WASTEWATER COST OF SERVICE CHARGE STUDY

BLACK & VEATCH PROJECT NO. 192415.2000

PREPARED FOR

San Diego County Sanitation District

County of San Diego | Department of Public Works

NOVEMBER 23, 2016

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Glossary

Annexation Fee – A one-time fee charged to new property being brought into the Sanitation District service area. Fee is established to help pay for past investment in District wastewater collection system where capacity is available and is applied on a per EDU basis. Fee would not be applied to new connections to the District wastewater system if connection resides on a parcel already established within District service area.

Base Costs – Costs that tend to vary with the total quantity of wastewater flow and sewer system operations under normal load conditions.

BOD - Biological Oxygen Demand – A rate at which organisms use oxygen in water and wastewater.

Capacity – A wastewater utility's ability to have a certain quantity or level of resources available to meet the wastewater service needs of its customers.

Capacity Charge – Related to setting annual customer sewer service charges, the capacity charge is the charge for District costs related to wastewater collection (conveyance from customer connection to treatment plant. This charge is uniform for all customer classes and does not incorporate unique flow and strength factors associated with each customer class.

Capacity Fee - A one-time fee charged to new wastewater connections to the Sanitation District, or to existing connections with a change in use requiring additional flow capacity to the District wastewater system. Fee is established to help pay for past investment in wastewater treatment facilities where capacity is available and is applied on a per EDU basis. Capacity fees would be applied to all new connections to the District whether inside or outside the District service area.

COS (Cost of Service) – The process of determining the cost of providing wastewater service to each of the defined customer classifications. This includes the functionalization and allocation of wastewater system revenue requirements followed by the distribution of costs by customer classification based on the annual flow, demands and customer-related costs for which each class of service is responsible.

Effluent - "Cleaned" or "treated" wastewater which flows out of a treatment plant.

EDU (Equivalent Dwelling Unit) – A unit of measure that standardizes all land use categories (housing, retail, office, food service, etc.) to the level of demand created by one single-family dwelling unit. EDUs are commonly utilized by utilities to calculate service charges for users connected to a utility system. EDUs are computed in accordance with the probable demand that a user places on the utility system by assignment of an equivalency factor. For example, the probable flow rate demand that a customer places on a wastewater treatment system is correlated to the demand expected by a single-family dwelling by the use of equivalency factors.

Flow EDU – A Flow EDU is derived from actual meter and/or water use data.

Functional Cost Component - Costs related to a particular operational function of a utility for which annual operations and maintenance expenses and utility plant investment records are

maintained. Functional cost components include those activities related to treatment, disposal, collection, customer accounts and services, billing, and general and administrative activities.

I/I (Infiltration and Inflow) - Infiltration is water (typically groundwater) entering the sewer underground through cracks or openings in joints. Inflow is water (typically storm water or surface runoff) that enters the sewer from grates or unsealed manholes exposed to the surface.

LAFCO - Established by State Law in 1963, the San Diego Local Agency Formation Commission (LAFCO) is a regulatory agency with quasi-legislative authority. While having county-wide jurisdiction, LAFCO is independent of county government. LAFCOs were designed to provide assistance to local agencies in overseeing jurisdictional boundary changes. LAFCOs are governed by the Cortese/Knox/Hertzberg Local Government Reorganization Act of 2000 (Government Code Section 56000, et seq.). LAFCO is responsible for coordinating, directing, and overseeing logical and timely changes to local governmental boundaries, including annexation and detachment of territory, incorporation of cities, formation of special districts, and consolidation, merger, and dissolution of districts. In addition, LAFCO is charged with reviewing ways to reorganize, simplify, and streamline governmental structure. A primary objective of LAFCO is to initiate studies and furnish information that contributes to the logical and reasonable development of public agencies. In 1994, LAFCOs were given the authority to initiate proposals involving district consolidation, dissolution, subsidiary district establishment, merger, and reorganization (combinations of the above jurisdictional changes).

MGD – Represents 1 million gallons per day.

Ordinance EDU - Ordinance based EDUs are assigned by the County at the time of sewer connection and are based on the type of sewer use and/or the square footage of the building.

Revenue Requirements – The total annual operation and maintenance expense and capital-related costs incurred in meeting various aspects of providing wastewater utility service.

Test Year – The annualized period for which costs are to be analyzed and rates established.

Treatment Charge – Related to setting annual customer sewer service charges, the treatment charge is designed for the costs associated with treatment and disposal of wastewater. This charge varies between each customer class flow and strength factors.

TSS (Total Suspended Solids) - Solids in water that can be trapped by a filter. TSS can include a wide variety of material, such as silt, decaying plant and animal matter, industrial wastes, and sewage.

USO (Uniform Sewer Ordinance) – A County of San Diego governing document that provides for maximum public benefit by regulating sewer use and wastewater discharges, provides for equitable distribution of costs, and contains procedures to comply with requirements of other regulatory agencies throughout unincorporated San Diego County.

Units of Services – An element of service for which a cost can be ascertained, such as thousand gallons, hundred cubic feet, million gallons per day, and number of billing units.

1 Executive Summary

This report was prepared for the County of San Diego Department of Public Works (County) to document the development of a wastewater multi-year financial plan, cost of service analysis, and rate design for the San Diego County Sanitation District (District). The specific goals of the study were to:

- Review and evaluate existing policies and procedures affecting wastewater service charges;
- Evaluate the adequacy of projected revenues under existing sewer service charges to meet projected revenue requirements;
- Develop a wastewater cost of service and rate model for the District covering a five-year study (Fiscal Year 2017-18 through Fiscal Year 2021-22) period for both ongoing operations and planned capital improvements;
- Allocate projected Fiscal Year (FY) 2017-18 (FY 2018) revenue requirements to the various customer classes in accordance with the respective service requirements;
- Develop suitable five-year sewer service charge schedules that produce revenues adequate to meet financial needs of the District while recognizing customer costs of service and local and state legal and policy considerations such as California Constitution Articles XIII C and D (Proposition 218), and Proposition 26; and
- Recommend appropriate reserve levels for operations and capital needs.

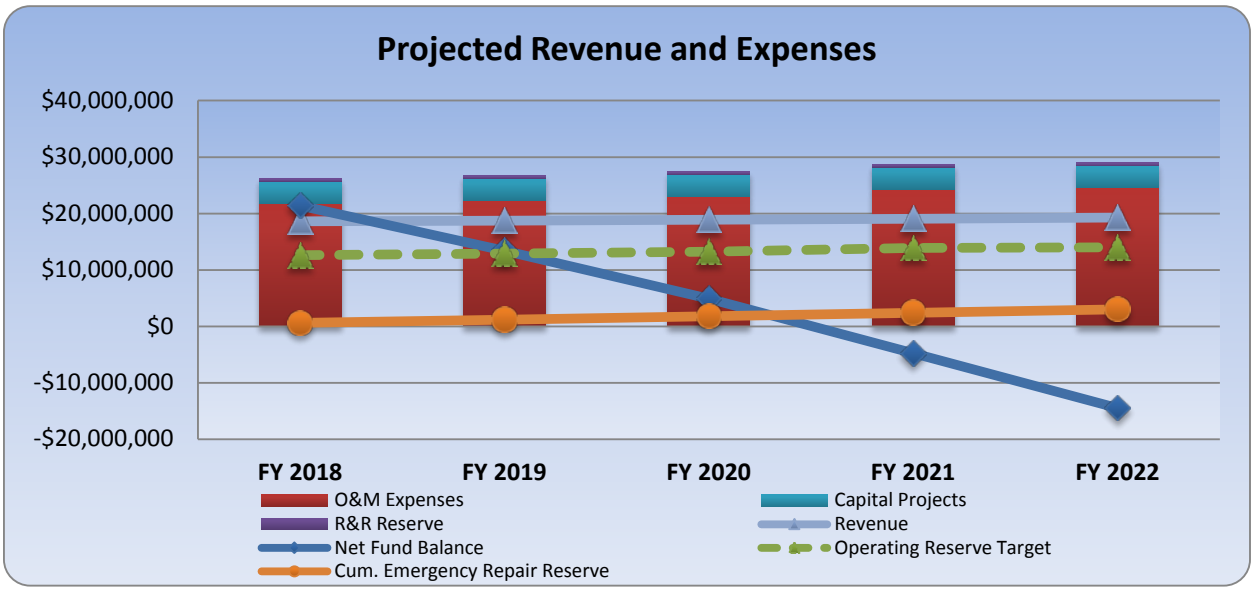
1.1 FINDINGS

The following lists the findings of this analysis:

1. Wastewater service charge revenues at current levels will not be sufficient over the next five years to meet the increasing cost of District operating and capital expenses without negatively affecting fund balance levels[1]. In the absence of charge adjustments (the status quo scenario), projections show that the District would deplete the Net Fund Balance during FY 2021. Figure 1-1 on the next page illustrates the projected financial picture without recommended sewer service charge adjustments and shows that the District Fund Balance falls below recommended operating target levels by FY 2019 and falls into a negative cash position by FY 2021.

[1] Strictly speaking, the term "fund balance" refers to the remaining amounts available after short-term liabilities (monies owed) are paid off with the agency's available cash and other financial resources (such as receivables). The fund balance includes reserved and unreserved components. For the purposes of this Study, this term refers to "available cash excluding reserved monies" and the term "fund" refers to either the Operating or Capital account in which these monies reside.

Figure 1-1 Projected Operating Cash Flow (Status Quo)



2. The County's Policy I-99 document lacks a defined capital reserve policy target.

3. Articles 5.2 through 5.4 of the County's Uniform Sewer Ordinance presents a sewer charge formula that in principle reflects proper elements of a cost of service-based rate structure, however is difficult to utilize when calculating annual customer sewer service charges.

4. The District does not have a mechanism to pass through wholesale treatment costs to customers should those costs rise beyond projections in the cost of service model or beyond future year projections.

1.2 RECOMMENDATIONS

The following lists Black & Veatch's recommendations to address the findings listed above:

1. Per the cost-of-service analysis contained within this report, Black & Veatch recommends District wastewater service charges be adjusted to reflect current costs of providing sewer service to customers within the District. This recommendation includes adjusting total revenue from rates by 8.65 percent in FY 2018 and 9.0 percent beginning in FY 2019 and ending in FY 2022 as shown in Table 1-1 on the next page. Based on the cost of service analysis, revenue adjustments per customer class will vary, however, in total, the District requires 8.65 to 9.0 percent more revenue from customer rates each year. Should the County approve these rate adjustments, the projected financial picture of the District should stabilize by FY 2021 as demonstrated in Figure 1-2. Based on the cost-of-service analysis and these revenue adjustments, Table 1-2 shows the proposed sewer charges for FY 2018 and compares them to existing charges. The proposed customer sewer charges for FY 2019 through FY 2022 are shown later in this report.

Table 1-1 Recommended Sewer Charge Revenue Adjustments

Fiscal Year	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
Revenue Adjustment	8.65%	9.00%	9.00%	9.00%	9.00%
Effective Month	July	July	July	July	July

