San Antonio Water System

Comprehensive Cost of Service and Rate Design Study

December 2009

RFC
RAFTELIS FINANCIAL CONSULTANTS, INC.

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EXECUTIVE SUMMARY

In December 2009, the Rates Advisory Committee (RAC), an advisory group appointed by the San Antonio Water System (SAWS) Board of Trustees, and SAWS staff completed work on an updated Comprehensive Cost of Service and Rate Design Study. The results of this effort are:

- Established with community input – inclusive and transparent: The RAC membership reflects a cross-section of the community; the committee held 16 public meetings in 2008 and 2009;
- Consistent with the Water Management Plan (approved by the SAWS Board and endorsed by the City Council in May 2009): The RAC recommends conservation-oriented rate structures that reward efficient water usage; – consequently, over 90% of residential water customers using less than 17,000 gallons per month would see decreases in their current monthly charges;
- Financially responsible: All required revenues to operate the water and wastewater systems are recovered under the recommendations; and,
- Competitive: For average levels of consumption, the recommended rates result in combined charges that are the second lowest among the top ten Texas water utilities.
- Revenue neutral

The RAC made its first major contribution in the rate setting process by identifying the policy priorities or pricing objectives the committee members felt were most important to consider. It was understood by all parties that the viable alternative rate structures would exemplify all of the pricing objectives, with an emphasis on the top ranked objectives.

Exhibit E-1
RAC Pricing Objectives

Top Three Rated Objectives

1. Conservation/Demand Management
2. Financial Sufficiency
3. Rate Stability

Other Rated Objectives

– Affordability to disadvantaged customers
– Cost of service based allocations
– Ease implementation
– Economic development
– Equitable contributions from new customers
– Legality
– Minimization of customer impacts
– Revenue stability
– Simple to understand and update

Following the determination of Pricing Objectives, the RAC held a Conceptual Design Workshop. Upon discussing the rate structure design options available, the RAC made the following decisions:

- Concurrence with concept of discretionary versus non-discretionary * water consumption as foundation for conceptual rate design.
- Resolved that rates should be based on cost of service principles to serve each class of customers.
- Concurrence with concept of multiple, tiered blocks for Water Supply rates.

With these basic principles in mind and after a review of various alternatives, the RAC agreed to recommend the following changes to Residential, General/Wholesale, Irrigation, Wastewater and Recycled Water rates as stated below.

WATER RATES

RESIDENTIAL CLASS

1. Modify existing Water Delivery block rates by reducing Block 1 and Block 2 rates to reward customers that use water efficiently and provide an incentive to others to reduce water usage while pushing more costs to Blocks 3 and 4 to discourage higher discretionary usage and promote conservation.

2. Extend Water Delivery seasonal rates from four months to six months (May to October) to promote conservation and reduce peak demand.

3. Change the uniform Water Supply Fee to match the recommended, tiered Water Delivery block rate cut-offs and differentials to discourage higher discretionary usage and promote conservation.

4. Revise Residential Meter Charges to better reflect the fixed costs of billing, service-on-demand availability, and fire protection availability, and to improve revenue stability.

5. Do NOT change the differential between non-seasonal and seasonal block rates since the seasonal rate was extended an additional two months.

* For the purposes of this Rate Study, non-discretionary water usage refers to a reasonable and responsible amount of outdoor irrigation per property. However, in the event of a severe water shortage, non-discretionary water usage would represent water needed for health and human safety.

GENERAL AND WHOLESALE CLASS

1. Increase the first Block Rate or Base from 90 percent to 100 percent to represent the usage needed to operate a business.

2. Reduce the number of Blocks from five to four since the usage difference between the existing 4th and 5th block rates is not significantly different.

3. Revise General/Wholesale Class Meter Charges to better reflect the fixed costs of billing, service-on-demand availability, and fire protection availability, and to improve revenue stability.

4. Do NOT tier the Water Supply Fee since there is less discretionary General class commercial or industrial usage as compared to Residential consumption.

IRRIGATION CLASS

1. Modify the Irrigation Block Rate structure to align the Irrigation Block Cut-Offs with the recommended changes in the Residential Block Rate structures. For example, the Block 3 Irrigation cut-off would include the difference between the Block 2 and Block 3 cut-offs for Residential customers to represent outdoor discretionary usage (Block 1 would include zero usage to align with residential rate structure).

2. Added seasonal rates to Irrigation to promote more water conservation and peak demand management. To be consistent, the recommended seasonal period will cover the same period as modified for Residential rates (May through October).

