

## **Draft Wastewater Rate Study**



Prepared for:  
San Andreas Sanitary District

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October 3, 2016

## Sign-off Sheet


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## DRAFT WASTEWATER RATE STUDY

Introduction and Project Overview  
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# 1.0 INTRODUCTION AND PROJECT OVERVIEW

## 1.1 INTRODUCTION

The San Andreas Sanitary District (District) has recently completed an update to their Wastewater Facilities Master Plan and developed a Collection System Master Plan. These plans identified a series of projects to improve the long-term reliability for the District to provide lawful sewer service to existing residences and businesses.

The District provides sewer service to approximately 939 customers, of which, approximately 80 percent are residential accounts and 20 percent are commercial business customers.

The District is currently planning improvements to the Wastewater Treatment Plant (WWTP) estimated to cost \$5.55 million. This rate analysis evaluates the revenue capacity of the wastewater fund to pay for the proposed Project as well as projected operating and maintenance costs going forward. Results of the analysis project sewer rates for a five-year period. Separate from this rate study, the District has developed, or is in the process of developing the technical reports necessary to support an application for assistance from the State Water Board.

The District is applying for a Clean Water State Revolving Fund (CWSRF) small communities grant to fund the proposed Project. Due to the District's size and financially "Disadvantaged Status" it is assumed that approximately 75% of Project costs will be grant funded by CWSRF (per 2016 Intended Use Plan). The District is currently working on a CWSRF application for design and construction funding. The proposed Project includes the following improvements include: replacement of the 60-year old anaerobic digester with a new aerobic digester; a new headworks (including electrical and control upgrades); irrigation pump station upgrades (including electrical and control upgrades); increase Pond D volume to 7.2 Mgal; modification to Ponds B and C; and aeration improvements.

The District is also applying for a United States Department of Agriculture (USDA) Rural Development (RD) loan and grant for further financial support of the proposed Project. If USDA RD confirms available funding for the proposed Project, the District may be eligible for an additional grant of approximately 12.5% of the proposed Project cost. The remaining costs would then be financed with a USDA loan to be repaid over 40 years.

As part of the SRF and USDA loan/grant applications, the District must submit financial documents and an analysis of its current revenues and expenses to determine if rates/charges need to be increased to repay the loan portion of the Project financing as well as existing, debt service and provide sufficient revenues to operate and maintain the District's infrastructure.



## DRAFT WASTEWATER RATE STUDY

Introduction and Project Overview  
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### 1.2 PURPOSE OF THE STUDY

The purpose of this study is to provide an explanation of and justification for the calculated sewer rates for the District. Rates have been calculated for the fiscal years 2017-18 through 2021-22. The rates have been calculated in accordance with the requirements of Article XIII D et. seq. of the California Constitution, commonly known as Proposition 218, which mandates that the fee or charge imposed be commensurate with the benefit received by those paying the fee.

### 1.3 SUMMARY OF FINDINGS

The following describes some of the major findings regarding the financial analysis.

- **Increase in Rates Projected:** The current monthly rate per equivalent dwelling unit (EDU) is \$69.00 for residential and commercial customers with commercial fee escalators based on potable water use. The District recently increased the rates to this level in 2015. Despite this adjustment, due to water conservation efforts, expected revenues from commercial users fell from the previous year when rates were \$62.00 per month. The financial review analysis shows that the District has had positive net revenues until 2010-11, but since 2011-12, net revenues have been negative. The District had a net revenue loss after depreciation for 2015-16 of \$360,865, which represents five consecutive years of negative net revenues or losses. Therefore, the District has determined it will need to change the commercial rate structure to fund existing operations as well as provide funding for the loan component of the proposed Project.
- **Proposed Changes to Rate Structure to allow for both Wastewater Flow and Strength:** Currently the rate structure employed by the District focuses only on wastewater flow and does not take into consideration strength (as measured by biochemical oxygen demand (BOD) and suspended solids (SS)). While this is not uncommon for small communities, rates are generally more equitable when both flow and influent strength are considered. Therefore, it is recommended that the District account for both flow and strength in allocating costs via rates. To simplify the methodology but still account for both flow and strength impacts on treatment and disposal, it is proposed that the District consolidate commercial categories into 7 groups (residential categories remain unchanged) as follows:

Group 1: Low Strength/Low Flow  
Group 2: Medium Strength/Low Flow  
Group 3: Medium Strength/Medium Flow  
Group 4: Medium Strength/High Flow  
Group 5: High Strength/Low Flow  
Group 6: High Strength/High Flow  
Group 7: Schools

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Commercial accounts have been aggregated into groups based on similarity of wastewater characteristics. For example, Group 1, which is low strength and flow, is generally the type of business with little or no food preparation facilities, perhaps just a toilet or washing facility, such as retail stores and offices.

- **Level of Annual CIP Costs and Set-Asides (aka Depreciation):** Per the Districts audited financial statements, depreciation (which is the general financial mechanism that public agencies employ to set aside monies to replace capital infrastructure as it deteriorates) is estimated at approximately \$563,000 per year. However, the current rates do not provide sufficient revenues to fully fund depreciation.

This preliminary rate analysis does not include the full allocation of recommended (audited) depreciation in the cost estimates. To include depreciation, which is referred to as "General Operating Reserves and Equipment/Fleet/Capital Replacement" in this analysis, would require significantly higher rate increases.

This analysis assumes approximately \$56,000 in Equipment/Fleet/Capital Replacement in 2017-18 and is gradually reduced to zero by year 2021-22. The analysis also includes approximately \$20,000 in annual General Operating Reserves escalated at 1.5% and gradually increased to 3.0% in the final year. This rate projection funds depreciation (General Operating Reserves and Equipment/Fleet/Capital Replacement) by approximately \$52,000 a year normalized over the five-year period.

- **Funding for the Wastewater Treatment Facility (WWTF) Capital Improvement Project:** The Project will provide necessary upgrades to improve wastewater long-term reliability for existing wastewater customers. The project cost is currently estimated at \$5.55 million and is anticipated to be completed in FY 2019-20. The District plans to borrow monies from State and/or Federal lenders that offer low interest loans and grants for wastewater capital improvement projects.
- **Specific Allowance for future Collection System Projects or other potential Master Planning Efforts:** The preliminary rates analysis does include \$73,000 in Annual Collection System Replacement funds for projects resulting from the need to replace or repair the existing Collection System. This number has been selected as a result of the District's review of the recent master plan evaluation that included an assessment of system needs.
- **No Additional Costs assumed for Increased District Staffing:** This analysis also does not include any assumptions for increased staffing, other than the assumed 1.5 – 3.0% increase in general and administrative expenses annually.

## **DRAFT WASTEWATER RATE STUDY**

Introduction and Project Overview  
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### **1.4 ORGANIZATION OF THE STUDY**

This study is divided into seven sections. Following this introduction, Section 2 provides an overview of the District including location and the current customer base. Section 3 provides a summary of the proposed Project and overview of project cost. Section 4 details the projected annual revenue requirements in a five-year financial plan, which serves as the basis for the rate calculations. Section 5 provides information on customer wastewater characteristics. Section 6 provides the rate analysis and rate calculations for the District. Section 7 includes the findings and recommendations of the analysis.





**Table 1**  
**Rate Summary - Current vs. Calculated Monthly Rates**

	Existing Rate Charge	2017-18	2018-19	Calculated 2019-20	2020-21	2021-22	
<b>Residential</b>							
Step 1: Baseline O&M		\$59.86	\$60.68	\$62.64	\$65.24	\$68.56	per unit
Step 2: Capital & Reserves		\$6.64	\$6.04	\$5.75	\$5.09	\$4.23	per unit
Step 3: WWTP Improvements Project		\$0.00	\$0.78	\$2.61	\$3.41	\$3.45	per unit
<b>Subtotal</b>	<b>\$69.00</b>	<b>\$66.50</b>	<b>\$67.50</b>	<b>\$71.00</b>	<b>\$73.73</b>	<b>\$76.24</b>	
<b>Commercial [1]</b>							
<b>Group 1 - Fixed, Monthly Charge</b>							
Step 1: Baseline O&M		\$64.33	\$65.21	\$67.31	\$70.10	\$73.68	per Account
Step 2: Capital & Reserves		\$7.16	\$6.52	\$6.20	\$5.48	\$4.56	per Account
Step 3: WWTP Improvements Project		\$0.00	\$0.84	\$2.81	\$3.68	\$3.71	per Account
<b>Subtotal</b>		<b>\$71.49</b>	<b>\$72.57</b>	<b>\$76.32</b>	<b>\$79.27</b>	<b>\$81.95</b>	
Variable Charge per 1000 Gal		\$4.44	\$4.50	\$4.74	\$4.92	\$5.09	per 1000 Gal
<b>Group 2 - Fixed, Monthly Charge</b>							
Step 1: Baseline O&M		\$81.77	\$82.89	\$85.54	\$89.07	\$93.59	per Account
Step 2: Capital & Reserves		\$9.39	\$8.54	\$8.13	\$7.19	\$5.98	per Account
Step 3: WWTP Improvements Project		\$0.00	\$1.10	\$3.69	\$4.82	\$4.87	per Account
<b>Subtotal</b>		<b>\$91.16</b>	<b>\$92.53</b>	<b>\$97.36</b>	<b>\$101.08</b>	<b>\$104.44</b>	
Variable Charge per 1000 Gal		\$5.20	\$5.28	\$5.55	\$5.77	\$5.96	per 1000 Gal
<b>Group 3 - Fixed, Monthly Charge</b>							
Step 1: Baseline O&M		\$345.34	\$350.06	\$361.25	\$376.17	\$395.24	per Account
Step 2: Capital & Reserves		\$39.72	\$36.14	\$34.38	\$30.40	\$25.30	per Account
Step 3: WWTP Improvements Project		\$0.00	\$4.64	\$15.60	\$20.40	\$20.60	per Account
<b>Subtotal</b>		<b>\$385.06</b>	<b>\$390.84</b>	<b>\$411.24</b>	<b>\$426.97</b>	<b>\$441.14</b>	
Variable Charge per 1000 Gal		\$5.25	\$5.33	\$5.60	\$5.82	\$6.01	per 1000 Gal
<b>Group 4 - Fixed, Monthly Charge</b>							
Step 1: Baseline O&M		\$1,167.76	\$1,183.69	\$1,221.53	\$1,271.93	\$1,336.38	per Account
Step 2: Capital & Reserves		\$134.75	\$122.60	\$116.62	\$103.14	\$85.83	per Account
Step 3: WWTP Improvements Project		\$0.00	\$15.74	\$52.94	\$69.21	\$69.87	per Account
<b>Subtotal</b>		<b>\$1,302.51</b>	<b>\$1,322.02</b>	<b>\$1,391.08</b>	<b>\$1,444.28</b>	<b>\$1,492.08</b>	
Variable Charge per 1000 Gal		\$5.34	\$5.42	\$5.71	\$5.93	\$6.12	per 1000 Gal
<b>Group 5 - Fixed, Monthly Charge</b>							
Step 1: Baseline O&M		\$177.24	\$179.65	\$185.36	\$192.96	\$202.69	per Account
Step 2: Capital & Reserves		\$21.14	\$19.24	\$18.30	\$16.18	\$13.47	per Account
Step 3: WWTP Improvements Project		\$0.00	\$2.47	\$8.31	\$10.86	\$10.96	per Account
<b>Subtotal</b>		<b>\$198.39</b>	<b>\$201.35</b>	<b>\$211.96</b>	<b>\$220.00</b>	<b>\$227.11</b>	
Variable Charge per 1000 Gal		\$6.64	\$6.74	\$7.09	\$7.36	\$7.60	per 1000 Gal
<b>Group 6 - Fixed, Monthly Charge</b>							
Step 1: Baseline O&M		\$3,786.28	\$3,837.78	\$3,960.07	\$4,122.95	\$4,331.23	per Account
Step 2: Capital & Reserves		\$445.07	\$404.91	\$385.16	\$340.64	\$283.48	per Account
Step 3: WWTP Improvements Project		\$0.00	\$51.98	\$174.84	\$228.59	\$230.77	per Account
<b>Subtotal</b>		<b>\$4,231.34</b>	<b>\$4,294.67</b>	<b>\$4,520.07</b>	<b>\$4,692.18</b>	<b>\$4,845.48</b>	
Variable Charge per 1000 Gal		\$5.99	\$6.08	\$6.40	\$6.64	\$6.86	per 1000 Gal
<b>Group 7 - Fixed, Monthly Charge</b>							
Step 1: Baseline O&M		\$1,205.93	\$1,222.40	\$1,261.51	\$1,313.61	\$1,380.23	per Account
Step 2: Capital & Reserves		\$138.41	\$125.92	\$119.78	\$105.93	\$88.16	per Account
Step 3: WWTP Improvements Project		\$0.00	\$16.16	\$54.37	\$71.09	\$71.76	per Account
<b>Subtotal</b>		<b>\$1,344.33</b>	<b>\$1,364.48</b>	<b>\$1,435.66</b>	<b>\$1,490.63</b>	<b>\$1,540.15</b>	
Variable Charge per 1000 Gal		\$5.18	\$5.26	\$5.53	\$5.75	\$5.94	per 1000 Gal

