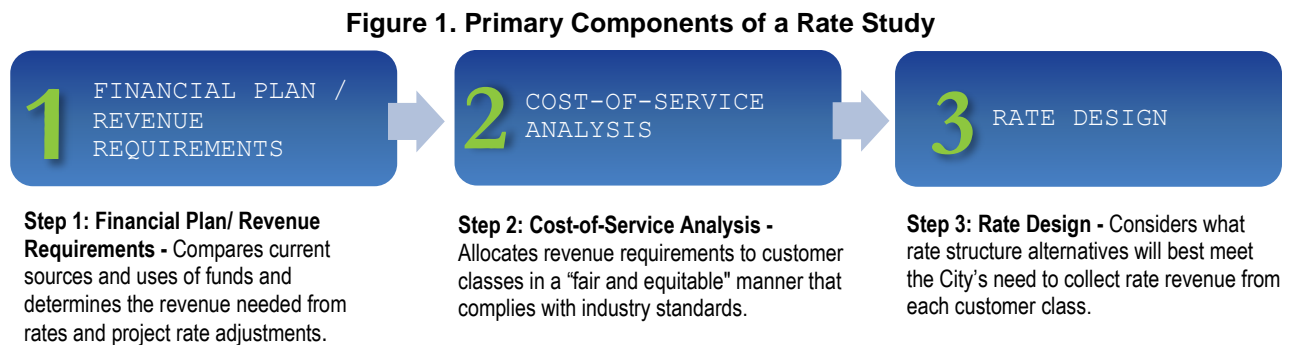
<sup>8</sup> That is, for treating Biochemical Oxygen Demand (BOD) and Total Suspended Solids (TSS) components of effluent.

<sup>9</sup> <http://cityofdavis.org/city-hall/finance/city-services/utility-rates/sewer-rate-calculation>

## SECTION 2. SEWER RATE STUDY METHODOLOGY

### A. RATE STUDY METHODOLOGY

**Components of the Rate Study Methodology** – A comprehensive utility rate study typically encompasses three major components: (1) preparation of a financial plan which identifies the net revenue requirements for the utility; (2) analysis of the cost to serve each customer class, and; (3) the rate structure design. These three steps are shown in **Figure 1**.



These three steps are intended to follow industry standards and reflect the fundamental principles of cost-of-service rate making embodied in the American Water Works Association (AWWA) Principles of Water Rates, Fees, and Charges<sup>10</sup>, also referred to as Manual M1. They address general requirements for equity and fairness and the requirements under Prop 218 that rates be proportionate and not exceed the cost of providing the service to all customers. In terms of the chronology of the study, these three steps represent the order they were performed in this study.

### B. FINANCIAL AND PLANNING ASSUMPTIONS

Following are the key assumptions used in the rate analyses:

- **Funding of Capital Projects** – After the City's extensive review of the planned capital improvement program (CIP) and funding requirements, the City has decided that the utility should fund the currently planned CIP. The capital improvement projects included in the rate program are designed to keep existing infrastructure in good repair and maintain current service levels. This includes the planned use of financing for the new wastewater treatment plant project.
- **Reserve Targets** – Target reserves for operations and maintenance (O&M) and capital rehabilitation and replacement (R&R), follow industry standards for utility reserve fund management, are set at the following levels:
  - ✓ Operating Reserve target level – approximately 90-days of O&M expenses.
  - ✓ Rehabilitation and Replacement Reserve level – approximately 3.0 percent of net assets.
- **Inflation and Growth Projections<sup>11</sup>**:
  - ✓ Customer Growth is based on adding about 140 equivalent residential dwelling units per year. This translates to an average of 0.50 percent (0.5%) annually for the next 10 years which is 0.50 percent less than assumed growth in recent water demand analysis documents.

<sup>10</sup> *Principles of Water Rates, Fees, and Charges, Manual of Water Supply Practices, M1, AWWA, sixth edition, 2012.*

<sup>11</sup> Inflation factors were developed as part of this study, and are specific to the sewer rate study.

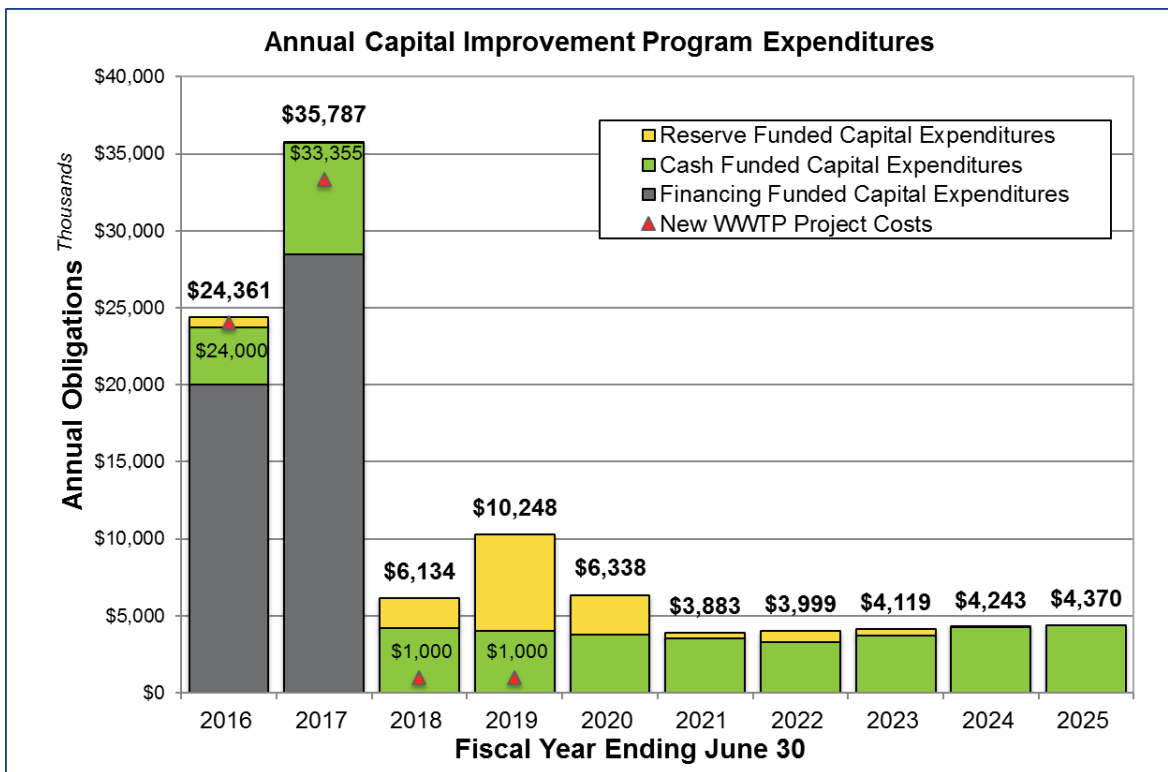
- ✓ General costs (such as professional and contractual services, fuel, vehicle maintenance, etc.) are inflated by 3 percent annually.
- ✓ Chemicals costs are inflated at 4 percent annually and energy costs are inflated by 3 percent annually.
- ✓ Labor costs are inflated 3 percent annually. Health benefits, including retirement, are inflated 4 percent annually.
- ✓ No inflation is added to other budget items, such as late fee revenue or lease income.

### C. CAPITAL IMPROVEMENT PROGRAM

The major capital improvement the City is currently completing is the new \$90 million wastewater treatment plant. This new plant changes the City’s treatment process from one that relies on oxidation ponds and overland flow to one that uses a conventional activated sludge and adds a tertiary filtration system. As noted at the beginning of this report, this new process shifts more of the treatment costs to the strength components (i.e., BOD and TSS constituents). The other components of the City’s capital improvement program include repair and replacement projects for sewer lift stations, sliplining large collection pipes, and lateral replacements. Appendix B provides more details on these projects.

