CITY OF VISTA

Sewer Rate Study

Report / Aug 26, 2017

CITY OF VISTA
CALIFORNIA

RAFTELIS
FINANCIAL CONSULTANTS, INC.

RAFTELIS
FINANCIAL CONSULTANTS, INC.

445 S. Figueroa Street
Suite 2270
Los Angeles, 90071

Phone 213.262.9304
Fax 626.583.1411

www.raftelis.com

Aug 26, 2017

Mr. Elmer Alex
Principal Engineer
200 Civic Center Drive
Vista, CA 92084

Subject: Sewer Rate Study Report

Dear Mr. Alex,

Raftelis Financial Consultants, Inc. (RFC) is pleased to provide this Sewer Rate Study Report (Report) for the City of Vista (City) which aims to address the financial challenges the City is currently facing, and to establish sewer rates that are equitable and in compliance with Proposition 218.

The objectives of the study include the following:

- Develop a financial plan and propose revenue adjustments to the sewer utility to achieve financial sufficiency by meeting operation and maintenance (O&M) costs; ensuring sufficient funding of the City's financial reserves; and funding of capital projects
- Conduct a cost-of-service analysis for the sewer utility
- Develop fair and equitable sewer rates, compliant with Proposition 218, that adequately recover costs and promote revenue stability
- Develop five-year rate projections and customer impact estimates
- Revise the existing extra usage charge and apply industry standards to determine its level

The Report summarizes the key findings and recommendations related to the development of financial plan for the wastewater utility and the design of sewer rates.

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

Sincerely,
RAFTELIS FINANCIAL CONSULTANTS, INC.

Sanjay Gaur
Vice President

Gabriella Stoyanova-Rozenova
Consultant

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

ABBREVIATIONS

AF	Acre foot / Acre feet, 1 AF = 435.6 HCF
AWWA	American Water Works Association
BOD	Biochemical Oxygen Demand
CIP	Capital Improvement Projects
City	City of Vista
COS	Cost of Service
CPI	Consumer Price Index/Indices
District	Buena Sanitation District
EDU	Equivalent Dwelling Unit
ENR CCI	Engineering News Records Construction Cost Indices
EWA	Encina Wastewater Authority
FY	Fiscal Year (July 1 – June 30)
JPA	Joint Powers Authority
GPCD	Gallons per capita per day
HCF	Hundred cubic feet or 100 cubic feet, 1 HCF = 748 gallons
M1 Manual	"Principles of Water Rates, Fees, and Charges: Manual of Water Supply Practices M1" published by AWWA
MFR	Multi-Family Residential
MGD	Million gallon per day
MGY	Million gallon per year
O&M	Operations and Maintenance
PAYGO	Pay-As-You-Go
R&R	Refurbishment and Replacement
RFC	Raftelis Financial Consultants, Inc.
RTS	Return to sewer
SFR	Single Family Residential
SRF	State Revolving Fund
Study	Wastewater rate study
TSS or SS	Total Suspended Solids
Vista	Vista Sewer System
WEF	Wastewater Environment Federation

1. EXECUTIVE SUMMARY

In 2016, Raftelis Financial Consultants, Inc. ("RFC") was engaged by the City of Vista ("City") to complete a financial plan and cost of service study (Study) for its sanitary sewer system. The Study covers the period FY2017-FY2025 and its primary objective is to develop equitable rates compliant with Proposition 218.

The utility owns and manages the sewer collection system for the City of Vista, CA (City). Wastewater is collected through a network comprising 215 miles of sewer pipes, serving approximately 16,000 parcels, and conveys an annual average flow of 5.3 million gallons per day. The City owns one small-capacity pump station and shares the ownership and operation of two other large-capacity pump stations and associated pipelines with the City of Carlsbad. The wastewater is delivered to and treated by the Encina Wastewater Authority Water Pollution Control Facility, and discharged into the ocean. Wastewater treatment costs to the City are based both on the City's ownership in EWA and the usage in terms of annual flow to the treatment facility.

The City also provides water quality protection services to protect life, property, receiving waters and the environment from loss or damage by discharges from within the City's jurisdiction. These services are also provided to Buena sewer customers who reside in the City limits and the City of Vista is compensated annually.

The last cost of service analysis for the City was completed in 2007 and the proposed rates were adopted in 2008. While the sewer utility's current revenues are sufficient to cover operating costs, the City has significant capital investment needs over the study period. This need to sufficiently fund the capital investments constitutes the main driver of the revenue requirement. The present rate study is based on standard industry principles and ensures that the proposed rates are consistent with the cost of service.

The main objectives of the Study include the following:

1. Develop financial plans and propose revenue adjustments to the sewer utility to achieve financial sufficiency by meeting operation and maintenance (O&M) costs; ensuring sufficient funding of the City's financial reserves; and funding of capital projects
2. Conduct a cost-of-service analysis for the sewer utility
3. Develop fair and equitable sewer rates, compliant with Proposition 218, that adequately recover costs and promote revenue stability
4. Develop five-year rate projections and customer impact estimates
5. Revise the existing extra usage charge and apply industry standards to determine its level

Wastewater rates were prepared based on the principles established by the Water Environment Federation's (WEF) Financing and Charges for Wastewater Systems (Manual of Practice No. 27)

which establishes commonly accepted professional standards for wastewater cost of service (COS) studies.

1.1 PROPOSED RESERVE POLICY

A reserve policy is a written document that establishes reserve goals/targets. It provides guidelines for sound financial management. Its overall long-term goals are maintaining financial solvency and mitigating financial risks associated with revenue instability, volatile capital costs and emergencies. Adopting and adhering to a sustainable reserve policy enhances financial management transparency and helps achieve and maintain a favorable credit rating for future debt issues. The appropriate amount of reserves and reserve types are determined by a variety of factors, such as the size of the operating budget, the amount of debt, the type of rate structure, frequency of customer billing, and risk of natural disaster. Typically, reserves fall into the following categories: operations & maintenance (O&M), rate stabilization, debt service and emergency reserve.

The proposed Vista Sewer Fund target reserves are summarized in the table below.

Table 1-1 Vista Sewer Fund Target Reserves

	Level	Notes	FY 2018
Operating Cash Flow	50%	of O&M	$5,291,578
Treatment and Discharge Rate Stabilization	15%	of 5yr annual average Encina Cost	$555,951
Debt Reserve	100%	of annual debt service	$537,706
Emergency Reserve Target	$2,900,000	No annual increase	$2,900,000
TOTAL			**$9,285,236**

1.2 PROPOSED REVENUE ADJUSTMENT

The City uses four funds to identify and allocate the cost of different sewer system activities. For the cost of service analysis, the Operating and Capital funds are combined into a single fund referred to as the Vista Sewer Fund. Separate financial plans are developed for Capital Expansion and Capital Facility Funds.

To ensure that the Vista Sewer Fund will generate adequate revenues to cover operating expenses and capital expenditures, RFC proposes the revenue adjustment for FY 2019 onward to be equal to 2%.

Table 1-2 Proposed Revenue Adjustments

Effective date	Adopted	Proposed
Jul-16	1.52%	n/a
Jul-17	1.96%	n/a
Jul-18	0%	2%
Jul-19	0%	2%
Jul-20	0%	2%
Jul-21	0%	2%
Jul-22	0%	2%
Jul-23	0%	2%
Jul-24	0%	2%

The financial plan based on the proposed revenue adjustments successfully meets the City's financial needs while minimizing the rate impact on its customers. The net cash flow remains negative in some years due to significant CIP expenditures, but the reserves remain above the total target level throughout the projection period.

1.3 PROPOSED WASTEWATER RATES

The tale below shows projections of the proposed rates for FY2019-FY2023. The rates are based on cost of service analysis for FY 2018 and escalated annually by the proposed revenue adjustments above.

Table 1-3 Proposed Five-Year Sewer Rates

	Current Rates FY 2018	Proposed Rates FY 2019	Proposed Rates FY 2020	Proposed Rates FY 2021	Proposed Rates FY 2022	Proposed Rates FY 2023
Proposed Rev. Adj't		**2%**	**2%**	**2%**	**2%**	**2%**
Commercial Fixed Charge (per EDU owned)	$159.00	$165.00	$168.00	$171.00	$174.00	$177.00
Commercial Flow Rate by Strength Class (per hcf)						
Commercial - Low	$5.26	$6.04	$6.17	$6.30	$6.43	$6.56
Commercial - Med	$6.02	$7.09	$7.24	$7.39	$7.54	$7.70
Commercial - High	$7.53	$10.14	$10.35	$10.56	$10.78	$11.00
Single Family (per unit)	$674.00	$654.00	$667.00	$680.00	$694.00	$708.00
Multi Family (per unit)	$471.00	$457.00	$466.00	$475.00	$485.00	$495.00
Surcharge for Extra Strength						
BOD Rate per lb	$0.91	$0.81	$0.83	$0.85	$0.87	$0.89
TSS Rate per lb	$0.42	$0.57	$0.59	$0.61	$0.63	$0.65

Residential customers are expected to see a 3 percent reduction in their wastewater bills in FY2019. The commercial customers' bills will increase but the magnitude of the increase will depend on the purchased capacity (in terms of EDU), the flow and the strength of the discharged wastewater.

Table 1-4 COS Based Rates

	Current Rates FY 2018	Proposed Rates FY 2019	% change
Commercial Fixed Charge (per EDU owned)	$159.00	**$165.00**	3.8%
Commercial Flow Rate by Strength Class (per hcf)			
Commercial - Low	$5.26	**$6.04**	14.8%
Commercial - Med	$6.02	**$7.09**	17.8%
Commercial - High	$7.53	**$10.14**	34.7%
Single Family (per unit)	$674.00	**$654.00**	-3.0%
Multi Family (per unit)	$471.00	**$457.00**	-3.0%
Surcharge for Extra Strength			
BOD Rate per lb	$0.91	**$0.81**	-11.0%
TSS Rate per lb	$0.42	**$0.57**	35.7%

Commercial customers who discharge wastewater with excess strength concentrations must pay an extra strength surcharge. Currently, extra strength is defined as strength above 500 milligrams per liter of BOD or 500 milligrams per liter of total suspended solids. The surcharges are levied per pound of biochemical oxygen demand and suspended solids. RFC proposes the extra strength surcharges per pound of BOD and TSS in FY 2019 to be equal to $0.81 and $0.57, respectively. In addition, RFC recommends to the City staff to update the extra strength surcharge threshold for BOD from 500 mg/L to 1000 mg/L and for TSS from 500 mg/L to 600 mg/L in line with the cost of service evaluations and the average wastewater strength of high strength commercial customers.

Currently, the commercial customers are charged the commercial fixed rate based on owned EDU capacity regardless of excess wastewater capacity used (in terms of EDUs). After discussion with City's staff, RFC proposed that the fixed charge be calculated on the owned and excess wastewater capacity used (in terms of EDUs). In addition, the commercial customers whose discharge is above the owned capacity will be charged a capacity rental charge (in EDU) for the excess capacity used

1.4 PROPOSED CAPACITY RENTAL CHARGE

Staff requested RFC to redefine the existing excess usage charge for commercial customers.
RFC determined that customers who exceed their purchased EDU capacity are essentially "renting" additional capacity; hence, that charge should be modeled after the framework that private water/wastewater utilities follow for return on investment, known as "utility basis approach".

RFC proposes that the Excess Usage Charge be renamed the Capacity Rental Charge. The new charge would be applied to wastewater capacity usage above the owned capacity in terms of equivalent dwelling units (EDU). The charge per EDU would be equal to the calculated annual rate of return per EDU. This is estimated to be $341 in FY2019 and after discussion with the City's staff, it was decided to be adjusted by 2 percent annually to compensate for inflation. The capacity rental charge would be applied in addition to the fixed and volumetric charges to those customers who exceed their owned capacity.

2. INTRODUCTION

In 2016, Raftelis Financial Consultants, Inc. was engaged by the City of Vista to complete a financial plan and cost of service study for its sanitary sewer system. The Study covers the period FY2017-FY2025 and its primary objective is to develop equitable rates compliant with Proposition 218.

2.1 VISTA SEWER SYSTEM

The utility owns and manages the sewer collection system for the City of Vista, CA. Wastewater is collected through a network comprised of 215 miles of sewer pipes, serving approximately 16,000 parcels, and conveying an annual average flow of 5.3 million gallons per day. The City owns one small capacity pump station, the Raceway Pump Station, and shares the ownership and operation of two large capacity pump stations and associated pipelines with the City of Carlsbad. The wastewater is delivered to and treated by the Encina Wastewater Authority, then discharged into the ocean.

Encina Wastewater Authority is a wastewater treatment agency, established through a Joint Powers Authority between six agencies. The City's ownership share of Encina includes the above-mentioned pump stations, 25.2 percent of the treatment plant (Unit I) and 24.63 percent of the ocean outflow (Unit J). The joint ownership facilitates cost sharing and enables economies of scale that cannot be achieved independently. Per the cost sharing arrangement, operational expenses of the treatment plant are proportional to the actual effluent from the member agencies, while expenses that are not related to the amount of wastewater are allocated based on the ownership shares.

The City also provides water quality protection services to protect life, property, receiving waters and the environment from loss or damage by discharges from within the City's jurisdiction. These services are also provided to Buena customers who reside in the City limits. The City of Vista is compensated annually for this service to Buena through a refund representing approximately 17 percent of the total water quality protection expenditures.