[1] Groups are defined as follows:

- Group 1: Low Strength/Low Flow (Retail, Offices, Beauty Shop, Churches, Parks)
- Group 2: Medium Strength/Low Flow (Gas Stations, Markets, Auto Repair, Dr. Offices, Community Centers, Restaurants, Car Wash, Lt Industrial, Motel, Government Services)
- Group 3: Medium Strength/Medium Flow (Hotel, Medical Office Building, Laundromat, Retirement Home, Continuation & Charter School)
- Group 4: Medium Strength/High Flow (Mixed-Use, Government Centers)
- Group 5: High Strength/Low Flow (Mortuary)
- Group 6: High Strength/High Flow (Hospitals)
- Group 7: Schools (Schools)

# DRAFT WASTEWATER RATE STUDY

District Overview  
October 3, 2016

## 2.0 DISTRICT OVERVIEW

### 2.1.1 District Location

The District is located in Calaveras County, California, and provides wastewater collection, treatment and disposal services to the properties within the District boundaries in the community of San Andreas which is also the County seat. The proposed Project activities will be located at the District-owned properties located at 675 Gold Oak Road and 1275 Gold Strike Road. A vicinity map showing the location of the community of San Andreas is provided in **Figure 1**. **Figure 2** identifies the boundaries of the District, and the locations of the District WWTP.

### 2.1.2 San Andreas Residents

The total population for the greater San Andreas area per the 2010 US Census is 2,783 residents and 1,146 total households. According to the 2010-2014 American Community Survey (ACS) the median household income (MHI) was estimated at \$40,613 which is approximately 66% of the California state MHI of \$61,489. This meets the CA CWSRF criteria of a "Disadvantaged Community."

### 2.1.3 Customer Summary and Rate Structure

The District currently charges residential customers \$69.00 per unit per month. Based on current billing practices, there are approximately 675 single family residential accounts and 75 multi-family units for a total of 750 residential accounts. There are currently approximately 153 commercial accounts in the District. The commercial accounts pay a flat monthly sewer service and collection charge of \$69.00 per month for an average monthly water consumption of less than 5400 gallons per month. Commercial users whose average monthly water consumption is greater than 5400 gallons pay a base charge plus a proportionate charge using the following formula:

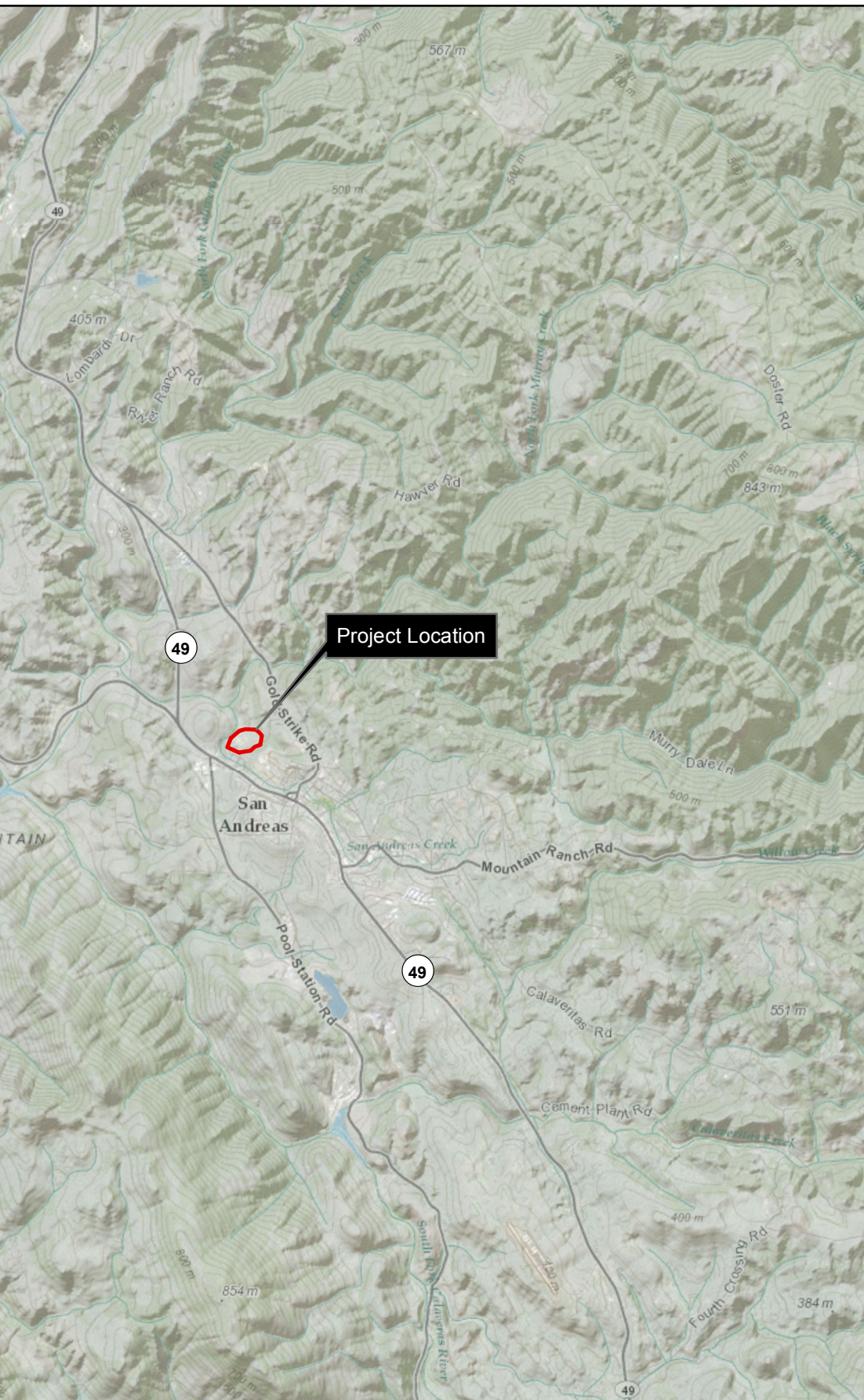
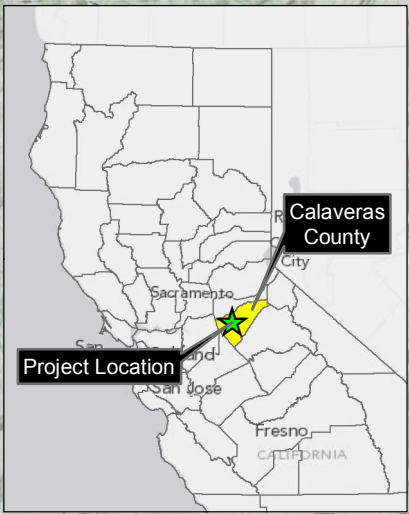
$$\begin{matrix} \text{Basic Monthly Sewer} & & \text{The Flat Rate} & & \text{Average Monthly} & & \text{Monthly} \\ \text{service and} & = & \text{Monthly} & \times & \text{water consumption} & = & \text{commercial} \\ \text{Collection charge} & & \text{Commercial Charge} & & \text{5400 gal per month} & & \text{User charge} \end{matrix}$$

This is currently represented as:

$$\$69 * (1 + \text{Monthly Water Use}/5400 \text{ gal/month}) = \text{Monthly Commercial User Charge}$$

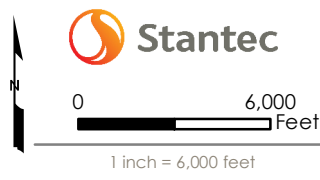
Current commercial water use is determined based on winter water use for the months of November, December, January, for the prior year. The District calculates an average for the three-month period and then uses that to determine the fixed rate for each month (for each 12-month period beginning the following July).





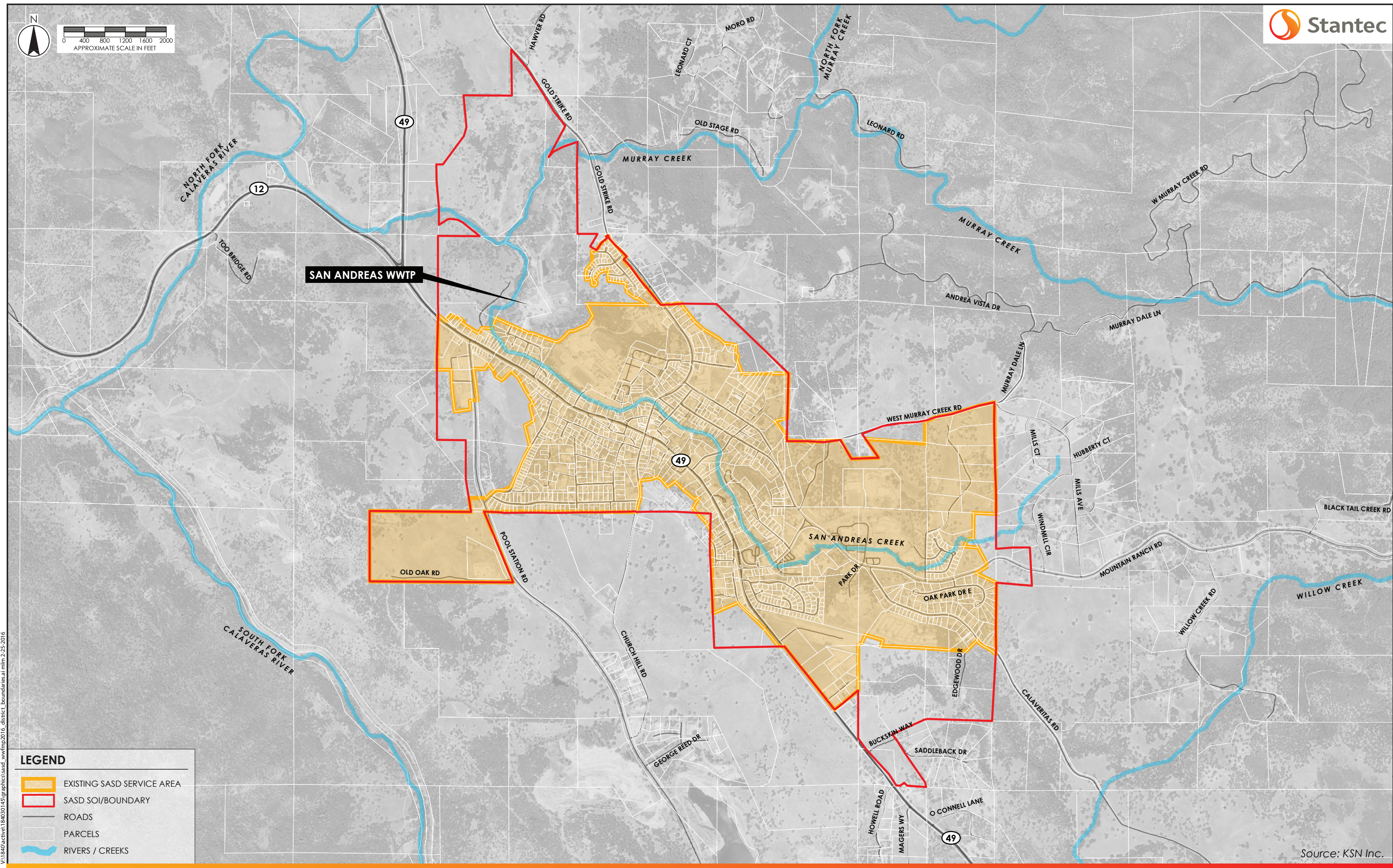
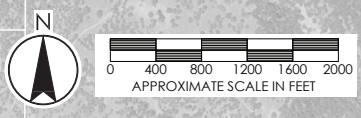
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Project: 184030145; Sources: Stantec 2014, NID GIS 2014, Calaveras County GIS 2014; Created by: K. Gross. Updated: 7/2/2014. Service Layer Credits: Copyright: ©2012 Esri, DeLorme, NAVTEQ  
 Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), and the GIS User Community  
 Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aergrid, IGN, IGP, swisstopo, and the GIS User Community



**Figure 1**  
**San Andreas Location Map**

San Andreas Sanitary District Digester Upgrade Project



**LEGEND**

- EXISTING SASD SERVICE AREA
- SASD SOI/BOUNDARY
- ROADS
- PARCELS
- RIVERS / CREEKS

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Source: KSN Inc.