**Figure 2** shows the annual expenditures of all planned CIP projects from the current year through FY 2024/25. This figure demonstrates vast year over year variance in planned project cost. Use of the reserves and debt funding prevent this variance from causing large year over year changes in rates.

**Figure 2. Annual Capital Improvement Expenditures**



## D. REVENUE REQUIREMENTS

Maintaining reasonable reserves is an important tool of a well-managed utility that allows for handling emergencies, funding working capital, maintaining a good credit rating, and generally following sound financial management practices. The level of sewer rates the City charges is governed by the need to meet operating and capital costs, and maintain its reserve funds. The current state of the sewer utility is as follows:

- **Meeting Net Revenue Requirements:** The City is currently in a strong financial position, with sufficient revenue to cover operating costs, expected debt expenditures, and planned expenditures on capital projects. The projected net annual revenue requirement (i.e., total annual expenses plus debt service and rate-funded capital costs, less non-rate revenues) over the next 5 years is approximately \$15 million. Current and projected rate revenues are more than sufficient to ensure the utility will meet debt coverage requirements for the State Revolving Fund (SRF) loans used to pay for the new treatment facilities.
- **Managing Reserve Funds:** The City is projected to end FY 2016/17 with a balance of unrestricted reserve funds of approximately \$33 million. NBS recommends that the City use the following as minimum reserve fund targets:
  - ✓ **Operating Reserve (Fund Number 531)** equal to approximately 90-days of the Utility's budgeted annual operating expenses (approximately \$1.9 million in FY 2016/17). This reserve target is equal to a three-month (or 25 percent) cash cushion for normal operations. An Operating Reserve is intended to promote financial viability in the event of any short-term fluctuation in revenues and/or expenditures.
  - ✓ **Capital Rehabilitation and Replacement Reserve (Fund Number 532)** equal to 3 percent of net depreciable capital assets (or approximately \$4 million based on a total system asset value of approximately \$133 million<sup>12</sup>). The reserve may assist the City in the event of natural disaster or other events that cause significant damage to critical infrastructure. A reserve target set at 3 percent of net depreciable capital assets is consistent with industry standards.
  - ✓ **Debt Reserve** equal to the reserve requirements for planned debt, which is approximately \$2.1 million for FY 2017/18. This reserve is required as part of SRF loan agreements.

City staff have considered a plan to draw down the existing reserve fund balance, which currently exceeds the recommended target balance of approximately \$6 million. This would include a financial plan that has a line item to pay down the new SRF loan, which funded the WWTP improvement project. Over the next ten years an additional \$14 million could be allocated above the normal debt service payment to lower the principal owed. However, this drawdown, and long-term use of these excess reserves are subjects for the Council's consideration, but do not ultimately affect the rates recommended for adoption at this time. The long-term objective is to maintain reserve fund levels at the target balance of around \$7.2 million by FY 2025/26.

**Figure 3** summarizes the sources and uses of funds, including rate-funded capital expenses and net revenue requirements, and indicates there are no recommended increases in total rate revenue for the next five years. This table also indicates that rate-funded capital expenses are the primary variable driving the net revenue requirements each year.

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<sup>12</sup> Total system asset value is calculated based on noncurrent assets net of accumulated depreciation, as reported in the City's CAFR, plus annual CIP additions, and less 3 percent for annual depreciation.



**Figure 3. Summary of Sewer Revenue Requirements**

Summary of Sources and Uses of Funds and Net Revenue Requirements	Actuals	Budget	Projected				
	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22
<b>Sources of Sewer Funds</b>							
Rate Revenue Under Prevailing Rates	\$ 13,775,555	\$ 14,391,544	\$ 14,463,502	\$ 14,535,819	\$ 14,608,498	\$ 14,681,541	\$ 14,754,949
Other Revenues	\$ 362,374	\$ 330,000	\$ 330,000	\$ 330,000	\$ 330,000	\$ 330,000	\$ 330,000
Non-Rate Revenues	238,764	228,568	228,568	228,568	228,568	228,568	228,568
Interest Earnings	170,952	97,080	165,372	217,604	206,920	200,631	204,439
<b>Total Sources of Funds</b>	<b>\$ 14,547,645</b>	<b>\$ 15,047,192</b>	<b>\$ 15,187,442</b>	<b>\$ 15,311,991</b>	<b>\$ 15,373,986</b>	<b>\$ 15,440,740</b>	<b>\$ 15,517,955</b>
<b>Uses of Sewer Funds</b>							
Operating Expenses	\$ 6,241,113	\$ 7,853,900	\$ 8,907,027	\$ 9,194,455	\$ 9,491,319	\$ 9,797,937	\$ 10,114,635
Debt Service	-	-	2,107,395	2,107,395	2,107,395	2,107,395	2,107,395
Rate-Funded Capital Expenses	3,695,808	7,193,292	4,173,020	4,010,142	3,775,272	3,535,408	3,295,925
<b>Total Use of Funds</b>	<b>\$ 9,936,921</b>	<b>\$ 15,047,192</b>	<b>\$ 15,187,442</b>	<b>\$ 15,311,991</b>	<b>\$ 15,373,986</b>	<b>\$ 15,440,740</b>	<b>\$ 15,517,955</b>
<b>Surplus (Deficiency) before Rate Increase</b>	<b>\$ 4,610,724</b>	<b>\$ 0</b>	<b>\$ 0</b>	<b>\$ 0</b>	<b>\$ 0</b>	<b>\$ -</b>	<b>\$ -</b>
Additional Revenue from Rate Increases	-	-	-	-	-	-	-
<b>Surplus (Deficiency) after Rate Increase</b>	<b>\$ 4,610,724</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>
<b>Projected Annual Rate Increase</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>
Cumulative Rate Increases	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
<b>Net Revenue Requirement<sup>1</sup></b>	<b>\$ 9,164,831</b>	<b>\$ 14,391,544</b>	<b>\$ 14,463,502</b>	<b>\$ 14,535,819</b>	<b>\$ 14,608,498</b>	<b>\$ 14,681,541</b>	<b>\$ 14,754,949</b>

1. Total Use of Funds less non-rate revenues and interest earnings. This is the annual amount needed from Sewer rates.

Figure 4 summarizes the projected reserve fund balances and reserve targets for the next five years. A summary of the City's proposed 10-year financial plan is included in Appendix B – Sewer Rate Study Summary Tables. These tables include revenue requirements, reserve funds, revenue source and proposed rate increases for the 10-year period.