Figure 1-2 Projected Operating Cash Flow with Proposed Revenue Adjustments

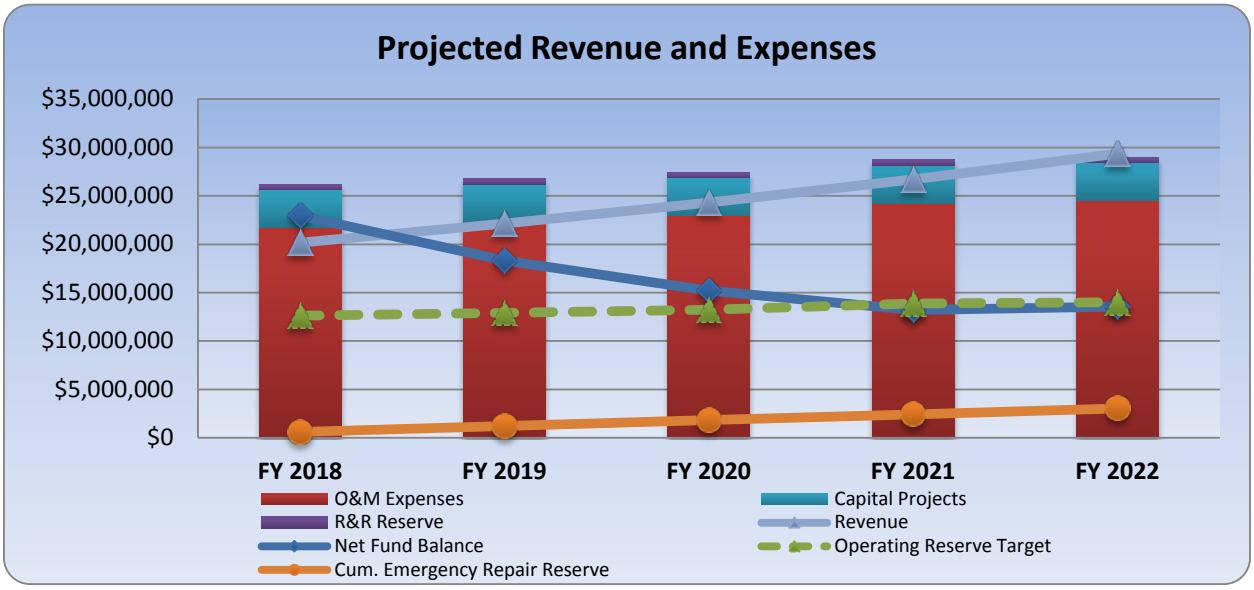


Table 1-2 Proposed Wastewater Rates for FY 2018 & Current Rates

Customer Class	Capacity Charge	Treatment Charge	Proposed FY 18 Charge	Current Charge
	($/EDU/year)	($/EDU/year)	($/EDU/year)	($/EDU/year)
Customer Class				
Single-family Residential	$182.18	$184.03	$366.22	$336.00
Multi-family Residential	$182.18	$184.03	$366.22	$336.00
Car Wash	$182.18	$128.12	$310.30	$287.14
Barber & Beauty Salons	$182.18	$176.91	$359.10	$337.13
Department Stores, Retail Stores, General Commercial	$182.18	$154.07	$336.25	$314.12
Warehouse	$182.18	$154.07	$336.25	$314.12
Hospitals & Convalescent Homes	$182.18	$162.62	$344.80	$323.37
Laundromats	$182.18	$144.94	$327.12	$304.92
Nurseries	$182.18	$230.47	$412.65	$375.16
Hotels/Motels w/o Dining	$182.18	$179.16	$361.34	$340.43
Auto Repair/Sales Shops & Service Stations	$182.18	$189.75	$371.93	$350.25
Shopping Centers	$182.18	$204.50	$386.68	$365.73
Bar w/o Dining	$182.18	$211.44	$393.62	$372.86
Commercial Laundry	$182.18	$234.50	$416.68	$397.09
Movie Theater	$182.18	$204.64	$386.83	$365.96
Lumber Yards	$182.18	$268.00	$450.18	$430.42
Convenience & Liquor Stores w/Deli	$182.18	$258.20	$440.39	$421.27
Industrial Laundry	$182.18	$413.88	$596.06	$543.97
Hotel w/ Restaurant	$182.18	$326.67	$508.85	$490.28
Auto Steam Cleaning	$182.18	$389.66	$571.84	$521.67
Bakery or Bakery/Deli	$182.18	$426.56	$608.74	$594.06
Restaurant & Bar w/Food	$182.18	$426.56	$608.74	$594.06
Food Stores	$182.18	$432.29	$614.47	$598.56
Mortuary	$182.18	$432.29	$614.47	$598.56
Churches	$182.18	$138.66	$320.84	$298.47
Schools	$182.18	$138.66	$320.84	$298.47
Membership Organizations	$182.18	$138.66	$320.84	$298.47
Restaurants w/ Waste Separation	$182.18	$280.57	$462.75	$421.27
Mobile Homes	$182.18	$184.03	$366.22	$336.00

2. Black & Veatch recommends that the County modify Background, Section 3 of the County's I-99 Policy document *"Expenditure and Use of Revenue for Replacement and Improvement of Sanitation District Facilities"* to include definitive language for recommended reserve target policies. These policies and resulting fund balance names are listed in Table 1-3.

Table 1-3 Summary of Recommended Reserve Targets

RESERVE	DESCRIPTION
Operating Reserves	The operating reserve provides working capital for day-to-day operations and helps absorb fluctuations in cash balances due to routine difference in revenue and expense cycles. The reserve is set at 50% of the District's annual operating budget.
Capital Repair and Replacement Reserves	The repair and replacement reserve provides funding for replacement, repair, or rehabilitation of wastewater infrastructure due to routine capital project planning or in the event of catastrophic failure of a major

	system asset. The maximum reserve target level is set at the next 3 years of budgeted cumulative capital project costs but should not exceed $9 million in any given year. The minimum floor is set at $3 million; a figure that represents a major system asset replacement cost.

3. Black & Veatch recommends that Articles 5.2 through 5.4 of the County's Uniform Sewer Ordinance (USO) be updated to show the recommended wastewater rates per customer class in tabular format. The current formula in Article 5.2 includes the same principles and factors utilized in this cost of service analysis. All of the factors used in the formula, including EDUs per class, are utilized in the wastewater rate model and many of those factors are notated in this report. However, the formula currently listed in the USO is difficult to implement on an annual basis when calculating customer rates to place on the County tax roll. The inclusion of the tabular format of rates by customer class will allow County staff an efficient mechanism to apply rates each year.

4. Black & Veatch recommends that the County provide a provision in the wastewater sewer charge ordinance to give the District the ability to pass through wholesale treatment costs to customers should those costs rise beyond projections in the cost of service model or beyond what the County notices to customers at time of rate implementation. This action would obviate the need for the County to conduct another Proposition 218 mailed 45-day notice and public hearing requirement before the Board-approved rate adjustment period has expired. The authority to provide this provision is located in California Government Code Section 53756. Specifically, the Government Code reads as follows:

   An agency providing water, wastewater, sewer, or refuse collection service may adopt a schedule of fees or charges authorizing automatic adjustments that pass through increases in wholesale charges for water, sewage treatment, or wastewater treatment or adjustments for inflation, if it complies with all of the following:

   (a) It adopts the schedule of fees or charges for a property-related service for a period not to exceed five years pursuant to Section 53755.

   (b) The schedule of fees or charges may include a schedule of adjustments, including a clearly defined formula for adjusting for inflation. Any inflation adjustment to a fee or charge for a property-related service shall not exceed the cost of providing that service.

   (c) The schedule of fees or charges for an agency that purchases wholesale water, sewage treatment, or wastewater treatment from a public agency may provide for automatic adjustments that pass through the adopted increases or decreases in the wholesale charges for water, sewage treatment, or wastewater treatment established by the other agency.

2 Introduction

This study (Study) takes a long-range planning approach to establishing wastewater service charges and fees. A detailed discussion of the long-range plan and recommended sewer charge and fee adjustments are included in the following sections of this report. The analyses contained herein include operation and maintenance (O&M) costs, City of San Diego Metropolitan Wastewater Department (Metro) treatment costs, local treatment costs, reserve levels, and identified and prioritized capital improvement projects (CIP). To that end, the study examines the revenues generated by the District and makes recommendations for revenue adjustments, as needed.

2.1 BACKGROUND

The District provides wastewater service to approximately 35,000 customers within the unincorporated area of San Diego County. It owns and operates approximately 432 miles of pipeline, 8,200 manholes, 10 lift stations/pressurized mains, and 3 wastewater treatment plants. The collection, treatment, and disposal of wastewater in an environmentally safe and efficient manner promote healthy communities and increase the quality of life for local residents.

Prior to FY 2011, the District consisted of nine (9) individual sanitation or maintenance districts. Each district was a separate entity with its own budget, sewerage infrastructure, operational permits, and environmental compliance criteria created to provide wastewater service. As of FY 2012, the County combined the individual districts into one, consolidated Sanitation District. The consolidated District now combines the budget, operational and infrastructure elements for ease and efficiency of administration. The former districts are now called “service areas” and the naming designation of each service area remains the same as in the past.

The District is responsible for collecting and conveying wastewater flows originating within the communities (service areas) of Alpine, East Otay Mesa, Lakeside, Spring Valley, and Winter Gardens to the City of San Diego’s Point Loma Treatment Plant for treatment and disposal. These service areas are dependent on the City of San Diego’s Metropolitan Wastewater System (Metro) for treatment of their wastewater effluent. Local, District-owned wastewater facilities handle the treatment and disposal of wastewater flows collected within the service areas of Campo, Julian and Pine Valley.

The County’s primary goals are operating the sewerage system safely and efficiently while meeting the needs of the District’s customers. To meet these goals, the District undertakes routine cleaning, inspections, and repairs and rehabilitates its facilities as needed. The wastewater system operates in an area subject to strict regulatory oversight by Federal and State agencies such as the U.S. Environmental Protection Agency (US EPA) and the California State Water Resources Control Board (SWRCB). The District must comply with a multitude of laws including, but not limited to, State Wastewater Discharge Requirements (WDRs). Complying with these regulations and resulting mandates contributes to a large share of the cost burden on the District system.

2.2 SCOPE OF WORK

The County retained Black & Veatch in 2016 to update a wastewater cost of service study and capacity fee analysis previously developed by Black & Veatch in 2014. Presented herein are the results of a study of the District’s projected revenues, revenue requirements, cost of service, and rates for service.

For purposes of this report, the study period is the fiscal years beginning July 1, 2016 and ending June 30, 2022. Unless otherwise noted, references in this report to a specific year are for the District's year ending June 30. To avoid confusion between calendar and fiscal years, the term FY refers to the year beginning July 1 and ending June 30.

The long-term financial plan for the District uses study period revenue and expense projections based on a review of historical factors and the District's operating and capital budgets and financial policies. The study of revenue requirements recognizes projected operation and maintenance expenses, establishment and maintenance of proposed reserve funds, and capital financing requirements. Capital financing requirements include capital improvement expenditures met from annual revenues and available reserve funds.

The District's costs of service were allocated to customer classes utilizing a cost causative approach endorsed by the Water Environment Federation (WEF) rate setting manual Financing and Charges for Wastewater Systems (MOP 27). The allocation methodology produced cost of service allocations recognizing the projected customer service requirements for the District. The design of proposed rates is in accordance with allocated cost of service and local policy considerations, such as reserve funding levels. Additionally, this study evaluates the extent to which the existing rate structure recovers revenues from customer classes in accordance with cost of service allocations.

2.3 DISCLAIMER

In conducting the Study, Black & Veatch reviewed the books, records, agreements, capital improvement programs, customer sales and financial projections of the District, as we deemed necessary to express our opinion of the operating results and projections. While Black & Veatch considers such books, records, documents, and projections to be reliable, Black & Veatch has not verified the accuracy of these documents.

The projections set forth in this report are intended as "forward-looking statements". In formulating these projections, Black & Veatch has made certain assumptions with respect to conditions, events, and circumstances that may occur in the future. The methodology utilized in performing the analyses follows generally accepted practices for such projections. Such assumptions and methodologies are reasonable and appropriate for the purpose for which they are used. While Black & Veatch believes the assumptions are reasonable and the projection methodology valid, actual results may differ materially from those projected, as influenced by the conditions, events, and circumstances that actually occur. Such factors that may affect the District's ability to manage the system and meet regulatory or environmental requirements include the following: the County's ability to execute the capital improvement program as scheduled and within budget; and adverse legislative, regulatory or legal decisions (including environmental laws and regulations).

3 Wastewater Rate Study

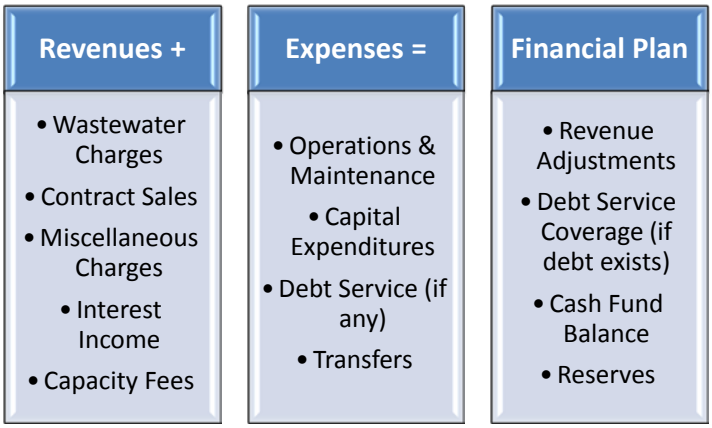
The rate study/cost of service process followed by Black & Veatch in this Study consists of three parts, with each part answering a specific question:

- **Revenue Requirements** – This section develops the District's Financial Plan and answers the question "How much money is needed to operate the utility and fund capital improvements?"
- **Cost of Service** – This section allocates the different costs for providing wastewater service to customers. The question addressed in this part of the process is "From whom should the money be collected?"
- **Rate Design** – This last part of the process examines different possible user fee structures to answer the question "How should the District's services be priced?"

The subsequent sections of this Study present the three parts of the cost of service analysis conducted by Black & Veatch for the District.

3.1 REVENUE REQUIREMENTS

The District provides wastewater collection and treatment services to its residential and non-residential customer classes. As noted in the figure below, to meet the costs associated with providing wastewater services to its customers, the District derives revenue from a variety of sources including but not limited to wastewater sales (user charges), contract sales, miscellaneous charges, interest income, and capacity and annexation fees (one-time fees collected at time of system connection to use capacity in the existing treatment and collection facilities). The level of future revenue generated in the study is projected through a combination of an analysis of future system growth in terms of number of equivalent dwelling units (EDU) and sewage volume. An EDU is defined as a unit of measure that is based on the flow of characteristics of an average single-family residence in terms of sewage quantity.