## **3.0 PROJECT SUMMARY AND COST OVERVIEW**

This section provides an overview of the proposed Project, including estimated project costs and financing assumptions. Table 2 provides the estimated cost for both annual Collection System costs and system wide one-time costs including proposed currently expected timing of these one-time costs.

### **3.1.1 Annual Collection System Costs**

The District's Collection System Master Plan identifies annual costs to address collection system repair and replacement. The District's network of existing sewers serves all connections and conveys committed flows within the District boundary. This includes existing connections for unoccupied services and a single source flow agreement the District has to convey wastewater from Calaveras County Jail. As with all agencies, the District's assets are aging and must be replaced, ideally, before they exceed their useful life.

Additional studies/investigations are warranted in order to further isolate problem areas and maximize the benefit of existing users. This additional investigation will likely be accomplished through regular smoke testing and CCTV inspection.

### **3.1.2 Current Capital Improvement Project Description**

Recommended projects related to modifying WWTP for the benefits of the existing users are summarized below; **Figure 3** shows the layout of existing treatment processes and those identified for upgrade on the WWTP site.

#### **3.1.2.1 Replace the Existing Anaerobic Digester with a New Aerobic Digester**

Project components include the construction of an aerobic digester to digest the sludge from the primary clarifier as well as the WAS from the new (2009/10) activated sludge, extended aeration process. The existing anaerobic digester would be decommissioned. The aerobic digester would consist of two concrete basins. A mixture of primary sludge and WAS would be continuously fed to the aerobic digester where sludge would be digested under aerobic conditions. Aeration blowers and diffusers would be provided to maintain oxygen needed for aerobic degradation of sludge.

It is proposed that this project provide the new aerobic digester described in the project Engineering Report for the San Andreas Sanitary District Digester Upgrade dated February 20, 2015 and previously submitted to the DFA and USDA RD, with an estimated cost of \$2.5 Million.



**Table 2**  
**Sewer Rate Study**  
**Capital Improvement Project Schedule and Anticipated Annual Cost (Preliminary)**

					Fiscal Year							
					0	1	2	3	4	5		
Ranking	Project Description	Project Phase			16/17	17/18	18/19	19/20	20/21	21/22	Total	
<b>Collection System - Semi Annual Costs</b>												
1	CCTV Inspection	Annual				\$18,000		\$18,000		\$18,000		
2	Smoke Testing	Annual				\$5,000		\$5,000		\$5,000		
3	Collection System Replacement	Annual					\$150,000		\$150,000			
<b>Total Semi Annual Costs - Ongoing</b>					<b>\$0</b>	<b>\$23,000</b>	<b>\$150,000</b>	<b>\$23,000</b>	<b>\$150,000</b>	<b>\$23,000</b>	<b>\$369,000</b>	
<hr/>												
					0	1	2	3	4	5		
Ranking	Project Description	Project Phase	Funding	Completion	Total Project Cost*	16/17	17/18	18/19	19/20	20/21	21/22	
<b>System-wide - One-time Project Costs</b>												
1	Aerobic Digester		SRF/USDA		\$2,500,000							
	Engineering Report	complete			\$0	\$0						
	Environmental Design	complete			\$0	\$0						
	Design	2017-18			\$172,000	\$86,000	\$86,000					
	Construction	2018-19			\$2,328,000		\$582,000	\$1,164,000	\$582,000			
					\$2,500,000							
2	Headworks		SRF/USDA		\$1,170,000							
	Planning	complete			\$0	\$0						
	Design	2017-18			\$97,000	\$48,500	\$48,500					
	Construction	2018-19			\$1,073,000		\$268,250	\$536,500	\$268,250			
					\$1,170,000							
3	Pump Station Upgrade (Irrigation)		SRF/USDA		\$1,200,000							
	Planning	complete			\$0	\$0						
	Design	2017-18			\$100,000	\$50,000	\$50,000					
	Construction	2018-19			\$1,100,000		\$275,000	\$550,000	\$275,000			
					\$1,200,000							
4	Improve and Expand Pond D ( 7.2 Mgal)		SRF/USDA		\$370,000							
	Planning	2016-17			\$80,000	\$80,000						
	Design	2017-18			\$25,000		\$25,000					
	Improvement Construction	2018-19			\$265,000		\$66,250	\$132,500	\$66,250			
					\$370,000							
5	Pond B&C Improvements		SRF/USDA		\$190,000							
	Planning	complete			\$0	\$0						
	Design	2016-17			\$16,000	\$16,000						
	Construction	2018-19			\$174,000		\$43,500	\$87,000	\$43,500			
					\$190,000							
6	Aeration System Improvements		SRF/USDA		\$120,000							
	Planning	complete			\$0							
	Design	2017-18			\$20,000	\$20,000						
	Construction	2018-19			\$100,000		\$25,000	\$50,000	\$25,000			
					\$120,000							
<b>Total One-time Costs</b>					<b>\$5,550,000</b>	<b>\$300,500</b>	<b>\$1,469,500</b>	<b>\$2,520,000</b>	<b>\$1,260,000</b>	<b>\$0</b>	<b>\$0</b>	<b>\$5,550,000</b>
* Construction costs include Contingency and Engineering Services during construction												
										<b>Total Annual and One-time Capital Improvement Costs</b>	<b>\$5,919,000</b>	
										<b>Total Semi-Annual Costs - Ongoing</b>	<b>\$369,000</b>	
										<b>Total Project Costs to be Funded</b>	<b>\$5,550,000</b>	

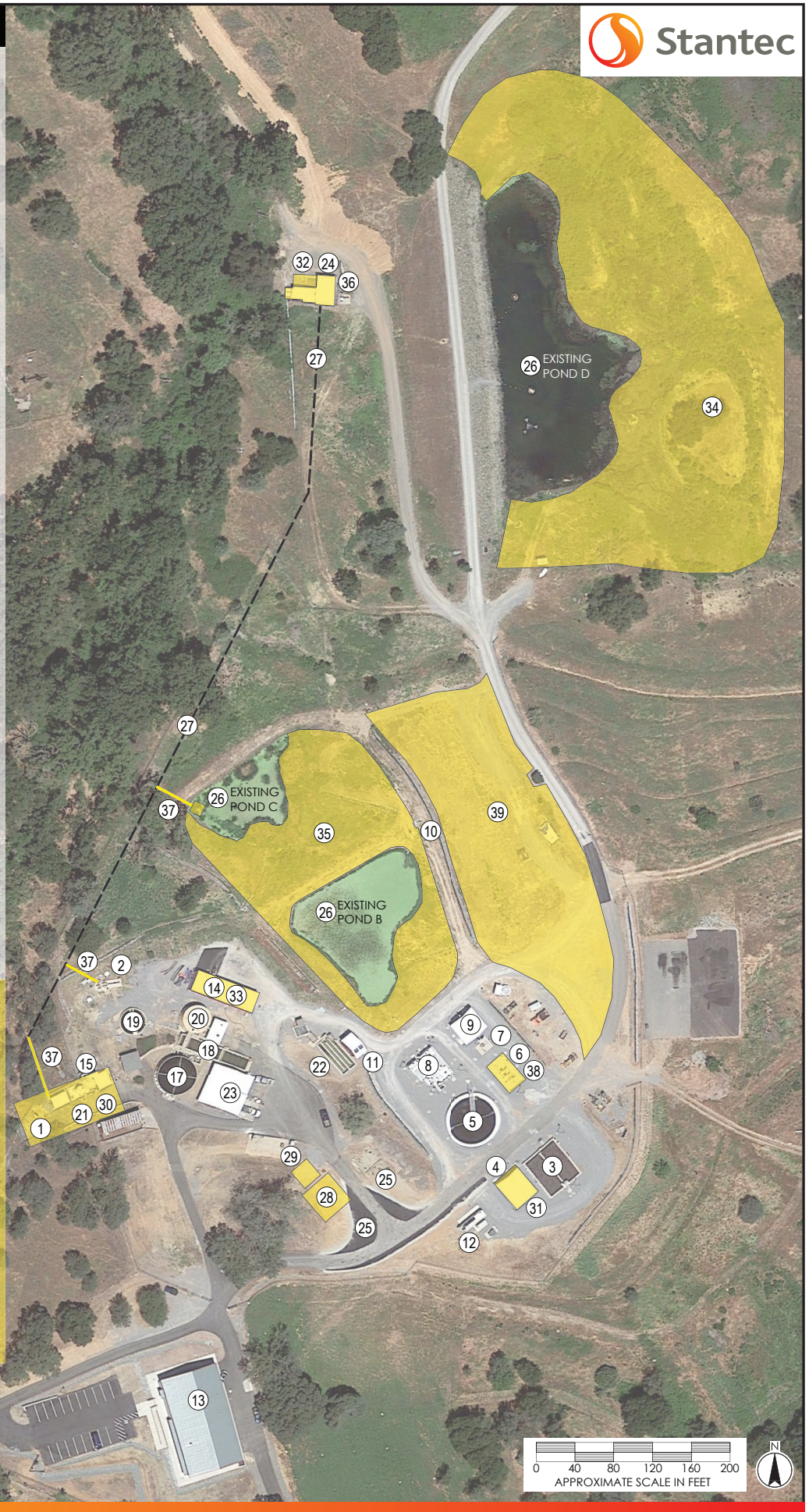
**Existing Facilities**

- ① Influent Chemical Facilities
- ② Process Feed Pump Station
- ③ Aeration Basins
- ④ Blower & MCC Building
- ⑤ Secondary Clarifier
- ⑥ RAS/WAS Pump Station
- ⑦ SCUM/Drain Pump Station
- ⑧ Flocculation and Filtration
- ⑨ Polymer Feed System and Storage
- ⑩ Effluent Control
- ⑪ Plant Water Pump Station (3W)
- ⑫ Electrical and Standby Generator
- ⑬ Office and SCADA System
- ⑭ Belt Filter Press
- ⑮ Headworks
- ⑯ Diversion Box
- ⑰ Trickling Filter
- ⑱ Primary Clarifier
- ⑲ Intermediate Clarifier
- ⑳ Digester
- ㉑ Influent Flow Meter
- ㉒ Chlorine Chamber
- ㉓ Maintenance Building
- ㉔ Irrigation Pump Station
- ㉕ Sludge Drying Beds
- ㉖ Ponds (not shaded for clarity)
- ㉗ Effluent Return Piping (Existing 6" FM)\*

\* Existing 6" FM, design criteria must be confirmed to determine if this line can be reused.

**Upgrade Project Components**

- ⑳ Aerobic Digester
- ㉑ Digester Blowers
- ㉒ Headworks Upgrades
- ㉓ Aeration Improvements
- ㉔ Irrigation PS, Electrical Service & new MCC
- ㉕ Belt Filter Press Building Improvements
- ㉖ Pond D Improvements
- ㉗ Pond B & Pond C Improvements
- ㉘ Irrigation PS Improvements
- ㉙ Effluent Return Piping Modifications
- ㉚ RAS Pump Station Canopy
- ㉛ Staging Area



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Figure 3  
SASD WWTP Upgrade Project Components

## DRAFT WASTEWATER RATE STUDY

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### 3.1.2.2 Replace the 60-Year Old Headworks

The existing Headworks is nearing the end of its useful life and needs to be replaced. This project was not included in the 2010 Phase A - WWTP upgrade project for economic reasons. Basic issues with the existing headworks are:

1. The 60-year-old concrete is deteriorating (hydrogen sulfide in raw sewage forms sulfuric acid, which attacks concrete).
2. The influent sewer pipe was up-sized years ago, and for economic reasons, the bottom of the new, larger pipe was placed below the floor of the headworks structure. This “step up” from the bottom of the sewer pipe into the bottom of the headworks accumulates debris and limits the capacity of the influent sewer.
3. The headworks was designed to be a “pass through” structure. However, as the WWTP has evolved over time, this “pass through” structure must, now, function as an influent flow splitting structure between the trickling filter, activated sludge process, and HFTS (High Flow Treatment System).