The last cost of service analysis for the City was completed in 2007 and the proposed rates were adopted in 2008. In 2013, RFC carried out an analysis of the sewer system and provided recommendations for rate updates. While the sewer utility's current revenues are sufficient to cover operating costs, the City has significant capital investment needs over the study period. This need to sufficiently fund the capital investments constitutes the main driver of the revenue requirement. The present rate study is based on industry standard principles and ensures that the proposed rates are consistent with the cost of service.

2.2 OBJECTIVES OF THE STUDY

The main objectives of the Study include the following:

1. Develop financial plans and propose revenue adjustments to the sewer utility to achieve financial sufficiency by meeting operation and maintenance (O&M) costs; ensuring sufficient funding of the City's financial reserves; and funding of capital projects
2. Conduct a cost-of-service analysis for the sewer utility
3. Develop fair and equitable sewer rates, compliant with Proposition 218, that adequately recover costs and promote revenue stability
4. Develop five-year rate projections and customer impact estimates
5. Revise the existing extra usage charge and apply industry standards to determine its level

2.3 PROCESS

Wastewater rates were prepared based on the principles established by the Water Environment Federation's (WEF) Financing and Charges for Wastewater Systems (Manual of Practice No. 27) which establishes commonly accepted professional standards for wastewater cost of service studies. The WEF Manual's general principles and their application in the context of the Report are described below.

The first step in the rate setting process is determining the adequate level of funding for the utility, referred to as "revenue requirement" analysis. This analysis considers the utility's short-term and long-term service requirements and objectives over a given planning horizon, including capital facilities and system operations and maintenance, to determine the adequacy of the existing rates in terms of recovering the utility's costs. Various factors can affect these calculations, including the number of customers served, water-use trends, nonrecurring sales, conservation, inflation, interest rates, capital finance needs, changes in tax laws (to the extent applicable), and other changes in operating and economic conditions.

After determining the utility's revenue requirement, the next step is a cost of service (COS) analysis. Using approved expense and revenue budgets and capital improvement plans, the utility's costs and assets are classified by major operating functions such as collection, treatment, etc. (cost functionalization).

The next step is to allocate the "functionalized costs" to cost causation components. For wastewater, these components include wastewater flow and strength, and general administrative costs. Wastewater strength is defined as the Biochemical Oxygen Demand (BOD) and Total Suspended Solid (TSS) loads. These cost causation components are then allocated among different customer classes (e.g., single-family residential, multi-family residential and commercial) by determining the loadings of flow and strength for each class.

Once the analysis is completed, rates are designed such that to cover the cost of service for each customer class.

2.4 LEGAL REQUIREMENTS

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

Proposition 218, reflected in the California Constitution as Article XIII D, was enacted in 1996 to ensure that rates and fees are reasonable and proportional to the cost of providing service. The principal requirements for fairness of the fees, as they relate to public water service are as follows:

1. A property-related charge (such as water and wastewater rates) imposed by a public agency on a parcel shall not exceed the costs required to provide the property related service.
2. Revenues derived by the charge shall not be used for any purpose other than that for which the charge was imposed.
3. The amount of the charge imposed upon any parcel shall not exceed the proportional cost of service attributable to the parcel.
4. No charge may be imposed for a service unless that service is actually used or immediately available to the owner of property.
5. A written notice of the proposed charge shall be mailed to the record owner of each parcel at least 45 days prior to the public hearing, when the agency considers all written protests against the charge.

2.5 DISCLAIMERS

In performance of the services, it is understood that the City and/or others may supply RFC with certain information and/or data, and that RFC will rely on such information. The accuracy of such information is not within RFC's control and RFC shall not be liable for its accuracy, nor for its verification, except to the extent that such verification is expressly a part of RFC's scope of services.

RFC's opinions, estimates, projections, and forecasts of current and future costs, revenues, other levels of any sort, and events shall be made on the basis of available information and RFC's expertise and qualifications as a professional. RFC does not warrant or guarantee that its opinions, estimates, projections or forecasts of current and future levels and events will not vary from the City's estimates or forecasts or from actual outcomes. RFC identifies costs, allocates costs to customer classes and provides rate models. It does not establish rates, which is the legislative responsibility of City.

The numbers shown in the tables listed in this Report may contain decimal rounding errors, thus they may not add up to the precise numbers as shown.

3. GENERAL ASSUMPTIONS

The Study period includes FY 2017 through FY 2025, with the Fiscal Year beginning July 1 of the previous calendar year. Various types of assumptions and inputs were incorporated into the Study, based on discussions with and direction from the City staff. These include account and usage growth rates for the different customer classes, inflation factors and other relevant assumptions.

3.1 INFLATION FACTORS

The City's inflationary assumptions are presented in Table 3-1, below.

Table 3-1 Inflation Factors

	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
CPI	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
General	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Salaries& Benefits	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%	7.00%
ENR (YOY, March)[1]	2.09%	2.09%	2.09%	2.09%	2.09%	2.09%	2.09%	2.09%
Interest on reserves	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%
Encina Cost Change	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%
Utilities	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%
Capital	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%

3.2 WASTEWATER DISCHARGE PROJECTIONS

Projections of the amount of wastewater discharge are based on two key variables — the number of accounts and demand per account. City staff anticipates that there will be a minimal account growth of about 0.3% per year for residential customers over the Study period and projects no change in the commercial accounts.

The wastewater flow is expected to remain constant with the exception of the extra wastewater discharge (the discharge above the purchased capacity in terms of Equivalent Dwelling Units (EDU)) for commercial customers. The latter is likely to decline in FY 2017 and FY 2018 due to the specific lag of two years[2] in reporting of water consumption and the drought-related reduction in water consumption in FY 2015 and FY 2016, respectively. However, the decline in the overall inflow from Vista, as reported by EWA, was relatively small in FY 2016. FY 2015 saw a marginal increase[3] which implies that there was optimization of the wastewater flow within the limits of the purchased capacity. Table 3-2 shows the annual percent change in demand by customer class and in excess usage for the commercial class.

[1] ENR CCI 5-year annual average for March.
[2] The City assumes 100% Return to Sewer (RTS) and uses water consumption with a lag of two years to calculate wastewater discharge.
[3] Data for 2015 and 2016 wastewater discharge come from EWA CAFR 2016.

Table 3-2 Sewer Demand Projections Factors (annual percentage change)

	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
Number of EDUs									
Residential	0.00%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%
Commercial (Permit EDUs)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Excess Usage (EDUs)	-15.00%	-15.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Flow (hcf)									
Low	0.6%	-1.7%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Medium	0.6%	-1.7%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
High	0.6%	-1.7%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

The projections assume a constant combined wastewater flow from Vista and Buena throughout the study period.

3.3 ENDING BALANCES

The City uses four funds to identify and allocate the cost of different sewer system activities. The Operating Fund (Fund 501) includes the rate revenues as well as operation and management costs associated with sewer system operation. The capital fund (Fund 503) accounts for the capital investment expenditure and debt funding and service. It also receives transfers from the operating fund.

The Capital Expansion and Capital Facility Funds (Fund 502 and Fund 509, respectively) are used for revenues and expenses related to capacity expansion and development. For the cost of service analysis, the Operating and Capital Funds are combined into a single fund referred to as Vista Sewer Fund.

Table 3-3 Funds Structure

Fund	Primary Revenue Sources	Primary Expenditures
Vista Sewer Fund		
Operating Fund (Fund 501)	Sewer service charges	O&M expenses
Capital Replacement Fund (Fund 503)	Debt proceeds	CIP Funding, Debt service
Capital Expansion Fund (Fund 502)	Excess Usage Charge (from FY 2018)	CIP Funding
Capital Facility Fund (Fund 509)	Capacity Fees	CIP Funding

City staff provided the ending balances for the four funds as of June 30, 2016. According to the City's plans, the Capital Expansion Fund's end balance of $1,441,159 will be used to fund the capital project "Paseo Santa Fe Sewer Improvements" in FY 2018[4].

[4] See Appendix

Table 3-4 Ending Balances as of June 30, 2016

	VISTA
Operating Fund Reserves	
Operating Cash Flow	$5,407,639
Rate Stabilization	$761,660
Total Operating Fund Reserves	$6,169,299
Capital Fund Reserves	
Emergency Reserve	$2,900,000
Debt Reserve	$537,751
Other Available Capital	$18,476,669
Total Capital Fund Reserves	$21,914,420
Total Vista Sewer Fund End Balances	$28,083,719
Capital Expansion Fund End Balances	$1,441,159
Capital Facility Fund End Balances	$280,816

3.4 RESERVE POLICY

A reserve policy is a written document that establishes reserve goals/targets. It provides guidelines for sound financial management with an overall long-term goal of maintaining financial solvency and mitigating financial risks associated with revenue instability, volatile capital costs and emergencies. Adopting and adhering to a sustainable reserve policy helps to achieve and maintain a favorable credit rating for future debt issues.

The appropriate amount of reserves and reserve types are determined by a variety of factors, such as the size of the operating budget, the amount of debt, the type of rate structure, frequency of customer billing, and risk of natural disaster. Typically, reserves fall into the following categories: operations & maintenance (O&M), rate stabilization, debt service and emergency reserve. Reserves can offset unanticipated reductions in revenues, fluctuations in costs of providing services, and fiscal emergencies such as revenue shortfalls, asset failures, and natural disasters. Capital reserves set funds aside for replacement of capital assets as they age, as well as for new capital projects.

The proposed Vista Sewer Fund target reserves are summarized in Table 3-5 and described in detail below.

Table 3-5 Vista Sewer Fund Target Reserves

	Level	Notes	FY 2018
Operating Cash Flow	50%	of O&M	$5,291,578
Treatment and Discharge Rate Stabilization	15%	of 5yr annual average Encina Cost	$555,951
Debt reserve	100%	of annual debt service	$537,706
Emergency Reserve Target	$2,900,000	No annual increase	$2,900,000
TOTAL			**$9,285,236**

3.4.1 Operating Cash Flow Reserve

The purpose of an O&M reserve is to provide working capital to support the operation, maintenance, and administration of the sewer system. From a risk management perspective, the O&M reserve

supports the City's cash flow needs during normal operations and ensures that operations can continue should there be significant events that impact cash flows. As it is unlikely for a utility to perfectly predict the revenues and revenue requirements for each billing period, setting aside a reserve to hedge the risk of negative cash positions is a prudent financial planning decision. An important factor to consider when creating a cash flow reserve is the billing frequency. A utility that bills once a month would generally require less reserves than a utility that bills semi-annually[5].

RFC recommends that the City continues to calculate the O&M reserve as the equivalent of half of the annual operating budget to ensure adequate working capital for operating expenses. The annual bills are paid in two installments; thus, a six-month reserve is the minimum to provide sufficient working capital accounting for the timing of expenses and revenue collection. The projected O&M target reserve for FY 2018 is $5,291,578.

3.4.2 Treatment and Discharge Rate Stabilization Reserve

While it is not typical for wastewater treatment utilities to have substantial rate increases in a short period of time, factors such as an unexpected increase in short-term O&M expenses may result in a large rate correction. A treatment and discharge rate stabilization reserve could be set up to smooth rates through a gradual adjustment as opposed to abrupt and large rate changes. Based on directions from the City's staff, the main factor that could trigger a sizeable rate increase is a large increase in the operating cost of Encina Wastewater Authority.

The City's current rate stabilization reserve is set to 25 percent of the City's five-year average annual obligations to EWA. After discussion with the City's staff and since there were no significant unanticipated increases in treatment costs in the last five years, RFC recommends a reduction in the percentage from 25 to 15 percent. This results in a Rate Stabilization Reserve target of $555,951 in FY 2018.

3.4.3 Capital Emergency Reserve

The purpose of an emergency fund is to allow the utility to provide uninterrupted service in the event of a fiscal emergency, natural disaster, or facility failure. An emergency reserve mitigates the impact on operations by considering the high capital cost of the utilities and setting aside adequate funds to restart the system after an event or replace an essential facility.

Based on discussions with staff, the capital emergency reserve will remain fixed at $2.9M. This level was assessed to be sufficient to fund an emergency repair to a failure of the sewer collection system. The capital emergency reserve will not be adjusted by inflation in the following years.

[5] Vista sewer customers pay their annual bills in two installments.

3.4.4 Debt Reserve

The purpose of the Debt Service Reserve is to secure cash assets for full and timely payment of debt obligations in periods of reduced revenue. These reserves signal to creditors that the utility has a sound debt servicing capacity.

The Debt Service Reserve is set to be equal to 100 percent of the annual debt service for the current year. Its level in FY 2018 is projected to be $537,706.

3.5 DATA

The following data provided by the City's staff was used in the development of the Vista Sewer Fund financial plan and cost of service analysis:

1. Vista residential and commercial customers dataset for 2016
2. Adopted rates for FY 2017 and FY 2018
3. FY 2017 Budget (revenues as of May 2017) and FY 2018 proposed Budget (as of Apr 2017)
4. CIP as of March 2017
5. FY 2016 actual financial performance for the four funds
6. Encina Wastewater Authority billings for Vista Sewer System 2014-2016
7. Encina proposed budget for 2018
8. City Sewer Fixed Assets List by accusation cost
9. Vista Sewer debt payments schedules for SRF 8125, SRF 8158, SRF 8164 and SRF 8165
10. Funds 501, 502, 503 and 509 cash balances as of June 30, 2016

4. FINANCIAL PLAN

This section of the report provides a discussion of the projected revenues, O&M, capital expenditures, capital improvement financing plan and revenue adjustments required to ensure the financial sustainability of the Vista Sewer Fund.

4.1 OPERATING REVENUES

4.1.1Current Rates and Customer Classes

The effective rates for FY 2017 and FY 2018 were adopted in 2013[6]. Sewer charges are collected on an annual basis. They are generally placed on the property owner's San Diego County Property Tax Bill and paid in two installments each year. The estimated wastewater discharge volume is based on water consumption with a two-year lag and 100 percent return to sewer. There are two categories of sewer customers in Vista: residential and commercial.