**Figure 4. Summary of Sewer Reserve Funds<sup>1</sup>**

Beginning Reserve Fund Balances and Recommended Reserve Targets	Actuals	Budget	Projected				
	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22
<b>Operating Reserve</b>							
Ending Balance	\$ 7,877,960	\$ 1,963,000	\$ 2,227,000	\$ 2,242,805	\$ 2,263,879	\$ 2,290,222	\$ 2,321,833
<i>Recommended Minimum Target</i>	<i>1,560,000</i>	<i>1,963,000</i>	<i>2,227,000</i>	<i>2,299,000</i>	<i>2,373,000</i>	<i>2,449,000</i>	<i>2,529,000</i>
<b>Capital Rehabilitation &amp; Replacement Reserve</b>							
Ending Balance	\$20,257,139	\$31,111,473	\$26,786,843	\$18,449,179	\$13,786,634	\$11,339,036	\$ 8,535,466
<i>Recommended Minimum Target</i>	<i>3,050,300</i>	<i>4,000,200</i>	<i>4,058,700</i>	<i>4,235,200</i>	<i>4,292,500</i>	<i>4,276,700</i>	<i>4,264,800</i>
<b>Debt Reserve</b>							
Ending Balance	\$ -	\$ -	\$ 2,107,395	\$ 2,107,395	\$ 2,107,395	\$ 2,107,395	\$ 2,107,395
<i>Recommended Minimum Target</i>	<i>-</i>	<i>-</i>	<i>2,107,395</i>	<i>2,107,395</i>	<i>2,107,395</i>	<i>2,107,395</i>	<i>2,107,395</i>
<b>Total Ending Balance</b>	<b>\$28,135,099</b>	<b>\$33,074,473</b>	<b>\$31,121,238</b>	<b>\$22,799,379</b>	<b>\$18,157,908</b>	<b>\$15,736,653</b>	<b>\$12,964,694</b>
<i>Total Recommended Minimum Target</i>	<i>\$4,610,300</i>	<i>\$ 5,963,200</i>	<i>\$ 8,393,095</i>	<i>\$ 8,641,595</i>	<i>\$ 8,772,895</i>	<i>\$ 8,833,095</i>	<i>\$ 8,901,195</i>

## E. SEWER CUSTOMER CHARACTERISTICS

The key factors used to allocate costs as a part of the wastewater cost-of-service analysis include the estimated effluent (flow) going to the wastewater treatment plant from each customer class as well as the effluent strengths (i.e., biochemical oxygen demand, or BOD, and total suspended solids, or TSS). The most current flow and strength data from the City's wastewater treatment plant was used (as of September 2016).

Based on average winter water consumption, residential customers account for approximately 83.6 percent of effluent generated (i.e., single-family = 45.2 percent and all other residential<sup>13</sup> = 38.4 percent). Commercial customers account for the remaining 16.4 percent of the effluent. These estimates are summarized in **Figure 5**.

<sup>13</sup> Other residential customer categories include Condos, Duplexes, Triplexes, Quadplexes, 5+ Units and Mobile Homes.

**Figure 5. Summary of Estimated Effluent Generation by Class**

Customer Class	Estimated FY 2015/16 Winter-Based Annual Vol. (ccf/yr.) (1)	Adjusted Annual FY 2015/16 Volume Total (ccf) (2)	Percent of Adjusted Volume	4-Month Billable Volume FY 2015/16 (below Cap) (3)	Percent of Billable Volume
<b>Residential Classes</b>					
Single Family	1,230,987	957,538	45.2%	1,112,976	46.0%
Condo	65,552	50,990	2.4%	42,828	1.8%
Duplex	89,932	69,955	3.3%	74,472	3.1%
Triplex	15,152	11,786	0.6%	12,456	0.5%
Quadplex	31,104	24,195	1.1%	24,900	1.0%
5+ Units	803,676	625,149	29.5%	671,340	27.8%
Mobile Home Park	39,620	30,819	1.5%	33,888	1.4%
<b>Non-Residential Classes</b>					
Office/Retail	143,756	111,822	5.3%	143,756	5.9%
Laundry	3,588	2,791	0.1%	3,588	0.1%
All Other	131,616	102,379	4.8%	131,616	5.4%
Conv. Hospital	25,976	20,206	1.0%	25,976	1.1%
Auto/Service Station	31,476	24,484	1.2%	31,476	1.3%
Restaurants	100,652	78,293	3.7%	100,652	4.2%
Industrial	2,712	2,110	0.1%	2,712	0.1%
City Accounts	6,404	4,981	0.2%	6,404	0.3%
<b>Total</b>	<b>2,722,203</b>	<b>2,117,498</b>	<b>100%</b>	<b>2,419,040</b>	<b>100%</b>

(1) Consumption data was provided by the City in file: Consumption Reads July 2015 to May 2016.xls.

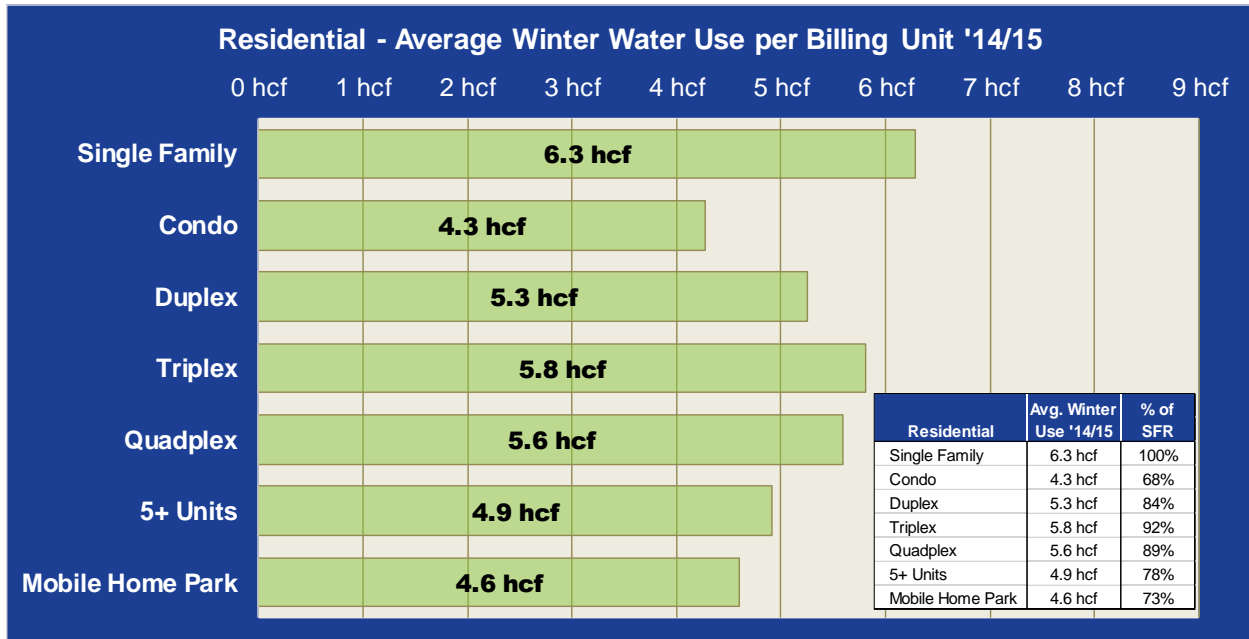
Estimated annual volume is based on Average Winter Water Consumption for all customers.

(2) Includes an assumed water conservation of 0%.