3. Revise Irrigation Class Meter Charges to better reflect the fixed costs of billing, service-on-demand availability, and fire protection availability, and to improve revenue stability.

4. Change the uniform Water Supply Fee to match the Residential tiered block rate cut-offs and differentials to discourage higher discretionary usage and promote conservation.

WASTEWATER RATES

Do NOT change the existing wastewater rate structure given that no changes are warranted at this time.

RECYCLED WATER RATES

1. Do NOT change existing Recycled Water rates given that no changes are warranted at this time.

2. In the future, consider Recycle Rate increases at the same time adjustments to Water Delivery and Water Supply Rates are considered.

MISCELLANEOUS CHANGES

1. Modify Private Fire Protection fees based on AWWA M1 Manual to provide a rationale for the differentials in Fire Protection fees based on meter sizes. Note that total revenues collected would NOT change. Private fire protection customers with smaller meters would see a decrease in their bill.

2. Current method for calculating SAWS Lift Station Maintenance Fee is valid and no change is necessary.

3. A special wastewater charge for customers in the Edwards Recharge Zone is determined to NOT be advisable. Any limited gains with respect to equitable cost recovery do NOT justify the additional effort associated with calculating, maintaining, assessing and explaining geographically based charges for such a small area.

CUSTOMER IMPACTS

Exhibit E-2 shows the change in a residential customer's bill at various usage levels**. As shown, over 90% of residential customers would experience a decrease in their monthly bill under the RAC-recommended Water Delivery, Water Supply and Wastewater rate structures.**

Exhibit E-2

Residential Combined Customer Impacts under Recommended Rates (5/8" Meter)

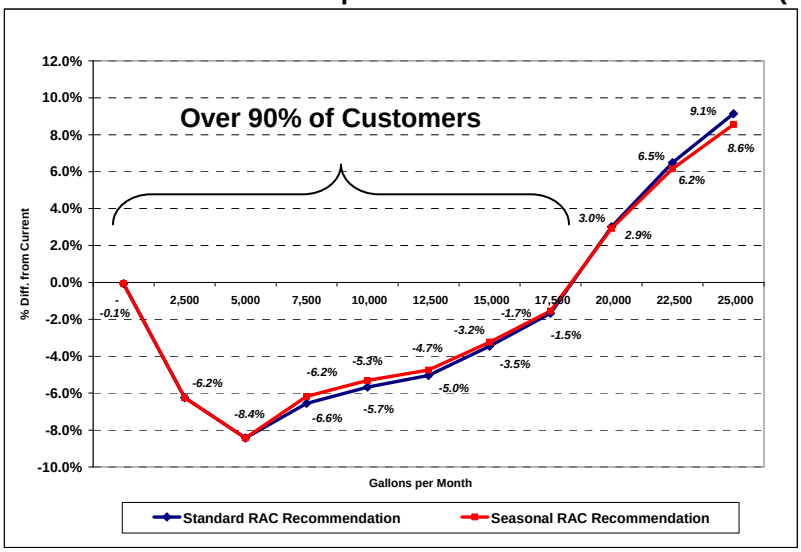
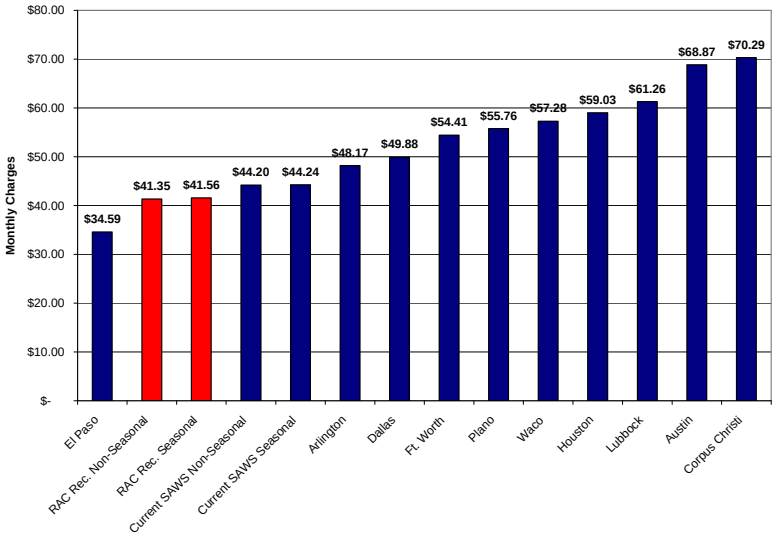


Exhibit E-3 shows the average residential SAWS customer's combined monthly Water Delivery, Water Supply and Wastewater charge (7,788 gallons water and 6,178 gallons of wastewater winter average) relative to the other water and wastewater utilities among the top ten in the state of Texas. As shown, the average residential customer's monthly bill under the RAC recommended rate structure would remain the second lowest among the top ten utilities in the state and be approximately 6% less than the charges under the current rates.