Table 4-1 Current Rates

Customer Class	FY 2017	FY 2018
Residential		
SFR (per unit/EDU)	$661.00	$674.00
MFR (per unit)	$462.00	$471.00
Commercial		
per EDU	$156.00	$159.00
Per Excess Usage EDU	$441.30	$447.90
Flow Rate by Strength Class (per hcf)		
Low	$5.16	$5.26
Medium	$5.90	$6.02
High	$7.38	$7.53
Surcharge Extra Strength		
BOD Rate per lb	$0.89	$0.91
TSS Rate per lb	$0.41	$0.42

The residential customers are divided into two separate groups. The first combines single-family residences (SFR), townhomes, condos and duplex units. Their rate is based on the total EDU per dwelling unit.

The second residential group encompasses multi-family residencies (MFR). The expected sewer capacity needed per one multi-family dwelling unit is estimated to be 70 percent of 1 EDU. Therefore, the rate for a multi-family residence is 70 percent of the rate for a single family residence.

Commercial customers are divided into three groups based on the strength of their wastewater discharge. The strength is calculated as a combination of the biochemical oxygen demand (BOD) and

[6] Vista Ordinance 2013-4

suspended solids (TSS) content in the discharge. It is assigned to each commercial customer upon joining the system. In addition to the strength, each commercial customer buys sewer capacity (in terms of EDUs) which reflect the expected volume of discharge per year.

The rate for commercial customers has two components: a fixed charge and a volumetric rate. The fixed charge is based on the purchased EDU and the volumetric rate is-per hundred cubic feet of wastewater discharge.

If commercial customers discharge more than the purchased capacity, they are charged an excess usage charge for each additional tenth of an EDU [7]. The definition of the current excess usage charge is provided in the Municipal Code[8]. Since this charge represents rental income to Vista Sewer (the customers pay for renting more capacity), RFC recommends that its revenues be diverted to the Capital Expansion Fund[9]. This change would become effective in FY 2018 and it is incorporated in the revenue projection.

Table 4-2 Vista Sewer Demand

	FY 2016
Residential	
SFR EDUs	15,433
MFR Units	9,324
Commercial	
Permit EDUs	8,950
Excess Usage EDUs[10]	2,006
Flow by Strength Class(hcf) [11]	
Low	316,389 hcf
Medium	175,305 hcf
High	145,127 hcf

4.1.2 Projected Sewer Demand

The EDU capacity purchased by commercial customers is projected to remain at its FY 2016 level. The flow by strength class is also expected to remain relatively stable. The City expects a small increase in the number of residential EDUs, driven by new customers in the area. Projections also incorporate the two-year lag. The small annual fluctuations in FY 2017 and FY 2018 captures the actual total effluent change reported by Encina**.** A 15 percent reduction is expected in the number of excess usage EDUs in FY 2017 and FY 2018 due to the drought in 2015 and 2016.

The FY 2017 sewer demand is obtained by multiplying the FY 2016 actual number of EDUs (or flow volume) by the respective projection factor for FY 2017 (Table 3-2). Next, the projection for FY 2018

[7] The 2016 data reveals that while some of the customers have significant excess usage, others are considerably below their purchased capacity.
[8] Section 14.06.040
[9] For details see the section on Capacity Rental Charge in this Study.
[10] Provided by the City.
[11] Flow data is based on 2014 water consumption.

is based on the calculated volumes for FY 2017, multiplied by the projection factor for FY 2018 for each customer category. The sewer demand projection for the study period is shown in Table 4-3

Table 4-3 Projected Sewer Demand

	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
Residential									
SFR EDUs	15,433	15,478	15,524	15,570	15,616	15,662	15,708	15,754	15,800
MFR Units	9,324	9,351	9,379	9,407	9,434	9,462	9,490	9,518	9,546
Commercial									
Permit EDUs	8,950	8,950	8,950	8,950	8,950	8,950	8,950	8,950	8,950
Excess EDUs	1,705	1,449	1,449	1,449	1,449	1,449	1,449	1,449	1,449
Flow by Strength Class									
Low (hcf)	318,140	312,886	312,886	312,886	312,886	312,886	312,886	312,886	312,886
Medium (hcf)	176,275	173,364	173,364	173,364	173,364	173,364	173,364	173,364	173,364
High (hcf)	145,930	143,520	143,520	143,520	143,520	143,520	143,520	143,520	143,520

The revenue projection for 2018 is based on the adopted rates for FY 2018 (Table 4-1) multiplied by the projected residential and commercial EDUs and flows (Table 4-3).

Table 4-4 Rate Revenue Calculation

		Rates 2018 *Table 4-1*	Projected Sewer Demand 2018 *Table 4-3*	Revenues Projection 2018
	A	B	C	D=B*C
1	**Residential**			
2	SFR EDUs	$674.00	15,478	$10,432,479
3	MFR Units	$471.00	9,351	$4,404,539
4	**Total Residential**			**$14,837,017**
5	**Commercial**			
6	Permit EDUs	$159.00	8,950	$1,422,977
7	Excess EDUs	$447.90	1,449	*Diverted to Capital Expansion Fund*
8	Flow by Strength Class			
9	*Low (hcf)*	$5.26	312,886	$1,645,781
10	*Medium (hcf)*	$6.02	173,364	$1,043,653
11	*High (hcf)*	$7.53	143,520	$1,080,709
12	***Total Flow Strength*** *[9]+[10]+[11]*			**$3,770,143**
13	***Total Commercial*** *[6]+[12]*			**$5,193,120**
14	***Total revenue from rates***			**$20,030,137**

The revenue projection in the period FY 2019 - FY 2025 assumes no rates increase and the deviation from FY 2018 is due entirely to the assumed annual changes in purchased capacity (in terms in EDUs) and wastewater discharge flows.

The shift of excess usage charge revenues from the Vista Sewer Fund to the Capital Expansion Fund in FY 2018 is reflected by showing zero revenue from this item in the Vista Sewer Fund in FY 2018 and in the subsequent periods. This revenue is then shown in the Capital Expansion Fund.

Table 4-5 Projected Revenues from Current Rates

	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
Residential									
SFR	$10,201,213	$10,432,479	$10,463,206	$10,494,023	$10,524,931	$10,555,930	$10,587,021	$10,618,203	$10,649,477
MFR	$4,307,688	$4,404,539	$4,417,511	$4,430,522	$4,443,572	$4,456,659	$4,469,786	$4,482,950	$4,496,154
Total Residential	**$14,508,901**	**$14,837,017**	**$14,880,717**	**$14,924,545**	**$14,968,503**	**$15,012,590**	**$15,056,806**	**$15,101,153**	**$15,145,631**
Commercial									
Permit EDUs	$1,396,128	$1,422,977	$1,422,977	$1,422,977	$1,422,977	$1,422,977	$1,422,977	$1,422,977	$1,422,977
Excess EDUs	$752,473	$0	$0	$0	$0	$0	$0	$0	$0
Flow	$3,758,591	$3,770,143	$3,770,143	$3,770,143	$3,770,143	$3,770,143	$3,770,143	$3,770,143	$3,770,143
Total Commercial	**$5,907,192**	**$5,193,120**	**$5,193,120**	**$5,193,120**	**$5,193,120**	**$5,193,120**	**$5,193,120**	**$5,193,120**	**$5,193,120**
Total Rate Revenues	$20,416,093	$20,030,137	$20,073,837	$20,117,665	$20,161,622	$20,205,709	$20,249,926	$20,294,273	$20,338,751

The projection of other revenues assumes that most of the items will remain at their FY 2017 budgeted level, except for investment earnings which are calculated based on the available resources and assumed interest rate and GASB adjustments, which are expected to be neutral to revenues during the study period.

Table 4-6 Other Revenue Projection

	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
Cal Recycling	$24,589	$24,589	$24,589	$24,589	$24,589	$24,589	$24,589	$24,589	$24,589
Inter Agency Flow Agreement	$11,312	$11,312	$11,312	$11,312	$11,312	$11,312	$11,312	$11,312	$11,312
Sewer Service Charges Prorated	$34,923	$34,923	$34,923	$34,923	$34,923	$34,923	$34,923	$34,923	$34,923
Investment Earnings	$90,011	$87,598	$89,713	$93,805	$98,073	$102,586	$107,433	$112,588	$118,028
GASB 31 Adjustment	-$123,419	$0	$0	$0	$0	$0	$0	$0	$0
Creek Maintenance	$42,136	$42,136	$42,136	$42,136	$42,136	$42,136	$42,136	$42,136	$42,136
Other Revenue	$25	$25	$25	$25	$25	$25	$25	$25	$25
Sale of City Property	$6,204	$6,204	$6,204	$6,204	$6,204	$6,204	$6,204	$6,204	$6,204
Insurance Settlements	$0	$0	$0	$0	$0	$0	$0	$0	$0
Operating Fund Total Other Revenue	**$85,781**	**$206,787**	**$208,902**	**$212,994**	**$217,262**	**$221,775**	**$226,622**	**$231,777**	**$237,217**
Investment Earnings	$348,303	$296,774	$216,343	$195,454	$176,812	$155,749	$92,708	$23,228	$0
GASB 31 Adjustment	-$337,067	$0	$0	$0	$0	$0	$0	$0	$0
Developer Contributed Lines	$0	$0	$0	$0	$0	$0	$0	$0	$0
Other Revenue	$0	$0	$0	$0	$0	$0	$0	$0	$0
Capital Fund Total Other Revenues	**$11,236**	**$296,774**	**$216,343**	**$195,454**	**$176,812**	**$155,749**	**$92,708**	**$23,228**	**$0**
TOTAL Vista Sewer Other Revenue	**$97,017**	**$503,560**	**$425,245**	**$408,448**	**$394,074**	**$377,524**	**$319,330**	**$255,005**	**$237,217**

4.2 OPERATING EXPENSES

Operating expenses are projected by adjusting the budgeted expenses in FY 2017 by the applicable inflation factor from Table 3-1 . The only exceptions are the treatment costs and the refunded water quality protection expenses from Buena.

The treatment costs, which represent Vista Sewer Fund payments to Encina for wastewater treatment, have two components. The first combines the fixed costs that do not depend on the

amount of effluent to be treated. The budgeted fixed costs for FY 2017 are inflated each year with the assumed "Encina Cost Change" inflation factor from Table 3-1

The second component is based on the volume of the treated effluent and the unit cost per treated million gallon of wastewater. The latter is calculated by using Encina's operating revenues from Vista[12] in 2017 of $2,600,824 and dividing it by 1,956 MG in that year (effluent from Vista Table 4-7). The resulting unit cost per million gallon of treated wastewater for FY 2017 of $1,329 is escalated by an inflation factor of 5 percent ('Encina Cost Change') each year for the rest of the study period. Finally, the unit cost is multiplied by the projected effluent to obtain the volumetric cost of treated wastewater.

Table 4-7 Wastewater Treatment Cost Projection

		Escalation factor:	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
1	**Fixed Cost**	*Table 3-1*	**$1,278,148**	**$1,301,805**	**$1,366,895**	**$1,435,240**	**$1,507,002**	**$1,582,352**	**$1,661,470**	**$1,744,543**	**$1,831,770**
2	Unit cost (MG)	*Table 3-1*	$1,329.39	$1,395.86	$1,465.66	$1,538.94	$1,615.89	$1,696.68	$1,781.51	$1,870.59	$1,964.12
3	Projected effluent (MGY)	*City's staff projections*	1,956	1,847	1,847	1,847	1,847	1,847	1,847	1,847	1,847
4	**Volumetric Cost**	[2]*[3]	**$2,600,824**	**$2,578,018**	**$2,706,919**	**$2,842,265**	**$2,984,378**	**$3,133,597**	**$3,290,277**	**$3,454,791**	**$3,627,531**
5	**TOTAL Treatment Cost**	**[1]+[4]**	**$3,878,972**	**$3,879,823**	**$4,073,814**	**$4,277,505**	**$4,491,380**	**$4,715,949**	**$4,951,747**	**$5,199,334**	**$5,459,301**

Vista provides water quality protection services to all customers in the service area and to Buena customers who reside in the City limits (Buena - City)[13]. The total water quality protection service costs are calculated based on the budget figures in FY 2017 and inflation factors for expense category. Since Vista receives a refund from Buena, representing 17 percent of the total water quality protection service expenses, it is shown as an offset to the operating expenses in Table 4-8.

Table 4-8 Operating Expenses by Type

	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
Staffing	$3,603,240	$3,593,614	$3,825,194	$4,072,584	$4,336,885	$4,619,271	$4,921,000	$5,243,417	$5,587,963
Professional Services	$776,195	$618,449	$630,818	$643,434	$656,303	$669,429	$682,818	$696,474	$710,404
Encina Costs	$3,878,972	$3,879,823	$4,073,814	$4,277,505	$4,491,380	$4,715,949	$4,951,747	$5,199,334	$5,459,301
Operating Expenses	$367,158	$332,339	$338,986	$345,765	$352,681	$359,734	$366,929	$374,268	$381,753
Allocated Costs	$2,125,848	$2,101,336	$2,143,363	$2,186,230	$2,229,955	$2,274,554	$2,320,045	$2,366,446	$2,413,775
Utilities	$83,272	$83,303	$87,468	$91,842	$96,434	$101,255	$106,318	$111,634	$117,216
Capital Outlay	$129,115	$344,980	$351,880	$358,917	$366,096	$373,417	$380,886	$388,504	$396,274
Water Quality Protection (Refund from Buena)	-$380,914	-$370,688	-$379,704	-$389,256	-$399,379	-$410,113	-$421,496	-$433,573	-$446,391
TOTAL	**$10,582,886**	**$10,583,156**	**$11,071,818**	**$11,587,022**	**$12,130,353**	**$12,703,497**	**$13,308,246**	**$13,946,503**	**$14,620,293**

[12] Encina Wastewater Authority Proposed Budget 2018, page 5
[13] Buena (City) is an area within Buena Sanitation District

Table 4-8 presents the operating and maintenance expenses by cost categories and explicitly shows the allocated overhead cost[14] while Table 4-9 shows the same operating expenses grouped by functional cost categories to be used in the cost of service analysis.