The existing headworks should be replaced to address the problems identified, and to automate the influent flow splitting function of the headworks. An opinion of probable cost to replace the headworks is approximately \$1.17 million. The new headworks would include the following specific features and functions:

- Hydraulic improvements to improve flow characteristics (align influent trunk sewer invert with headworks structure invert)
- Automation of influent flow splitting functions
- New mechanical influent screen
- New electrical service and motor control center (MCC)

### 3.1.2.3 Irrigation Pump Station

The irrigation pump provides a critical effluent disposal function and is in need of upgrades to continue this function effectively and reliably.

Upgrading the pumps in the existing pump station would improve irrigation pumping capabilities to the Dedicated Land Disposal Area (DLDA) and provide additional capacity for expansion of the DLDA area. Pump upgrades will also improve pumping capabilities to return secondary effluent to the WWTP headworks from Pond D. This would provide increased operational flexibility for the facility overall, providing the ability to retreat stored effluent at the WWTP if necessary.



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Project Summary and Cost Overview  
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The cost to upgrade the pumping capacity to return effluent from pond D to the WWTP headworks is estimated to be approximately \$420,000. The cost to improve the pumping capacity to the DLDA is estimated to be approximately \$550,000. The cost to improve the electrical instrumentation and controls, including the existing MCC is \$230,000. The total combined cost of these irrigation pump station improvements is estimated at approximately \$1,200,000.

### 3.1.2.4 Increase Pond D to a Volume of 7.2 Mgal

Based on the District Engineer's revised water balances, the capacity of Pond D needs to be increased from its current capacity of 4.3 Mgal to 7.2 Mgal to serve the needs of the District's existing constituency through 100-year rainfall conditions, and thereby avoid a repeat of the overtopping event that occurred in December 2014. This increase in storage volume capacity will be achieved through a four-step process:

1. Improving drainage around Pond D to divert storm water away from Pond D

A portion of the slope above Pond D to the north currently drains into the pond. Improvements upslope of Pond D could be made to capture and route surface storm water runoff from this area around Pond D. Such improvements could include construction of a drainage ditch or installation of a portable drainage pumping system to divert drainage around Pond D to San Andreas Creek.

2. Increasing the spillway level to the two feet of permitted freeboard elevation, thereby increasing the storage volume

The existing overflow structure weir is located approximately three feet below the lowest elevation of the top of the dam (spillway crest). The current permit requires the District to maintain at least two feet of freeboard from the lowest point of overflow (spillway crest). Based on this, the maximum permitted water surface elevation could be increased by one foot. This is based on maintaining a minimum elevation difference from the overflow structure weir to the lowest elevation point on the top of the dam of at least two feet.

3. Negotiating revised permit conditions to allow freeboard to be less than two feet

The District Engineer proposes to revise the 2014 permit (Order No. R5-2014-0104) to allow operation of Pond D with only one foot of freeboard (the 2014 permit requires two feet of freeboard). Along with minor modification of the dam spillway, this revision will increase the effective storage volume of Pond D from 4.3 Mgal to 6.1 Mgal. This revision requires various submittals to regulatory agencies, and is estimated to have a total planning cost of approximately \$80,000. This project has no significant annual cost, thereafter, associated with it. This should be a "one time" expense.

## DRAFT WASTEWATER RATE STUDY

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### 4. Excavate Within Pond D

Pond D is underlain by soil and soil/rock as characterized by Crawford & Associates, Inc. in their April 13, 2015 Geotechnical Report. The depth of the excavatable soil is from 1.5 to 3 feet below the land surface. Based on seismic refraction surveys, as correlated to test pit surveys, Crawford & Associates estimates that excavation of the soil and underlying weathered rock with typical grading equipment would be limited to 2 ½ to 6 feet below the existing ground surface. Assuming that an average depth of about 3 feet could be excavated within Pond D, the estimated volume increase from this activity could be approximately 1.1 Mgal.

If the Pond D overflow weir structure elevation (and reduction of minimum permitted freeboard) can be implemented as described above, the combined total permitted volume of Pond D with the excavation work can result in a total volume of 7.2 Mgal.

### 3.1.2.5 Modify Ponds B and C

Ponds B and C were part of the pre-2010 WWTP and have limited usefulness as currently configured and permitted for use in the 2014 permit. These ponds receive stormwater runoff, and therefore can overflow to San Andreas Creek. Because they can overflow, they cannot be used in any way that may leave significant contaminants, solids, or pathogens of wastewater origins in these ponds.

The plant currently does not have an emergency storage basin. Re-purposing ponds B and C for maintenance purposes (to receive plant drains or emergency overflow) would greatly improve the plant operational flexibility. Possible modifications to Ponds B and C include:

1. Route stormwater runoff around these ponds
2. Install return pumping and piping to allow ponds to be drained after use

An opinion of probable project cost to complete these modifications is approximately \$190,000. Having these ponds available to receive effluent or partially treated wastewater would simplify maintenance operations and is expected to reduce annual O&M costs.

### 3.1.2.6 Aeration Improvements

Based on 5 years of experience with the Phase A - WWTP trickling filter/activated sludge process under a wide range of climate and wastewater conditions, it is apparent that there is a broad range of air requirements for the activated sludge system.

## DRAFT WASTEWATER RATE STUDY

Project Summary and Cost Overview  
October 3, 2016

There are three existing positive displacement (PD) blowers; one blower dedicated to each of the two aeration basins and the third blower providing redundancy. This practice wastes aeration energy and incurs unnecessary wear on the blowers by delivering more air than required. The proposed Project will construct piping modifications to allow one blower to supply air to both aeration basins, halving the air flow to each.

An opinion of probable cost to complete these modifications is approximately \$120,000.

### 3.1.3 Estimated Project Cost & Funding Sources

The District is considering upgrades to the WWTP to replace critical aging facilities and equipment, improve efficiencies and operational flexibility. The combined estimated cost of the proposed Project is approximately \$5.55 million. Because of the District's status as a "disadvantaged community" under the State Water Board DFA financial assistance program policy, the District is likely to qualify for approximately \$4.16 million in "principal forgiveness" or grant funding. The grant assumptions are based on the existing sewer rates being above the CWSRF threshold 1.5% of community median household income (MHI) (which they currently are). In addition, due to the District's existing sewer residential rate being above 2%, the District may qualify for up to 100% principal forgiveness/grant funding as determined by the State Water Board.

It is estimated that after accounting for 75% grant funding the District would need to finance approximately \$1.09 million in project costs with the CWSRF Program, or USDA-RD program.

The District is also pursuing an additional 12.5% in grant funds from USDA-RD. This amount could potentially be more or less depending on available grant funds.

Table 3 and 4 shows the Capital Improvement Project cost allocations using a conservative breakdown of the potential funding sources (CWSRF only) for the District to construct the proposed Project cost estimated at approximately \$5.55 million.

### 3.1.4 Financing Assumptions & Debt Service Calculations

Table 5 shows a summary of the financing assumptions for the estimated \$1.09 million CWSRF construction loan for the proposed Project. CWSRF's current interest rate is 1.70%, however, due to construction starting in 2017/18 a more conservative 1.90% interest rate was assumed with a 30-year duration. The estimated debt service for a CWSRF loan for the Project is approximately \$48,000 per year, based on the foregoing assumptions.

It is anticipated that the District will finance the project through either the CWSRF program or a combination of CWSRF and USDA RD financing. During conversations and research with the two funding agencies it was determined to be of greater benefit to work with conservative grant and loan assumptions until USDA-RD can provide a letter confirming their funding intent. If the USDA-RD 2.25% interest rate and a longer 40-year term were assumed, this would result in a lower loan and debt service.

**Table 3**  
**San Andreas Sanitary District**  
**Capital Improvement Project Cost Allocations**

---

<b>Item</b>	
<b>Total Capital Improvement Costs to be Funded</b>	<b>\$5,550,000</b>
Planning/Design/Construction	\$5,550,000
<i>Grant Assumptions (CWSRF)</i>	<i>\$4,162,500</i>
<i>Grant Assumptions (USDA)</i>	<i>\$0</i>
<i>Applicant's (SASD) Share</i>	<i>\$300,000</i>
<i>Costs to be Financed</i>	<i>\$1,087,500</i>

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**Table 4**  
**WWTP Improvements Project**  
**Estimated Project Cost & Funding Source**

	Planning (2012-16)		Construction (2017-18 and after)				Total, \$	Total, \$ Financed
	Loan Share, \$	Grant Share, \$	Loan Share, \$	CWSRF Grant Share, \$	Applicant's Share, \$	USDA Grants, \$		
A. Facilities Construction	\$0	\$0	\$617,500	\$2,752,500	\$300,000	\$ -	\$3,670,000	\$617,500
B. Facilities Planning	\$0	\$500,000	\$20,000	\$60,000	\$0		\$80,000	\$20,000
C. Facilities Design	\$0	\$0	\$107,500	\$322,500	\$0		\$430,000	\$107,500
D. Administrative and Legal	\$0	\$0	\$0	\$0	\$0		\$0	\$0
E. Land and Right-of-Way	\$0	\$0	\$0	\$0	\$0		\$0	\$0
F. Prime Engineering	\$0	\$0	\$0	\$0	\$0		\$0	\$0
G. Contingencies	\$0	\$0	\$235,000	\$705,000	\$0		\$940,000	\$235,000
H. Relocation Payments	\$0	\$0	\$0	\$0	\$0		\$0	\$0
I. Engineering Services During Construction	\$0	\$0	\$107,500	\$322,500	\$0		\$430,000	\$107,500
J. Other Costs	\$0	\$0	\$0	\$0	\$0		\$0	\$0
I. Other Costs	\$0	\$0	\$0	\$0	\$0		\$0	\$0
<b>L. Total Capital Costs</b>	<b>\$0</b>	<b>\$500,000</b>	<b>\$1,087,500</b>	<b>\$4,162,500</b>	<b>\$300,000</b>	<b>\$0</b>	<b>\$5,550,000</b>	<b>\$1,087,500</b>
M. Additional Cash Flow Needs								
<b>N. Total Funding Requirements</b>	<b>\$0</b>	<b>\$500,000</b>	<b>\$1,087,500</b>	<b>\$4,162,500</b>	<b>\$300,000</b>	<b>\$0</b>	<b>\$5,550,000</b>	<b>\$1,087,500</b>

**Table 5**  
**San Andreas Sanitary District**  
**WWTP Improvements Project Financing**  
**Assumptions & Debt Service Calculation**

<b>Item</b>	<b>Construction, Financed</b>
<b>Project Cost</b>	<b>\$5,550,000</b>
<b>Net Amount Financed</b>	<b>\$1,087,500</b>
Issuance Costs	\$0
Capitalized Interest	\$0
Debt Service Reserve Fund	\$0
Rounding Amount	\$0
<b>Total Bond/Loan Amount</b>	<b>\$1,087,500</b>
Calculated Debt Service	\$47,892
<b>Annual Debt Service - Rounded</b>	<b>\$48,000</b>
<b><u>Assumptions</u></b>	
Interest Rate	1.90%
Term	30 years
Bond/Loan Factor	1.000



### 4.0 REVENUE REQUIREMENTS AND FINANCIAL PLAN

A review of District revenue requirements is a key step in the rate analysis process. The review involves an analysis of current and historical operating revenues and expenses. This section of the report also provides a discussion of projected revenues and expenses.

#### 4.1 Historical Revenue and Expenses

Table 6 provides a summary of the District's historical and budgeted revenues and expenses. Revenues include sewer sales, property tax, interest income and miscellaneous revenues. Operating expenses include operation and maintenance (O&M) costs, capital costs including debt service, depreciation and transfers.

#### 4.2 Projected Revenue Requirement

Table 7 shows the projected revenue requirement from sewer account charges for fiscal years (FY) 2017/18 through 2021-22. The revenue requirement adjusts projected expenses for other non-sewer account charges related revenues (other revenue sources), such as property tax, income and interest. The annual revenue requirement for all Steps (as defined in the following discussion) in FY 2017-18 is approximately \$1.57 million and is projected to increase to \$1.71 million by FY 2021-22.

The analysis is broken into three steps to show the relative impact of needed increases in general operations and maintenance of the District or current costs (Step 1), general reserves and annual sanitary sewer cost including replacement (Step 2), and costs related to the currently proposed WWTP Project (Step 3).