With revenue derived from the various sources, the District funds the cash requirements of operation and maintenance (O&M); reserve levels set forth in the County's Reserve Policy, Number I-99; and recurring annual capital expenditures for replacements, system betterments, and extensions. O&M expenses are those expenditures necessary to maintain the system in good working order. Capital expenditures consist of recurring routine annual replacements as well as major capital projects for larger infrastructure. Currently, the District cash finances all capital expenditures, meaning that no expenses are financed with debt or grant monies. As noted in the Executive Summary, current and projected system revenues at current rate and fee levels are not sufficient to meet District expenses over the study period.

3.2 CUSTOMER PROJECTIONS

In order to bill its customers, the District uses residential and non-residential EDUs. An EDU represents a typical single family residential household that discharges roughly 240 gallons per day (gpd) of wastewater flow. All single-family residential accounts are assigned one EDU, while all multi-family residential accounts are assigned 80 percent of an EDU, or 0.8 EDU. Residential accounts are assigned baseline EDUs because the effluent flow and concentration qualities for residential classes are fairly homogenous from one dwelling unit to another. For non-residential customers, EDUs are calculated based on measured water consumption provided to the District by the respective water purveyor or estimated based on industry standard water usage factors. Non-residential customers have a wider variety of effluent flow and concentration qualities than do residential and therefore consist of a wider range of EDU assignments.

The District uses EDUs based on Ordinance and flow data. An **Ordinance EDU** is an assigned EDU based on the total capacity that a customer can contribute to the wastewater system based on characteristics of the customer class. For example, a new single family residential customer is assigned one Ordinance EDU based on the premise that it will discharge sewage flow on average about 240 gpd. Non-residential customers are initially assigned Ordinance EDUs based on calculated sewer flow using type of business, square footage and number of fixtures. A **Flow EDU** uses measured contributed wastewater volume generated from water consumption data. Flow EDUs are assigned to non-residential customers as water purveyors provide the District with water usage data for these customers on a yearly basis. Refer to the County's USO Articles 5.3 and 5.4.

Flow EDU:

- **Measured contributed wastewater volume using water consumption data**

Ordinance EDU:

- **Total capacity contributed based on customer class characteristics**

To forecast revenue, the number of Ordinance and Flow EDUs, as well as wastewater volume needs to be forecasted for the District's service areas. Table 3-1 shows the projected Ordinance EDUs and Table 3-2 shows the projected Flow EDUs. Based on growth trends in San Diego County, as provided by SANDAG Series 13 Regional Growth Forecast, this analysis assumes that single-family customer connections will increase by 1.5 percent annually over the study period, while other customer classes will experience less than 1.0 percent annual growth during the same period.

Table 3-1 Projection of Ordinance EDUs

Line No.	Description	Fiscal Year Ending June 30,				
		FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
		(EDUs)	(EDUs)	(EDUs)	(EDUs)	(EDUs)
	Ordinance EDUs					
1	Single-family Residential	33,946	34,456	34,974	35,499	36,031
2	Multi-family Residential	10,256	10,337	10,420	10,503	10,586
3	Car Wash	149	149	149	149	149
4	Barber & Beauty Salons	97	97	97	97	97
5	Department Stores, Retail Stores, General Commercial	2,607	2,611	2,615	2,619	2,623
6	Warehouse	49	49	49	49	49
7	Hospitals & Convalescent Homes	961	963	965	967	969
8	Laundromats	77	77	77	77	77
9	Nurseries	0	0	0	0	0
10	Hotels/Motels w/o Dining	103	103	103	103	103
11	Auto Repair/Sales Shops & Service Stations	344	344	344	344	344
12	Shopping Centers	2	2	2	2	2
13	Bar w/o Dining	34	34	34	34	34
14	Commercial Laundry	15	15	15	15	15
15	Movie Theater	15	15	15	15	15
16	Lumber Yards	1	1	1	1	1
17	Convenience & Liquor Stores w/Deli	138	138	138	138	138
18	Industrial Laundry	0	0	0	0	0
19	Hotel w/ Restaurant	5	5	5	5	5
20	Auto Steam Cleaning	0	0	0	0	0
21	Bakery or Bakery/Deli	20	20	20	20	20
22	Restaurant & Bar w/Food	883	885	887	889	891
23	Food Stores	111	111	111	111	111
24	Mortuary	4	4	4	4	4
25	Churches	338	339	340	341	342
26	Schools	735	736	737	738	739
27	Membership Organizations	31	31	31	31	31
28	Restaurants w/ Waste Separation	0	0	0	0	0
29	Mobile Homes	2,946	2,926	2,906	2,886	2,866
30	**Total Ordinance EDUs**	**53,867**	**54,448**	**55,039**	**55,637**	**56,242**

Table 3-2 Projection of Flow EDUs

Line No.	Description	Fiscal Year Ending June 30,				
		FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
		(EDUs)	(EDUs)	(EDUs)	(EDUs)	(EDUs)
	Flow EDUs					
1	Single-family Residential	33,946	34,456	34,974	35,499	36,031
2	Multi-family Residential	9,682	9,759	9,837	9,915	9,994
3	Car Wash	249	249	249	249	249
4	Barber & Beauty Salons	58	58	58	58	58
5	Department Stores, Retail Stores, General Commercial	2,259	2,262	2,265	2,268	2,271
6	Warehouse	48	48	48	48	48
7	Hospitals & Convalescent Homes	884	886	888	890	892
8	Laundromats	102	102	102	102	102
9	Nurseries	0	0	0	0	0
10	Hotels/Motels w/o Dining	108	108	108	108	108
11	Auto Repair/Sales Shops & Service Stations	301	301	301	301	301
12	Shopping Centers	2	2	2	2	2
13	Bar w/o Dining	25	25	25	25	25
14	Commercial Laundry	10	10	10	10	10
15	Movie Theater	14	14	14	14	14
16	Lumber Yards	1	1	1	1	1
17	Convenience & Liquor Stores w/Deli	122	122	122	122	122
18	Industrial Laundry	0	0	0	0	0
19	Hotel w/ Restaurant	9	9	9	9	9
20	Auto Steam Cleaning	0	0	0	0	0
21	Bakery or Bakery/Deli	23	23	23	23	23
22	Restaurant & Bar w/Food	719	720	721	722	723
23	Food Stores	102	102	102	102	102
24	Mortuary	5	5	5	5	5
25	Churches	309	310	311	312	313
26	Schools	730	731	732	733	734
27	Membership Organizations	54	54	54	54	54
28	Restaurants w/ Waste Separation	0	0	0	0	0
29	Mobile Homes	2,841	2,821	2,802	2,783	2,764
30	**Total Flow EDUs**	**52,603**	**53,178**	**53,763**	**54,355**	**54,955**

In comparing the results of Table 3-1 to Table 3-2, the number of Flow EDUs is less than Ordinance EDUs because the Ordinance EDU count is based on the wastewater system's designed ability to handle a certain amount of contributed volume whereas the Flow EDU count is based on actual measured volume plus typical flow amounts for residential customers. The application of Flow and Ordinance EDUs is more fully explained in the Cost of Service Allocation section of this report.

3.2.1 Customer Flows

As mentioned earlier in this section, the amount of sewage flow is estimated based on 240 gpd usage per EDU for each customer class. For residential customers, Ordinance EDU is utilized while for non-residential customers Flow EDU is utilized. In addition, sewage flow incorporates contributed infiltration and inflow (I/I) of water into the wastewater system of roughly 5 percent based on typical I/I experienced in the area. I/I, while not generated by customers, is a real cost to the District as this added flow is eventually treated at the end of the wastewater collection system. I/I flows are distributed to the customer classes based on sewage contribution to help ensure each class pays its proportionate share of I/I treatment costs. Projection of contributed flow is represented in Table 3.3.

Table 3-3 Projection of Contributed Flow in Million Gallons

Line No.	Description	Fiscal Year Ending June 30,				
		FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
		(MG)	(MG)	(MG)	(MG)	(MG)
	Billed Volume					
1	Single-family Residential	3,122	3,169	3,217	3,265	3,314
2	Multi-family Residential	891	898	905	912	919
3	Car Wash	23	23	23	23	23
4	Barber & Beauty Salons	5	5	5	5	5
5	Department Stores, Retail Stores, General Commercial	208	208	208	209	209
6	Warehouse	4	4	4	4	4
7	Hospitals & Convalescent Homes	81	81	82	82	82
8	Laundromats	9	9	9	9	9
9	Nurseries	0	0	0	0	0
10	Hotels/Motels w/o Dining	10	10	10	10	10
11	Auto Repair/Sales Shops & Service Stations	28	28	28	28	28
12	Shopping Centers	0	0	0	0	0
13	Bar w/o Dining	2	2	2	2	2
14	Commercial Laundry	1	1	1	1	1
15	Movie Theater	1	1	1	1	1
16	Lumber Yards	0	0	0	0	0
17	Convenience & Liquor Stores w/Deli	11	11	11	11	11
18	Industrial Laundry	0	0	0	0	0
19	Hotel w/ Restaurant	1	1	1	1	1
20	Auto Steam Cleaning	0	0	0	0	0
21	Bakery or Bakery/Deli	2	2	2	2	2
22	Restaurant & Bar w/Food	66	66	66	66	67
23	Food Stores	9	9	9	9	9
24	Mortuary	0	0	0	0	0
25	Churches	28	29	29	29	29
26	Schools	67	67	67	67	68
27	Membership Organizations	5	5	5	5	5
28	Restaurants w/ Waste Separation	0	0	0	0	0
29	Mobile Homes	261	259	258	256	254
30	**Total Billed WW Volume (MG)**	**4,838**	**4,891**	**4,945**	**5,000**	**5,055**

3.2.2 Customer Strengths

The level of pollutant loading in the influent stream is an important consideration in the operation of a wastewater treatment facility. Table 3-4 on the next page summarizes the level of total suspended solids (TSS) and biological oxygen demand (BOD) for each customer class. The strength loadings use a combination of measured readings (from the City of San Diego at the Metro treatment facilities) and standard reference materials. Additional information regarding customer strengths is provided later in this report.

Table 3-4 Projection of Pollutant Loadings in Pounds

Line No.	Description	Fiscal Year Ending June 30,				
		FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
		(Lbs)	(Lbs)	(Lbs)	(Lbs)	(Lbs)
	Billed BOD Loadings					
1	Single-family Residential	5,728,893	5,814,964	5,902,384	5,990,985	6,080,768
2	Multi-family Residential	1,633,982	1,646,977	1,660,140	1,673,304	1,686,636
3	Car Wash	3,820	3,820	3,820	3,820	3,820
4	Barber & Beauty Salons	6,674	6,674	6,674	6,674	6,674
5	Department Stores, Retail Stores, General Commercial	259,936	260,282	260,627	260,972	261,317
6	Warehouse	5,523	5,523	5,523	5,523	5,523
7	Hospitals & Convalescent Homes	169,532	169,916	170,299	170,683	171,066
8	Laundromats	11,737	11,737	11,737	11,737	11,737
9	Nurseries	0	0	0	0	0
10	Hotels/Motels w/o Dining	25,683	25,683	25,683	25,683	25,683
11	Auto Repair/Sales Shops & Service Stations	41,562	41,562	41,562	41,562	41,562
12	Shopping Centers	476	476	476	476	476
13	Bar w/o Dining	5,753	5,753	5,753	5,753	5,753
14	Commercial Laundry	3,452	3,452	3,452	3,452	3,452
15	Movie Theater	3,222	3,222	3,222	3,222	3,222
16	Lumber Yards	307	307	307	307	307
17	Convenience & Liquor Stores w/Deli	46,794	46,794	46,794	46,794	46,794
18	Industrial Laundry	0	0	0	0	0
19	Hotel w/ Restaurant	3,452	3,452	3,452	3,452	3,452
20	Auto Steam Cleaning	0	0	0	0	0
21	Bakery or Bakery/Deli	17,644	17,644	17,644	17,644	17,644
22	Restaurant & Bar w/Food	551,554	552,322	553,089	553,856	554,623
23	Food Stores	62,596	62,596	62,596	62,596	62,596
24	Mortuary	3,068	3,068	3,068	3,068	3,068
25	Churches	30,815	30,915	31,014	31,114	31,214
26	Schools	72,799	72,899	72,998	73,098	73,198
27	Membership Organizations	5,385	5,385	5,385	5,385	5,385
28	Restaurants w/ Waste Separation	0	0	0	0	0
29	Mobile Homes	479,461	476,086	472,879	469,673	466,466
30	**Total Billed BOD Loadings (Lbs)**	**9,174,120**	**9,271,509**	**9,370,578**	**9,470,833**	**9,572,436**

Table 3-4 Projection of Pollutant Loadings in Pounds (cont'd.)