Table 4-9 Operating Expenses by Sub-Fund

By sub-fund	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
Sewer Administration	$4,221,850	$4,172,093	$4,377,483	$4,593,189	$4,819,736	$5,057,676	$5,307,587	$5,570,080	$5,845,796
of which: Encina cost	*$3,878,972*	*$3,879,823*	*$4,073,814*	*$4,277,505*	*$4,491,380*	*$4,715,949*	*$4,951,747*	*$5,199,334*	*$5,459,301*
Sewer Engineering	$1,777,717	$1,831,278	$1,923,601	$2,021,668	$2,125,867	$2,236,612	$2,354,347	$2,479,545	$2,612,714
Water Quality Protection Engineering	$1,216,102	$1,155,950	$1,208,984	$1,265,171	$1,324,721	$1,387,857	$1,454,819	$1,525,862	$1,601,261
Sewer Maintenance	$2,799,415	$2,864,083	$2,991,301	$3,125,934	$3,268,470	$3,419,430	$3,579,371	$3,748,889	$3,928,620
Water Quality Protection Maintenance	$948,716	$930,440	$950,153	$970,315	$990,939	$1,012,036	$1,033,619	$1,055,701	$1,078,295
Water Quality Protection (Refund from Buena)	-$380,914	-$370,688	-$379,704	-$389,256	-$399,379	-$410,113	-$421,496	-$433,573	-$446,391
TOTAL	**$10,582,886**	**$10,583,156**	**$11,071,818**	**$11,587,022**	**$12,130,353**	**$12,703,497**	**$13,308,246**	**$13,946,503**	**$14,620,293**

4.3 CAPITAL IMPROVEMENT PROGRAM

The City provided estimates of the capital improvement costs associated with refurbishment and replacement (R&R) needs through the end of study period in FY 2025. The proposed capital improvement program (CIP) will be funded entirely through rate revenues and reserves (Pay-As-You-Go or PAYGO). The detailed project list and funding by years are presented in the Appendix. Except in FY 2018, about one half of the capital program represents funding of Encina's capital improvements. In FY 2018, the City plans to build the Vista Village Trunk Sewer, which is expected to cost a $12M in 2017 dollars.

Table 4-10 Total CIP Funded by Operating and Capital Funds (in 2017 dollars)

	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
Total CIP	$6,769,820	$18,537,867	$8,825,399	$7,835,844	$5,885,026	$6,497,651	$8,942,318	$6,737,045	$5,484,002
of which:									
Encina Capital Improvements	$3,442,320	$3,931,143	$5,673,899	$5,785,844	$4,094,026	$3,742,651	$7,274,318	$5,947,045	$4,354,002
Vista Village Trunk Sewer	$0	$12,000,000	$0	$0	$0	$0	$0	$0	$0

[14] Overhead costs – Ongoing administrative costs collectively incurred by Vista Sewer and Buena Sanitation District, which are allocated to each agency on a percentage split basis. Examples include engineering services, administrative staff, and IT services. The allocation method was developed by RFC in 2016

Figure 4-1 Vista Sewer Capital Improvement Program (in current dollars)[15]

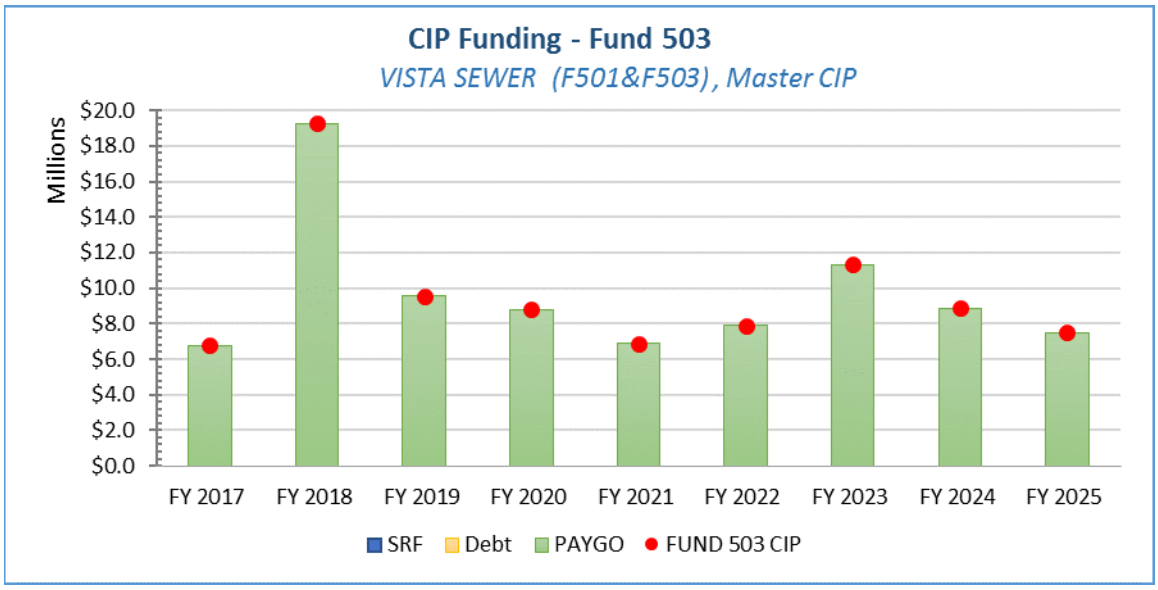


Figure 4-1 shows the CIP to be funded by Vista Sewer Fund (the red dots) and the funding source. In the presented scenario, all CIP will be funded by rates.

4.4 DEBT

The City has four outstanding State Revolving Fund (SRF) loans. The service of the SRF loan for CIP 8125 will start in FY 2020 which will increase total annual debt payments more than three times. The City does not plan to issue new debt during the projection period.

Table 4-11 Total Debt Service

	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
SRF 8125	$0	$0	$0	$1,191,570	$1,333,681	$1,333,681	$1,333,681	$1,333,681	$1,333,681
SRF 8158	$208,833	$208,833	$208,833	$208,833	$208,833	$208,833	$208,833	$208,833	$208,833
SRF 8164	$162,775	$162,775	$162,775	$162,775	$162,775	$162,775	$162,775	$162,775	$162,775
SRF 8165	$166,098	$166,098	$166,098	$166,098	$166,098	$166,098	$166,098	$166,098	$166,098
Total Current Debt Service	$537,706	$537,706	$537,706	$1,729,276	$1,871,387	$1,871,387	$1,871,387	$1,871,387	$1,871,387

4.5 STATUS QUO FINANCIAL PLAN

Table 4-12 displays the City's pro forma under the current rate structure over the study period. No rate adjustments are assumed beyond the increases in FY 2017 and FY 2018 that have been already adopted. The pro-forma includes the data on current rate revenues (Table 4-5), operation expenses (Table 4-8), inflated CIP expenditures (Figure 4-1) and debt service (Table 4-11).

[15] CIP in 2017 dollars is inflated to incorporate the price increase in the future years

Under the status-quo scenario, revenues generated from rates and other miscellaneous revenues are insufficient to recover the expenses of the sewer system. The Net Cash Flow turns negative in FY 2018 due to the capital investment expenditures and increasing debt service, depleting the reserves below their target level in the last three years of the study period. As a result, the City is unable to maintain financial sustainability under the current financial plan.

Table 4-12 Status Quo Financial Plan

		Source/Notes	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
1.	REVENUES										
2.	Rate & Excess EDUs Revenue	*Table 4-5*	$20,416,093	$20,030,137	$20,073,837	$20,117,665	$20,161,622	$20,205,709	$20,249,926	$20,294,273	$20,338,751
3.	Other Revenues	*Table 4-6*	$97,017	$503,560	$425,245	$408,448	$394,074	$377,524	$319,330	$255,005	$237,217
4.	TOTAL REVENUE	*[2]+[3]*	$20,513,110	$20,533,697	$20,499,081	$20,526,113	$20,555,697	$20,583,233	$20,569,256	$20,549,278	$20,575,967
5.											
6.	TOTAL O&M EXPENSES	*Table 4-8*	$10,582,886	$10,583,156	$11,071,818	$11,587,022	$12,130,353	$12,703,497	$13,308,246	$13,946,503	$14,620,293
7.											
8.	NET REVENUE	*[4]-[6]*	$9,930,224	$9,950,541	$9,427,263	$8,939,091	$8,425,343	$7,879,736	$7,261,010	$6,602,775	$5,955,674
9.											
10.	TOTAL DEBT PAYMENTS	*Table 4-11*	$537,706	$537,706	$537,706	$1,729,276	$1,871,387	$1,871,387	$1,871,387	$1,871,387	$1,871,387
11.											
12.	CIP EXPENDITURES										
13.	Capital Fund		$6,769,820	$19,279,381	$9,545,552	$8,814,259	$6,884,648	$7,905,385	$11,314,885	$8,865,492	$7,505,235
14.	TOTAL CIP EXPENDITURES		$6,769,820	$19,279,381	$9,545,552	$8,814,259	$6,884,648	$7,905,385	$11,314,885	$8,865,492	$7,505,235
15.											
16.	NET CASH FLOW	[8]-[10]-[14]	$2,622,697	-$9,866,546	-$655,995	-$1,604,445	-$330,692	-$1,897,037	-$5,925,262	-$4,134,104	-$3,420,949
17.	BEGINNING BALANCES	*Table 3-4*	$28,083,719	$30,706,416	$20,839,870	$20,183,875	$18,579,430	$18,248,738	$16,351,701	$10,426,439	$6,292,334
18.	ENDING BALANCES		$30,706,416	$20,839,870	$20,183,875	$18,579,430	$18,248,738	$16,351,701	$10,426,439	$6,292,334	$2,871,386
19.	TARGET RESERVES	[20]+[21]+ +[22]+[23]	$9,269,863	$9,285,236	$9,551,858	$11,022,460	$11,454,609	$11,766,290	$12,100,822	$12,453,716	$12,826,065
20.	Operating Cash Flow		$5,291,443	$5,291,578	$5,535,909	$5,793,511	$6,065,177	$6,351,749	$6,654,123	$6,973,251	$7,310,147
21.	Rate Stabilization		$540,713	$555,951	$578,243	$599,673	$618,045	$643,154	$675,312	$709,077	$744,531
22.	Debt reserve		$537,706	$537,706	$537,706	$1,729,276	$1,871,387	$1,871,387	$1,871,387	$1,871,387	$1,871,387
23.	Emergency Reserve Target		$2,900,000	$2,900,000	$2,900,000	$2,900,000	$2,900,000	$2,900,000	$2,900,000	$2,900,000	$2,900,000

4.6 PROPOSED FINANCIAL PLAN

To ensure that the Vista Sewer Fund will generate adequate revenues to cover operating expenses and capital expenditures, RFC recommends the following sewer revenue adjustments (Table 4-13). As noted earlier, the rate increases in FY 2017 and FY 2018 have already been adopted and are presented for information purposes only[16]. RFC proposes the revenue adjustment for FY 2019 and on to be equal to 2 percent.

Table 4-13 Proposed Revenue Adjustments

	Adopted	Proposed
Jul-16	1.52%	n/a
Jul-17	1.96%	n/a
Jul-18	0%	2%
Jul-19	0%	2%
Jul-20	0%	2%
Jul-21	0%	2%
Jul-22	0%	2%
Jul-23	0%	2%
Jul-24	0%	2%

A pro forma of the proposed financial plan is shown in Table 4-14 below. The proposed financial plan meets successfully the City's financial needs, while minimizing the rate impact on its customers. The net cash flow remains negative in some of the years due to significant CIP expenditures but the reserves remain above the target level throughout the projection period.

[16] The adopted rate increases are estimated as the ratio between the calculated rate revenues with adopted rates and calculated rate revenues with FY 2016 rates.