Exhibit E-3

Residential Water Delivery, Water Supply, and Wastewater Monthly Charges for 7,788 Gallons Water Consumption and 6,178 Gallons Wastewater for Select Texas Utilities (5/8" Meter)



IMPACT ON MAJOR PRICING OBJECTIVES

Conservation/Demand Management

- Allows better peak demand management by extending residential seasonal rates by two months, and establishing six months of seasonal rates for irrigation customers
- Discourages discretionary water use to promote water conservation efforts. established in the Water Management Plan through tiering of the water supply rate structure for residential and irrigation customers.
- Provides increased conservation incentive to residences with low occupancy but high discretionary water use through a reduced Block 1 cut-off and reduced rates for Block 1 and Block 2 usage.

Financial Sufficiency

- Enhances overall financial sufficiency through the tiering of the water supply fee which acknowledges the added cost of obtaining future water supply sources.

Rate Stability

- Promotes further rate stability by increasing the fixed monthly meter charge for larger meter sizes.

Affordability

- Increases overall affordability by reducing the rates charged for Block 1 and Block 2 usage to reward those customers that use water efficiently.
- Over 90% of residential customers will see a decrease in their monthly bill.
- The combined monthly bill for the average customer using 7,788 gallons of water and 6,178 gallons for sewer per month would be lower than the charges under the current rate structure and remain the second lowest among the top ten Texas water utilities.

Cost of Service-Based Allocations

- Utilizes nationally recognized cost allocation methodologies to ensure that rates reflect cost of service allocation principles.

I. INTRODUCTION

The San Antonio Water System (SAWS) is responsible for providing water services to about 350,000 customers and wastewater services to about 390,000 customers within the City of San Antonio (the City) and portions of the surrounding metropolitan area. SAWS is also responsible for the operation of chilled water and steam plants that support various downtown hotels, the City's convention center, the Alamodome, industrial operations at Port San Antonio and various buildings at Brook City-Base. Additionally, SAWS supports the City of San Antonio in efforts to comply with federal permit requirements related to stormwater runoff. SAWS is currently structured around several core business areas: Water Delivery, Water Supply, Wastewater, Conservation, Recycled Water, Stormwater and Chilled Water and Steam.

In 2003, SAWS, along with assistance from Raftelis Financial Consultants, Inc. (RFC), conducted a comprehensive rate study. The purpose of the Comprehensive Cost of Service (COS) and Rate Design Study (rate study) was to provide SAWS with information concerning the rate structure for Water Delivery, water resource development (Water Supply), Recycled Water, and Wastewater. The results of the 2003 study were an adjustment to the individual rates based on cost of service principles and also a confirmation of the existing rate structures including:

- Consistent irrigation rate policies across customer classes;
- Modified base and block rate structure for the General class;
- The use of winter averaging for estimating Residential wastewater returned to the system; and
- Confirmation of a single-tiered water supply fee (with a recommendation to review this structure during the next rate study process)

Since the 2003 study, SAWS, with the approval of the City Council, has implemented adjustments to the rates in order to ensure self-sufficiency, but has not changed the rate structure resulting from the 2003 study. In accordance with its policy to perform rate studies once every five years, the SAWS Board of Trustees authorized a new Comprehensive Cost of Service and Rate Design Study (rate study) to be initiated in 2008 and concluded in 2009. Best industry practices include recommending a comprehensive cost of service study be conducted every three to five years to review cost of service principals and to ensure the rate structures are meeting the objectives of the utility. SAWS initiated the rate study to maintain best industry practices and to ensure alignment with the initiatives from the new Water Management Plan (approved by the SAWS Board and endorsed by the City Council in May 2009), the key results which were as follow:

- Identified a short-range (through 2014), a mid-range (through 2034), and long-range (through 2060) water supply plan;

- Identified a conservation goal of 116 gallons per day per capita usage ("gpcd") by 2016 by targeting discretionary water use; and
- Committed to utilizing recycled water to maximize limited resources for potable water.