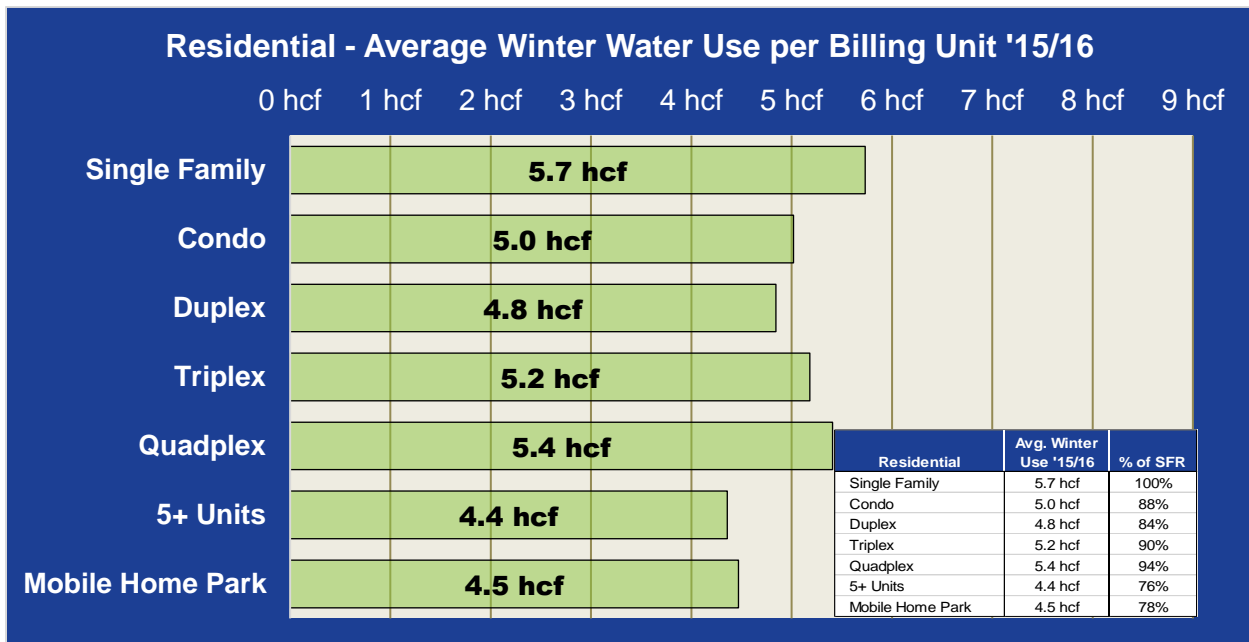
(3) Billable Annual Volume, calculated using avg winter water use below the cap (FY 2015/16 billing data).

Another relevant factor to consider with regard to average winter water use shows the averages have changed over the last several years as the City has responded to drought mandates and conservation messaging. **Figure 6** and **Figure 7** illustrate the differences in average winter water use for various residential customer classes in FY 2014/15 and FY 2015/16; single-family customers have decreased average water use by 9.5 percent. Other classes, except condos, also reduced their average water use, although by lesser amounts.

**Figure 6. Summary of Average Residential Winter Water Use by Class in FY 2014/15**



**Figure 7. Summary of Average Residential Winter Water Use by Class in FY 2015/16**



**Customer Class Effluent Strengths** – Effluent strength factors for individual customer classes are often determined by using the State Water Resources Control Council (SWRCB) Revenue Program Guidelines<sup>14</sup>, although they are typically adjusted based on the actual strength of effluent received at the treatment plant. These strength factors are described below.

- All residential customers, including single-family, multi-family and mobile homes, have estimated BOD and TSS strength factors of approximately 250 mg/l. Once this is adjusted for actual effluent strength coming to the treatment plant, this is still slightly higher than the normal due to lower hydraulic flows resulting from water conservation.
- Commercial standard strength customers can have strength factors that are higher or lower than residential strength factors, depending on the particular type of commercial uses. In the City’s case, there are eight different commercial classes<sup>15</sup>. Therefore, strength factors assigned to commercial class customers were both lower and higher than residential customers, but were also adjusted to reflect the actual flow and loadings received at the treatment plant.

**Figure 8** and **Figure 9** summarize the flow and strength characteristics of each of the utility’s customer classes. **Figure 10** compares the total number of accounts and billing units by customer class; either accounts or billing units are used depending on how each customer class is billed.

**Figure 8. Summary of Annual Flow and BOD Strength by Customer Class**

Customer Class	Adjusted Annual Flow	Biochemical Oxygen Demand (BOD)			
		Average Strength Factor (mg/l) <sup>1</sup>	Calculated BOD (lbs./yr.)	Adjusted BOD (lbs./yr.)	Percent of Total
Single Family	957,538	250	1,493,357	1,331,558	44.0%
Condo	50,990	250	79,524	70,908	2.3%
Duplex	69,955	250	109,100	97,279	3.2%
Triplex	11,786	250	18,381	16,390	0.5%
Quadplex	24,195	250	37,733	33,645	1.1%
5+ Units	625,149	250	974,970	869,336	28.7%
Mobile Home Park	30,819	250	48,065	42,857	1.4%
Office/Retail	111,822	130	90,686	80,860	2.7%
Laundry	2,791	150	2,612	2,329	0.1%
All Other	102,379	130	83,028	74,032	2.4%
Conv. Hospital	20,206	250	31,512	28,098	0.9%
Auto/Service Station	24,484	180	27,493	24,514	0.8%
Restaurants	78,293	800	390,735	348,401	11.5%
Industrial	2,110	485	6,383	5,691	0.2%
City Accounts	4,981	130	4,040	3,602	0.1%
<b>Total</b>	<b>2,117,498</b>		<b>3,397,617</b>	<b>3,029,500</b>	<b>100%</b>
<i>Target, from WWTP Data<sup>2</sup></i>				<i>3,029,500 BOD (lbs./yr.)</i>	
				<i>0.892 BOD Adj. Factor</i>	

(1) Average strength factors for BOD and TSS are based on the State Water Resources Control Board Revenue Program Guidelines, Appendix G. NBS has adjusted residential strength factors to reflect an increase in concentrations due to lower hydraulic flows resulting from water conservation.

(2) WWTP flow data provided by City staff, via email, September 2016.

<sup>14</sup> Appendix G, page G-21 “Commercial User Strength Characteristics.”

<sup>15</sup> Commercial customer categories include Office/Retail, Laundry, Convalescent Hospital, Auto/Service Station, Restaurant, Industrial, City Accounts, and “All Other.”

**Figure 9. Summary of Annual Flow and TSS Strength by Customer Class**

Customer Class	Adjusted Annual Flow	Total Suspended Solids (TSS)			
		Average Strength Factor (mg/l) <sup>1</sup>	Calculated TSS (lbs./yr.)	Adjusted TSS (lbs./yr.)	Percent of Total
Single Family	957,538	250	1,493,357	1,938,294	46.2%
Condo	50,990	250	79,524	103,217	2.5%
Duplex	69,955	250	109,100	141,606	3.4%
Triplex	11,786	250	18,381	23,858	0.6%
Quadplex	24,195	250	37,733	48,976	1.2%
5+ Units	625,149	250	974,970	1,265,456	30.1%
Mobile Home Park	30,819	250	48,065	62,385	1.5%
Office/Retail	111,822	80	55,807	72,434	1.7%
Laundry	2,791	110	1,915	2,486	0.1%
All Other	102,379	130	83,028	107,765	2.6%
Conv. Hospital	20,206	100	12,605	16,361	0.4%
Auto/Service Station	24,484	280	42,767	55,509	1.3%
Restaurants	78,293	550	268,630	348,667	8.3%
Industrial	2,110	425	5,593	7,259	0.2%
City Accounts	4,981	80	2,486	3,227	0.1%
<b>Total</b>	<b>2,117,498</b>		<b>3,233,960</b>	<b>4,197,500</b>	<b>100%</b>
<i>Target, from WWTP Data<sup>2</sup></i>				4,197,500 TSS (lbs./yr.)	1.298 TSS Adj. Factor

(1) Average strength factors for BOD and TSS are based on the State Water Resources Control Board Revenue Program Guidelines, Appendix G. NBS has adjusted residential strength factors to reflect an increase in concentrations due to lower hydraulic flows resulting from water conservation.

(2) WWTP flow data provided by City staff, via email, September 2016.