The projected expenses are broken out into the following categories:

- **Step 1 - Baseline O&M:** Step 1 is intended to reflect the existing operations and maintenance expenses and debt service obligations of the sewer fund. The fiscal year 20115-16 draft financials serve as the basis for the expense projections for FY 17-16 through FY 2021-22. For FY 17-18, these costs total approximately \$1.42 million.
- **Step 2 –Reserves & Replacement:** Step 2 sanitary sewer annual costs are shown in Table 2. These costs are intended to reflect annual costs that may be necessary for repair and replacement of the District's equipment and collections system. The Equipment/Fleet/Capital replacement would be applied toward depreciation, when specific annual expenditures for this expense category are not identified. This step also includes approximately \$20,300 to \$22,188 in an allowance for general operating reserve. This would be the net revenue expected to be earned each year.
- **Step 3- Construction Project:** Step 3 costs are those costs associated with the currently proposed WWTP Improvement Project. Table 2 shows the engineer's preliminary project cost estimate (\$5.55 million, including contingency). Step 3 costs also include additional operation and maintenance costs due to the project, which are estimated at approximately \$24,000 in FY 2019-20. A ten percent debt service reserve is also included in Step 3 typically required by the funding agencies. This ten percent reserve is a requirement of the State Water Board DFA to secure financial assistance.



**Table 6**  
**Sewer Rate Study**  
**Summary of Historical Revenue and Expenses [1]**

	Audited					Draft
	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
<b>Operating Revenue</b>						
Sewer service charges	\$1,405,017	\$1,385,760	\$1,517,871	\$1,503,232	\$1,502,269	\$1,502,269
Connection Fees	\$327,631	\$12,644	\$0	\$1,000	\$0	\$3,000
<b>Total Operating Revenues</b>	<b>\$1,732,648</b>	<b>\$1,398,404</b>	<b>\$1,517,871</b>	<b>\$1,504,232</b>	<b>\$1,502,269</b>	<b>\$1,505,269</b>
<b>Non-Operating Revenues</b>						
Interest income	\$16,462	\$11,602	\$15,362	\$9,519	\$9,566	\$15,569
Rents and leases	\$1,640	\$1,640	\$1,640	\$1,640	\$1,640	\$1,640
In lieu taxes	\$577	\$557	\$508	\$527	\$560	\$476
Other	\$19	\$0	\$0	\$3,051	\$3,521	\$0 [2]
Jail Contract				\$8,559	\$9,522	\$9,522
Property tax	\$50,715	\$48,351	\$46,426	\$46,975	\$51,568	\$49,959
<b>Total Non-Operating Revenues</b>	<b>\$69,413</b>	<b>\$62,150</b>	<b>\$63,936</b>	<b>\$70,271</b>	<b>\$76,377</b>	<b>\$77,166</b>
<b>Total Revenues</b>	<b>\$1,802,061</b>	<b>\$1,460,554</b>	<b>\$1,581,807</b>	<b>\$1,574,503</b>	<b>\$1,578,646</b>	<b>\$1,582,435</b>
<b>Expenses</b>						
Plant, treatment and disposal						
Special Engineer Sewer Sys (43197)	\$50,000				\$0	\$0
Other Plant, treatment and disposal	\$843,924	\$1,385,760	\$592,120	\$487,748	\$765,710	\$755,642
<b>Subtotal Plant, treatment and disposal</b>	<b>\$893,924</b>	<b>\$1,385,760</b>	<b>\$592,120</b>	<b>\$433,770</b>	<b>\$765,710</b>	<b>\$755,642</b>
General and administrative	\$259,655	\$206,379	\$678,351	\$704,932	\$356,785	\$431,115
Annual Sanitary Sewer	\$0	\$0	\$40,599	\$1,860	\$0	\$0
Equipment/Fleet/Capital Replacement	\$0	\$0	\$0	\$0	\$0	\$0
Debt Service - Interest	\$74,808	\$80,744	\$72,688	\$71,202	\$69,558	\$68,721
Debt Service - Principal	\$6,347	\$120,745	\$120,449	\$121,950	\$123,563	\$125,187
<b>Total Expenses</b>	<b>\$1,234,734</b>	<b>\$1,793,628</b>	<b>\$1,504,207</b>	<b>\$1,387,692</b>	<b>\$1,315,616</b>	<b>\$1,380,665</b>
<b>Net Revenues (Loss) before Depreciation</b>	<b>\$567,327</b>	<b>(\$333,074)</b>	<b>\$77,600</b>	<b>\$186,811</b>	<b>\$263,030</b>	<b>\$201,770</b>
Depreciation	\$182,579	\$545,131	\$551,388	\$559,663	\$559,261	\$562,635
<b>Net Revenues (Loss) after Depreciation</b>	<b>\$384,748</b>	<b>(\$878,205)</b>	<b>(\$473,788)</b>	<b>(\$372,852)</b>	<b>(\$296,231)</b>	<b>(\$360,865)</b>
Grant reimbursement	\$0	\$0	\$0	\$53,978	\$98,462	\$282,363

[1] Based on Audited Financial Statements for fiscal years ending in 2011, 2012, 2013, 2014, 2015, and 2016.

[2] Actual other operating income for 2015-16 was \$17,322. Based on previous years this amount was not used in future projections



**Table 7**  
**San Andreas Sanitary District**  
**Summary of Projected Annual Revenue Requirement through FY 2020-21**



	Projected				
	2017-18	2018-19	2019-20	2020-21	2021-22
	1	2	3	4	5
<b>Revenue Requirement</b>					
<b>STEP 1</b>					
<b>Expenses</b>					
Plant, treatment and disposal					
Special Engineer Sewer Sys (43197)	\$0	\$0	\$0	\$0	\$0
Other Plant, treatment and disposal	\$778,481	\$790,158	\$817,931	\$854,940	\$902,276
<b>Subtotal Plant, treatment and disposal</b>	<b>\$778,481</b>	<b>\$790,158</b>	<b>\$817,931</b>	<b>\$854,940</b>	<b>\$902,276</b>
General and administrative	\$444,145	\$450,808	\$466,653	\$487,767	\$514,774
Other	\$0	\$0	\$0	\$0	\$0
Existing Debt Service (USDA & SRF)	\$194,718	\$194,749	\$194,754	\$194,733	\$194,686
<b>Subtotal</b>	<b>\$638,864</b>	<b>\$645,557</b>	<b>\$661,407</b>	<b>\$682,500</b>	<b>\$709,460</b>
<b>Subtotal Step 1 Revenue Req.</b>	<b>\$1,417,345</b>	<b>\$1,435,715</b>	<b>\$1,479,338</b>	<b>\$1,537,440</b>	<b>\$1,611,736</b>
<b>STEP 2</b>					
General Reserve Set Aside	\$20,300	\$20,605	\$21,017	\$21,542	\$22,188
Annual Sanitary Sewer	\$73,800	\$73,800	\$73,800	\$73,800	\$73,800
Equipment/Fleet/Capital Replacement	\$56,600	\$42,700	\$35,600	\$25,000	\$0
<b>Subtotal</b>	<b>\$150,700</b>	<b>\$137,105</b>	<b>\$130,417</b>	<b>\$120,342</b>	<b>\$95,988</b>
<b>STEP 3</b>					
New Debt Service	\$0	\$16,000	\$32,000	\$48,000	\$48,000
Debt Service Coverage	\$0	\$1,600	\$3,200	\$4,800	\$4,800
Additional Cost Related to Project	\$0	\$0	\$24,000	\$24,600	\$25,338
<b>Subtotal</b>	<b>\$0</b>	<b>\$17,600</b>	<b>\$59,200</b>	<b>\$77,400</b>	<b>\$78,138</b>
<b>Subtotal Revenue Requirement</b>	<b>\$1,568,045</b>	<b>\$1,590,420</b>	<b>\$1,668,955</b>	<b>\$1,735,182</b>	<b>\$1,785,862</b>
<i>Less Other Revenue Sources</i>					
Non-Operating Revenue	(\$77,166)	(\$77,166)	(\$77,166)	(\$77,166)	(\$77,166)
<b>Revenue Requirement from Rate</b>	<b>\$1,490,879</b>	<b>\$1,513,254</b>	<b>\$1,591,789</b>	<b>\$1,658,016</b>	<b>\$1,708,696</b>

## DRAFT WASTEWATER RATE STUDY

Revenue Requirements and Financial Plan  
October 3, 2016

### 4.3 Projected Cash Flows

Table 8 shows the five-year projected cash flow for the District. The existing revenue from sewer charges (per the FY 2015-16 draft financials) is shown and then the additional revenue required (based on Table 7) that is needed for each subsequent fiscal year. The projected annual revenue requirements and corresponding rate calculations are directly related to the projected expenses of the District. Table 8 shows the projected expenses for fiscal years 2017-18 through 2021-22. The annual cost adjustment factors are also shown to range between 1.5 to 3.0 % for each cost category. This range accounts for the recent reduction in the US inflation rates by gradually increasing the cost adjustment to a standard 3.0% by 2021/22. Annual net revenues in FY 2017-18 are projected to be \$20,300 and increase to 22,188 in FY 2021-22. These funds will allow the District to maintain an operating fund balance over time. Table 9 shows five-year projected cash flows related to the CIP projects including annual costs as outlined in Table 2. The revenues are based on the revenue requirement shown in Table 7. The expenses are based on the CIP, Table 2. The revenue requirement, while taking into account the Table 2 need, has been normalized (averaged) over the five years in order to keep rates steady from 2017-18 through 2021-22.