Table 4-14 Financial Plan with Proposed Revenue Adjustment

		Notes:	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
1.	REVENUES										
2.	Rate & Excess EDUs Revenue		$20,416,093	$20,030,137	$20,073,837	$20,117,665	$20,161,622	$20,205,709	$20,249,926	$20,294,273	$20,338,751
3.	Revenue Adjustment		$0	$0	$401,477	$812,754	$1,234,053	$1,665,600	$2,107,629	$2,560,375	$3,024,081
4.	Other Revenues[17]		$97,017	$503,560	$428,256	$420,611	$421,771	$427,383	$398,236	$359,506	$346,468
5.	TOTAL REVENUE	[2]+[3]+[4]	$20,513,110	$20,533,697	$20,903,569	$21,351,030	$21,817,446	$22,298,693	$22,755,791	$23,214,153	$23,709,299
6.	TOTAL O&M EXPENSES		$10,582,886	$10,583,156	$11,071,818	$11,587,022	$12,130,353	$12,703,497	$13,308,246	$13,946,503	$14,620,293
7.											
8.	NET REVENUE	[5]-[6]	$9,930,224	$9,950,541	$9,831,751	$9,764,008	$9,687,092	$9,595,196	$9,447,545	$9,267,650	$9,089,006
9.											
10.	DEBT PAYMENTS										
11.	Current debt payments		$537,706	$537,706	$537,706	$1,729,276	$1,871,387	$1,871,387	$1,871,387	$1,871,387	$1,871,387
12.	TOTAL DEBT PAYMENTS		$537,706	$537,706	$537,706	$1,729,276	$1,871,387	$1,871,387	$1,871,387	$1,871,387	$1,871,387
13.											
14.	CIP EXPENDITURES										
15.	Capital Fund		$6,769,820	$19,279,381	$9,545,552	$8,814,259	$6,884,648	$7,905,385	$11,314,885	$8,865,492	$7,505,235
16.	TOTAL CIP EXPENDITURES		$6,769,820	$19,279,381	$9,545,552	$8,814,259	$6,884,648	$7,905,385	$11,314,885	$8,865,492	$7,505,235
17.											
18.	NET CASH FLOW	[8]-[12]-[16]	$2,622,697	-$9,866,546	-$251,508	-$779,528	$931,057	-$181,577	-$3,738,727	-$1,469,229	-$287,617
19.	BEGINNING BALANCES		$28,083,719	$30,706,416	$20,839,870	$20,588,362	$19,808,835	$20,739,891	$20,558,314	$16,819,587	$15,350,358
20.	ENDING BALANCES		$30,706,416	$20,839,870	$20,588,362	$19,808,835	$20,739,891	$20,558,314	$16,819,587	$15,350,358	$15,062,741
21.	TARGET RESERVES		$9,269,863	$9,285,236	$9,551,858	$11,022,460	$11,454,609	$11,766,290	$12,100,822	$12,453,716	$12,826,065
22.	Operating Cash Flow		$5,291,443	$5,291,578	$5,535,909	$5,793,511	$6,065,177	$6,351,749	$6,654,123	$6,973,251	$7,310,147
23.	Rate Stabilization		$540,713	$555,951	$578,243	$599,673	$618,045	$643,154	$675,312	$709,077	$744,531
24.	Debt reserve		$537,706	$537,706	$537,706	$1,729,276	$1,871,387	$1,871,387	$1,871,387	$1,871,387	$1,871,387
25.	Emergency Reserve Target		$2,900,000	$2,900,000	$2,900,000	$2,900,000	$2,900,000	$2,900,000	$2,900,000	$2,900,000	$2,900,000

[17] Other revenues are higher compared to the Status Quo scenario because of higher interest earnings

Figure 4-2 displays proposed revenue adjustments for the study period, which includes the adopted adjustments for FYs 2018 and 2018. The figure also shows the debt coverage ratio (DCR*).* The decline in the DCR in FY 2020 is due to the start of the debt payments under the SRF Loan for CIP 8125 which will increase total annual debt payments more than three times. However, under the proposed scenario, the actual debt coverage ratio is consistently above the required ratio[18].

Figure 4-2 Proposed Revenue Adjustment and Debt Coverage Ratio

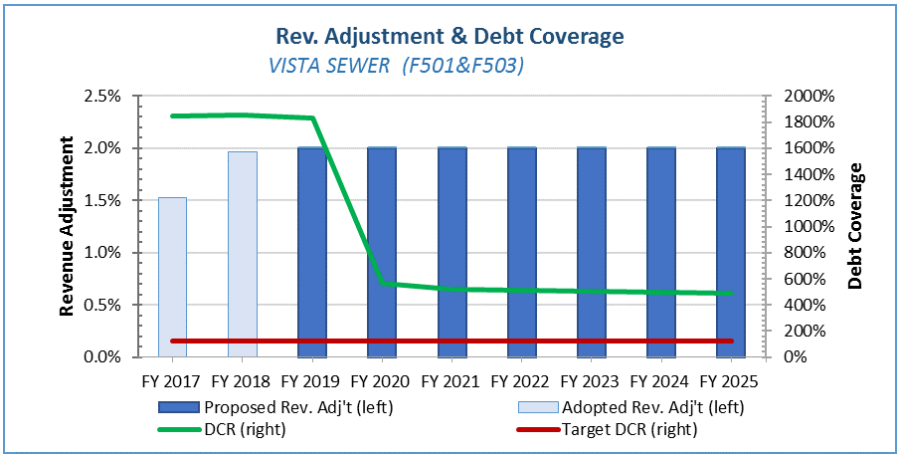


Figure 4-3 illustrates the Vista Sewer Fund operating position, where the expenses, reserve funding, and debt payments are represented by stacked bars. Total revenues at current and proposed rates are shown as green and red lines respectively. The proposed revenues meet all operating costs and contributes to reserves each year of the study period for capital replacement projects and for fulfilling target reserve requirements.

Figure 4-3 Operating Financial Plan with Revenue Adjustment

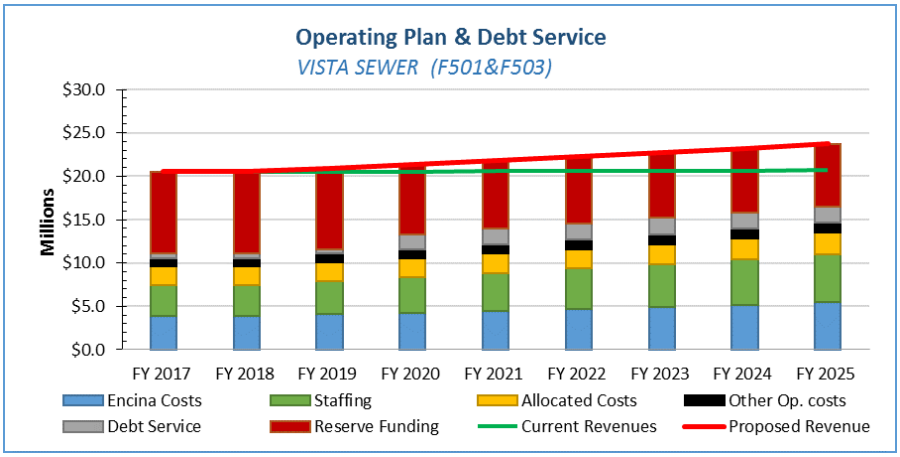
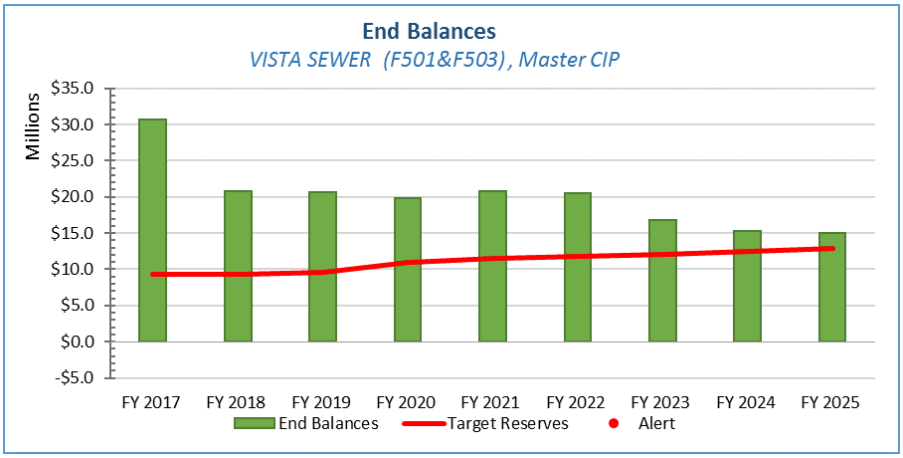


Figure 4-4 shows the annual Vista Sewer Fund ending balance, with the red line indicating the target reserve balance as discussed in Reserve Policy section. With the proposed revenue adjustments, the ending fund balance meets the target reserves in all years of the study period.

[18] The debt coverage ratio (DCR) is defined as the ratio between net revenues and the annual debt service payments. A DCR level of at least 120 percent is considered to be the industry standard.

Figure 4-4 Ending Balances with Proposed Revenue Adjustment



5. CAPITAL EXPANSION FUND

The Capital Expansion Fund (Fund 502) was established to collect the capacity fees from new customers. Since FY 2017, those revenues have been directed to the Capital Facility Fund (Fund 509). In FY 2018, based on RFC recommendation, the Capital Expansion Fund will begin to collect the charges from customers who exceed their purchased sewer capacity (the current "excess usage charge"). These charges are intended to cover the cost of capital facilities associated with excess usage, and the proceeds will be used to finance capital projects that improve the sewer capacity.

Projections of the excess capacity use are based on the actual excess use (in EDUs) in FY 2016 and assumed annual changes over the study period. The billing system uses FY 2014 water consumption to estimate the excess usage charge in FY 2016. Therefore, the extra usage charge revenue projections for FY 2017 and FY 2018 should account for the drought in 2015 and 2016, respectively, when excess usage is expected to have shrunk by 15%. After that, it is expected to remain stable until the end of the projection horizon (Table 3-2). The projected excess capacity usage in terms of EDU is shown above in Table 4-3.

The extra capacity usage fee per 1 EDU is 10 percent of the capacity fee per 1 EDU[19]. Capacity fees are inflated annually by the annual ENR CCI.

Table 5-1 Excess Usage Charge Revenue Projection

		FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
1.	Annual percentage change	-15%	-15%	0%	0%	0%	0%	0%	0%	0%
2.	Total excess capacity usage (EDU)	1,705	1,449	1,449	1,449	1,449	1,449	1,449	1,449	1,449
3.										
4.	Excess Usage Capacity Fee per EDU	$441.30[20]	$447.90	$464.00	$473.70	$483.60	$493.70	$504.00	$514.50	$525.30
5.										
6.	**Excess Capacity Usage Revenues [2]x[4]**	**$752,473**	**$649,168**	**$672,502**	**$686,561**	**$700,910**	**$715,548**	**$730,477**	**$745,695**	**$761,348**

The City plans to finance one capital investment project from the Capital Expansion Fund[21] totaling $1,441,159 (in 2017 dollars). The value of this project is inflated to 1,498,805 to reflect the price increase at the time of implementation.

Table 5-2 summarizes the financial plan for the Capital Expansion Fund. The projected capital inflows and outflows reveal that the main revenue sources are the excess fee revenues and interest earnings from the accumulated ending balances.

[19] Municipal Code, Section 14.06.060
[20] The capacity fee per 1 EDU was $4,4130 in 2016
[21] Appendix Vista Sewer Capital Improvement Program

Table 5-2 Capital Expansion Fund Financial Plan

	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
CASH INFLOW									
Sewer Capacity Charges	$0	$0	$0	$0	$0	$0	$0	$0	$0
Excess Capacity Charges	$0	$649,168	$672,502	$686,561	$700,910	$715,548	$730,477	$745,695	$761,348
Investment Earnings	$21,376	$15,083	$13,981	$24,384	$35,156	$46,306	$57,846	$69,785	$82,135
GASB 31 Adjustment	-$32,159	$0	$0	$0	$0	$0	$0	$0	$0
TOTAL CASH INFLOW	**-$10,783**	**$664,251**	**$686,483**	**$710,945**	**$736,065**	**$761,855**	**$788,323**	**$815,481**	**$843,485**
CASH OUTFLOW									
CIP Expenditures	$0	$1,498,805	$0	$0	$0	$0	$0	$0	$0
TOTAL CASH OUTFLOW	**$0**	**$1,498,805**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
NET CASH FLOW	**-$10,783**	**-$834,554**	**$686,483**	**$710,945**	**$736,065**	**$761,855**	**$788,323**	**$815,481**	**$843,485**
BEGINNING BALANCES	$1,441,159	$1,430,376	$595,822	$1,282,305	$1,993,250	$2,729,315	$3,491,170	$4,279,493	$5,094,974
ENDING BALANCES	**$1,430,376**	**$595,822**	**$1,282,305**	**$1,993,250**	**$2,729,315**	**$3,491,170**	**$4,279,493**	**$5,094,974**	**$5,938,459**

6. CAPITAL FACILITY FUND

The revenue projection for the Capital Facility Fund is based on the expected purchases of new capacity (in terms of EDU) per year. The City's staff expects a stable small increase of about 0.3% of residential capacity (in terms of EDU) per year throughout the projection period.

Table 6-1 New Sewer Purchases (EDU)

	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
SFR (EDU)	46	46	46	46	46	46	46	47
MFR (Units)	28	28	28	28	28	28	28	28

The Capital Facility Fund revenues are calculated by multiplying the number of new capacity to be purchased by the capacity fee per EDU for each of the residential categories. The City does not envision financing of investment programs from the Capital Facility Fund.

Table 6-2 Capacity Fees Projection[22]

	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
Capacity fee per 1EDU (SFR)	$4,640	$4,737	$4,836	$4,937	$5,040	$5,145	$5,253	$5,363
Capacity Fee per 0.7 EDU (MFR)	$3,248	$3,316	$3,385	$3,456	$3,528	$3,602	$3,677	$3,754

Table 6-3 shows the pro forma for the Capital Facility Fund. Since currently the City does not project cash outflows from this fund, it is expected to accumulate about $3.5M in reserves by the end of the study period.