**Figure 10. Number of Accounts and Billing Units by Customer Class**

Customer Class	Number of Accounts <sup>1</sup>	Percent of Total Accounts	Number of Billing Units <sup>2</sup>	Percent of Total Billing Units
Single Family	12,829	84.2%	12,836	44.9%
Condo	803	5.3%	810	2.8%
Duplex	565	3.7%	1,134	4.0%
Triplex	60	0.4%	180	0.6%
Quadplex	89	0.6%	356	1.2%
5+ Units	226	1.5%	11,255	39.3%
Mobile Home Park	5	0.0%	565	2.0%
Office/Retail	237	1.6%	389	1.4%
Laundry	2	0.0%	2	0.0%
All Other	240	1.6%	533	1.9%
Conv. Hospital	3	0.0%	3	0.0%
Auto/Service Station	50	0.3%	62	0.2%
Restaurants	88	0.6%	239	0.8%
Industrial	9	0.1%	225	0.8%
City Accounts	25	0.2%	25	0.1%
<b>Total</b>	<b>15,231</b>	<b>100.0%</b>	<b>28,614</b>	<b>100.0%</b>

(1) Number of accounts and number of billing units from Source File: *Consumption Reads July 2015 to May 2016.xls* emailed September 2016.

(2) Billing units from June 30, 2016, file: *Sewer Charges.xlsx*.

## F. SEWER COST OF SERVICE ANALYSIS

The cost of service analysis consists of estimating the functional use that various budget line items are used for, such as collection, treatment, customer related, etc. These functional costs are then further allocated to various classifications related to basic categories such as volume (or effluent flow), strength (such as BOD and TSS treatment), and customer costs (billing, accounting, and related customer administrative costs). Appendix B includes a more detailed documentation of this process, but the end result is that annual revenue requirements were allocated to the following categories:

- Volume-related costs = 65 percent or \$9.4 million
- Treatment-related costs = 30 percent or \$2.34 million
  - BOD-related costs = 15 percent or \$2.17 million
  - TSS-related costs = 15 percent or \$2.17 million
- Customer-related costs = 5 percent or \$0.72 million.

Using the customer characteristics shown above in Figure 5, Figure 8, Figure 9, and Figure 10, these costs are allocated to each customer class as follows:

- Volume-related costs are allocated based on percentage of the volume (Figure 5) which reflects a four-month winter average of water consumption (for water use in the months of November, December, January, and February).
- BOD-related costs are allocated based on their percentage of BOD received at the treatment plant (Figure 8).
- TSS-related costs are allocated based on their percentage of TSS received at the treatment plant (Figure 9).
- Customer-related costs are allocated based on their percentage of accounts (Figure 10).

**Figure 11** summarizes the results of this analysis, and shows the total rate revenue requirements by customer class.

**Figure 11. Summary of Sewer Rate Revenue Requirements by Customer Class**

Allocation of FY 2017/18 Rev. Reqs. by Customer Class - Commercial Billed on Winter Usage						
Customer Class	Cost Classification Components				Cost-of-Service Net Revenue Reqs.	% of COS Net Revenue Reqs.
	Volume	Treatment		Customer Related		
		BOD	TSS			
<b>Net Revenue Requirements <sup>1</sup></b>	<b>\$ 9,401,276</b>	<b>\$ 2,169,525</b>	<b>\$ 2,169,525</b>	<b>\$ 723,175</b>	<b>\$ 14,463,502</b>	<b>--</b>
	65.0%	15.0%	15.0%	5.0%	100.0%	
Single Family	\$ 4,325,433	\$ 953,573	\$ 1,001,829	\$ 609,127	\$ 6,889,962	47.6%
Condo	\$ 166,445	\$ 50,779	\$ 53,349	\$ 38,127	\$ 308,700	2.1%
Duplex	\$ 289,425	\$ 69,665	\$ 73,190	\$ 26,826	\$ 459,107	3.2%
Triplex	\$ 48,409	\$ 11,737	\$ 12,331	\$ 2,849	\$ 75,326	0.5%
Quadplex	\$ 96,771	\$ 24,094	\$ 25,314	\$ 4,226	\$ 150,404	1.0%
5+ Units	\$ 2,609,073	\$ 622,560	\$ 654,065	\$ 10,731	\$ 3,896,429	26.9%
Mobile Home Park	\$ 131,701	\$ 30,691	\$ 32,244	\$ 237	\$ 194,874	1.3%
Office/Retail	\$ 558,689	\$ 57,907	\$ 37,438	\$ 11,253	\$ 665,286	4.6%
Laundry	\$ 13,944	\$ 1,668	\$ 1,285	\$ 95	\$ 16,992	0.1%
All Other	\$ 511,508	\$ 53,017	\$ 55,700	\$ 11,395	\$ 631,620	4.4%
Conv. Hospital	\$ 100,952	\$ 20,122	\$ 8,456	\$ 142	\$ 129,673	0.9%
Auto/Service Station	\$ 122,327	\$ 17,555	\$ 28,690	\$ 2,374	\$ 170,947	1.2%
Restaurants	\$ 391,171	\$ 249,501	\$ 180,213	\$ 4,178	\$ 825,063	5.7%
Industrial	\$ 10,540	\$ 4,076	\$ 3,752	\$ 427	\$ 18,795	0.1%
City Accounts	\$ 24,888	\$ 2,580	\$ 1,668	\$ 1,187	\$ 30,323	0.2%
<b>Total</b>	<b>\$ 9,401,276</b>	<b>\$ 2,169,525</b>	<b>\$ 2,169,525</b>	<b>\$ 723,175</b>	<b>\$ 14,463,502</b>	<b>100%</b>

1. Revenue requirement for each customer class is determined by multiplying the revenue requirement from each cost classification by the allocation factors for each customer class.

## G. RATE DESIGN ANALYSIS

**Overview** – Once the revenue requirements for each customer class is determined by means of the cost-of-service analysis, how those revenue requirements are collected from each customer class is part of the rate design. The City has no compelling reason, and NBS does not see any rate-making rationale, to change the current rate design, which uses average winter water use along with the various other allocation factors noted above to recover costs from each customer class.

Currently, all customers are charged a monthly “base rate” that covers customer service related costs. Residential customer classes are also charged a larger monthly fixed charge covering basic flow-related costs (i.e., they do not include treatment related costs for BOD and TSS strengths). Volumetric rates are also charged on the basis of the estimated average winter water use. This volumetric rate is the same for all residential customers, and was implemented for the purpose of improving equity between customers with differing levels of effluent generation as estimated using average winter water use.

Commercial customers are charged the same monthly customer service “base rate” as residential customers, but the remainder of their charges are collected entirely from volumetric rates that reflect the effluent strength of typical customers in each commercial class. It is assumed in this analysis that the City originally adopted this approach to avoid difficulties related to how charges are assigned to commercial customers of vastly different costs-of-service. For example, restaurants range from strictly takeout services to large operations with seating for 100 customers. Retail and office accounts also have significant differences between the smallest and largest customers. For all commercial customers, average winter water use is a reasonable approximation of the impacts on the City’s sewer collection and treatment system.

**Rate Alternatives Evaluated** – As previously noted, a rate study offers the opportunity to consider both the cost of service and the overall fairness and equity of the rate design. As a part of this process, the City wanted to consider alternatives that may offer improved equity in addition to verifying the cost basis of the rates.

The City’s sewer system costs are largely fixed; that is the cost of the infrastructure (collection and treatment facilities) is extremely capital intensive, and the variable operation costs such as energy to pump effluent through the system and chemicals necessary to treat wastewater effluent, are relatively small. Historically, sewer rates were typically based on 100 percent fixed charges; this was due in large part to the lack of water meters, and hence no means to measure any service levels provided to customers. A 100% fixed charge also provided a predictable and reliable source of revenue because changes in water use (and levels of effluent generation) do not effect revenue. The disadvantage of a 100 percent fixed charge is it cannot reflect cost differences for various customers. For example, a single-person household would typically generate far less effluent than another household of eight people. A rate design that includes a volume-based rate is capable of charging the smaller household less and the larger household more.