Line No.	Description	Fiscal Year Ending June 30,				
		FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
		(Lbs)	(Lbs)	(Lbs)	(Lbs)	(Lbs)
	Billed TSS Loadings					
1	Single-family Residential	5,728,893	5,814,964	5,902,384	5,990,985	6,080,768
2	Multi-family Residential	1,633,982	1,646,977	1,660,140	1,673,304	1,686,636
3	Car Wash	28,652	28,652	28,652	28,652	28,652
4	Barber & Beauty Salons	11,123	11,123	11,123	11,123	11,123
5	Department Stores, Retail Stores, General Commercial	259,936	260,282	260,627	260,972	261,317
6	Warehouse	5,523	5,523	5,523	5,523	5,523
7	Hospitals & Convalescent Homes	67,813	67,966	68,120	68,273	68,426
8	Laundromats	8,607	8,607	8,607	8,607	8,607
9	Nurseries	0	0	0	0	0
10	Hotels/Motels w/o Dining	9,942	9,942	9,942	9,942	9,942
11	Auto Repair/Sales Shops & Service Stations	64,652	64,652	64,652	64,652	64,652
12	Shopping Centers	353	353	353	353	353
13	Bar w/o Dining	5,178	5,178	5,178	5,178	5,178
14	Commercial Laundry	1,841	1,841	1,841	1,841	1,841
15	Movie Theater	2,578	2,578	2,578	2,578	2,578
16	Lumber Yards	330	330	330	330	330
17	Convenience & Liquor Stores w/Deli	28,076	28,076	28,076	28,076	28,076
18	Industrial Laundry	0	0	0	0	0
19	Hotel w/ Restaurant	4,142	4,142	4,142	4,142	4,142
20	Auto Steam Cleaning	0	0	0	0	0
21	Bakery or Bakery/Deli	10,586	10,586	10,586	10,586	10,586
22	Restaurant & Bar w/Food	330,933	331,393	331,853	332,313	332,774
23	Food Stores	62,596	62,596	62,596	62,596	62,596
24	Mortuary	3,068	3,068	3,068	3,068	3,068
25	Churches	23,704	23,781	23,857	23,934	24,011
26	Schools	55,999	56,076	56,153	56,229	56,306
27	Membership Organizations	4,142	4,142	4,142	4,142	4,142
28	Restaurants w/ Waste Separation	0	0	0	0	0
29	Mobile Homes	479,461	476,086	472,879	469,673	466,466
30	**Total Billed TSS Loadings (Lbs)**	**8,832,110**	**8,928,914**	**9,027,402**	**9,127,072**	**9,228,093**

3.3 REVENUE UNDER EXISTING RATES

The primary source of revenue for the District is derived from sewer service user charges. Therefore, to derive the total revenue under existing rates, the Ordinance EDUs and Flow EDUs are multiplied by their respective rates and summed for all customer classes.

$$Revenue\ under\ Existing\ Rates\ = \sum (Number\ of\ Ordinance\ or\ Flow\ EDUs)\ x\ \$/EDU$$

The capacity charge is the charge for District costs outside of Metro associated with local collection of wastewater. The treatment charge is associated with costs for treatment and disposal of wastewater. The capacity charge is uniform for all customer classes as it does not distinguish between customer classes. The treatment charge varies between each customer class as it is based on each class' flow and strength factors. The logic in using strength data is that each customer contributes different factors to the treatment system and thus the system is designed and operated to handle these flows and loadings. Therefore, customer classes that contribute higher strength flows should contribute more towards the costs of operating and maintaining the treatment system operations and infrastructure. This study does not take into account the potential effect of the US EPA's future decision on the renewal of the Point Loma treatment facility Clean Water Act 301(h) waiver. It is not known at this time what the fiscal impact will be on Metro costs to the District regarding the status of the waiver.

The current wastewater rates for each customer class are shown in Table 3-5

Table 3-5 Existing Wastewater Rates for FY 2017

Description	Capacity Charge	Treatment Charge	Total Charge
	($/EDU/year)	($/EDU/year)	($/EDU/year)
Customer Class			
Single-family Residential	$163.04	$172.96	$336.00
Multi-family Residential	$163.04	$172.96	$336.00
Car Wash	$163.04	$124.10	$287.14
Barber & Beauty Salons	$163.04	$174.09	$337.13
Department Stores, Retail Stores, General Commercial	$163.04	$151.08	$314.12
Warehouse	$163.04	$151.08	$314.12
Hospitals & Convalescent Homes	$163.04	$160.33	$323.37
Laundromats	$163.04	$141.88	$304.92
Nurseries	$163.04	$212.12	$375.16
Hotels/Motels w/o Dining	$163.04	$177.39	$340.43
Auto Repair/Sales Shops & Service Stations	$163.04	$187.21	$350.25
Shopping Centers	$163.04	$202.69	$365.73
Bar w/o Dining	$163.04	$209.82	$372.86
Commercial Laundry	$163.04	$234.05	$397.09
Movie Theater	$163.04	$202.92	$365.96
Lumber Yards	$163.04	$267.38	$430.42
Convenience & Liquor Stores w/Deli	$163.04	$258.23	$421.27
Industrial Laundry	$163.04	$380.93	$543.97
Hotel w/ Restaurant	$163.04	$327.24	$490.28
Auto Steam Cleaning	$163.04	$358.63	$521.67
Bakery or Bakery/Deli	$163.04	$431.02	$594.06
Restaurant & Bar w/Food	$163.04	$431.02	$594.06
Food Stores	$163.04	$435.52	$598.56
Mortuary	$163.04	$435.52	$598.56
Churches	$163.04	$135.43	$298.47
Schools	$163.04	$135.43	$298.47
Membership Organizations	$163.04	$135.43	$298.47
Restaurants w/ Waste Separation	$163.04	$258.23	$421.27
Mobile Homes	$163.04	$172.96	$336.00

Table 3-6 summarizes wastewater user charge revenue by multiplying the existing capacity charge rates with the ordinance EDUs plus multiplication of the existing treatment charge rates with the flow EDUs for each customer class. The projected wastewater revenue, at existing rates, increases from approximately $18.0 million in FY 2018 to roughly $18.8 million in FY 2022 due to projected growth in customer accounts during this period.

Table 3-6 Summary of Service Charge Revenues (Existing Charges)

Line No.	Description	Fiscal Year Ending June 30,				
		FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
		($)	($)	($)	($)	($)
	Customer Class					
1	Single-family Residential	11,405,856	11,577,216	11,751,264	11,927,664	12,106,416
2	Multi-family Residential	3,346,737	3,373,261	3,400,284	3,427,308	3,454,504
3	Car Wash	55,194	55,194	55,194	55,194	55,194
4	Barber & Beauty Salons	25,912	25,912	25,912	25,912	25,912
5	Department Stores, Retail Stores, General Commercial	766,338	767,443	768,549	769,654	770,760
6	Warehouse	15,241	15,241	15,241	15,241	15,241
7	Hospitals & Convalescent Homes	298,417	299,064	299,711	300,358	301,004
8	Laundromats	27,026	27,026	27,026	27,026	27,026
9	Nurseries	0	0	0	0	0
10	Hotels/Motels w/o Dining	35,951	35,951	35,951	35,951	35,951
11	Auto Repair/Sales Shops & Service Stations	112,437	112,437	112,437	112,437	112,437
12	Shopping Centers	731	731	731	731	731
13	Bar w/o Dining	10,789	10,789	10,789	10,789	10,789
14	Commercial Laundry	4,786	4,786	4,786	4,786	4,786
15	Movie Theater	5,286	5,286	5,286	5,286	5,286
16	Lumber Yards	430	430	430	430	430
17	Convenience & Liquor Stores w/Deli	54,004	54,004	54,004	54,004	54,004
18	Industrial Laundry	0	0	0	0	0
19	Hotel w/ Restaurant	3,760	3,760	3,760	3,760	3,760
20	Auto Steam Cleaning	0	0	0	0	0
21	Bakery or Bakery/Deli	13,174	13,174	13,174	13,174	13,174
22	Restaurant & Bar w/Food	453,867	454,624	455,381	456,138	456,895
23	Food Stores	62,520	62,520	62,520	62,520	62,520
24	Mortuary	2,830	2,830	2,830	2,830	2,830
25	Churches	96,955	97,253	97,552	97,850	98,149
26	Schools	218,697	218,996	219,294	219,593	219,891
27	Membership Organizations	12,367	12,367	12,367	12,367	12,367
28	Restaurants w/ Waste Separation	0	0	0	0	0
29	Mobile Homes	971,695	964,975	958,428	951,881	945,334
30	**Total Revenue**	**$ 18,001,000**	**$ 18,195,270**	**$ 18,392,901**	**$ 18,592,884**	**$ 18,795,391**

3.4 OTHER MISCELLANEOUS REVENUE

In addition to revenue from user charges, the District obtains revenue from other operating sources. Other revenue sources include rents and concessions, services to property owners, contributions from other government agencies, interest earned from the investment of available funds and minor miscellaneous revenues. In total, these revenues represent about 3.3 percent of total wastewater revenues. It is anticipated that these revenues will remain relatively constant for the duration of the study period.

3.5 OPERATION AND MAINTENANCE PROJECTIONS

Inflation Assumptions

- ***Personnel: 2.6%***
- ***Supplies: 2.3%***
- ***Treatment (Metro): 2.6%***
- ***Treatment (County): 2.3%***
- ***Maintenance: 2.3%***
- ***Contract Services: 2.3%***
- ***Utilities: 2.3%***
- ***Administrative: 2.3%***

Summarized in Table 3-7 are the District's projected O&M expenditures. These expenditures include costs related to personnel, operating supplies, treatment, maintenance, contract services, utilities, and general administrative. The forecasted expenditures reflect projected operational needs of the utility and anticipated expenses. In addition, Black & Veatch examined industry inflation factors to escalate factors associated with personnel, treatment, supplies, maintenance and utilities. The figure box to the right summarizes key assumptions for inflation rates used in the O&M expense projections. The levels of adjustment illustrated on the right are consistent with recent increases seen throughout the San Diego area.

Table 3-7 Summary of O&M Expenses

Line No.	Description	Fiscal Year Ending June 30,				
		FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
		($)	($)	($)	($)	($)
	Operation and Maintenance					
1	Personnel	6,459,407	6,627,352	6,799,663	6,976,454	7,157,841
2	Maintenance	750,000	767,250	784,897	802,950	821,418
3	Metro Treatment	12,735,994	13,059,215	13,507,587	14,578,756	14,593,772
4	Services and Supplies	1,178,700	1,205,810	1,233,543	1,261,914	1,290,938
5	Utilities	155,297	158,869	162,523	166,261	170,085
6	Administrative	415,189	424,738	434,507	444,501	454,725
7	**Total O&M Expenses**	**$ 21,694,587**	**$ 22,243,234**	**$ 22,922,720**	**$ 24,230,836**	**$ 24,488,779**

3.6 CAPITAL IMPROVEMENT PROGRAM

Utilities are infrastructure-heavy businesses. Inflating future costs by an ENR-CCI index that specifically adjusts for construction and commodity costs is an industry best practice.

While O&M expenses cover day-to-day operations, the District wastewater system incurs additional capital expenditures to replace existing and/or build new wastewater facilities. As a result, District staff has developed a long-term Capital Improvement Plan (CIP) that identifies future wastewater facility's needs. For purposes of this study CIP expenditures were based on the average annual cost of the CIP of approximately $4 million per year. The CIP is a constantly evolving program and District staff reviews all projects on an annual basis. Consequently, projects may extend out in time or drop off the CIP if they become unnecessary or can be deferred to a later year. Conversely, District staff may add projects as the need arises.

Table 3-8 Summary of Capital Improvement Projects

Line No.	Description	Fiscal Year Ending June 30,				
		FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
		($)	($)	($)	($)	($)
	Capital Improvement Program					
1	Aggregate CIP Spending	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000
2	**Total CIP**	**$ 4,000,000**	**$ 4,000,000**	**$ 4,000,000**	**$ 4,000,000**	**$ 4,000,000**

3.6.1 Capital Fund Financing

In order to finance the CIP, the District proposes to utilize a combination of funds on hand (reserves), capacity fees, annexation fees, and customer service charges. No debt financing is anticipated during the study period. Summarized in Table 3-9 is the capital fund financing plan for the study period.

Table 3-9 Capital Fund Financing

Line No.	Description	Fiscal Year Ending June 30, FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
	Source of Funds					
1	Sanitation Service Connection	70,000	70,000	70,000	70,000	70,000
2	Revenue Bond Proceeds	0	0	0	0	0
3	Transfer In - Operating Fund	3,894,152	3,897,688	3,897,697	3,897,697	3,897,697
4	Transfer In - Emergency Repair Reserve Fund	0	0	0	0	0
5	Grant Funding	0	0	0	0	0
6	Interest Earnings	32,312	32,303	32,303	32,303	32,303
7	**Total Sources**	**$ 3,996,464**	**$ 3,999,991**	**$ 4,000,000**	**$ 4,000,000**	**$ 4,000,000**
	Use of Funds					
8	Capital Improvements Projects	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000
9	Transfers Out	0	0	0	0	0
10	Debt Issuance Expense	0	0	0	0	0
11	**Total Uses**	**$ 4,000,000**	**$ 4,000,000**	**$ 4,000,000**	**$ 4,000,000**	**$ 4,000,000**
12	Net Annual Cash Balance	(3,536)	(9)	0	0	0
13	Beginning Capital Fund Balance	6,464,223	6,460,687	6,460,678	6,460,678	6,460,678
14	Net Cumulative Capital Fund Balance	$ 6,460,687	$ 6,460,678	$ 6,460,678	$ 6,460,678	$ 6,460,678

Currently, the District maintains one fund to finance operating and capital needs. In an effort to separate operating needs from capital needs, Black & Veatch, with the assistance of the District, recommended creation of a distinct capital reserve fund (for more explanation, see Section 3.8 of this report). The proposed capital reserve fund would be used strictly to finance the CIP through capacity fees and transfers from the operating fund. Much of the current balance consists of committed funds.