SAWS' rate structures are progressive and complex compared to those assessed by many other cities. The existing rate structures include the combination of tiered rates, seasonal rates, and individualized rates which aggressively promote water conservation. The comprehensive rate study reviewed the effectiveness of these rate structures and provided information and recommendations regarding the most appropriate structure for all rates assessed by SAWS considering such current issues as conservation, consumption characteristics of various customer classes, fairness and equity implications, financial stability, customer affordability, economic development and policy considerations. This report summarizes the processes and recommendations arising from this rate study.

A. Scope of Study

In late 2008, SAWS engaged RFC to work with SAWS staff (Staff) and the Rates Advisory Committee (RAC) members to conduct a comprehensive cost of service study for the Water Delivery, Water Supply, Wastewater and Recycled Water systems. The study would assist staff in determining the effectiveness of existing rate structures, identifying opportunities for improvement and developing viable rate structure alternatives. Specifically, RFC was to perform the following tasks:

1) Develop a comprehensive rate model to:
    a. Determine the revenue requirements for each core business;
    b. Perform a cost of service analysis, following industry guidelines provided in the American Water Works Association (AWWA) M-1 manual and the Water Environment Federation's (WEF) Manual of Practice #27, for each core business under the existing rate structures and under viable alternative rate structures;
    c. Analyze bill frequency and customer usage data to determine the impacts of various rate structures; and
    d. Calculate rates, customer impacts, and rate comparisons under the viable alternative rate structures.
2) Participate in RAC workshops to assist in educating staff and RAC members on rate setting issues, methodologies, and industry practices;
3) Make recommendations to Staff and the RAC regarding the most viable rate structure options that best meet the initiatives identified in the Water Management Plan;
4) Review and make recommendations on other system-wide fees; and
5) Document the rate study in a formal report.

B. RAC Involvement

One of the key initiatives was to involve stakeholders, such as the RAC, in the entire cost of service rate study process, in order to obtain stakeholder support and participation in the rate setting process. The RAC consisted of members of the community, each of whom represented a diverse segment of SAWS' customer base depending on his/her background, profession and interests. See Appendix A for a list of each RAC member and the group they represented during the rate study process. The participation of the RAC was a key component of the rate study process and was necessary to ensure proper community representation in establishing rate setting objectives and rate structures. Staff held a series of workshops with the RAC members. RFC facilitated discussions in several workshops which covered the following topics:

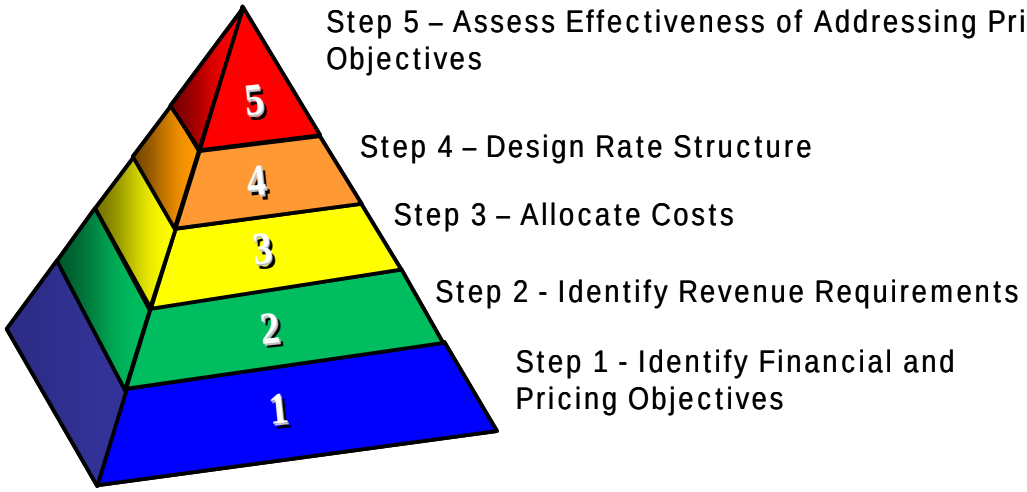
a. Overview of the rate setting process;
b. Identification of pricing objectives;
c. Conceptual design and identification of alternative rate structures;
d. Cost of service methodologies; and
e. Rates, customer impacts, and rate comparisons of the different rate structure options.

RAC members were asked to provide key input in the rate development process. This report documents the methodology used to perform the cost of service analysis, the analyses and recommendations developed as part of the rate setting process, and the key decisions made by the RAC. The resulting rate structures, rates, and customer impacts reflect the input received from SAWS Staff, the recommendations made by RFC, and the decisions made by the RAC.