A key issue in this discussion of rate design is “how much revenue should be recovered from the volumetric rates vs. the fixed rates?” Currently, residential rates recover approximately 45 percent of the rate revenue from fixed charges and 55 percent from volumetric rates. Commercial rates essentially recover all rate revenue from volumetric rates (except for the monthly base rate).

The rate alternatives range from the current rate design to incrementally higher percentages of fixed charges, of which the highest (#3) would be closest to the actual cost of service:

- Rate Alternative #1 – 35 percent Fixed Charges/65 percent Volumetric Rates (approximates the current rate design if total annual revenues for both residential and commercial customers are used)
- Rate Alternative #2 – 45 percent Fixed Charges/55 percent Volumetric Rates (reflects current residential rates)
- Rate Alternative #3 – 50 percent Fixed Charges/50 percent Volumetric Rates (closer to actual costs)

**Figure 12** summarizes the fixed and variable charges resulting from this analysis. As shown in this figure, the monthly base rate, representing customer costs per account, was held the same in each case, while residential monthly fixed charges were smallest in Alternative #1 and largest in Alternative #3. Commercial volumetric rates, as well as the monthly base rate, are the same in each alternative, since it is 100 percent volumetric in each case (excluding the base rate).

**Figure 12. Summary of Rate Design Alternatives**

Sewer Rate Schedule	Current Rates	Rate Alt. #1 (35%F/65%V)	Rate Alt. #2 (45%F/55%V)	Rate Alt. #3 (50%F/50%V)
	FY 2017/18	FY 2017/18	FY 2017/18	FY 2017/18
<b>Monthly Base Service Charge (All Customer Classes)</b>				
Monthly Base Rate (cost per account)	\$2.82	\$3.94	\$3.94	\$3.94
<b>Monthly Fixed Service Charge (Residential Only, \$/unit)</b>				
Single Family	\$19.47	\$14.20	\$18.26	\$20.29
Condo	\$14.82	\$9.69	\$12.46	\$13.85
Duplex	\$14.82	\$11.06	\$14.22	\$15.80
Triplex	\$16.97	\$11.69	\$15.02	\$16.69
Quadplex	\$16.82	\$11.92	\$15.32	\$17.02
5+ Units	\$11.30	\$10.02	\$12.88	\$14.31
Mobile Home Park	\$11.30	\$10.00	\$12.85	\$14.28
<b>Volumetric Charge - Based on Winter Water Use (\$/ccf)</b>				
Residential				
Single Family	\$3.02	\$3.70	\$3.13	\$2.85
Condo	\$3.02	\$3.70	\$3.13	\$2.85
Duplex	\$3.02	\$3.70	\$3.13	\$2.85
Triplex	\$3.02	\$3.70	\$3.13	\$2.85
Quadplex	\$3.02	\$3.70	\$3.13	\$2.85
5+ Units	\$3.02	\$3.70	\$3.13	\$2.85
Mobile Home Park	\$3.02	\$3.70	\$3.13	\$2.85
Commercial (100% Volumetric Based on Winter Water Use)				
Office/Retail	\$5.34	\$4.53	\$4.53	\$4.53
Laundry	\$5.41	\$4.69	\$4.69	\$4.69
All Other	\$5.34	\$4.69	\$4.69	\$4.69
Conv. Hospital	\$5.58	\$4.96	\$4.96	\$4.96
Auto/Service Station	\$5.69	\$5.33	\$5.33	\$5.33
Restaurants	\$7.62	\$8.12	\$8.12	\$8.12
Industrial	\$5.72	\$6.74	\$6.74	\$6.74
City Accounts	\$5.34	\$4.53	\$4.53	\$4.53

After considering these three alternatives, NBS and City staff concluded that Rate Alternative #2 (45 percent fixed/55 percent volumetric) should be the recommended option. Here are some observations about Rate Alternative #2:

- Alternative #2 is the most consistent with the City’s current rates (and we see no compelling reason to change them);
- The recommended ratio balances the need for revenue stability with the ability for customers to have significant control over their sewer charge (less water use will result in a lower charge).
- It maintains an incentive for water conservation which benefits both the sewer and water utilities.
- It has the least impact on residential customers, including those with the lowest winter water use to those with the highest use:
  - Alternative #1, while producing lower monthly bills for low water users, also results in the highest bills for those using more than the average water use
  - Alternative #3 results in the highest monthly bills for low water users but also the lowest for those using more than the average water use.

These results are illustrated in the bill comparison for single-family residential customers in **Figure 13**. Similar results are shown for the Commercial-Office/Retail customer class (**Figure 14**) and the Commercial Restaurant customer class (**Figure 15**).