In developing the capital fund, it was identified that the service area locations of Lakeside, and Winter Gardens still had funds on hand from previous annexation fees and capacity fees. Therefore, within the District, there is an effort to use those funds strictly within the areas in which they were originally collected. Once those funds are expended, the District's capital fund will have one bucket for the entire District.

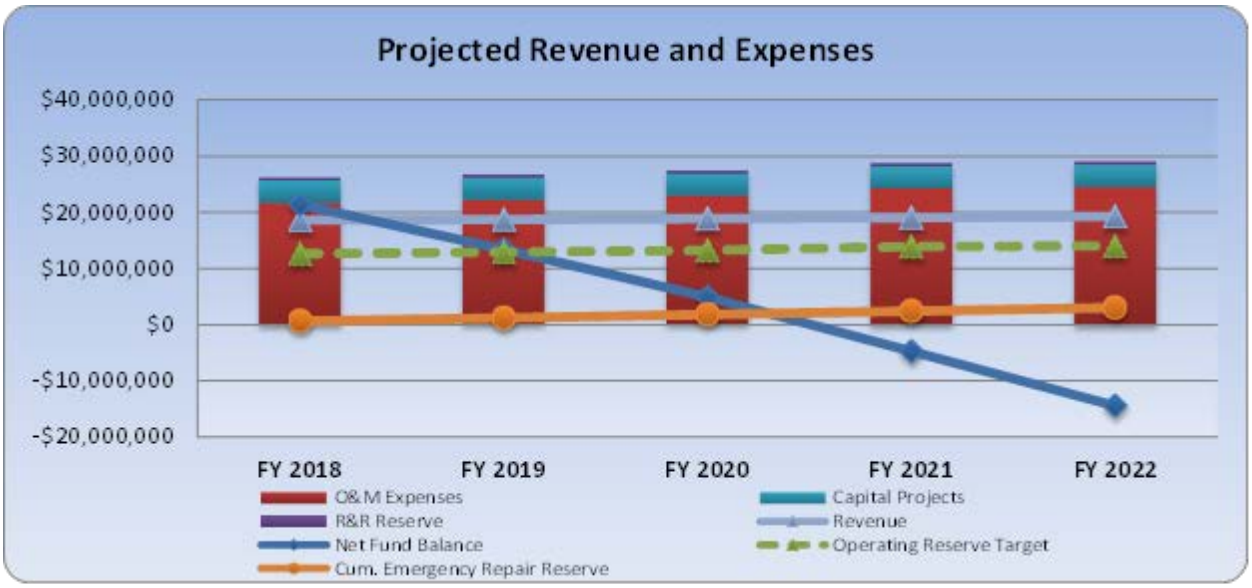
3.6.2 Operating Results

Similar to the capital fund, the District maintains an operating fund. The operating fund is designed to cover day-to-day expenses, debt service requirements and transfers (capital contribution). The District currently has no debt and does not intend to use any during the study period.

In the analysis, it was important to identify the state of the District under the status quo scenario where the District does not impose any rate revenue increases over the study period. As shown in Figure 3-1, the status quo conditions means that the District will continue to operate at an annual deficit position thus tapping into its fund balance. As noted in the figure, the net fund balance will be depleted by FY 2020.

Under the Status Quo scenario, the District's revenues are not enough to cover annual O&M and capital needs. With the suggested adjustments, the District moves towards making sure that annual revenues equal annual expenditures plus policy requirements.

Figure 3-1 Projected Operating Cash Flow (Status Quo)



In order to avoid the deficit position starting in FY 2021, the District determined that the appropriate scenario for rate revenue increases that would meet the revenue requirements and operating reserve requirements would be to implement the rate revenue increases shown in Table 3-10. The revenue increases represent the total revenue adjustment needed to meet revenue requirements. The revenue adjustment does not necessarily represent the specific adjustment to individual rates.

Table 3-10 Recommended Rate Revenue Adjustments

Fiscal Year	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
Revenue Adjustment	8.65%	9.00%	9.00%	9.00%	9.00%
Effective Month	July	July	July	July	July

Table 3-11 reflects the proposed operating cash flow. The recommended adjustments incorporate the required revenue increases to meet revenue requirements, capital contribution for capital projects, contributions to a capital reserve, and bring the District to a positive annual cash flow over the study period.

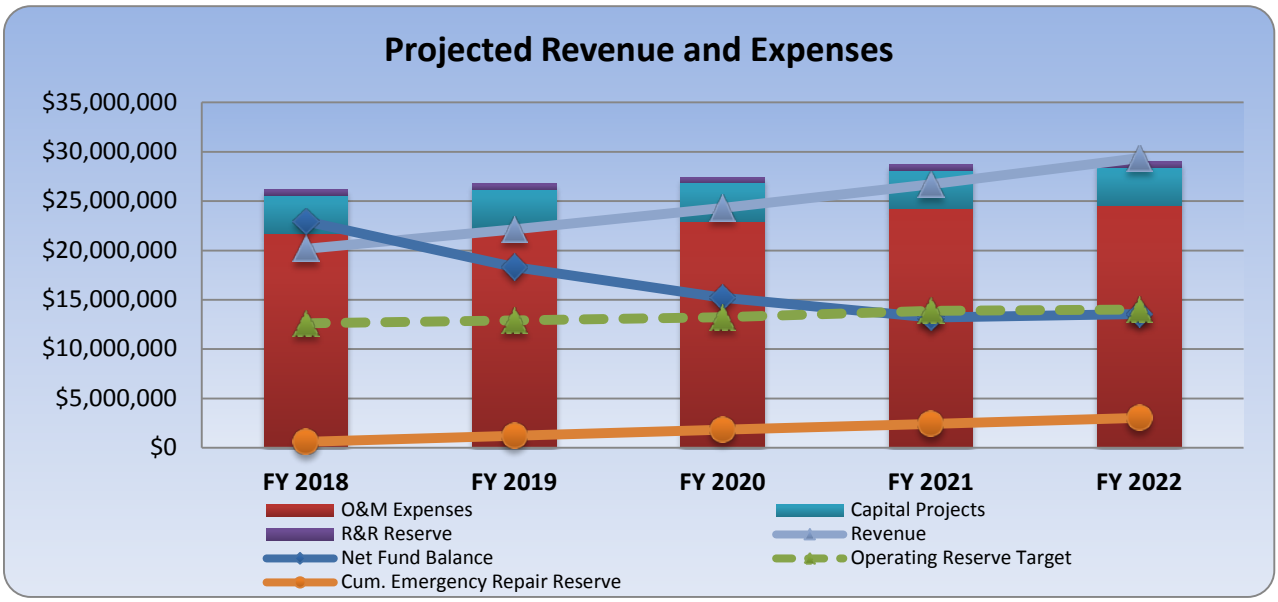
The operating fund is subdivided into revenue and revenue requirements. On line 1 is the revenue under existing rates while lines 2 to 7 are the additional revenue generated from the required annual revenue increases indicated in Table 3-11. Lines 9 to 11 represent other revenues, which include sewer charges from County facilities, miscellaneous fees and interest earned from the investment of available funds. Line 13 represents transfer from the capital fund. In line 15, the total revenues generated from existing sewer service charges, revenue from service charge increases and other operating revenue is summarized.

Table 3-11 Operating Cash Flow

Line No.	Description			Fiscal Year Ending June 30, FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
	Revenue							
	Rate Revenue							
1	Revenue from Existing Rates			18,001,000	18,195,270	18,392,901	18,592,884	18,795,391
	Year	Months Effective	Rate Adj					
2	FY 2018	12	8.65%	1,557,087	1,573,891	1,590,986	1,608,284	1,625,801
3	FY 2019	12	9.00%		1,779,224	1,798,550	1,818,105	1,837,907
4	FY 2020	12	9.00%			1,960,419	1,981,735	2,003,319
5	FY 2021	12	9.00%				2,160,091	2,183,618
6	FY 2022	12	9.00%					2,380,143
7	Increased Revenue Due to Adjustments			1,557,087	3,353,115	5,349,955	7,568,215	10,030,788
8	Subtotal Rate Revenue			$19,558,087	$21,548,385	$23,742,856	$26,161,099	$28,826,179
	Other Operating Revenue							
9	Sewer Service Charges from County			83,769	91,308	99,526	108,483	118,246
10	Other Miscellaneous Revenue			473,800	473,800	473,800	473,800	473,800
11	Interest Earnings			130,001	103,415	84,098	71,265	67,185
12	Subtotal Other Operating Revenue			$603,801	$577,215	$557,898	$545,065	$540,985
	Transfers							
13	Transfer from Capital Fund			0	0	0	0	0
14	Subtotal Non-Operating Revenue			$0	$0	$0	$0	$0
15	**Total Revenue**			**$ 20,161,888**	**$ 22,125,600**	**$ 24,300,754**	**$ 26,706,164**	**$ 29,367,164**
	Revenue Requirements							
	Operating & Maintenance							
16	O&M Expenses (Collection)			8,958,593	9,184,019	9,415,133	9,652,080	9,895,007
17	Treatment Costs			12,735,994	13,059,215	13,507,587	14,578,756	14,593,772
18	Subtotal O&M			$21,694,587	$22,243,234	$22,922,720	$24,230,836	$24,488,779
	Transfers							
19	Transfer to Capital Fund			3,894,152	3,897,688	3,897,697	3,897,697	3,897,697
20	Transfer to Committed Funds			0	0	0	0	0
21	Transfer to Emergency Repair Reserve			600,000	600,000	600,000	600,000	600,000
22	Total Transfers			$4,494,152	$4,497,688	$4,497,697	$4,497,697	$4,497,697
23	**Total Revenue Requirements**			**$ 26,188,739**	**$ 26,740,922**	**$ 27,420,417**	**$ 28,728,533**	**$ 28,986,476**
24	Net Annual Cash Balance			(6,026,851)	(4,615,322)	(3,119,663)	(2,022,369)	380,688
25	Beginning Fund Balance			28,971,781	22,944,930	18,329,608	15,209,945	13,187,576
26	Net Cumulative Fund Balance			$ 22,944,930	$ 18,329,608	$ 15,209,945	$ 13,187,576	$ 13,568,264

The revenue requirements for O&M and transfers are shown on lines 16 through 22. These expenses have been previously discussed. Line 23 represents the total revenue requirement that will need to be met through revenue. The net cumulative balance is indicated in line 26. By County policy, the District strives to maintain a minimum of 180 days of O&M expenses as an operating reserve balance. While the industry standard is typically 90 days of O&M expenses, the District maintains a larger minimum because the District receives revenues from payment of property taxes. Because the County does not begin to remit collected tax, assessment and fee revenues until December or January of the fiscal year, the District must maintain reserves equivalent to 6 months to cover day-to-day expenses. Figure 3-2 presents the operating cash flow projections with the proposed sewer service charge adjustments.

Figure 3-2 Projected Operating Cash Flow with Recommended Sewer Charge Adjustments



The operating fund operates in an annual deficit, relying on its reserves to meet expenses. The District has maintained a healthy reserve with an estimated $29 million beginning in FY 2017, but with increasing O&M costs and planned capital expenditures, the District needs to adjust sewer charges to avoid depleting reserve levels. Therefore, Black & Veatch recommends that the District implement the series of proposed sewer service charge revenue increases. The District should be able to meet its revenue requirements under the assumption that no significant changes occur outside the assumptions maintained in this study. While this analysis and report should be working products, we recommend District staff re-examine the revenue requirements and rate structure on an annual basis to verify sewer service charge revenues are adequate.

The District's current mode of using reserves to meet annual expenses is not a long-term sustainable practice. The proposed financial plan combines short-term use of reserves with revenue increases move the District to a fiscally sustainable position.

3.7 FINANCIAL RESERVES

The San Diego County Board of Supervisors set Policy I-99 which defines the financial planning and budgeting requirements to provide funding for replacement and improvement of the wastewater system and facilities. Replacement of facilities is required when facilities reach the end of their useful life (typically ranging from 25-60 years). The District, like other jurisdictions, sets aside a portion of wastewater user charges to address future needs. Facility improvements can also be funded by capacity fees and annexation fees, developer contributions, assessments, and bonds.

Currently, the County's policy as stated in I-99 requires that the District maintain one reserve fund, called Fund Balance. According to County policy, the District "shall maintain separate accounting for replacement and improvement reserves. Funds shall be placed in a single operational reserve account (Fund Balance) for (the) Sanitation District." Furthermore, the policy states that "(t)he Fund Balance shall be utilized as an operational reserve" and that the reserve minimum balance shall be set at 50 percent of the District's annual operations budget. Furthermore, the Fund Balance can provide for all repair, replacement and rehabilitation projects as well as emergency replacements that can be "reasonably anticipated".