Table 6-3 Capital Facility Fund Financial Plan

	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
CASH INFLOW									
Sewer Capacity Charges	$340,852	$304,384	$310,750	$317,236	$323,870	$330,624	$337,526	$344,594	$357,173
Investment Earnings	$6,769	$11,709	$16,499	$21,456	$26,586	$31,894	$37,383	$43,060	$48,969
TOTAL INFLOW	$347,621	$316,093	$327,249	$338,692	$350,456	$362,518	$374,909	$387,654	$406,142
CASH OUTFLOW									
CIP Expenditures	$0	$0	$0	$0	$0	$0	$0	$0	$0
TOTAL CASH OUTFLOW	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
NET CASH FLOW	**$347,621**	**$316,093**	**$327,249**	**$338,692**	**$350,456**	**$362,518**	**$374,909**	**$387,654**	**$406,142**
BEGINNING BALANCES	$280,816	$628,437	$944,530	$1,271,779	$1,610,471	$1,960,927	$2,323,444	$2,698,353	$3,086,007
ENDING BALANCES	**$628,437**	**$944,530**	**$1,271,779**	**$1,610,471**	**$1,960,927**	**$2,323,444**	**$2,698,353**	**$3,086,007**	**$3,492,149**

[22] The capacity fees are inflated annually by the annual ENR CCI in March. RFC projection for ENR CCI is based on 5-year average annual index.

7. COST OF SERVICE

This section of the Report discusses the allocation of O&M expenses and capital costs to the appropriate cost causation components consistent with industry standards; the determination of unit costs; and the calculation of costs by customer class. It is recommended that the City carries out a cost of service analysis at least once in every five years to ensure that the rates are consistent with the cost of providing service.

The total cost of sewer service is first analyzed by system function, so that it can be distributed equitably among the various classes of customers. The approach to allocating the cost of service adopted in this report is consistent with the guidelines in the WEF Manual of Practice No. 27, Financing and Charges for Wastewater Systems, 2004. Wastewater rates are calculated for FY 2018, the test year. The test year revenue requirements are used for the cost allocation process. The rates for subsequent years are based on a uniform application of the revenue adjustments shown in Table 4-13 to the proposed rates for FY 2018.

The COS analysis of Vista's sewer system includes the following steps:

1. Determine non-residential customer flow and strength loadings based on water usage
2. Conduct plant balance to estimate the flow and strength of the residential customer class with consideration for infiltration and inflow (I&I)
3. Functionalize O&M and capital costs into functional categories such as Collection, Treatment, and Billing and Customer Service, etc.
4. Determine revenue requirements and allocate them using functional categories into cost components such as Flow, Strength, and Billing and Customer Service, etc.
5. Develop customer class characteristics by cost component
6. Calculate the unit cost of service by dividing the total cost in each cost component in Step 4 by the customer class characteristics in Step 5
7. Calculate the cost by customer class by multiplying the unit cost in Step 6 by the customer class characteristics in Step 5

7.1 CURRENT CUSTOMER CLASSES

The sewer utility's two primary classes are residential (SFR and MFR) and commercial. As discussed in section 4.1.1, both customer classes are billed annually. The residential customers pay a fixed charge, while commercial customers pay a combination of fixed and flow charges. The flow charges for commercial customers have three categories based on the strength of the discharged wastewater. Commercial customers are classified into one of the three strength categories shown in Table 7-1 below. The classification of each commercial customer is based on inputs from the City. The strength chart is presented in Appendix. The City wishes to maintain a fixed and variable annual rate structure for commercial sewer service customers and a fixed annual rate for residential customers, similar to how its customers are currently billed.

Table 7-1 Strength Definitions

Commercial customer classes	Description	BOD mg/L	SS mg/L
Low strength commercial	*Light users:* offices, groceries markets, schools	200	200
Medium strength commercial	*Medium users*: manufacturing, hotels, auto repair shops	450	240
High strength commercial	*Heavy users:* restaurants, breweries, manufacturing – dairy or chemical products	1,000	600

7.2 PLANT MASS BALANCE

The plant mass balance analysis is used to estimate and validate the sewage load (flow and strength) generated by each customer class. RFC's assessment draws on the flow and strength loads found in the City's strength chart. Commercial customer flows can be estimated based on their water usage. The strength loads are based on the nature of the customer's business. The infiltration and inflow (I&I) is estimated by the City's staff to 4 percent of total wastewater. The remaining load (calculated as total wastewater less I&I and commercial customer discharge) is assigned to residential customers.

Based on this mass balance, the estimated residential flow for a single family residential customer is determined to be 162 gallons per day per dwelling unit or 57 gallons per capita per day[23]. This is close to the industry standard estimate of the amount of indoor water usage per person of 55 gallons per capita per day. The estimated residential strength concentration is 245 milligrams per liter (mg/l) for BOD and 217 milligrams per liter (mg/l) for TSS.

Table 7-2 Plant Mass Balance 2018

	FY 2018	Number of EDUs	Water Usage (hcf)	RTS	BOD mg/L	TSS mg/L	Est. flow in MGY	BOD lb/year	SS lb/year
A	B	C	D	E	F	G	H	I	J
1.								*F× H × 8.3432 × 365*	*G × H × 8.3432 × 365*
2.	Total Plant effluent		2,468,953		294	236	1,846.9	4,529,044	3,641,714
3.	Less: I&I		98,758		150	150	73.9	92,479	92,479
4.	**Net Plant Effluent *[6]+[11]***		**2,370,195**		**300**	**240**	**1,773.0**	**4,436,565**	**3,549,235**
5.									
6.	Commercial - Low		312,886	100%	200	200	234.1	390,656	390,656
7.	Commercial - Med		173,364	100%	450	240	129.7	487,024	259,746
8.	Commercial - High		143,520	100%	1,000	600	107.4	895,966	537,580
9.	**Commercial *[7]+[8]+[9]***	**8,950**	**629,771**				**471.1**	**1,773,646.1**	**1,187,981.7**
10.									
11.	Single Family	15,478	1,223,142	100%	245	217	914.97	1,871,457	1,659,452
12.	Multi Family	6,546	517,281	100%	245	217	386.95	791,462	701,802
13.	**Residential *[12]+[13]***	**22,024**	**1,740,424**				**1,302**	**2,662,919**	**2,361,254**

The estimated loads by customer class are shown in Table 7-2, including the assumed BOD and TSS loads. The numbers shown in Table 7-2 by columns are :

» **Number of EDUs** represents the purchased capacity in terms of EDUs and is based on actual FY 2016 data for commercial and residential customers. The number of EDUs shown Table 7-2 coincides with

[23] Based on the average number of persons per household in City of Vista of 3.13

the projections for FY 2018, per Table 4-3. The MFR units (one unit is equal to 0.7EDU) are converted to number of EDUs as follows:

9,351 MFR units 0.7 =6,546 EDUs*

- **Water usage** for commercial customers is projected from actual water use data contained in the FY 2016 bill calculations. The water use data shown in Table 7-2 coincide with the projections for FY 2018 (Table 4-3).
- **Return-to-Sewer Factor** (RTS) is the percentage of potable water that enters the sewage collection system. The return-to-sewer factor is assumed to be 100% for all commercial customers.
- **BOD (mg/L)**, or biochemical oxygen demand, is the amount of oxygen required to break down the organic material present in the wastewater. Higher strength wastewater requires greater amounts of oxygen and therefore is more costly to treat.
- **TSS (mg/L)**, or suspended solids, is the measure of the suspended solids in wastewater. Higher suspended solids are also more costly to treat. Similar to BOD, TSS is also a measure of wastewater strength.
- **Estimated flow (MGD)** is the estimated sewage flow converted from hundred cubic feet (hcf) to million gallons per day (MGD). The estimated flow is derived from the total effluent and projected commercial flows and strength.

7.3 COST ALLOCATIONS

The sewer utility is comprised of various facilities, each designed and operated to fulfill a specific function. In order to provide sufficient service to its customers at all times, the utility must be capable of collecting and conveying the total wastewater generated. The defined utility functions are:

1. Wastewater treatment
2. Wastewater collection
3. Water quality protection
4. General

The above functions enable the allocation of the functionalized costs to the cost causation components:

1. Flow
2. Inflow and Infiltration (I&I)
3. Biochemical oxygen demand (BOD)
4. Suspended Solids (SS)
5. General

7.3.1 O&M Cost Allocation

RFC used the classification of operating costs by subfund (Table 4-9) to allocate them to functional cost components. The wastewater treatment costs (payments to the Encina Wastewater Authority) are allocated to flow, BOD and TSS since the cost of treatment is a function of these causation components. They are derived from the actual invoices from EWA for FY 2016.

Sewer engineering and maintenance expenses are related to the wastewater collection system and therefore, the bulk of those costs is allocated to the flow component. Administrative and water quality protection costs are allocated to the general component. This reflects staff's time needed to maintain the collection system and provide water quality protection services to all customers. The resulting allocation is shown in Table 7-3.The total allocation of each cost components is shown in the last row of the table. Note that the total O&M expense matches that in Table 4-9.

Table 7-3 Allocating O&M Expenses to Cost Causation Components

O&M Expenses	FY 2018	I&I	Flows	BOD	TSS	General
Encina Cost	$3,879,823	0%	47%	40%	13%	
Sewer engineering and maintenance	$4,695,361	4%	96%			
Admin. Expenses	$292,270					100%
Water quality protection engineering and maintenance	$2,086,390					100%
Water Quality Protection (Refund from Buena)	-$370,688					100%
TOTAL	**$10,583,156**	**$187,814**	**$6,336,558**	**$1,539,348**	**$511,464**	**$2,007,972**
O&M Allocation Factors (%)		**2%**	**60%**	**15%**	**5%**	**19%**

7.3.2 Capital Cost Allocation

The sewer capital costs (by acquisition value) are assigned based on the actual usage of the respective asset. For example, the capital cost associated with the ownership in Encina's Unit I (treatment plant) is allocated to flow, BOD and TSS[24] since the plant operation is dependent on the flow and strength of the effluent. The acquisition costs of Unit I and J for Vista are calculated from total acquisition costs for those units using Vista Sewer ownership shares[25]. The City's capital assets[26] are limited to flow (collection) and general (general service) components.

Table 7-4 Capital Cost Allocation Factors

FIXED ASSETS	Acquisition Cost	I&I	Flows	BOD	TSS	General
Encina Unit I	$55,350,405		34%	37%	29%	
Encina Unit J- Ocean outfall	$3,476,685		100%			
Building	$526,860					100%
Improvements	$6,144,622					100%
Machinery/Equipment	$1,413,829					100%
Vehicles	$1,070,699					100%
Sewer Lines	$40,412,273		100%			
County Sewer Lines	$1,707,438		100%			
Developer Sewer Lines	$20,032,219		100%			
TOTAL	**$130,135,030**	**$0**	**$84,447,753**	**$20,479,650**	**$16,051,618**	**$9,156,010**
Capital Cost Allocation Factors (%)		**0%**	**65%**	**16%**	**12%**	**7%**

[24] Allocation provided by City's staff.
[25] EWA Comprehensive Annual Financial Report 2016. Vista membership shares are: 25.2 percent of the treatment plant (Unit I) and 24.63 percent of the ocean outflow (Unit J)
[26] Provided by City's staff.

7.3.3 Revenue Requirements Determination

The cost of service analysis translates the revenue requirement into the cost to serve each customer class. An important step in the cost of service analysis is determining how much revenue needs to be collected from rates. The methodology underlying this estimate is based on the premise that the utility must generate annual revenues that are enough to cover its estimated annual O&M expenses, reserve targets, debt service and capital investment.

To determine the revenue required from current rates, the calculation starts with the total revenue requirements for the functioning of the sewer utility. This includes O&M expenses, capital expenditures, debt service, etc. (see Table 7-5). Next, the total revenue requirement is offset by non-rate revenues. These include investment earnings, creek maintenance revenue and property sales. They must be subtracted from the total revenue requirement. The operating reserve funding reduces the total costs as it represents non-rate funding of the sewer utility. The annual reserve funding is the net operating revenues less debt service. The revenue to be collected from rates to support operating and capital needs is shown in row 10, column B of Table 7-5.

Using the factors derived in Table 7-3 and Table 7-4, the revenue requirements are allocated to cost causation components. For example, of the total CIP expenditures $19,279,381, 65 percent are allocated to the flow cost causation component ($12,510,855), 16 percent to BOD ($3,034,041), 12 percent to SS ($2,378,032) and 7 percent to general ($1,356,454).

The I&I costs are entirely reallocated to flow cost component as they do not increase wastewater strength but put a burden on the collection system.

Finally, the general costs (calculated in row 10 of Table 7-5) are reallocated flow, BOD and SS cost components, based on the ratios of the already allocated cost for flow, BOD and TSS (73:18:10 – calculated in row 11 of Table 7-5).

Table 7-5 Revenue Requirement Determination 2018

		Total rev. requirements	Allocation factor	I&I	Flows	BOD	TSS	General
	A	B	C	D	E	F	G	H
1.	*O&M Allocation Factor*			*2%*	*60%*	*15%*	*5%*	*19%*
2.	*Capital Cost Allocation Factor*			*0%*	*65%*	*16%*	*12%*	*7%*
3.								
4.	O&M Expenses	$10,583,156	O&M	$187,814	$6,336,558	$1,539,348	$511,464	$2,007,972
5.	Debt	$537,706	Capital Cost	$0	$348,931	$84,620	$66,324	$37,832
6.	CIP Expenditures	$19,279,381	Capital Cost	$0	$12,510,855	$3,034,041	$2,378,032	$1,356,454
7.	Reserve Funding	-$9,866,546	Capital Cost	$0	-$6,402,639	-$1,552,721	-$1,216,998	-$694,188
8.	Other revenues	-$503,560	Capital Cost	$0	$326,772	$79,246	$62,112	$35,429
9.	**Total Rev. Requirements from Current Rates**	**$20,030,137**		**$187,814**	**$12,466,931**	**$3,026,041**	**$1,676,710**	**$2,672,640**
10.	Allocation of I&I Cost				$187,814			
11.	Allocation of General Cost (%)			0%	73%	18%	10%	0%
12.	Allocation of General Cost ($)			$0	$1,940,608	$471,035	$260,997	-$2,672,640
13.	**Total Allocated Rev. Req. from Current Rates**	**$20,030,137**			**$14,595,354**	**$3,497,076**	**$1,937,707**	

In order to allocate the cost of service to different customer classes, a unit cost needs to be developed for each cost component. The unit cost of service can be calculated as follows:

$$Unit\ cost\ of\ service = \frac{Total\ revenue\ requirement\ by\ cost\ component}{Total\ annual\ units\ of\ service}$$

This calculation is repeated for all three components. Table 7-6 shows the total revenue requirement for each rate component which is then divided by its respective total annual units of service (Line 3) to obtain the unit cost of service for each rate component (row 4). The units of service for flow component are equal to total flow of wastewater discharge in hundred cubic feet. The units of service for the strength components are the annual content (in pounds) of BOD and SS.