Figure 13. Bill Comparison for the Single-Family Customer Class

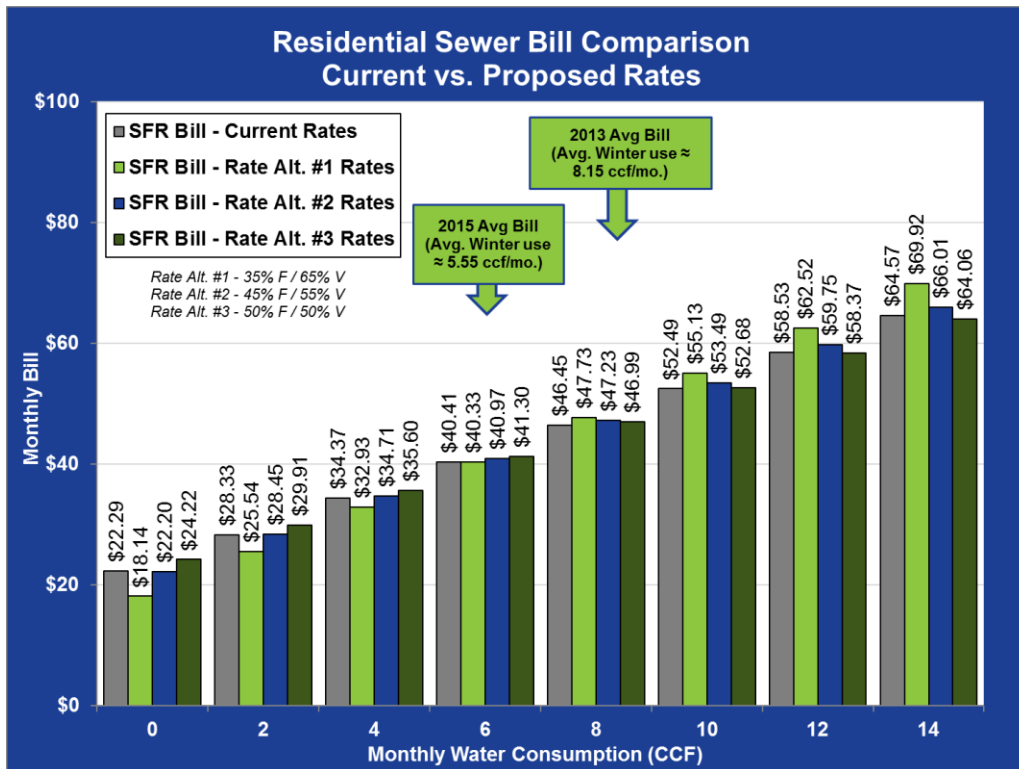


Figure 14. Bill Comparison for the Commercial (Office/Retail) Customer Class

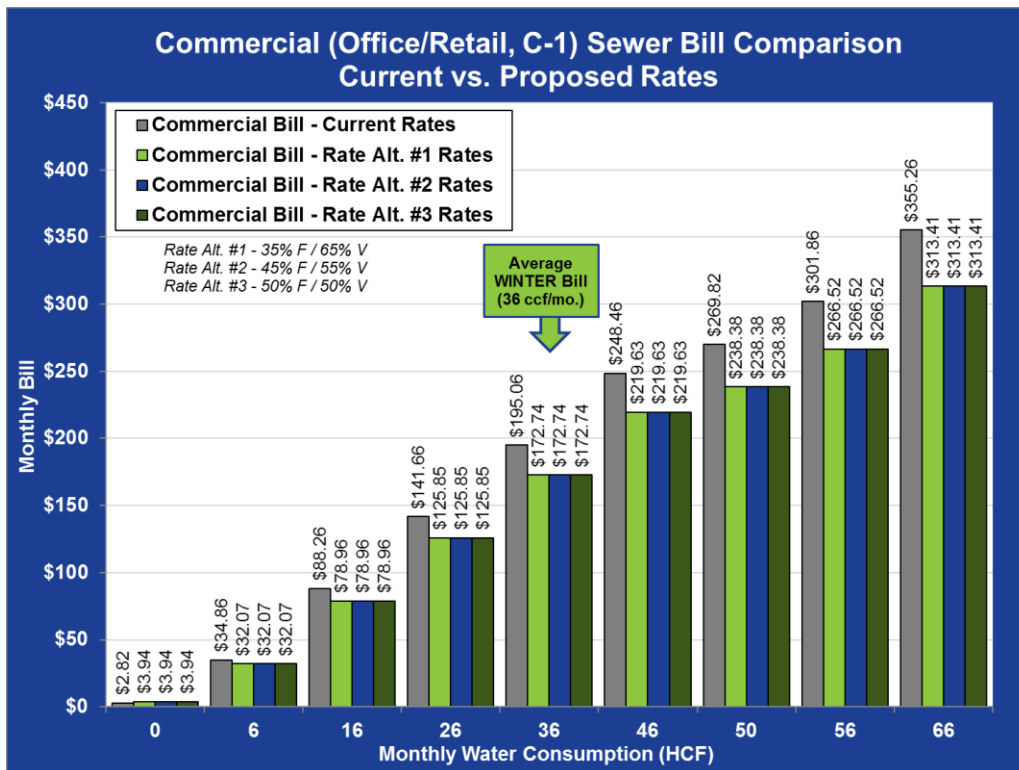
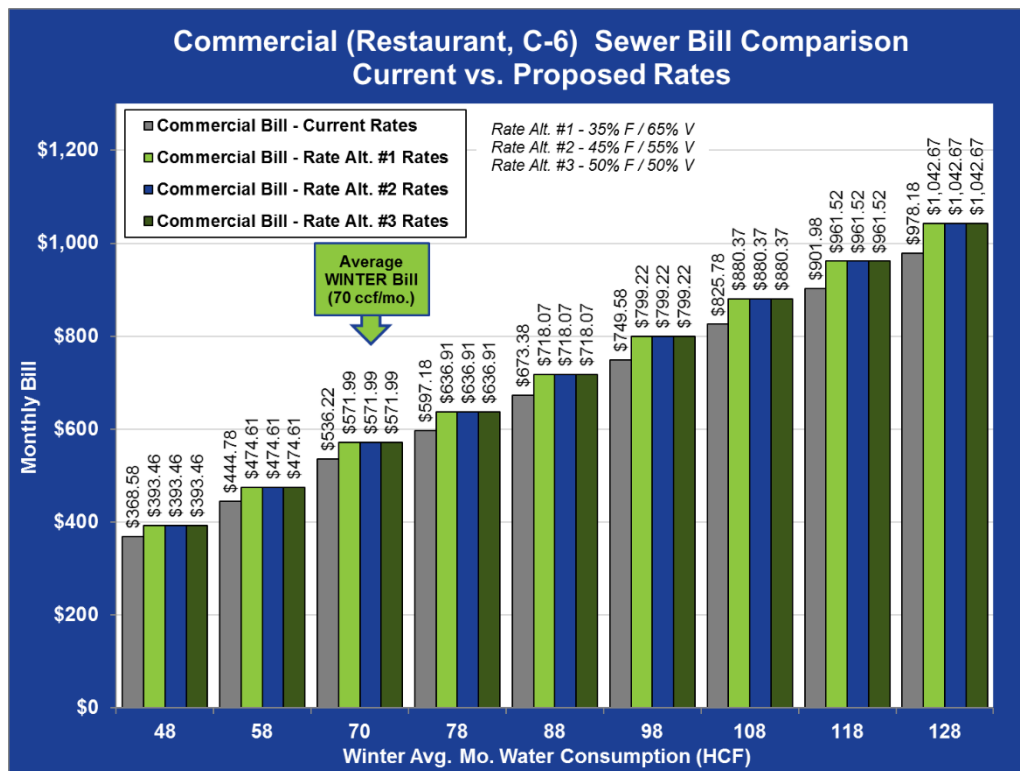


Figure 15. Bill Comparison for the Commercial (Restaurant) Customer Class



## H. CURRENT VS. PROPOSED SEWER RATES

As previously mentioned, the City has also chosen to maintain the existing rate structure while evaluating the variations of fixed vs. variable charges shown above in Figure 13, Figure 14, and Figure 15. The recommended rate design will continue with the current rate structure. These will be adopted for the planned five-year rate period as follows:

- Residential Sewer Rates** – Single family residential, condominium, townhouse and duplex, triplex, quadplex, apartments and mobile home park customers will be billed monthly based on average winter water usage (per ccf), a monthly customer-related base rate, and a monthly fixed charge per dwelling unit. Non-single-family customers have fixed monthly charges based upon housing type (all are less than the single-family charge). A monthly cap applies to volumetric charges; for example, single family residential customers will not be charged for more than 24 units of average monthly water use.
- Non-Residential Sewer Rates** – Commercial and Industrial customers are billed monthly based on average winter water usage (per ccf) and a monthly customer-related base rate. No fixed monthly charges apply to commercial and industrial customers; however, their volumetric rates are higher to offset the absence of this charge, and their volumetric rates vary based upon type of use.

Sometimes there is a concern about irrigation for commercial, industrial and multi-family customers that have a water-consumption component to their sewer bills; these customers can, if they so choose, install separate irrigation meters and, therefore, remove irrigation water use from the calculation of their sewer charges.

Figure 16 shows current and proposed sewer rates (i.e., Rate Design Alternative #2) for FY 2017/18 through FY 2021/22. Although the \$/EDU “rate” is the same for all customers, differences in charges are the result of how EDU’s are calculated, and the charges differ based on the number of EDU’s.