3.7.1 Benefits of Reserve Policies

The premise of formal reserve policies assumes that the District has sufficient funds to cover normal operating and capital costs and any other liabilities, such as debt service or post-retirement benefits, should these obligations exist. Having established and sound reserve policies has significant benefits to the District and County as whole. The following are a few benefits to having a reserve policy:

1. Increased ability to fund on-going capital needs;
2. Lower rate increases in the future;
3. Improved ability to address unforeseen cash flow disruptions;
4. Improved operational stability;
5. Lower costs of issuance and lower interest rates, if debt is issued.

In examining the District's policies, the question on hand was "What type of reserves should the District have in place?" and "At what targets should the reserve levels be set?" The following section describes the recommended reserve accounts and policies for the District and should be included in the County's I-99 policy document.

3.7.2 Operating Reserve

The operating reserve is an unrestricted reserve set by District policy at a minimum of 50 percent of the District's operating budget or 180 days. The balance is intended to provide the operating fund an allowance to cover fluctuations in month-to-month expenses associated with receipt of revenues and expenses. For agencies that bill customers on a monthly or bi-monthly basis, it is industry standard to maintain a minimum reserve level anywhere from 45 to 90 days of O&M expenses[2]. However, given that the District collects service charges via the general property tax roll and annual invoices to non-taxable entities, the 180 days target is appropriate. Collections via the tax roll take place at specific points during the fiscal year; however, the District does not receive its first installment of wastewater receipts until late December or early January of the current fiscal year in which it operates. The District operates, and pays its bills, for approximately 6 months before receiving the first installment of revenues. In some cases, where County remittance of wastewater revenues is separated into percentage payments throughout the latter half of the fiscal year, a longer target level may be warranted. Therefore, we recommend continuing with the 180-day operating reserve target level and treating the net assets in this fund as unrestricted for accounting purposes.

3.7.3 Capital Repair and Replacement Reserve

Capital repair and replacement (R&R) reserve funds are typically used to repair or replace system assets that are worn out or not functioning as intended, or in the event of catastrophic failure.

[2] Due to the financial and housing crisis starting in 2008, rating agencies now recommend agencies increase their working capital levels. Agencies with large debt obligations and higher revenue volatility should have higher working capital levels.

When detailed asset condition information in not available, many agencies use depreciation expense as a guiding factor in determining the appropriate R&R reserve level. In reality, each system's assets are different in terms of use, age, condition and location. Common industry metrics used to gauge adequate levels include, but are not limited to, the following methods:

- Multiple of annual depreciation expense.
- Percentage of original cost of assets (based on the typical useful life data for each system component).
- Long-term annual average of the agency's capital improvement plan project costs (5 – 20 years).
- Cumulative amount of annual CIP costs over a given period.

Table 3-12 presents a summary of reserve policy recommendations for the District. We recommend the District maintain a maximum capital reserve target equal to the next 3 years of budgeted cumulative capital project costs but should not exceed $12 million in any given year. This figure represents a typical 3-year CIP plan cost amount. However, the minimum amount that should be held in the R&R reserve fund should never fall below $3 million. This is a figure that represents the cost for repairing a significant system asset should a catastrophic failure occur requiring the District to immediately fund such a replacement.

From an accounting perspective, the monies in the R&R reserve would not be restricted. However, we recommend that the District regard them as such. These funds are being set aside to address current and future R&R needs. Use of the funds should be limited to these purposes and changes to such a policy would require Board approval. Sewer service charges, miscellaneous revenues, future bond proceeds, if any, capacity fees, annexation fees, and related fund balance interest income would be the primary funding sources of this R&R reserve fund.

Table 3-12 Summary of Recommended Reserve Targets

RESERVE	DESCRIPTION
Operating Reserves	The operating reserve provides working capital for day-to-day operations and helps absorbs fluctuations in cash balances due to routine difference in revenue and expenses cycles. The reserve is set at 50% of annual operating budget.
Capital Repair and Replacement Reserves	The repair and replacement reserve provides funding for replacement of wastewater infrastructure due to routine capital project planning or in the event of catastrophic failure of a major system asset. The maximum reserve target level is set at the next 3 years of budgeted cumulative capital project costs but should not exceed $12 million in any given year. The minimum floor is set at $3 million; a figure that represents a major system asset replacement cost.

4 Cost of Service Allocation

The principle behind a Cost of Service (COS) study is to match the cost of providing service to customer classes and to design rates that equitably recover these costs. The first step in the COS process is to allocate the costs of operating the utility to its customers. In accordance with WEF MOP 27, we use a five-step process to allocate the costs of operating the utility to customers:

1. Select a Test Year
2. Allocate costs to utility functions according to cost causative parameters
3. Estimate total customer class service requirements for each cost function
4. Divide costs by requirements for each function to get unit costs of service
5. Distribute costs to each customer class based on its share of total requirements for each cost function

The purpose of using the revenue requirements for a specific year (Test Year) out of the Financial Plan is to illustrate how the annual revenues and costs are assigned to cost drivers and ultimately, to different customer classes.

The COS to be allocated to the various customer classes consists of the total revenue requirements for FY 2018, which is known as the test year, as summarized in Table 4-1. In determining costs of service to be met from sewer service charges only, other operating revenues (such as interest income and rents and concessions) are deducted from total revenue requirements. Other operating revenues are not subject to the revenue adjustments described earlier in this report.

Table 4-1 Wastewater Utility Cost of Service to be Recovered from Rates

Line No.	Description	Operating Expense	Capital Cost	Total Cost
		($)	($)	($)
	Revenue Requirements			
1	O&M Expense	8,958,593	0	8,958,593
2	Treatment Costs - Metro	11,719,055	0	11,719,055
3	Treatment Costs - County	1,016,939		1,016,939
4	Transfers	0	4,494,152	4,494,152
5	Subtotal	$21,694,587	$4,494,152	$26,188,739
	Less Revenue Requirements Met from Other Sources			
6	Other Operating Revenue	603,801	0	603,801
7	Transfers	0	0	0
8	Subtotal	$603,801	$0	$603,801
	Adjustments			
9	Adjustment for Annual Cash Balance	6,026,851	0	6,026,851
10	Adjustment to Annualize Rate Increase	0	0	0
11	Subtotal	$6,026,851	$0	$6,026,851
12	**Cost of Service to be Recovered from Rates**	**$ 15,063,935**	**$ 4,494,152**	**$ 19,558,087**

Note: Line 5 represents total in Table 3-7 and Line 23 from Table 3-11. Line 8 represents Lines 12 and 13 from Table 3-11. Line 11 represents Line 24 from Table 3-11.

The elements comprising the COS are assigned to the two cost categories of operating expense and capital costs. Operating expenses consist of O&M expense and other non-capital related costs such as Treatment. Operating expense is reduced by other operating revenue. Capital costs consist of capital improvements financed from annual rate revenues. Capital costs to be recovered by user charges are reduced by capacity fee transfers. As shown in Table 4-1, the total test year cost of service to be recovered from rates represents approximately $19.6 million.

Line 12 of Table 4-1 illustrates how much revenue the District must collect from user charges to meet FY 2018 needs.

The total cost shown on Line 5 of Table 4-1 matches the O&M expenses for FY 2018 found in Table 3-7.

4.1 FUNCTIONAL COMPONENTS OF WASTEWATER SYSTEM

The principles outlined in WEF's MOP 27 recognize that different parts of the wastewater system are designed to address different needs. For example, if the influent flows contain low levels of pollutants, then the level of treatment needed at the plant may be minimal. Conversely, if the wastewater utility is located in a heavily industrialized area, the level of treatment may be extensive. As a basis for allocating costs of service among customer classes, costs may be separated into the following four basic functional cost components: (1) "Capacity"; (2) "Volume"; (3) "Strength"; and (4) "Customer".

- Capacity costs represent operating and capital costs primarily associated with collection. The collection costs vary directly with the number of EDUs connected to the system.
- Volume, or flow, costs represent operating and capital costs primarily associated with treatment.
- Strength costs represent those operating costs primarily associated with treatment. The treatment costs are specifically related to treatment of Biochemical Oxygen Demand (BOD) and Total Suspended Solids (TSS). BOD and TSS relate to the strength of the wastewater which directly affects the energy and cost of wastewater treatment.
- Customer costs are defined as those that tend to vary in proportion to the number of customers connected to the system. These include billing, collecting and accounting. Since the District does not identify customer costs separately, any customer billing aspects have been incorporated into the capacity costs.

4.2 ALLOCATION TO COST COMPONENTS

Each element of costs e.g. treatment, collection, pumping, billing, customer services, is allocated to functional cost components (as defined above) on the basis of the parameter or parameters having the most significant influence on the magnitude of that element of cost. In other words, the volume of flow affects the costs to operate the collection (capacity) and treatment (volume) facilities, whereas wastewater strength affects only treatment facilities. Likewise, the analysis demonstrates a link between number of customer accounts and billing and customer service activities, and the costs of those activities.

O&M expense items are allocated directly to appropriate cost components, while the allocation of capital and replacement costs is based upon a detailed allocation of related capital investment. The separation of costs into functional components provides a means for distributing such costs to the various classes of customers on the basis of their respective responsibilities for each particular type of service. The principle guidelines used in the functional cost allocations were:

- Costs related to collection were allocated 100% to flow (expressed as EDUs) based on industry standards.
- Costs related to treatment were allocated to volume (flow), BOD and TSS based on industry standards. Costs specifically related to treatment provided by the Metro system were allocated 48.2% to flow, 24.4% to BOD, and 27.4% to TSS based on City allocations. Costs specifically related to treatment provided by the County system were allocated 50% to flow, 25% to BOD, and 25% to TSS based on industry standards.
- Indirect costs and reserve funding were allocated as "administrative" expenses. Because these administrative expenses are difficult to link to a functional cost component, such as collection or treatment, the percentage allocations for indirect costs are based on the allocation percentages of other O&M expenses.

4.2.1 Allocation of Operating and Maintenance Expense

The allocation of O&M expenses is performed by allocating them directly to the appropriate cost components to the extent possible. Where such an allocation is not possible, discussions with staff and a review of allocations used by other similarly sized utilities helped to formulate the allocation percentages shown in Table 4-2. Table 4-2 represents the allocation of O&M expenses to the functional cost components. Since the District does not have the ability to identify costs by functional cost centers, the major costs components such as personnel, supplies and services, maintenance, contract services, utilities, and administrative were used.

Table 4-2 Allocation of Operation and Maintenance Expense to Functional Cost Components

Line No.	Description	Total Cost	Collection	Treatment		
			Flow	Flow	BOD	TSS
		($)	($)	($)	($)	($)
	O&M Expenses					
1	Personnel	6,459,407	5,185,443	637,032	318,516	318,516
2	Maintenance	750,000	750,000	0	0	0
3	Treatment	12,735,994	0	6,157,055	3,113,684	3,465,256
4	Services and Supplies	1,178,700	1,178,700	0	0	0
5	Utilities	155,297	155,297	0	0	0
6	Admin	415,189	415,189	0	0	0
7	Total O&M Expenses	21,694,587	7,684,629	6,794,087	3,432,200	3,783,772
	Less Other Revenue					
8	Miscellaneous Revenues	603,801	206,267	192,782	97,388	107,364
9	Other Adjustments	6,026,851	2,058,856	1,924,253	972,084	1,071,658
10	**Net Operating Expenses**	**$ 15,063,935**	**$ 5,419,506**	**$ 4,677,052**	**$ 2,362,728**	**$ 2,604,750**
11	Percent Allocation		36.0%	31.0%	15.7%	17.3%

Note: Line 10 represents the operating expense in Table 4-1, Line 12.

4.2.2 Allocation of Capital Investments

The District's existing fixed assets are examined and classified to cost components based on their function. This analysis is conducted to determine the percentage of asset costs to allocate between the amounts of wastewater flow, BOD and TSS produced by the system and by customer class. Since the majority of the sewage flow is treated by the City of San Diego, the District maintains minimal treatment fixed assets. Using the existing fixed allocations as a guideline, future capital investments are

allocated in a similar manner. Table 4-3 represents the allocation of capital to the functional cost components.

Table 4-3 Allocation of Plant Investment to Functional Cost Components

Line No.	Description	Total Cost	Collection	Treatment		
			Flow	Flow	BOD	TSS
		($)	($)	($)	($)	($)
	Plant Assets					
1	Collection	49,833,532	49,833,532	0	0	0
2	Lift Station	13,814,572	13,814,572	0	0	0
3	Treatment	1,446,435	99	723,218	361,609	361,609
4	General Plant	848,941	830,077	9,432	4,716	4,716
5	Total Plant Assets	$65,943,480	$64,478,280	$732,650	$366,325	$366,325
	Less Contributed Capital					
6	Contributed Capital	0	0	0	0	0
7	**Net Capital Investment**	**$ 65,943,480**	**$ 64,478,280**	**$ 732,650**	**$ 366,325**	**$ 366,325**

4.3 UNITS OF SERVICE

The work completed in the previous sections essentially takes the net O&M and capital costs for FY 2018 and breaks these costs into their respective cost components. This section illustrates how to derive the unit costs for each of the cost components.