Table 7-6 Unit Cost of Service

		Source	Flow	BOD	TSS
1.	Units of service		Flow (HCF)	BOD (lb/yr)	TSS (lb/yr)
2.	Revenue requirements	*Table 7-5*	$14,595,354	$3,497,076	$1,937,707
3.	Total units of service	*Table 7-2*	**2,370,195**	**4,436,565**	**3,549,235**
4.	**Units Cost of Service**	*[2]/[3]*	**$6.16**	**$0.79**	**$0.55**

8. RATES DESIGN AND CUSTOMER IMPACTS

Proposition 218 requires a nexus between the rates charged and the cost of providing service. In the previous sections, calculations were provided to demonstrate how much revenue needs to be collected from rates and how it is allocated by cost causation components. In this section, the revenue requirements by cost component will be allocated to customer classes and will be used as a base for the rate calculations.

8.1 DISTRIBUTING COSTS TO CUSTOMER CLASSES

In order to calculate the rates per customer class, the revenue requirement that needs to be raised by each customer class should be determined. The unit costs of service from Table 7-6 are applied to the units of service by customer class to get the respective customer class contribution in the total revenue requirement.

Table 8-1 Cost of Service Allocation by Customer Class

		Units of Service by Customer Class			Revenue Requirements by Customer Class			
		FLOW (hcf)	BOD (lb/yr)	TSS (lb/yr)	Flow	BOD	TSS	Total
A	B	C	D	E	F	G	H	I
1.	*Unit Cost*	*$6.16*	*$0.79*	*$0.55*				
2.					*Line 1 x Column C*	*Line 1 x Column D*	*Line 1 x Column E*	*F+G+H*
3.	Commercial - Low	312,886 hcf	390,656	390,656	$1,927,378	$308,618	$214,861	$2,450,857
4.	Commercial - Med	173,364 hcf	487,024	259,746	$1,067,924	$384,749	$142,860	$1,595,534
5.	Commercial - High	143,520 hcf	895,966	537,580	$884,086	$707,813	$295,669	$1,887,568
6.	**Commercial**	**629,771 hcf**	**1,773,646**	**1,187,982**	**$3,879,388**	**$1,401,180**	**$653,390**	**$5,933,959**
7.	Single Family	1,223,142 hcf	1,871,457	1,659,452	$7,534,556	$1,478,451	$912,698	$9,925,706
8.	Multi Family	517,281 hcf	791,462	701,802	$3,186,454	$625,255	$385,991	$4,197,699
9.	**Residential**	**1,740,424 hcf**	**2,662,919**	**2,361,254**	**$10,721,010**	**$2,103,706**	**$1,298,689**	**$14,123,405**
10.	**TOTAL**				**$14,600,398**	**$3,504,886**	**$1,952,079**	**$20,057,364**

8.2 RATE CALCULATIONS

8.2.1 Commercial Customers' Rates

The revenue requirement for the commercial customer class is $5,933,959. The City plans to keep the existing rate structure for commercial customers, which includes a fixed and a variable component. The fixed rate is per purchased EDU and the volumetric component is based on the discharged flow (in hcf) and its strength. The COS based fixed rate is proposed to be equal to the adopted fixed rate for FY 2018 of $159, increased by the proposed 2 percent.

$$COS\ based\ fixed\ charge\ per\ EDU = \$159 * (1 + 2\%) = \$162^{27}$$

Therefore, as there are 8,950 EDUs of purchased capacity by commercial customers (see Table 7-2), the proposed fixed charge will recover $1,449,825 from the total revenue requirement by commercial customers of $5,933,959 (or 24.4%). The remaining $4,484,133 will need to be recovered by volumetric rates.

[27] Rounded to the nearest dollar

Table 8-2 provides details on the revenue to be collected from different strength categories (column D). The rates per strength category are calculated by dividing the revenue requirement by the annual flow for each strength category (column F).

Table 8-2 Commercial Customers Rate Calculation

		Total	Fixed Charge (Share 24.4%)	Variable Rate (Share=75.6%)	Flow (hcf)	Variable Rates (COS based)
	A	B =*(Table 8-1)*	C=B*24.4%	D=B*75.6%	E=*(Table 8-1)*	F=D/E
1.	**Commercial Customers**	**$5,933,959**	**$1,449,825**	**$4,484,133**	**629,771 hcf**	
2.	Commercial - Low	$2,450,857	$598,810	$1,852,047	312,886 hcf	$5.92
3.	Commercial - Med	$1,595,534	$389,832	$1,205,702	173,364 hcf	$6.95
4.	Commercial - High	$1,887,568	$461,184	$1,426,385	143,520 hcf	$9.94

8.2.2 Residential Rates

The City plans to keep the current annual billing per EDU for residential customers. The single-family residences are billed 1 EDU,[28] while multi-family residences are billed per multi-family unit (1 unit equals 0.7 EDU). To determine the COS based rates for these two customer categories, the estimated revenue requirement is divided by the number of EDUs (for SFR) and by the number of units (for MFR).

Table 8-3 Residential Rates Calculation

	Revenue requirements *Table 8-1*	Number of Units *Table 4-3*	COS Based Rates[29]
A	**B**	**C**	**D=B/C**
Single Family	$9,925,706	15,478	$641.00
Multi Family	$4,197,699	9,351	$448.00

8.2.3 Extra Strength Surcharge

The City applies surcharges for extra strength to commercial customers who discharge wastewater with strength concentrations that are in excess of 500 milligrams per liter of BOD or 500 milligrams per liter of total suspended solids. The surcharges are levied per pound of biochemical oxygen demand and suspended solids. RFC proposes the extra strength surcharges per pound of BOD and TSS to be equal to the calculated unit cost of service of $0.79 and $0.55 for BOD and TSS (Table 7-6), respectively, as these rates reflect the estimated cost of service. The proposed annual revenue adjustments will be applied to strength surcharges as well.

In addition, RFC recommends updating the extra strength surcharge threshold for BOD from 500 mg/L to 1000 mg/L and for TSS from 500 mg/L to 600 mg/L in line with the cost of service evaluations and the average wastewater strength of high strength commercial customers.

[28] The EDU (equivalent dwelling unit) is the estimated sewer flow of the average single family household. Average SFR customers are assigned the value of 1.0; multi-family residencies are assigned 0.7 EDU and commercial customers purchase sewer flow capacity in terms of EDUs.
[29] The rates are rounded down to the nearest dollar.

8.2.4 Rate Comparison and Five-Year Rate Projections

Table 8-4 shows projections of the proposed rates for FY2019-FY2023. The rates are calculated from COS based rates developed in the previous sections, multiplied by the proposed revenue adjustment[30].

Table 8-4 Proposed Five-Year Sewer Rates

	Current Rates FY 2018	Proposed Rates FY 2019	Proposed Rates FY 2020	Proposed Rates FY 2021	Proposed Rates FY 2022	Proposed Rates FY 2023
Proposed Rev. Adj't		2%	2%	2%	2%	2%
Commercial Fixed Charge (per EDU owned)	$159.00	$165.00	$168.00	$171.00	$174.00	$177.00
Commercial Flow Rate by Strength Class (per hcf)						
Commercial - Low	$5.26	$6.04	$6.17	$6.30	$6.43	$6.56
Commercial - Med	$6.02	$7.09	$7.24	$7.39	$7.54	$7.70
Commercial - High	$7.53	$10.14	$10.35	$10.56	$10.78	$11.00
Single Family (per unit)	$674.00	$654.00	$667.00	$680.00	$694.00	$708.00
Multi Family (per unit)	$471.00	$457.00	$466.00	$475.00	$485.00	$495.00
Surcharge for Extra Strength						
BOD Rate per lb	$0.91	$0.81	$0.83	$0.85	$0.87	$0.89
TSS Rate per lb	$0.42	$0.57	$0.59	$0.61	$0.63	$0.65

Table 8-5 summarizes the proposed rates for FY 2019 (including proposed 2% annual revenue adjustment) and the percent difference from the FY 2018 adopted rates.

Table 8-5 Rate Comparison

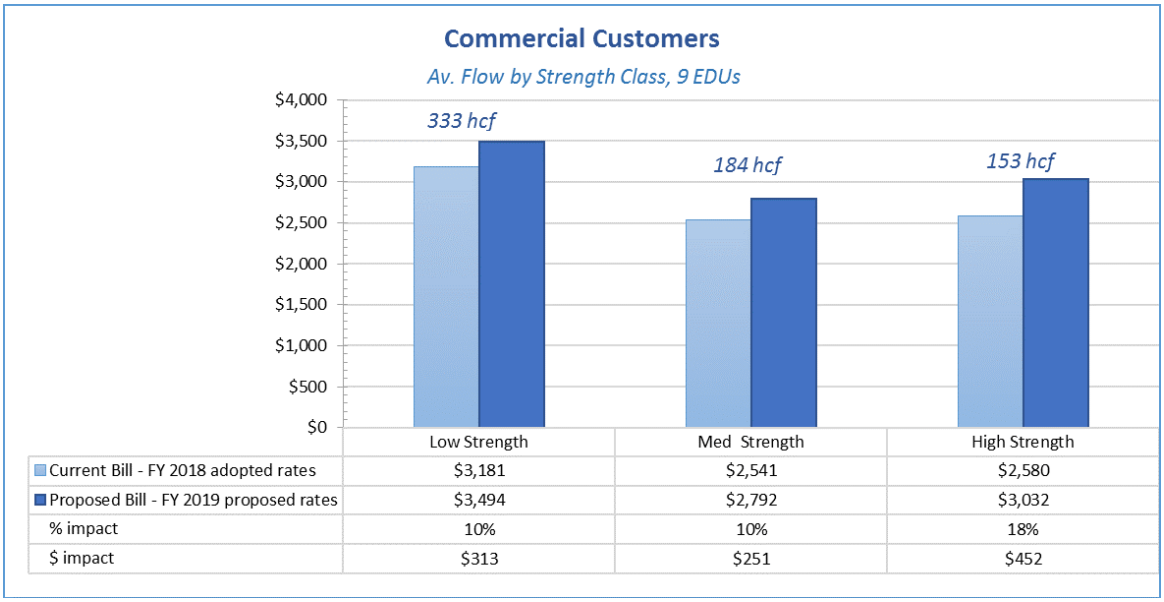
	Current Rates FY 2018	Proposed Rates FY 2019	% change
Commercial Fixed Charge (per EDU owned)	$159.00	**$165.00**	3.8%
Commercial Flow Rate by Strength Class (per hcf)			
Commercial - Low	$5.26	**$6.04**	14.8%
Commercial - Med	$6.02	**$7.09**	17.8%
Commercial - High	$7.53	**$10.14**	34.7%
Single Family (per unit)	$674.00	**$654.00**	-3.0%
Multi Family (per unit)	$471.00	**$457.00**	-3.0%
Surcharge for Extra Strength			
BOD Rate per lb	$0.91	**$0.81**	-11.0%
TSS Rate per lb	$0.42	**$0.57**	35.7%

8.2.5 Customer Impacts

Residential customers are expected to see a 3 percent reduction in their wastewater bills in FY2019. The commercial customers' bills will increase but the magnitude of the increase will depend on the purchased capacity as well as the flow and the strength of the discharged wastewater. The figure below displays the impact on bills assuming 9 EDU of purchased capacity[31] and the average flow for low, medium and high strength flows. The calculated bills do not include extra strength or capacity rental charges.

[30] Rounded to the nearest dollar.
[31] The average purchased capacity by commercial customers of Vista sewer utility

Figure 8-1 Commercial Customer Impact FY 2019 (9 EDU & Average Flow)



	Low Strength	Med Strength	High Strength
Current Bill - FY 2018 adopted rates	$3,181	$2,541	$2,580
Proposed Bill - FY 2019 proposed rates	$3,494	$2,792	$3,032
% impact	10%	10%	18%
$ impact	$313	$251	$452

Currently, the commercial customers are charged the commercial fixed rate based on owned EDU capacity regardless of excess wastewater capacity used (in terms of EDUs). After discussion with City's staff, RFC proposed that the fixed charge be calculated on the owned and excess wastewater capacity used (in terms of EDUs). In addition, the commercial customers whose discharge is above the owned capacity will be charged a capacity rental charge (in EDU) for the excess capacity used

9. CAPACITY RENTAL CHARGE

City staff requested RFC to redefine the existing excess usage charge for commercial customers. In the rate ordinance[32], the excess usage is based on the number of capacity EDUs being used in excess of the paid sewer capacity. The excess usage charge per 1 EDU represents 10 percent of the Vista Sewer capacity fee and it is intended to cover the cost of capital facilities required for excess usage.