**Figure 16. Current vs. Recommended Sewer Rates (Alternative #2)**

Sewer Rate Schedule	Monthly Cap (ccf)	Current Rates	Recommended Sewer Rates				
<i>Projected Increase in Rate Revenue per Financial Plan:</i>		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
<b>Monthly Base Service Charge (All Customer Classes)</b>							
Monthly Base Rate (cost per account)		\$2.82	\$3.94	\$3.94	\$3.94	\$3.94	\$3.94
<b>Monthly Fixed Service Charge (Residential Only, \$/unit)</b>							
Single Family		\$19.47	\$18.26	\$18.26	\$18.26	\$18.26	\$18.26
Condo		\$14.82	\$12.46	\$12.46	\$12.46	\$12.46	\$12.46
Duplex		\$14.82	\$14.22	\$14.22	\$14.22	\$14.22	\$14.22
Triplex		\$16.97	\$15.02	\$15.02	\$15.02	\$15.02	\$15.02
Quadplex		\$16.82	\$15.32	\$15.32	\$15.32	\$15.32	\$15.32
5+ Units		\$11.30	\$12.88	\$12.88	\$12.88	\$12.88	\$12.88
Mobile Home Park		\$11.30	\$12.85	\$12.85	\$12.85	\$12.85	\$12.85
<b>Volumetric Charge (\$/ccf) - Based on Winter Water Use</b>							
<b>Residential</b>							
Single Family	24	\$3.02	\$3.13	\$3.13	\$3.13	\$3.13	\$3.13
Condo	19	\$3.02	\$3.13	\$3.13	\$3.13	\$3.13	\$3.13
Duplex	36	\$3.02	\$3.13	\$3.13	\$3.13	\$3.13	\$3.13
Triplex	56	\$3.02	\$3.13	\$3.13	\$3.13	\$3.13	\$3.13
Quadplex	76	\$3.02	\$3.13	\$3.13	\$3.13	\$3.13	\$3.13
5+ Units	19 ccf/unit	\$3.02	\$3.13	\$3.13	\$3.13	\$3.13	\$3.13
Mobile Home Park	19 ccf/unit	\$3.02	\$3.13	\$3.13	\$3.13	\$3.13	\$3.13
<b>Commercial (100% Volumetric Based on Winter Water Use)</b>							
Office/Retail	--	\$5.34	\$4.53	\$4.53	\$4.53	\$4.53	\$4.53
Laundry	--	\$5.41	\$4.69	\$4.69	\$4.69	\$4.69	\$4.69
All Other	--	\$5.34	\$4.69	\$4.69	\$4.69	\$4.69	\$4.69
Conv. Hospital	--	\$5.58	\$4.96	\$4.96	\$4.96	\$4.96	\$4.96
Auto/Service Station	--	\$5.69	\$5.33	\$5.33	\$5.33	\$5.33	\$5.33
Restaurants	--	\$7.62	\$8.12	\$8.12	\$8.12	\$8.12	\$8.12
Industrial	--	\$5.72	\$6.74	\$6.74	\$6.74	\$6.74	\$6.74
City Accounts	--	\$5.34	\$4.53	\$4.53	\$4.53	\$4.53	\$4.53

Even though the billing structure will remain exactly the same with no (or zero percent) annual rate increases, most customers will see some type of change in their monthly bill, as previously shown in Figure 13, Figure 14, and Figure 15. When evaluating their new sewer bills, customers are reminded that, although volumetric rates maybe be higher in their case, overall customers are using less water and their lower average winter water use will help minimize any impact of the new rates.

## SECTION 3. RECOMMENDATIONS AND NEXT STEPS

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### A. CONSULTANT RECOMMENDATIONS

NBS recommends the City take the following actions for the sewer rates:

- **Approve and Accept this Study Report:** NBS recommends the City Council formally approve and accept this report and its recommendations. This will provide documentation of the rate study analyses and the basis for analyzing potential changes to future rates.
- **Complete a Review by a Qualified Attorney:** This rate study outlines proposed new rates. Prior to adoption, these rates should be reviewed by legal counsel with respect to compliance with Prop 218 and related State laws, as well as developing acceptable language for new resolutions to implement these rates.
- **Implement Recommended Rates:** Retaining the current rate design maintains an approach that is well-accepted in the community and is consistent with how many other California communities are recovering costs from sewer customers. Unless there is a successful challenge as a result of the Prop 218 protest balloting, the City Council should implement the rates recommended and shown in Figure 16, which will apply to the next five years.

### B. NEXT STEPS

**Annually Review Rates and Revenue** – Any time an Agency adopts new utility rates, those new rates should be closely monitored over the next several years to ensure the revenue generated is sufficient to meet the annual revenue requirements. Changing economic and drought-related water consumption patterns underscore the need for this review, as well as potential and unseen changing revenue requirements, particularly those related to environmental regulations that can significantly affect capital improvements and repair and replacement costs. This review is conducted by the City's Utility Rate Advisory Committee.

*Note: The attached Technical Appendices provide more detailed information on the analysis of the revenue requirements, cost of service and rate design analyses that have been summarized in this report.*

### C. PRINCIPAL ASSUMPTIONS AND CONSIDERATIONS

In preparing this report and the recommendations included herein, NBS has relied on a number of principal assumptions and considerations with regard to financial matters, including the City's wastewater utility budget, the number of customer accounts, water consumption records, and other conditions and events that may occur in the future. This information and these assumptions were provided by sources we believe to be reliable, although NBS has not independently verified this data.

While we believe NBS' use of such information and assumptions is reasonable for the purpose of this report and its recommendations, some assumptions will invariably not materialize as stated herein or may vary significantly due to unanticipated events and circumstances. Therefore, the actual results can be expected to vary from those projected to the extent that actual future conditions differ from those assumed by us or provided to us by others.

## APPENDIX A – ABBREVIATIONS AND ACRONYMS<sup>16</sup>

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AAF	Average Annual Flow
AF	Acre Foot, equal to 435.6 HCF/CCF or 325,851 gallons
Alt.	Alternative
Avg.	Average
AWWA	American Water Works Association
BMP	Best Management Practice
BOD	Biochemical Oxygen Demand
CA	Customer
CAP	Capacity
CCF	Hundred Cubic Feet (same as HCF); equal to 748 gallons
CCI	Construction Cost Index
COD	Chemical Oxygen Demand
COM	Commodity
Comm.	Commercial
COS	Cost of Service
COSA	Cost of Service Analysis
CPI	Consumer Price Index
CIP	Capital Improvement Program
DU	Dwelling Unit
Excl.	Exclude
ENR	Engineering News Record
EDU	Equivalent Dwelling Unit
Exp.	Expense
FP	Fire Protection
FY	Fiscal Year (e.g., July 1st to June 30th)
FY 2016/17	July 1, 2016 through June 30, 2017
GPD	Gallons per Day
GPM	Gallons per Minute
HCF	Hundred Cubic Feet; equal to 748 gallons or 1 CCF
Ind.	Industrial
Irr.	Irrigation
LAIF	Local Agency Investment Fund
Lbs.	Pounds
MFR	Multi-Family Residential
MGD	Million Gallons per Day
MG/L	Milligrams per Liter
Mo.	Month
Muni.	Municipal
NH3	Ammonia
NPV	Net Present Value
N/A	Not Available or Not Applicable
O&M	Operational & Maintenance Expenses
Prop 13	Proposition 13 (1978) – Article XIII A of the California Constitution which limits taxes on real property to 1% of the full cash value of such property.
Prop 218	Proposition 218 (1996) – State Constitutional amendment expanded restrictions of local government revenue collections.
Req't	Requirement
Res.	Residential
Rev.	Revenue
RTS	Readiness-to-Serve
R&R	Rehabilitation & Replacement
SFR	Single Family Residential
SRF Loan	State Revolving Fund Loan
SWRCB	State Water Resources Control Council
TSS / SS	Total Suspended Solids
V. / Vs. /vs.	Versus
WWTP	Waste Water Treatment Plant

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<sup>16</sup> This appendix identifies abbreviations and acronyms that may be used in this report. This appendix has not been viewed, arranged, or edited by an attorney, nor should it be relied on as legal advice. The intent of this appendix is to support the recognition and analysis of this report. Any questions regarding clarification of this document should be directed to staff or an attorney specializing in this particular subject matter.

## APPENDIX B – SEWER RATE ANALYSIS

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*Appendix B is included under separate cover.*