**Table 8**  
**San Andreas Sanitary District**  
**Projected Cash Flow**

	Cost Factor	Draft 2015-16 [1]	Projected				
			2017-18 1	2018-19 2	2019-20 3	2021-21 4	2020-22 5
<b>Revenues</b>							
Current Budgeted Sewer Service Charges		\$1,502,269	\$1,502,269	\$1,502,269	\$1,502,269	\$1,502,269	\$1,502,269
Additional Revenue Required:							
Year							
2016-17			(\$16,314)	(\$16,314)	(\$16,314)	(\$16,314)	(\$16,314)
2017-18			\$4,924	\$4,924	\$4,924	\$4,924	\$4,924
2018-19				\$22,375	\$22,375	\$22,375	\$22,375
2019-20					\$78,535	\$78,535	\$78,535
2020-21						\$66,227.09	\$66,227
2021-22							\$50,681
<b>Subtotal</b>		<b>\$1,502,269</b>	<b>\$1,490,879</b>	<b>\$1,513,254</b>	<b>\$1,591,789</b>	<b>\$1,658,016</b>	<b>\$1,708,696</b>
<b>Non-Operating Revenues</b>							
Interest income		\$15,569	\$15,569	\$15,569	\$15,569	\$15,569	\$15,569
Rents and leases		\$1,640	\$1,640	\$1,640	\$1,640	\$1,640	\$1,640
In lieu taxes		\$476	\$476	\$476	\$476	\$476	\$476
Other		\$0	\$0	\$0	\$0	\$0	\$0
Jail Contract		\$9,522	\$9,522	\$9,522	\$9,522	\$9,522	\$9,522
Property tax		\$49,959	\$49,959	\$49,959	\$49,959	\$49,959	\$49,959
<b>Total Non-Operating Revenues</b>		<b>\$77,166</b>	<b>\$77,166</b>	<b>\$77,166</b>	<b>\$77,166</b>	<b>\$77,166</b>	<b>\$77,166</b>
<b>Total Revenues</b>		<b>\$1,579,435</b>	<b>\$1,568,045</b>	<b>\$1,590,420</b>	<b>\$1,668,955</b>	<b>\$1,735,182</b>	<b>\$1,785,862</b>
<b>STEP 1</b>							
<b>Expenses</b>							
Plant, treatment and disposal							
Special Engineer Sewer Sys (43197)		\$0	\$0	\$0	\$0	\$0	\$0
Other Plant, treatment and disposal	1.5% - 3.0%	\$755,642	\$778,481	\$790,158	\$817,931	\$854,940	\$902,276
<b>Subtotal Plant, treatment and disposal</b>		<b>\$755,642</b>	<b>\$778,481</b>	<b>\$790,158</b>	<b>\$817,931</b>	<b>\$854,940</b>	<b>\$902,276</b>
General and administrative	1.5% - 3.0%	\$431,115	\$444,145	\$450,808	\$466,653	\$487,767	\$514,774
Other		\$0	\$0	\$0	\$0	\$0	\$0
Existing Debt Service (USDA & SRF)		\$193,908	\$194,718	\$194,749	\$194,754	\$194,733	\$194,686
<b>Subtotal Step 1</b>		<b>\$1,380,665</b>	<b>\$1,417,345</b>	<b>\$1,435,715</b>	<b>\$1,479,338</b>	<b>\$1,537,440</b>	<b>\$1,611,736</b>
<b>STEP 2 (Capitol Set-Asides)</b>							
General Operating Reserve [2]		\$0	\$0	\$0	\$0	\$0	\$0
Annual Sanitary Sewer Costs		\$0	\$73,800	\$73,800	\$73,800	\$73,800	\$73,800
Equipment/Fleet/Capital Replacement		\$0	\$56,600	\$42,700	\$35,600	\$25,000	\$0
<b>Subtotal Step 2</b>		<b>\$0</b>	<b>\$130,400</b>	<b>\$116,500</b>	<b>\$109,400</b>	<b>\$98,800</b>	<b>\$73,800</b>
<b>STEP 3 (New Project)</b>							
WWTP Improvements: New Debt Service		\$0	\$0	\$16,000	\$32,000	\$48,000	\$48,000
New Debt Service Coverage		\$0	\$0	\$1,600	\$3,200	\$4,800	\$4,800
Additional Costs Related to Project	2.0% - 3.0%	\$0	\$0	\$0	\$24,000	\$24,600	\$25,338
<b>Subtotal Step 3</b>		<b>\$0</b>	<b>\$0</b>	<b>\$17,600</b>	<b>\$59,200</b>	<b>\$77,400</b>	<b>\$78,138</b>
<b>Total Expense</b>		<b>\$1,380,665</b>	<b>\$1,547,745</b>	<b>\$1,569,815</b>	<b>\$1,647,938</b>	<b>\$1,713,640</b>	<b>\$1,763,674</b>
<b>Less</b>							
<b>Net Revenues</b>		<b>\$198,770</b>	<b>\$20,300</b>	<b>\$20,605</b>	<b>\$21,017</b>	<b>\$21,542</b>	<b>\$22,188</b>
<i>Total Debt Service</i>		<i>\$193,908</i>	<i>\$194,718</i>	<i>\$210,749</i>	<i>\$226,754</i>	<i>\$242,733</i>	<i>\$242,686</i>
<i>Net Revenues Before D/S and Capital Set-Asides</i>		<i>\$198,770</i>	<i>\$345,418</i>	<i>\$349,454</i>	<i>\$384,371</i>	<i>\$392,475</i>	<i>\$368,812</i>
<i>Debt Service Coverage</i>			<i>1.77</i>	<i>1.66</i>	<i>1.70</i>	<i>1.62</i>	<i>1.52</i>
<b>Beginning Fund Balance</b>		<b>\$1,059,657</b>	<b>\$1,278,427</b>	<b>\$998,727</b>	<b>\$1,019,332</b>	<b>\$1,040,348</b>	<b>\$1,061,890</b>
Net Revenues	1.5% - 3.0%	\$198,770	\$20,300	\$20,605	\$21,017	\$21,542	\$22,188
Project Contribution [3]			(\$300,000)				
<b>Ending Fund Balance</b>		<b>\$1,258,427</b>	<b>\$998,727</b>	<b>\$1,019,332</b>	<b>\$1,040,348</b>	<b>\$1,061,890</b>	<b>\$1,084,078</b>
<i>Target Fund Balance [4]</i>		<i>\$345,166</i>	<i>\$386,936</i>	<i>\$392,454</i>	<i>\$411,984</i>	<i>\$428,410</i>	<i>\$440,918</i>

[1] Excludes depreciation

[2] General Operating Reserve are the Net Revenues

[3] San Andreas Sanitary District contribution towards project financing, see table 4

[4] Assumes 3 months of operating expenses before debt service and reserve funding.

**Table 9**  
**San Andreas Sanitary District**  
**Projected CIP Cash Flow**



	2017-18	2018-19	2019-20	2020-21	2021-22
	1	2	3	4	5
<b>Revenues</b>					
<i>Transfer From Operating Fund</i>					
Annual Sanitary Sewer Allocation	\$73,800	\$73,800	\$73,800	\$73,800	\$73,800
Equipment/Fleet/Capital Replacement	\$56,600	\$42,700	\$35,600	\$25,000	\$0
Debt Proceeds		\$1,087,500			
<b>Subtotal Revenues</b>	<b>\$130,400</b>	<b>\$1,204,000</b>	<b>\$109,400</b>	<b>\$98,800</b>	<b>\$73,800</b>
Expenses					
Annual Repair & Replacement	\$0	\$23,000	\$150,000	\$23,000	\$150,000
Major CIP Repair & Replacement [1]		\$1,087,500			
<b>Subtotal Expenses</b>	<b>\$0</b>	<b>\$1,110,500</b>	<b>\$150,000</b>	<b>\$23,000</b>	<b>\$150,000</b>
<b>Net Income/(Loss)</b>	<b>\$130,400</b>	<b>\$93,500</b>	<b>(\$40,600)</b>	<b>\$75,800</b>	<b>(\$76,200)</b>
<b>Beginning Balance [1]</b>	<b>\$530,687</b>	<b>\$661,087</b>	<b>\$754,587</b>	<b>\$713,987</b>	<b>\$789,787</b>
Net Income/(Loss)	\$130,400	\$93,500	(\$40,600)	\$75,800	(\$76,200)
<b>Ending Balance</b>	<b>\$661,087</b>	<b>\$754,587</b>	<b>\$713,987</b>	<b>\$789,787</b>	<b>\$713,587</b>

[1] Restricted cash and investments 2014-2015 audited financials

## DRAFT WASTEWATER RATE STUDY

Wastewater Characteristics and Rates Analysis  
October 3, 2016

# 5.0 WASTEWATER CHARACTERISTICS AND RATES ANALYSIS

This section of the report describes the development of sewer rate calculations for the District based on new user classifications as described below.

## 5.1 Wastewater Customer Characteristics

Historically, the District rate structure has not accounted for strength as it was focused primarily on flow, which is not uncommon in small communities. However, strength is a significant component in the treatment of wastewater. Therefore, it is recommended that the District include both flow and strength in the rate structure. This will also tend to stabilize revenues from commercial charges over time, creating more fiscal certainty for the District.

Table 10 summarizes the wastewater customers, the number of units or accounts in each category, and their respective assumed wastewater characteristics in terms of flow and strength (BOD and SS). These characteristics are translated into estimated daily wastewater flow and strength contributions and then annual wastewater flow and strength contributions. This capacity is reflective of existing average flows and loadings. Total annual flow is estimated at approximately 96.13 million gallons.

Residential customers are all assumed to have wastewater flow and strength characteristics which are similar. Commercial users are defined in the District's ordinance, "as each separate business or commercial enterprise..." Commercial customers have been separated into seven groups as listed below and are further detailed, by group, in Table 11:

Group 1: Low Strength/Low Flow	(Retail, Offices, Beauty Shop, Churches, Parks)
Group 2: Medium Strength/Low Flow	(Gas Stations, Markets, Auto Repair, Dr. Offices, Community Centers, Restaurants, Car Wash, Lt Industrial, Motel, Government Services),
Group 3: Medium Strength/High Flow	(Hotel, Medical Office Building, Laundromat, Retirement Home, Government Center, Continuation & Charter School)
Group 4: Low Flow/High Strength	(Mixed Use, and Government Centers)
Group 5: Low Flow/High Strength	(Mortuary)
Group 6: High Strength/High Flow	(Hospitals)
Group 7: Schools	(Schools)

These groups reflect groups of customers with similar sewer flows and loads (based on District water data and industry averages for wastewater strength). Commercial users will continue to be charged a fixed rate, but this fixed charge will be based on the group into which they are categorized. The commercial user charge will also include a variable component with the rates varying by group. It is assumed that the variable rate will be charged based on annual water use by each account for the previous year. Ultimately, this should provide greater rate equity. For example, restaurants, with their heavy influent concentrations, are more costly to treat than business/retail, which typically have wastewater characteristics similar to single-family units.



**Table 10**  
**Summary of Wastewater User Characteristics**

Customer Category	Basis of Charge	Accounts/ Business	Units/ EDUs	Wastewater Characteristics [1]			Existing Treatment Flow & Loading			Annual Flow & Loading		
				ADWF/EDU GPD	BOD MG/L	SS MG/L	Flow MGD	BOD Lbs/Day	SS Lbs/Day	Flow MG	BOD Lbs/Year	SS Lbs/Year
			(A)	(B)	(C)	(D)	(E)=(A)x(B)	(F)= (C)x(E)x8.34	(G)= (D)x(E)x8.34	(K)=(E)x365	(L)=(F)x(K)x8.34	(M)=(G)x(K)x8.34
<b>Residential</b>												
Single Family	per Unit	675	675	150	200	200	0.1013	169	169	36.96	61,643	61,643
Multi-Family	per Unit	75	481	150	200	200	0.0722	120	120	26.33	43,926	43,926
Capacity Maintenance	per Connection	2	13	150	200	200	0.0020	3	3	0.71	1,187	1,187
<b>Subtotal</b>		<b>752</b>	<b>1,169</b>				<b>0.1754</b>	<b>292</b>	<b>292</b>	<b>64.00</b>	<b>106,757</b>	<b>106,757</b>
<b>Commercial [1]</b>												
Group 1	per Business	100		227	210	210	0.0227	40	40	8.29	14,511	14,511
Group 2	per Business	69		247	328	328	0.0170	47	47	6.22	17,005	17,005
Group 3	per Business	10		1,034	335	335	0.0103	29	29	3.77	10,544	10,544
Group 4	per Business	3		3,434	350	350	0.0103	30	30	3.76	10,976	10,976
Group 5	per Business	1		421	550	550	0.0004	2	2	0.15	705	705
Group 6	per Business	2		9,950	450	450	0.0199	75	75	7.26	27,260	27,260
Group 7	per Business	2		3,655	325	325	0.0073	20	20	2.67	7,232	7,232
<b>Subtotal</b>		<b>187</b>					<b>0.0880</b>	<b>242</b>	<b>242</b>	<b>32.13</b>	<b>88,234</b>	<b>88,234</b>
Infiltration/Inflow												
<b>TOTAL</b>		<b>939</b>	<b>1,169</b>				<b>0.2634</b>	<b>534</b>	<b>534</b>	<b>96.13</b>	<b>194,990</b>	<b>194,990</b>

"user\_characteristics"

[1] Groups are defined as follows:

- Group 1: Low Strength/Low Flow
- Group 2: Medium Strength/Low Flow
- Group 3: Medium Strength/Medium Flow
- Group 4: Medium Strength/High Flow
- Group 5: High Strength/Low Flow
- Group 6: High Strength/High Flow
- Group 7: Schools

**Table 11**  
**Commercial Customer and Wastewater Characteristic Assumptions Summary**



	Sewer Code	Accounts	Average Annual Water Flow [1] [2]	Strength [2]		
			GPD	BOD - MG/L	SS - MG/L	
<b>Group 1 - Low Strength/Low Flow</b>						
Retail	1.1	34	101	200	200	
Offices	1.2	52	123	200	200	
Beauty/Barber Shop	1.3	3	85	200	200	
Churches	1.4	7	699	250	250	
Parks [3]	1.7	4	-	200	200	
<b>Average</b>			<b>252</b>	<b>210</b>	<b>210</b>	
<b>Total</b>		<b>100</b>				
<b>Group 2 - Medium Strength/Low Flow</b>						
Gas Stations & Mini Marts	2.1	7	366	350	350	
Auto Repair	2.2	6	51	325	325	
Doctor and Dentist Offices	2.3	3	62	300	300	
Community Center & Lodges	2.4	6	301	325	325	
Motel/ Bed & Breakfast	2.5	2	544	350	350	
Restaurants & Bars	2.6	13	190	350	350	
Car Wash	2.7	1	340	300	300	
Lt. Industrial/Warehouse/Storage	2.8	11	102	300	300	
Government Services	2.9	20	654	350	350	
<b>Average</b>			<b>290</b>	<b>328</b>	<b>328</b>	
<b>Total</b>		<b>69</b>				
<b>Group 3 - Medium Strength/Medium Flow</b>						
Medical Office Buildings	3.1	4	1027	350	350	
Laundromat	3.2	1	785	300	300	
Retirement Home	3.3	2	1066	350	350	
Continuation/Charter Schools	3.4	2	1533	325	325	
Grocery Store and Butcher	3.5	1	1668	350	350	
<b>Average</b>			<b>1216</b>	<b>335</b>	<b>335</b>	
<b>Total</b>		<b>10</b>				
<b>Group 4 - Medium Strength/High Flow</b>						
Mixed Use	4.1	1	3465	350	350	
Government Centers	4.2	2	4616	350	350	
<b>Average</b>			<b>4040</b>	<b>350</b>	<b>350</b>	
<b>Total</b>		<b>3</b>				
<b>Group 5 - High Strength/Low Flow</b>						
Mortuary	5.1	1	496	550	550	
<b>Average</b>			<b>496</b>	<b>550</b>	<b>550</b>	
<b>Total</b>		<b>1</b>				
<b>Group 6 - High Strength/High Flow</b>						
Hospitals	6.1	2	16583	450	450	
<b>Average</b>			<b>16583</b>	<b>450</b>	<b>450</b>	
<b>Total</b>		<b>2</b>				
<b>Group 7</b>						
Schools	7.1	2	6646	325	325	
<b>Average</b>			<b>6646</b>	<b>325</b>	<b>325</b>	
<b>Total</b>		<b>2</b>				
<b>Total</b>		<b>187</b>				

[1] Based on water use during years 2013, 2014 and 2015

[2] Based on industry standards where available and past rate study experience of Stantec/G Aronow Consulting.