The test year unit cost of service for each functional cost component is based on the total cost divided by the applicable units of service as shown in Table 4-4.

Table 4-4 Estimated Wastewater Utility Units of Service

Line No.	Description	Total Cost	Collection	Treatment		
			Flow	Flow	BOD	TSS
		($)	($)	($)	($)	($)
	Unit Cost of Service					
1	Net Operating Expense	15,063,935	5,419,405	4,677,052	2,362,728	2,604,750
2	Capital Costs	4,494,152	4,394,289	49,931	24,966	24,966
3	**Total Cost of Service**	**$19,558,087**	**$ 9,813,694**	**$ 4,726,983**	**$ 2,387,694**	**$ 2,629,716**
4	Units of Service (EDUs - Flow in MG - BOD in lbs - TSS in		53,867	4,838	9,174,120	8,832,110
5	Cost per Unit		$182.18	$976.97	$0.26	$0.30
			per EDU	per MG	per lbs	per lbs

Note: Lines 1 and 2 represent the operating and capital expenses in Table 4-1, Line 12.

4.4 COST OF SERVICE ALLOCATIONS

Under this section, the total cost of service for each customer class is determined by summing up each class' cost for each cost component. The number of units of each cost component that a class has, multiplied by the unit cost for the component equals the total cost for the category.

$$Customer\ Cost\ for\ a\ Cost\ Component = Unit\ Cost\ x\ Number\ of\ Units$$

4.4.1 Customer Class Strength Factors

The District has sewer service charges that are developed based on strength characteristics. The strengths are measurements of the quality of wastewater and are measured in milligrams per liter (mg/L). The District uses Biochemical Oxygen Demand (BOD) and Total Suspended Solids (TSS) as strength parameters. BOD identifies the amount of organic compounds found in the wastewater while

TSS identifies the amount of suspended particles. The logic in using strengths is that each customer contributes different factors to the treatment system and thus the systems need to be designed to handle these flows and loadings. Therefore, customer classes that contribute higher strength flows should contribute more towards the costs of operating and maintaining the system infrastructure.

The strengths used for the District's customer classes as shown in Table 4-5 are based on existing strength factors as well as California State Water Resources Control Board (SWRCB) standards published in 1998. The SWRCB standards specify 20 commercial user strength characteristics. These characteristics were obtained by the State of California's four largest wastewater utilities which consisted of East Bay Municipal Utility District, City of San Jose, Los Angeles County Sanitation Districts, and the Sacramento Regional County Sanitation District. Since the 1998 publication, these strength factors have served as the standard for many utilities in the Southwest that use strength as an allocation component within their wastewater rate structures.

Table 4-5 Customer Class Strength Factors

Line No.	Description	Strength Factors	
		BOD	TSS
		(mg/L)	(mg/L)
	Customer Class		
1	Single-family Residential	220	220
2	Multi-family Residential	220	220
3	Car Wash	20	150
4	Barber & Beauty Salons	150	250
5	Department Stores, Retail Stores, General Commercial	150	150
6	Warehouse	150	150
7	Hospitals & Convalescent Homes	250	100
8	Laundromats	150	110
9	Nurseries	300	280
10	Hotels/Motels w/o Dining	310	120
11	Auto Repair/Sales Shops & Service Stations	180	280
12	Shopping Centers	310	230
13	Bar w/o Dining	300	270
14	Commercial Laundry	450	240
15	Movie Theater	300	240
16	Lumber Yards	400	430
17	Convenience & Liquor Stores w/Deli	500	300
18	Industrial Laundry	670	680
19	Hotel w/ Restaurant	500	600
20	Auto Steam Cleaning	1,150	150
21	Bakery or Bakery/Deli	1,000	600
22	Restaurant & Bar w/Food	1,000	600
23	Food Stores	800	800
24	Mortuary	800	800
25	Churches	130	100
26	Schools	130	100
27	Membership Organizations	130	100
28	Restaurants w/ Waste Separation	500	300
29	Mobile Homes	220	220

4.4.2 Distribution of Costs of Service to Customer Classes

The customer class responsibility for service is obtained by applying the unit costs of service derived in Table 4-4 to the number of units for which the customer class is responsible. To determine the individual units for each customer class, the following methodology was used for each component.

$$Capacity = Total\ Ordinance\ EDU$$

$$Volume = Flow\ EDU\ x\ 240(10^{-6})\ MG/day\ x\ 365\ days\ x\ Inflow/Infiltration\ \%$$

$$Strength\ BOD = Strength\ in\ mg/L\ x\ 8.34\ Lbs/MG\ \text{x Volume in MG}$$

$$Strength\ TSS = Strength\ in\ mg/L\ x\ 8.34\ Lbs/MG\ x\ Volume\ in\ MG$$

The sewer flows (volume) for each customer class are derived earlier in Table 3-3. To assist the reader in calculating sewer rates per this analysis, the following section demonstrates a sample calculation for the residential customer class using the formulas noted above.

$$Capacity = 33{,}946\ Res\ Ordinance\ EDUs$$

$$Volume = 33{,}946\ Res\ Flow\ EDUs\ x\ 240(10^{-6})\ MG/day\ x\ 365\ days\ x\ 1.05\% = 2{,}974\ MG$$

$$Strength\ BOD = 220\ mg/L\ x\ 8.34\ Lbs/MG\ \ x\ 2{,}974\ MG = 5{,}728{,}893\ Res\ Lbs$$

$$Strength\ TSS = 220\ mg/L\ x\ 8.34\ Lbs/MG\ \ x\ 2{,}485\ MG = 5{,}728{,}893\ Res\ Lbs$$

The results of determining the units and then applying the unit costs of Table 4-4 are illustrated in Table 4-6.

Table 4-6 Distribution of Costs of Service to Customer Classes

Line No.	Description	Total Cost	Collection	Treatment		
			Flow	Flow	BOD	TSS
			per EDU	per MG	per lbs	per lbs
1	Cost per Unit		$ 182.18	$ 976.97	$ 0.26	$ 0.30
	Single-family Residential					
2	Units		33,946	3,122	5,728,893	5,728,893
3	Allocation of COS	12,431,624	6,184,412	3,050,436	1,491,027	1,705,749
	Multi-family Residential					
4	Units		10,256	891	1,633,982	1,633,982
5	Allocation of COS	3,650,293	1,868,477	870,039	425,267	486,510
	Car Wash					
6	Units		149	23	3,820	28,652
7	Allocation of COS	59,046	27,145	22,376	994	8,531
	Barber & Beauty Salons					
8	Units		97	5	6,674	11,123
9	Allocation of COS	27,933	17,672	5,212	1,737	3,312
	Department Stores, Retail Stores, General Commercial					
10	Units		2,607	208	259,936	259,936
11	Allocation of COS	822,997	474,953	202,997	67,652	77,395
	Warehouse					
12	Units		49	4	5,523	5,523
13	Allocation of COS	16,321	8,927	4,313	1,437	1,644
	Hospitals & Convalescent Homes					
14	Units		961	81	169,532	67,813
15	Allocation of COS	318,831	175,079	79,438	44,123	20,191
	Laundromats					
16	Units		77	9	11,737	8,607
17	Allocation of COS	28,812	14,028	9,166	3,055	2,563
	Nurseries					
18	Units		0	0	0	0
19	Allocation of COS	0	0	0	0	0
	Hotels/Motels w/o Dining					
20	Units		103	10	25,683	9,942
21	Allocation of COS	38,114	18,765	9,705	6,684	2,960
	Auto Repair/Sales Shops & Service Stations					
22	Units		344	28	41,562	64,652
23	Allocation of COS	119,786	62,671	27,048	10,817	19,250
	Shopping Centers					
24	Units		2	0	476	353
25	Allocation of COS	773	364	180	124	105
	Bar w/o Dining					
26	Units		34	2	5,753	5,178
27	Allocation of COS	11,480	6,194	2,247	1,497	1,542

Line No.	Description	Total Cost	Collection	Treatment		
			Flow	Flow	BOD	TSS
			per EDU	per MG	per lbs	per lbs
1	Cost per Unit		$ 182.18	$ 976.97	$ 0.26	$ 0.30
28	Units		15	1	3,452	1,841
29	Allocation of COS	5,078	2,733	899	898	548
	Movie Theater					
30	Units		15	1	3,222	2,578
31	Allocation of COS	5,598	2,733	1,258	839	768
	Lumber Yards					
32	Units		1	0	307	330
33	Allocation of COS	450	182	90	80	98
	Convenience & Liquor Stores w/Deli					
34	Units		138	11	46,794	28,076
35	Allocation of COS	56,642	25,141	10,963	12,179	8,359
	Industrial Laundry					
36	Units		0	0	0	0
37	Allocation of COS	0	0	0	0	0
	Hotel w/ Restaurant					
38	Units		5	1	3,452	4,142
39	Allocation of COS	3,851	911	809	898	1,233
	Auto Steam Cleaning					
40	Units		0	0	0	0
41	Allocation of COS	0	0	0	0	0
	Bakery or Bakery/Deli					
42	Units		20	2	17,644	10,586
43	Allocation of COS	13,455	3,644	2,067	4,592	3,152
	Restaurant & Bar w/Food					
44	Units		883	66	551,554	330,933
45	Allocation of COS	467,562	160,868	64,610	143,550	98,534
	Food Stores					
46	Units		111	9	62,596	62,596
47	Allocation of COS	64,317	20,222	9,166	16,291	18,638
	Mortuary					
48	Units		4	0	3,068	3,068
49	Allocation of COS	2,889	729	449	798	913
	Churches					
50	Units		338	28	30,815	23,704
51	Allocation of COS	104,423	61,578	27,767	8,020	7,058
	Schools					
52	Units		735	67	72,799	55,999
53	Allocation of COS	235,124	133,905	65,599	18,947	16,673
	Membership Organizations					
54	Units		31	5	5,385	4,142
55	Allocation of COS	13,136	5,648	4,853	1,402	1,233
	Restaurants w/ Waste Separation					
56	Units		0	0	0	0
57	Allocation of COS	0	0	0	0	0
	Mobile Homes					
58	Units		2,946	261	479,461	479,461
59	Allocation of COS	1,059,552	536,713	255,296	124,786	142,757
60	**TOTAL COSTS OF SERVICE**	**$ 19,558,087**	**$ 9,813,694**	**$ 4,726,983**	**$ 2,387,694**	**$ 2,629,716**

Note: Line 1 represents Table 4-4, Line 5.

4.5 ADEQUACY OF EXISTING RATES TO MEET COSTS OF SERVICE

Table 4-7 is a comparison of the FY 2018 allocated COS and revenues under existing rates by customer class and for the system in total. The indicated revenue increase required over existing rates for each customer class indicates where the emphasis should be directed. This increase is considered necessary to meet the projected revenue requirements for the FY 2018 test year. This overall level of revenue needs to be produced by the proposed sewer service charges developed and presented in this report.

Table 4-7 Comparison of Allocated Cost of Service with Revenues under Existing Rates

Line No.	Description	Allocated COS (Table 4-6)	Rev under Exist Rate (Table 3-6)	Indicated Revenue Increase
		($)	($)	(%)
1	Single-family Residential	12,431,624	11,405,856	9.0%
2	Multi-family Residential	3,650,293	3,346,737	9.1%
3	Car Wash	59,046	55,194	7.0%
4	Barber & Beauty Salons	27,933	25,912	7.8%
5	Department Stores, Retail Stores, General Commercial	822,997	766,338	7.4%
6	Warehouse	16,321	15,241	7.1%
7	Hospitals & Convalescent Homes	318,831	298,417	6.8%
8	Laundromats	28,812	27,026	6.6%
9	Nurseries	0	0	0.0%
10	Hotels/Motels w/o Dining	38,114	35,951	6.0%
11	Auto Repair/Sales Shops & Service Stations	119,786	112,437	6.5%
12	Shopping Centers	773	731	5.7%
13	Bar w/o Dining	11,480	10,789	6.4%
14	Commercial Laundry	5,078	4,786	6.1%
15	Movie Theater	5,598	5,286	5.9%
16	Lumber Yards	450	430	4.7%
17	Convenience & Liquor Stores w/Deli	56,642	54,004	4.9%
18	Industrial Laundry	0	0	0.0%
19	Hotel w/ Restaurant	3,851	3,760	2.4%
20	Auto Steam Cleaning	0	0	0.0%
21	Bakery or Bakery/Deli	13,455	13,174	2.1%
22	Restaurant & Bar w/Food	467,562	453,867	3.0%
23	Food Stores	64,317	62,520	2.9%
24	Mortuary	2,889	2,830	2.1%
25	Churches	104,423	96,955	7.7%
26	Schools	235,124	218,697	7.5%
27	Membership Organizations	13,136	12,367	6.2%
28	Restaurants w/ Waste Separation	0	0	0.0%
29	Mobile Homes	1,059,552	971,695	9.0%
30	**Total Wastewater System**	**$ 19,558,087**	**$ 18,001,000**	**8.7%**

5 Proposed Rate Adjustments

The initial consideration in the design of sewer service charge schedules is the establishment of equitable charges to the customers commensurate with the cost of providing that service to each customer class. While the cost of service allocations to customer classes should not be construed as literal or exact determinations, they offer a guide to the necessity for, and the extent of, rate adjustments. Practical considerations sometimes modify these adjustments by taking into account additional factors such as the extent of bill impacts, and local policies and practices.