RFC determined that customers who exceed their purchased EDU capacity are essentially "renting" additional capacity; hence, that charge should be modeled after the framework that private water/wastewater utilities follow for return on investment, known as "utility basis approach".

The utility basis approach entitles the owner of the utility "to earn a reasonable return from nonowner customers based on the value of its plant investment required to serve those customers"[33]. There are two components of the annual rate of return: (i) rate of return to capital less depreciation and (i) the annual depreciation.

The rate of return of capital is derived from the total replacement cost less depreciation (RCLD) multiplied by the industry specific average cost of capital (see line 3, Table 9-1 below). The replacement cost of capital plant investment includes the sewer utility's fixed assets and the ownership in Encina Wastewater Authority. Consequently, the total annual depreciation encompasses the annual depreciation of the Vista Sewer fixed assets and the share of Vista in Encina's annual depreciation.

The total rate of return (line 5, Table 9-1) is divided by the total EDUs (both commercial and residential) in FY 2014 to get the annual rate of return per EDU (line 8, Table 9-1). Next, the FY 2014 annual rate of return is inflated to FY 2019 dollars using the actual and projected ENR annual index.

[32] Details on the excess usage capacity calculation for commercial customers are provided Ordinance 95-7 from Jun 27, 1995, section 13.04.130

[33] AWWA, Manual of Water Supply Practices, M1, page 14

Table 9-1 Capacity Rental Charge Calculation

			Source:
1	Weighted Average Cost of Capital (WACC)	4.92%	*Cost of Capital by Sector (US)*[34]
2	Replacement Cost Less Depreciation (in FY2014)	$96,816,168	*RFC City of Vista Capacity Charge report 2015, page 15*
3	**Rate of Return [1]x[2]**	**$4,763,355**	
4	Annual Depreciation incl. ownership in EWA (in FY2014)	$4,011,025	*City of Vista CAFR 2014, EWA CAFR 2014*
5	**Total Rate of Return [3]+[4]**	**$8,774,380**	
6			
7	Total number of EDUs (FY 2014)	28,899	*RFC City of Vista Capacity Charge report 2015, page 15*
8	**Annual rate of Return per EDU (FY 2014)**	$303.62	
9	ENR index, March 2016/March 2014	105.57%	*Engineering News Record*
10	Annual Rate of Return per EDU (FY 2016) [8]x[9]	$320.52	
11	Projected ENR index increase 2017-2019	106.4%	*Table 3-1*
12	**Annual Rate of Return per EDU[35] (FY 2019) [10]x[11]**	**$341.00**	

RFC proposes that the Excess Usage Charge be renamed the Capacity Rental Charge. The new charge will be applied to wastewater capacity usage above the purchased capacity (in terms of EDU). The charge per EDU will be equal to the calculated annual rate of return per EDU. The charge per EDU would be equal to the calculated annual rate of return per EDU. This is estimated to be $341 in FY2019 and after discussion with the City's staff, it was decided to be adjusted by 2 percent annually to compensate for inflation.[36]. The capacity rental charge will be applied in addition to the fixed and volumetric charges to those customers who exceed their owned capacity.

[34]Cost of capital by industry, NYU Stern School of Business, http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/wacc.htm

[35] Rounded down

[36] ENR CCI 5-year annual average is 2.09 percent.

10. APPENDIX

APPENDIX Table 1 Vista Sewer Capital Improvement Program

Project number	Name of the project/Funding Source	Financing Fund	2017	2018	2019	2020	2021	2022	2023	2024	2025
8077	V1 West Vista Way	502									
		503									
8125	VC 11-15 VCI & AHLS	502									
		503									
		503 (SRF)									
8199	Monte Vista	503									
8209	Hacienda Drive Trunk Sewer	503	$2,749,000	-$1,000,000							
8212	V2 Vista Village Trunk Sewer	502									
		503		$12,000,000							
8229	Delpy Ditch Protection	503									
8244	Pipeline Rehab Phase 2	503		$1,100,000							
8256	Business Park Culvert	503									
8258	VC1 Manhole Access Improvements	503			$264,000						
8271	VC2: Sewer Rehab	503			$1,687,500						
8272	Buena Vista Pump Station Rehab	503	$370,000	-$150,000							
8273	Raceway Pump Station Rehab	503	$208,500								
8277	Pipeline Rehab Phase 3	503									
8286	Crescent Drive Sewer Improv	503									
8188	Sewer Mitigation	503									
8157	Encina Capital Improvements	503	$3,442,320	$3,931,143	$5,673,899	$5,785,844	$4,094,026	$3,742,651	$7,274,318	$5,947,045	$4,354,002
8288	OV1 Access Improvements	503									
NEW	Buena Vista Pump Station Standby Pum	503		$500,000	-$300,000						
8289	Paseo Santa Fe Sewer Improvments	503		$2,156,724							
		502		$1,441,159							
NEW	Eucalpltus Ave and Citrus Ave Sewer Ca	503			$100,000	$550,000					
NEW	Vista Small Diameter Rehabiliation	503			$1,400,000	$1,500,000	$1,550,000	$1,550,000	$1,550,000		
NEW	South Santa Fe Sewer Capacity Improve	503								$100,000	$300,000
NEW	E Broadway Sewer Capacity Improveme	503								$100,000	$750,000
NEW	North Santa Fe Sewer Capacity Improve	503									$80,000
NEW	Raceway Pump Station Pressure Surge &	503							$118,000	$590,000	
NEW	Buena Vista PS Odor Control & Wet Wel	503					$241,000	$1,205,000			

APPENDIX Table 2 Strength Chart

City of Vista and Buena Sanitation District
Compilation of Published Data on Sewer User Strength Classifications

User Classification Description	SIC Code	Proposed Strength (mg/L) BOD	SS	Weighted Average	Percent of Single Family	Data Source
Strength Weighting Factor		50%	50%			
Residential Single Family	881	200	200	200	100%	SWRCB
LOW STRENGTH CLASSICATION						
Low I Strength:						
Soft Water Service	494	3	55	29	15%	SWRCB
Office With Public Access	738	80	80	80	40%	SWRCB
Car Wash	550	20	150	85	43%	SWRCB
Veterinarian	74	130	80	105	53%	Los Angeles
Business Equipment Rental	735	130	80	105	53%	Los Angeles
Business Services -- Other	730	130	80	105	53%	Los Angeles
Office (Finance, Insurance, etc.)	600	130	80	105	53%	Los Angeles
Office (No Public Access)	871	130	80	105	53%	SWRCB
Office (Medical Services)	807	130	80	105	53%	Los Angeles
Personal Services (Other)	720	130	80	105	53%	Los Angeles
Photo & Portrait Studios	722	130	80	105	53%	Los Angeles
Manufacturing - Textile Mill Products	220	115	115	115	58%	Metcalf & Eddy
Schools	821	130	100	115	58%	SWRCB
Low II Strength:						
Laundromat-Public	721	150	110	130	65%	SWRCB
Landscaping Services	70	150	150	150	75%	Los Angeles
Amusement & Recreation: Indoor & Out	790	150	150	150	75%	Los Angeles
Auto Parking	752	150	150	150	75%	Los Angeles
Barber Shop	724	150	150	150	75%	Los Angeles
Beauty Shop	723	150	150	150	75%	Los Angeles
Church (No Kitchen)	866	150	150	150	75%	Los Angeles
Community Center (No Kitchen)	864	150	150	150	75%	Los Angeles
Grocery Market (No Butcher or Baker)	541	150	150	150	75%	Los Angeles
Health Spa	805	150	150	150	75%	Los Angeles
Kennel	75	150	150	150	75%	Los Angeles
Malls/Dept. Stores (No Food Svcs)	531	150	150	150	75%	SWRCB
Manufacturing (Other)	200	150	150	150	75%	Los Angeles
Manufacturing (Apparel & Other Textiles)	230	150	150	150	75%	Los Angeles
Manufacturing (Furniture)	250	150	150	150	75%	Los Angeles
Membership Organizations	860	150	150	150	75%	Los Angeles
Museum/Art Gallery	840	150	150	150	75%	Los Angeles
Nursery/Greenhouse	526	150	150	150	75%	Los Angeles
Office (Construction)	150	150	150	150	75%	Los Angeles
Massage Parlor	805	150	150	150	75%	Los Angeles
Retail Apparel and Accessory Store	560	150	150	150	75%	Los Angeles
Retail Bldg. (Materials & Gardening)	520	150	150	150	75%	Los Angeles
Retail (Packaged) Food (No Sewer Disposal)	540	150	150	150	75%	Los Angeles
Retail Furniture & Home Furnishings	570	150	150	150	75%	LACSD
General Merchandise -- Retail/Wholesale	530	150	150	150	75%	SWRCB

City of Vista and Buena Sanitation District
Compilation of Published Data on Sewer User Strength Classifications Continued

User Classification Description	SIC Code	Proposed Strength (mg/L)			Percent of Single Family	Data Source
		BOD	SS	Weighted Average		
Retail Trade -- Misc. (Except Food/Drink)	590	150	150	150	75%	SWRCB
Storage, Warehouse & Outdoor	422	150	150	150	75%	Los Angeles
Studio/Recording Sound Stage	781	150	150	150	75%	Los Angeles
Theater/Auditorium (No Food)	780	150	150	150	75%	Los Angeles
Low III (Residential) Strength:						
Convalescent Homes	836	250	100	175	88%	SWRCB
Hospital	806	250	100	175	88%	SWRCB
Other Health Services	800	250	100	175	88%	SWRCB
Transp. & Utilities (SIC 400 through 489)	400	200	150	175	88%	Metcalf & Eddy
Agricultural Production	10	150	250	200	100%	Metcalf & Eddy
Agricultural Services - Other	70	250	150	200	100%	Metcalf & Eddy
Bar Without Restaurant	581	200	200	200	100%	SWRCB
Restaurant -- Preprocessed Only	581	200	200	200	100%	Los Angeles
Social Services	830	200	200	200	100%	SWRCB
MEDIUM STRENGTH CLASSICATION						
Medium I Strength:						
Hotel (No Restaurant)	700	310	120	215	108%	SWRCB
Prison With Food Service	704	310	120	215	108%	Los Angeles
Auto Repair (No Steam Cleaning)	753	180	280	230	115%	SWRCB
Auto Service Station (No Steam Cleaning)	554	180	280	230	115%	SWRCB
Agricultural Services -- Animal	75	350	150	250	125%	Metcalf & Eddy
Auto/Vehicle Sales	550	300	200	250	125%	Metcalf & Eddy
Repair Services -- Misc.	760	250	250	250	125%	Metcalf & Eddy
Manufacturing -- Rubber/Plastic Products	300	200	350	275	138%	Metcalf & Eddy
Medium II Strength:						
Manufacturing -- Electric/Electronic Equipme	360	300	350	325	163%	Metcalf & Eddy
Manufacturing - Instruments	380	300	350	325	163%	Metcalf & Eddy
Manufacturing -- Fabricated Metal Products	340	300	350	325	163%	Metcalf & Eddy
Manufacturing -- Transport Equipment	370	400	250	325	163%	Metcalf & Eddy
Laundromat, Commercial	721	450	240	345	173%	SWRCB
Transportation -- Bus/Air Terminal	417	350	350	350	175%	Metcalf & Eddy
Medium III Strength:						
Malls/Shopping (Including Food Sales)	541	400	400	400	200%	Los Angeles
Manufacturing -- Machine Shops	350	290	550	420	210%	Los Angeles
Manufacturing -- Metal Industry	330	290	550	420	210%	Los Angeles
Manufacturing -- Lumber & Wood Products	240	431	431	431	216%	Los Angeles
Manufacturing -- Stone, Clay, Glass Product	320	200	700	450	225%	Metcalf & Eddy
Reproduction/Mailing Service	733	500	400	450	225%	Metcalf & Eddy
Hotel (With Restaurant)	701	500	600	550	275%	SWRCB
Manufacturing -- Paper/Containers	260	700	500	600	300%	Metcalf & Eddy
Manufacturing -- Printing & Publishing	270	700	500	600	300%	Metcalf & Eddy
Laundry (Industrial)	721	670	680	675	338%	SWRCB

City of Vista and Buena Sanitation District
Compilation of Published Data on Sewer User Strength Classifications Continued

User Classification Description	SIC Code	Proposed Strength (mg/L)			Percent of Single Family	Data Source
		BOD	SS	Weighted Average		
HIGH STRENGTH CLASSICATION						
High I Strength:						
Agricultural Production - Livestock	20	1,200	350	775	388%	Metcalf & Eddy
Mortuary	726	800	800	800	400%	SWRCB
Grocery (W/Butcher or Baker)	542	800	800	800	400%	SWRCB
Manufacturing -- Baked Foods	205	1,000	600	800	400%	SWRCB
Restaurant/Bar (W/Food Preparation)	581	1,000	600	800	400%	SWRCB
Manufacturing -- Beverages	208	1,500	300	900	450%	Metcalf & Eddy
Manufacturing -- Paint	285	1,300	1,100	1,200	600%	Metcalf & Eddy
Manufacturing -- Other Chemical Products	280	1,300	1,100	1,200	600%	Metcalf & Eddy
High II Strength:						
Manufacturing -- Dairy Products	202	2,369	922	1,646	823%	Los Angeles
Steam Cleaning -- Auto	754	1,150	2,150	1,650	825%	SWRCB
Manufacturing -- Other Food Products	209	2,213	1,453	1,833	917%	Los Angeles
High III Strength:						
Septage	495	5,400	12,000	8,700	4350%	SWRCB