[3] Average water use not used for parks due to majority irrigation use

## DRAFT WASTEWATER RATE STUDY

Wastewater Characteristics and Rates Analysis  
October 3, 2016

As part of this rate analysis the District audited their commercial accounts per the ordinance definition of a commercial user. Previous billing practices had not accounted for separate business entities or residences on one commercial account. This resulted in an increase to approximately 752 residential customers and approximately 187 commercial businesses served by the District (See above section 2.1.3 for current customer summary).

For purposes of the rate model and calculating rates, some adjustments were assumed for commercial water flows that should be noted and which are detailed in Table 12. Fiscal Year 2015 annual water use (January through November) as provided by the Calaveras Public Utility District CPUD) was used as the basis for the wastewater use assumptions. However, the amount of wastewater flow assumed varies for each group. In the case of groups where there is lower strength or flow (Groups 1 and 4), all of it was generally assumed as 90-85 percent wastewater flow. In the case of high water volume users, 60 percent of the water use was assumed for hospitals and 55 percent for schools as wastewater flow, shown in Table 12.





**Table 12**  
**Commercial Water Use Assumed in Rate Calculations**

	Accounts	Average Annual Water Use		% Assumed in Model [1]	Water Use Assumed in Model	
		GPD per Account	Total - MG/Y		GPD per Account	Total - MG/Y
Commercial						
Group 1	100	252.0	9.20	90%	227.00	8.29
Group 2	69	290.2	7.31	85%	247.00	6.22
Group 3	10	1215.9	4.44	85%	1,034.00	3.77
Group 4	3	4040.4	4.42	85%	3,434.00	3.76
Group 5	1	495.7	0.18	85%	421.00	0.15
Group 6	2	16582.7	12.11	60%	9,950.00	7.26
Group 7	2	6646.3	4.85	55%	3,655.00	2.67
<b>Subtotal</b>	<b>187.0</b>		<b>42.51</b>			<b>32.13</b>

[1] Water Use is adjusted by a fixed percent to estimate for wastewater generation  
 (not all water use translates to wastewater, e.g. irrigation)

### 6.0 COST OF SERVICE ANALYSIS

The revenue requirements reviewed and finalized through the operating cash flow analysis discussed in Section 4 of the report provide the basis for performing the cost of service analysis and rate calculations, discussed in this Section.

Cost allocation is the method by which the annual sewer charge revenue requirement is recovered from each customer class based on the cost of providing sewer service. The total revenue requirements, net of revenue credits from other sources, shown in Table 7, is by definition the cost of providing service. These costs must then be allocated to each customer class. This is done in a three step process as follows:

1. **Allocate the Annual O&M Costs to Either Treatment or Collection** – The operating and maintenance costs are first allocated to either treatment or collection. Capital costs continue to be classified as capital costs.
2. **Determine the Unit Cost per Flow, BOD, or SS** – Once the costs are allocated to collection, treatment, or capital expenditures they are then distributed to either flow or strength categories. The flow category is simply referred to as flow. There are two strength categories – biochemical oxygen demand (BOD) and suspended solids (SS). The annual revenue requirement is distributed to flow, BOD and SS depending on a percentage distribution of O&M operations (or project capital expenditures) attributed to flow, BOD, and SS. The unit cost is then determined by dividing the allocated cost per flow or strength category by the total system demand for that category.
3. **Determine the Annual Cost per Customer Type** – The unit costs (for flow, BOD, and SS by cost category) are then multiplied by the number of units/accounts to determine the annual cost per customer category.

Once the costs are allocated to each customer category, the sewer rates can be calculated. By determining a unit cost to allocate customer costs, it ensures that each user is paying the same “unit cost” only then to vary by the use or impact of each user on the system and therefore meets the requirements of Proposition 218.

The tables used to illustrate the sewer rate calculations in the discussion below are for FY 2017-18. These same calculations are performed for each year of the rate study projection period.

## DRAFT WASTEWATER RATE STUDY

Cost of Service Analysis  
October 3, 2016

### 6.1.1 Cost Allocation to Collection and Treatment Categories

The operating and maintenance costs are allocated to collection and treatment function categories based on percentage allocation or distribution factors as shown in Table 13. These percentage allocation factors are based on the estimated distribution of District costs between the two system functions and based on Stantec and G Aronow Consulting experience with other sewer rate studies. Capital costs remain segregated as capital costs.

The costs shown in Table 13 correspond to the projected costs in Table 10, prior to any offsetting revenue adjustments.

### 6.1.2 Cost Allocation to Flow and Strength & Unit Cost Determination

Once the costs are allocated to a functional category, the costs are then further allocated to flow, BOD, and SS, as shown in Table 14. The costs are allocated to flow, BOD, and SS based on percent allocation factors. Collection costs are strictly related to flow and therefore, 100 percent of the collection costs are allocated to flow. For all other costs it is assumed that the distribution is 60% to flow, 20% to BOD, and 20% to SS. These distribution factors were determined based on discussions with the District Manager, Engineer and consulting engineers.

The allocated costs are then divided by the influent total to determine the unit cost per flow, BOD, and SS. These unit costs are then used to determine the cost allocated to each customer type and ultimately the calculated rates for each customer.

### 6.1.3 Cost Allocation by Customer Category

Table 15 shows the cost allocated to flow, BOD, and SS by customer category for 2017-18. The unit costs determined in Table 14 are multiplied by the flow, BOD, or SS for each customer type. These costs are then summed to determine the total cost allocation by customer type.

**Table 13**  
**San Andreas Sanitary District**  
**Projected Costs and Distribution between Collection and Treatment System**

<b>2017-18</b>
Baseline Analysis



	Inflation Adjustment	2015-16	Projected 2017-18	Allocation		Collection System			Treatment System			
				Collection	Treatment	Cost	Fixed	Variable	Cost	Fixed	Variable	
		Years Inflated: <input type="text" value="2"/>										
<b>Expenditures</b>												
<b>STEP 1</b>												
Plant, treatment and disposal												
Special Engineer Sewer Sys (43197)	1.5%	\$0	\$0	5%	95%	\$0	\$0		\$0	\$0		
Other Plant, treatment and disposal	1.5%	\$755,642	\$778,481	20%	80%	\$155,696	\$155,696		\$622,785	\$622,785		
<b>Subtotal Plant, treatment and disposal</b>		<b>\$755,642</b>	<b>\$778,481</b>			<b>\$155,696</b>	<b>\$155,696</b>		<b>\$622,785</b>	<b>\$622,785</b>		
General and administrative	1.5%	\$431,115	\$444,145	20%	80%	\$88,829	\$88,829		\$355,316	\$355,316		
Other	1.5%	\$0	\$0	0%	100%	\$0	\$0		\$0	\$0		
Existing Debt Service (USDA & SRF)	0.00%	\$193,908	\$194,718	0%	100%	\$0	\$0		\$194,718	\$194,718		
Less Other Revenue Sources		(\$77,166)	(\$77,166)	20%	80%	(\$15,433)	(\$15,433)		(\$61,733)	(\$61,733)		
<b>Subtotal Step 1</b>		<b>\$1,303,499</b>	<b>\$1,340,179</b>			<b>\$229,092</b>	<b>\$229,092</b>		<b>\$1,111,087</b>	<b>\$1,111,087</b>		
<b>STEP 2</b>												
General Operating Reserve	1.5%	\$0	\$20,300	20%	80%	\$4,060	\$4,060		\$16,240	\$16,240		
Annual Sanitary Sewer	0.0%	\$0	\$73,800	86%	14%	\$63,468	\$63,468		\$10,332	\$10,332		
Capital Projects Set-Aside	0.0%	\$0	\$56,600	20%	80%	\$11,320	\$11,320		\$45,280	\$45,280		
<b>Subtotal Step 2</b>		<b>\$0</b>	<b>\$150,700</b>			<b>\$78,848</b>	<b>\$78,848</b>		<b>\$71,852</b>	<b>\$71,852</b>		
<b>STEP 3</b>												
New Debt Service	0.00%	\$0	\$0	0%	100%	\$0	\$0		\$0	\$0		
Debt Service Coverage	0.00%	\$0	\$0	0%	100%	\$0	\$0		\$0	\$0		
Additional O&M Cost Related to Project	1.5%	\$0	\$0	0%	100%	\$0	\$0		\$0	\$0		
<b>Subtotal Step 3</b>		<b>\$0</b>	<b>\$0</b>			<b>\$0</b>	<b>\$0</b>		<b>\$0</b>	<b>\$0</b>		
<b>Total</b>		<b>\$1,303,499</b>	<b>\$1,490,879</b>			<b>\$307,940</b>	<b>\$307,940</b>	<b>\$0</b>	<b>\$1,182,939</b>	<b>\$1,182,939</b>	<b>\$0</b>	

[1] Depreciation is estimated \$559,261. It is not assumed to be fully funded due to constraints on rate economics

"proj\_costs"

Table 14  
 San Andreas Sanitary District  
 Unit Cost Determination

2017-18
Baseline Analysis



Cost Category	Allocated Operating Costs	Percent Allocation			Cost			Total Influent			Unit Cost Per:			
		Flow	BOD	SS	Flow	BOD	SS	Flow MG	BOD Klbs	SS Klbs	Mgal of Flow (\$/Mgal)	Klb of BOD (\$/Klb)	Klb of SS (\$/Klb)	
<b>STEP 1</b>														
<b>Collection System O&amp;M Costs</b>														
Fixed	\$229,092	100%			\$229,092			96.13	194.99	194.99	\$2,383.18			
Variable	\$0	100%			\$0			96.13	194.99	194.99	\$0.00			
<b>Total Collection</b>	<b>\$229,092</b>				<b>\$229,092</b>						<b>\$2,383.18</b>			
<b>Treatment O&amp;M Costs</b>														
Fixed	\$1,111,087	60%	20%	20%	\$666,652	\$222,217	\$222,217	96.13	194.99	194.99	\$6,935.00	\$1,139.63	\$1,139.63	
Variable	\$0	60%	20%	20%	\$0	\$0	\$0	96.13	194.99	194.99	\$0.00	\$0.00	\$0.00	
<b>Total Treatment</b>	<b>\$1,111,087</b>				<b>\$666,652</b>	<b>\$222,217</b>	<b>\$222,217</b>				<b>\$6,935.00</b>	<b>\$1,139.63</b>	<b>\$1,139.63</b>	
<b>Subtotal Step 1</b>	<b>\$1,340,179</b>				<b>\$895,744</b>	<b>\$222,217</b>	<b>\$222,217</b>				<b>\$9,318.19</b>	<b>\$1,139.63</b>	<b>\$1,139.63</b>	
<b>Step 2: General Reserve, CIP, Depreciation</b>	\$150,700	60%	20%	20%	\$90,420.00	\$30,140.00	\$30,140.00	96.13	194.99	194.99	\$940.62	\$154.57	\$154.57	
<b>Step 3: New Project Debt Service, Coverage, O&amp;M</b>	\$0	60%	20%	20%	\$0	\$0	\$0	96.13	194.99	194.99	\$0.00	\$0.00	\$0.00	
<b>TOTAL</b>	<b>\$1,490,879</b>				<b>\$986,164</b>	<b>\$252,357</b>	<b>\$252,357</b>				<b>\$10,258.80</b>	<b>\$1,294.20</b>	<b>\$1,294.20</b>	

Table 15  
San Andreas Sanitary District  
Allocation of Costs to Flow by Customer Category