5.1 EXISTING RATES

The existing wastewater charges shown in Table 5-1 consist of a capacity charge and a treatment charge. The capacity and treatment charges are applied to each customer based on the number of assigned EDUs. Refer to Section 3.2 regarding EDU assignments to customer classes.

Table 5-1 Existing Wastewater Service Charges

Description	Capacity Charge	Treatment Charge	Total Charge
	($/EDU/year)	($/EDU/year)	($/EDU/year)
Customer Class			
Single-family Residential	$163.04	$172.96	$336.00
Multi-family Residential	$163.04	$172.96	$336.00
Car Wash	$163.04	$124.10	$287.14
Barber & Beauty Salons	$163.04	$174.09	$337.13
Department Stores, Retail Stores, General Commercial	$163.04	$151.08	$314.12
Warehouse	$163.04	$151.08	$314.12
Hospitals & Convalescent Homes	$163.04	$160.33	$323.37
Laundromats	$163.04	$141.88	$304.92
Nurseries	$163.04	$212.12	$375.16
Hotels/Motels w/o Dining	$163.04	$177.39	$340.43
Auto Repair/Sales Shops & Service Stations	$163.04	$187.21	$350.25
Shopping Centers	$163.04	$202.69	$365.73
Bar w/o Dining	$163.04	$209.82	$372.86
Commercial Laundry	$163.04	$234.05	$397.09
Movie Theater	$163.04	$202.92	$365.96
Lumber Yards	$163.04	$267.38	$430.42
Convenience & Liquor Stores w/Deli	$163.04	$258.23	$421.27
Industrial Laundry	$163.04	$380.93	$543.97
Hotel w/ Restaurant	$163.04	$327.24	$490.28
Auto Steam Cleaning	$163.04	$358.63	$521.67
Bakery or Bakery/Deli	$163.04	$431.02	$594.06
Restaurant & Bar w/Food	$163.04	$431.02	$594.06
Food Stores	$163.04	$435.52	$598.56
Mortuary	$163.04	$435.52	$598.56
Churches	$163.04	$135.43	$298.47
Schools	$163.04	$135.43	$298.47
Membership Organizations	$163.04	$135.43	$298.47
Restaurants w/ Waste Separation	$163.04	$258.23	$421.27
Mobile Homes	$163.04	$172.96	$336.00

5.1.1 Methodology used in the Determination of Charges

The District currently determines the wastewater charges based on a formula established in Article 5 of the County's USO. The formula states that there are two primary variables associated with the sewer service charges: Collection (and related transport) and Treatment (and related disposal). The capacity charge is the charge for District costs related to wastewater collection. The treatment charge is designed for the costs associated with treatment and disposal of wastewater.

The formula stated in the USO is as follows:

$$SSC = \frac{n}{N}xD + \frac{f}{F}xM_F + \frac{b}{B}xM_B + \frac{s}{S}xM_S$$

Where:

SSC = Sewer Service Charge.

n = Number of EDUs for a specific customer class.

f = Flow in million gallons per year for a specific customer class.

b = BOD in pounds per year for a specific customer class.

s = TSS in pounds per year for a specific customer class.

N = Total number of EDUs for the entire District.

F = Total flow in million gallons per year for the entire District.

B = Total BOD in pounds per year for the entire District.

S = Total TSS in pounds per year for the entire District.

D = The District's budgeted costs for collecting, treating, and disposal of wastewater.

M = The District's budgeted costs associated with Metro for treating and disposal of wastewater. Metro costs are separated into three components: M_F = Flow, M_B = BOD, and M_S = TSS.

The COS and resulting sewer service charge structure recommendation utilizes the same principles as the current sewer service charge formula documented in Article 5 of the USO. Following the same principles, the proposed methodology is based on the following formula.

$$SSC = \frac{A}{a} + \frac{B}{b}$$

Where:

SSC = Sewer Service Charge per EDU.

a = Number of ordinance EDUs for a specific customer class.

b = Number of flow EDUs for a specific customer class.

A = The allocated costs for collection for a specific customer class.

B = The allocated costs for treatment for a specific customer class.

The following is a sample calculation for the residential customer class using the formula noted above.

$$Residential = \frac{\$6{,}190{,}880\ Total\ Capacity\ Costs}{33{,}946\ Res\ EDUs} + \frac{\$6{,}240{,}556\ Total\ Treatment\ Costs}{33{,}946\ Flow\ EDUs}$$

$$Residential = \$182.37/EDU + \$183.84/EDU$$

We recommend that the County revise Articles 5.2 through 5.4 to reflect the proposed formula and rate structure identified in this report. We believe that the proposed structure is simpler to calculate each year for purposes of placing sewer service charges on the County tax roll.

5.2 PROPOSED RATES

The proposed sewer service charges for FY 2018 are shown in Table 5-2 on the next page. In addition, Table 5-3 shows the proposed charges for the following four fiscal years between FY 2019 through FY 2022.

Table 5-2 Proposed Wastewater Service Charges for FY 2018

Customer Class	Capacity Charge ($/EDU/year)	Treatment Charge ($/EDU/year)	Proposed FY 18 Charge ($/EDU/year)
Customer Class			
Single-family Residential	$182.18	$184.03	$366.22
Multi-family Residential	$182.18	$184.03	$366.22
Car Wash	$182.18	$128.12	$310.30
Barber & Beauty Salons	$182.18	$176.91	$359.10
Department Stores, Retail Stores, General Commercial	$182.18	$154.07	$336.25
Warehouse	$182.18	$154.07	$336.25
Hospitals & Convalescent Homes	$182.18	$162.62	$344.80
Laundromats	$182.18	$144.94	$327.12
Nurseries	$182.18	$230.47	$412.65
Hotels/Motels w/o Dining	$182.18	$179.16	$361.34
Auto Repair/Sales Shops & Service Stations	$182.18	$189.75	$371.93
Shopping Centers	$182.18	$204.50	$386.68
Bar w/o Dining	$182.18	$211.44	$393.62
Commercial Laundry	$182.18	$234.50	$416.68
Movie Theater	$182.18	$204.64	$386.83
Lumber Yards	$182.18	$268.00	$450.18
Convenience & Liquor Stores w/Deli	$182.18	$258.20	$440.39
Industrial Laundry	$182.18	$413.88	$596.06
Hotel w/ Restaurant	$182.18	$326.67	$508.85
Auto Steam Cleaning	$182.18	$389.66	$571.84
Bakery or Bakery/Deli	$182.18	$426.56	$608.74
Restaurant & Bar w/Food	$182.18	$426.56	$608.74
Food Stores	$182.18	$432.29	$614.47
Mortuary	$182.18	$432.29	$614.47
Churches	$182.18	$138.66	$320.84
Schools	$182.18	$138.66	$320.84
Membership Organizations	$182.18	$138.66	$320.84
Restaurants w/ Waste Separation	$182.18	$280.57	$462.75
Mobile Homes	$182.18	$184.03	$366.22

Table 5-3 Proposed Wastewater Service Charges for FY 2019 through FY 2022

Customer Class	Total Charge FY 2019	Total Charge FY 2020	Total Charge FY 2021	Total Charge FY 2022
	($/EDU/year)	($/EDU/year)	($/EDU/year)	($/EDU/year)
Customer Class				
Single-family Residential	$399.18	$435.10	$474.26	$516.95
Multi-family Residential	$399.18	$435.10	$474.26	$516.95
Car Wash	$338.23	$368.67	$401.85	$438.01
Barber & Beauty Salons	$391.42	$426.64	$465.04	$506.90
Department Stores, Retail Stores, General Commercial	$366.52	$399.50	$435.46	$474.65
Warehouse	$366.52	$399.50	$435.46	$474.65
Hospitals & Convalescent Homes	$375.83	$409.66	$446.52	$486.71
Laundromats	$356.57	$388.66	$423.64	$461.76
Nurseries	$449.79	$490.27	$534.40	$582.49
Hotels/Motels w/o Dining	$393.86	$429.31	$467.95	$510.06
Auto Repair/Sales Shops & Service Stations	$405.41	$441.90	$481.67	$525.02
Shopping Centers	$421.49	$459.42	$500.77	$545.84
Bar w/o Dining	$429.05	$467.66	$509.75	$555.63
Commercial Laundry	$454.19	$495.06	$539.62	$588.18
Movie Theater	$421.64	$459.59	$500.95	$546.04
Lumber Yards	$490.70	$534.86	$583.00	$635.47
Convenience & Liquor Stores w/Deli	$480.02	$523.23	$570.32	$621.64
Industrial Laundry	$649.71	$708.18	$771.92	$841.39
Hotel w/ Restaurant	$554.65	$604.57	$658.98	$718.28
Auto Steam Cleaning	$623.31	$679.41	$740.55	$807.20
Bakery or Bakery/Deli	$663.53	$723.24	$788.34	$859.29
Restaurant & Bar w/Food	$663.53	$723.24	$788.34	$859.29
Food Stores	$669.78	$730.06	$795.76	$867.38
Mortuary	$669.78	$730.06	$795.76	$867.38
Churches	$349.72	$381.19	$415.50	$452.89
Schools	$349.72	$381.19	$415.50	$452.89
Membership Organizations	$349.72	$381.19	$415.50	$452.89
Restaurants w/ Waste Separation	$504.40	$549.80	$599.28	$653.21
Mobile Homes	$399.18	$435.10	$474.26	$516.95

5.3 REVENUE RECOVERY UNDER PROPOSED RATES

Table 5-4 illustrates the intent of COS analyses and their resulting charges – to help ensure that each customer recovers 100 percent of their allocated costs per the analysis conducted in the District wastewater charge model. This table shows the cost of service allocations for each customer class per this analysis and matches the allocations to the revenue to be generated through the proposed rates. These values for each column should match in a well-designed cost of service analysis with the percent recovery from rate revenues equal to 100 percent for each class.

Table 5-4 Comparison of Allocated Cost of Service with Revenue under Proposed COS Sewer Charges

Line No.	Description	Adjusted COS	Rev under Proposed Rates	Percent Recovery
		($)	($)	(%)
1	Single-family Residential	12,431,624	12,431,614	100.0%
2	Multi-family Residential	3,650,293	3,650,290	100.0%
3	Car Wash	59,046	59,046	100.0%
4	Barber & Beauty Salons	27,933	27,933	100.0%
5	Department Stores, Retail Stores, General Commercial	822,997	822,996	100.0%
6	Warehouse	16,321	16,322	100.0%
7	Hospitals & Convalescent Homes	318,831	318,831	100.0%
8	Laundromats	28,812	28,812	100.0%
9	Nurseries	0	0	100.0%
10	Hotels/Motels w/o Dining	38,114	38,114	100.0%
11	Auto Repair/Sales Shops & Service Stations	119,786	119,786	100.0%
12	Shopping Centers	773	773	100.0%
13	Bar w/o Dining	11,480	11,480	100.0%
14	Commercial Laundry	5,078	5,078	100.0%
15	Movie Theater	5,598	5,598	100.0%
16	Lumber Yards	450	450	100.0%
17	Convenience & Liquor Stores w/Deli	56,642	56,642	100.0%
18	Industrial Laundry	0	0	100.0%
19	Hotel w/ Restaurant	3,851	3,851	100.0%
20	Auto Steam Cleaning	0	0	100.0%
21	Bakery or Bakery/Deli	13,455	13,455	100.0%
22	Restaurant & Bar w/Food	467,562	467,562	100.0%
23	Food Stores	64,317	64,316	100.0%
24	Mortuary	2,889	2,890	100.0%
25	Churches	104,423	104,423	100.0%
26	Schools	235,124	235,125	100.0%
27	Membership Organizations	13,136	13,135	100.0%
28	Restaurants w/ Waste Separation	0	0	0.0%
29	Mobile Homes	1,059,552	1,059,552	100.0%
30	**Total Wastewater System**	**$ 19,558,087**	**$ 19,558,074**	**100.0%**

6 Wastewater Service Charge Survey

The chart (Figure 6-1) on the following page shows a comparison of *monthly* single-family residential wastewater service charges across San Diego County. The current and final year (FY 2022) of the proposed District charges, *on a monthly basis*, are included in this illustration. The survey data was obtained through agency web site searches and telephone and email solicitations to the agencies contained in this survey.

As the chart shows, the current and proposed District sewer service charges are well below most of the wastewater agencies within the County. Given that the proposed rate increase may not become effective until FY 2018, many of the other agency charges will likely increase their rates and charges beyond what is shown in this graph.

Figure 6-1 San Diego County Wastewater Rate Survey – Single Family Residential Customers (as of early 2016)