2017-18  
Baseline Analysis



Unit Cost/Customer Category				Step 1: Operating Costs				SUBTOTAL Step 1	Step 2			SUBTOTAL Step 2	Step 3			SUBTOTAL Step 3	TOTAL
	Flow MG/Yr	BOD Kib/Yr	SS Kib/Yr	Collection Flow (\$/Mgal)	Treatment		SS (\$/Kib)		Gen. Res., (\$/Mgal)	BOD (\$/Kib)	SS (\$/Kib)		New Proj. D/S, Coverage, O&M				
					Flow (\$/Mgal)	BOD (\$/Kib)							Flow (\$/Mgal)	BOD (\$/Kib)	SS (\$/Kib)		
<b>Unit Cost</b>				<b>\$2,383.18</b>	<b>\$6,935.00</b>	<b>\$1,139.63</b>	<b>\$1,139.63</b>	<b>\$11,597</b>	<b>\$940.62</b>	<b>\$154.57</b>	<b>\$154.57</b>	<b>\$1,250</b>	<b>\$0.00</b>	<b>\$0.00</b>	<b>\$0.00</b>	<b>\$0</b>	<b>\$25,694</b>
<b>Residential</b>																	
Single Family	36.96	61.64	61.64	\$88,074	\$256,292	\$70,250	\$70,250	<b>\$484,866</b>	\$34,762	\$9,528	\$9,528	<b>\$53,818</b>	\$0	\$0	\$0	<b>\$0</b>	<b>\$538,684</b>
Multi-Family	26.33	43.93	43.93	\$62,761	\$182,632	\$50,060	\$50,060	<b>\$345,512</b>	\$24,771	\$6,790	\$6,790	<b>\$38,350</b>	\$0	\$0	\$0	<b>\$0</b>	<b>\$383,862</b>
Capacity Maintenance	0.71	1.19	1.19	\$1,696	\$4,936	\$1,353	\$1,353	<b>\$9,338</b>	\$669	\$184	\$184	<b>\$1,036</b>	\$0	\$0	\$0	<b>\$0</b>	<b>\$10,375</b>
<b>Subtotal</b>	<b>64.00</b>	<b>106.76</b>	<b>106.76</b>	<b>152,530.35</b>	<b>443,859.23</b>	<b>121,663.19</b>	<b>121,663.19</b>	<b>\$839,716</b>	<b>60,201.95</b>	<b>16,501.54</b>	<b>16,501.54</b>	<b>\$93,205</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>\$0</b>	<b>\$932,921</b>
<b>Commercial [1]</b>																	
Group 1	8.29	14.51	14.51	\$19,746	\$57,460	\$16,537	\$16,537	<b>\$110,281</b>	\$7,793	\$2,243	\$2,243	<b>\$12,280</b>	\$0	\$0	\$0	<b>\$0</b>	<b>\$122,560</b>
Group 2	6.22	17.01	17.01	\$14,825	\$43,141	\$19,380	\$19,380	<b>\$96,725</b>	\$5,851	\$2,629	\$2,629	<b>\$11,108</b>	\$0	\$0	\$0	<b>\$0</b>	<b>\$107,834</b>
Group 3	3.77	10.54	10.54	\$8,994	\$26,173	\$12,017	\$12,017	<b>\$59,201</b>	\$3,550	\$1,630	\$1,630	<b>\$6,810</b>	\$0	\$0	\$0	<b>\$0</b>	<b>\$66,011</b>
Group 4	3.76	10.98	10.98	\$8,961	\$26,077	\$12,509	\$12,509	<b>\$60,056</b>	\$3,537	\$1,697	\$1,697	<b>\$6,930</b>	\$0	\$0	\$0	<b>\$0</b>	<b>\$66,986</b>
Group 5	0.15	0.70	0.70	\$366	\$1,066	\$803	\$803	<b>\$3,038</b>	\$145	\$109	\$109	<b>\$362</b>	\$0	\$0	\$0	<b>\$0</b>	<b>\$3,401</b>
Group 6	7.26	27.26	27.26	\$17,310	\$50,372	\$31,066	\$31,066	<b>\$129,815</b>	\$6,832	\$4,214	\$4,214	<b>\$15,259</b>	\$0	\$0	\$0	<b>\$0</b>	<b>\$145,075</b>
Group 7	2.67	7.23	7.23	\$6,359	\$18,504	\$8,242	\$8,242	<b>\$41,346</b>	\$2,510	\$1,118	\$1,118	<b>\$4,745</b>	\$0	\$0	\$0	<b>\$0</b>	<b>\$46,091</b>
<b>Subtotal</b>	<b>32.13</b>	<b>88.23</b>	<b>88.23</b>	<b>\$76,562</b>	<b>\$222,793</b>	<b>\$100,554</b>	<b>\$100,554</b>	<b>\$500,463</b>	<b>\$30,218</b>	<b>\$13,638</b>	<b>\$13,638</b>	<b>\$57,495</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$557,958</b>
<b>TOTAL</b>	<b>96.13</b>	<b>194.99</b>	<b>194.99</b>	<b>\$229,092</b>	<b>\$666,652</b>	<b>\$222,217</b>	<b>\$222,217</b>	<b>\$1,340,179</b>	<b>\$90,420</b>	<b>\$30,140</b>	<b>\$30,140</b>	<b>\$150,700</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$1,490,879</b>

## DRAFT WASTEWATER RATE STUDY

Findings and Recommendations  
October 3, 2016

### 7.0 FINDINGS AND RECOMMENDATIONS

Through this rate analysis it was determined that current sewer rates are insufficient to fund the on-going operating and maintenance expenses as well as provide funding for the District's proposed WWTP Upgrade Project.

It is recommended that the District change the commercial rate structure to provide revenues that are equitable and adequate to fund on-going operating and maintenance expenses, and to support existing and future debt service from the proposed Project (See Table 1).

#### 7.1.1 Calculated Rates

Based on the costs allocated to each customer type, rates are calculated. Table 16 shows the calculated rates for FY 2017-18 for residential and commercial customers. The rates for residential customers are charged on a per unit basis.

The commercial users are charged both a fixed monthly rate plus a flow charge that would be based on actual annual water consumption for the previous year (May through April). The cost allocated to commercial users is split between the fixed cost at 70% and the variable cost at 30%. This allows the District some reliability in the collection of sewer charges, i.e., that 70% of the charges are not based upon potentially fluctuating water use. The majority of the wastewater expenses are fixed expenses and do not vary by water use.

The variable portion of the commercial rate calculation assumes annual water flow as described in Table 12 above.

Table 16  
Detailed Sewer Rate Calculation

2017-18
Baseline Analysis



Customer Category	Accounts/ Customers	Units	Allocated Cost	Annual Cost Allocated to		Monthly Cost					Basis of Charge
				Flat Rate	Fixed Rate Metered	Flat Mo. Charge	Metered Base Charge	Consumption Charge			
								Ann.Flow- Water [1]	Cost/ Gallons	Cost/1000 Gallons	
<b>Step 1: Baseline O&amp;M</b>											
Residential											
Single Family	675	675	\$484,866	\$718.32		\$59.86					per Unit
Multi-Family	75	481	\$345,512	\$718.32		\$59.86					per Unit
Capacity Maintenance	2	13	\$9,338	\$718.32		\$59.86					per connection
<b>Residential Total</b>	<b>750</b>		<b>\$839,716</b>								
Commercial					(at 70%)						
Group 1	100		\$110,281	\$771.97			\$64.33	8.29	\$0.0040	\$3.99	per Account
Group 2	69		\$96,725	\$981.27			\$81.77	6.22	\$0.0047	\$4.66	per Account
Group 3	10		\$59,201	\$4,144.10			\$345.34	3.77	\$0.0047	\$4.71	per Account
Group 4	3		\$60,056	\$14,013.06			\$1,167.76	3.76	\$0.0048	\$4.79	per Account
Group 5	1		\$3,038	\$2,126.91			\$177.24	0.15	\$0.0059	\$5.93	per Account
Group 6	2		\$129,815	\$45,435.31			\$3,786.28	7.26	\$0.0054	\$5.36	per Account
Group 7	2		\$41,346	\$14,471.10			\$1,205.93	2.67	\$0.0046	\$4.65	per Account
<b>Commercial Total</b>	<b>187</b>		<b>\$500,463</b>								
<b>Subtotal Step 1</b>			<b>\$1,340,179</b>								
<b>Step 2: Capital &amp; Reserves</b>											
Residential											
Single Family	675	675	\$53,818	\$79.73		\$6.64					per Unit
Multi-Family	75	481	\$38,350	\$79.73		\$6.64					per Unit
Capacity Maintenance	2	13	\$1,036	\$79.73		\$6.64					
<b>Residential Total</b>	<b>750</b>		<b>\$93,205</b>								
Commercial					(at 70%)						
Group 1	100		\$12,280	\$85.96		\$7.16	8.29	\$0.0004	\$0.44	per Account	
Group 2	69		\$11,108	\$112.69		\$9.39	6.22	\$0.0005	\$0.54	per Account	
Group 3	10		\$6,810	\$476.68		\$39.72	3.77	\$0.0005	\$0.54	per Account	
Group 4	3		\$6,930	\$1,617.03		\$134.75	3.76	\$0.0006	\$0.55	per Account	
Group 5	1		\$362	\$253.71		\$21.14	0.15	\$0.0007	\$0.71	per Account	
Group 6	2		\$15,259	\$5,340.78		\$445.07	7.26	\$0.0006	\$0.63	per Account	
Group 7	2		\$4,745	\$1,660.90		\$138.41	2.67	\$0.0005	\$0.53	per Account	
<b>Commercial Total</b>	<b>187</b>		<b>\$57,495</b>								
<b>Subtotal Step 2</b>			<b>\$150,700</b>								
<b>Step 3: WWTP Improvements Project</b>											
Residential											
Single Family	675	675	\$0	\$0.00		\$0.00					per Unit
Multi-Family	75	481	\$0	\$0.00		\$0.00					per Unit
Capacity Maintenance	2	13	\$0	\$0.00		\$0.00					
<b>Residential Total</b>	<b>750</b>		<b>\$0</b>								
Commercial					(at 70%)						
Group 1	100		\$0	\$0.00		\$0.00	8.29	\$0.0000	\$0.00	per Account	
Group 2	69		\$0	\$0.00		\$0.00	6.22	\$0.0000	\$0.00	per Account	
Group 3	10		\$0	\$0.00		\$0.00	3.77	\$0.0000	\$0.00	per Account	
Group 4	3		\$0	\$0.00		\$0.00	3.76	\$0.0000	\$0.00	per Account	
Group 5	1		\$0	\$0.00		\$0.00	0.15	\$0.0000	\$0.00	per Account	
Group 6	2		\$0	\$0.00		\$0.00	7.26	\$0.0000	\$0.00	per Account	
Group 7	2		\$0	\$0.00		\$0.00	2.67	\$0.0000	\$0.00	per Account	
<b>Commercial Total</b>	<b>187</b>		<b>\$0</b>								
<b>Subtotal Step 3</b>			<b>\$0</b>								
<b>TOTAL</b>											
Residential											
Single Family	675	675	\$538,684	\$798.05		\$66.50					per Unit
Multi-Family	75	481	\$383,862	\$798.05		\$66.50					per Unit
Capacity Maintenance	2	13	\$10,375	\$798.05		\$66.50					
<b>Residential Total</b>	<b>750</b>		<b>\$932,921</b>								
Commercial					(at 70%)						
Group 1	100		\$122,560	\$857.92		\$71.49	8.29	\$0.0044	\$4.44	per Account	
Group 2	69		\$107,834	\$1,093.96		\$91.16	6.22	\$0.0052	\$5.20	per Account	
Group 3	10		\$66,011	\$4,620.78		\$385.06	3.77	\$0.0052	\$5.25	per Account	
Group 4	3		\$66,986	\$15,630.09		\$1,302.51	3.76	\$0.0053	\$5.34	per Account	
Group 5	1		\$3,401	\$2,380.62		\$198.39	0.15	\$0.0066	\$6.64	per Account	
Group 6	2		\$145,075	\$50,776.09		\$4,231.34	7.26	\$0.0060	\$5.99	per Account	
Group 7	2		\$46,091	\$16,132.00		\$1,344.33	2.67	\$0.0052	\$5.18	per Account	
<b>Commercial Total</b>	<b>187</b>		<b>\$557,958</b>								
<b>Total all Steps</b>			<b>\$1,490,879</b>								

[1] See Table 12.