II. Overview of the Rate Setting Process

RFC began the rate study process by holding a "Principles of Water and Wastewater Rate Setting" workshop with the RAC to explain each step in the rate setting process, as shown in Exhibit 1. The presentation provided information on how to develop cost of service based rates as well as trends in rate setting throughout the United States. The presentation discussed the pricing objectives that drive a utility's rate setting process, the various approaches to determining revenue requirements and studying cost allocation methodologies, and the advantages and disadvantages of different rate structures. The steps shown below were used in determining rates for each core business and are explained in detail in Sections III through VII of this report.

Exhibit 1
Rate Setting Process



Step 1: Identify Pricing Objectives

The first step in the rate setting process is the identification of pricing objectives. In order to facilitate the identification and prioritization of pricing objectives, RFC conducted a Pricing Objectives Workshop for the RAC. At the Pricing Objectives Workshop, participants reviewed a prepared list of pricing objectives and discussed the relevance of each pricing objective. The list of pricing objectives identified is provided in Exhibit 2.

Exhibit 2
Pricing Objectives

Pricing Objective	**Description**
Financial Sufficiency	The rate structure should not only adequately recover the costs associated with providing service, but also ensure enough revenues are generated to meet bond coverage requirements.
Cost of Service Based Allocations	The rate structure should ensure each customer class is contributing equitably toward revenue requirements based upon the costs of providing service to each customer class.
Minimization of Customer Impacts	The rate structure should be developed such that adverse rate impacts on each customer class are minimized.
Equitable Contributions from New Customers	New customers should be responsible for the incremental operating and capital costs associated with providing them service.
Economic Development	The rate structure should incorporate a preferential rate that may be used to attract economic development to the San Antonio area.
Rate Stability	The rate structure should minimize dramatic rate increases or decreases over the planning period.
Affordability to Disadvantaged Customers	The rate structure should incorporate practices or procedures that help ensure economically disadvantaged customers can afford water and wastewater service.
Simple to Understand and Update	The rate structure should be easy for SAWS customers to understand, utilizing a moderate level of educational tools. In addition, the rate structure should be able to be maintained effectively by SAWS Staff in future years.
Ease of Implementation	The rate structure should be compatible with SAWS' billing system. In addition, the rate structure should allow for the continuation of existing management and system reports.
Legality	The rate structure should be consistent with the rate setting methodologies provided by AWWA and applicable laws, in order to ensure rates are defensible if challenged in court.
Revenue Stability	The rate structure should provide for a steady and predictable stream of revenues to the utility such that the utility is capable of meeting its current financial requirements.
Conservation/Demand Management ***Sub-Objectives***	The rate structure should encourage water conservation as well as assist in managing system demand. • Reduce Peak Consumption • Reduce Seasonal Consumption • Reduce Total Consumption • Reward Economically Efficient Water Users • Surcharge Nonessential and Non-efficient Water Use • Communicate Conservation Consciousness

During the workshop, each pricing objective was discussed in detail. RFC also explained the competing nature of some of the pricing objectives. For example, the need for additional revenue stability (from fixed rate components) hampers conservation efforts as fewer costs are based on usage. RAC members were then asked to prioritize and select the objectives they believe are most important to SAWS. RFC had each RAC member classify each pricing objective as "Essential," "Very Important," "Important," or "Least Important" (classifying only

three objectives each as Essential or Very Important). RFC then tallied the responses of each RAC member and the resulting rankings are shown in Exhibit 3. It should be noted the rankings simply indicate which pricing objectives need to be emphasized more as compared to the existing rate structure. For example, the existing rate structure meets legal requirements. RFC and SAWS' legal staff confirmed any rate structure alternative identified during the rate study process would have to meet legal requirements in order for it to be considered a viable alternative rate structure. Therefore the RAC did not find it necessary to emphasize legality in its top pricing objectives. This is also true for the other pricing objectives with low rankings. It was understood by all parties that the viable alternative rate structures would exemplify all of the pricing objectives, with an emphasis on the top ranked objectives. The resulting pricing objectives would be used to identify viable alternative rate structures.

Exhibit 3
Results of Pricing Objectives Exercise

Top Three Rated Objectives

1. Conservation/Demand Management
2. Financial Sufficiency
3. Rate Stability

Other Rated Objectives

- Affordability to disadvantaged customers
- Cost of service based allocations
- Ease implementation
- Economic development
- Equitable contributions from new customers
- Legality
- Minimization of customer impacts
- Revenue stability
- Simple to understand and update

Step 2: Identify Revenue Requirements

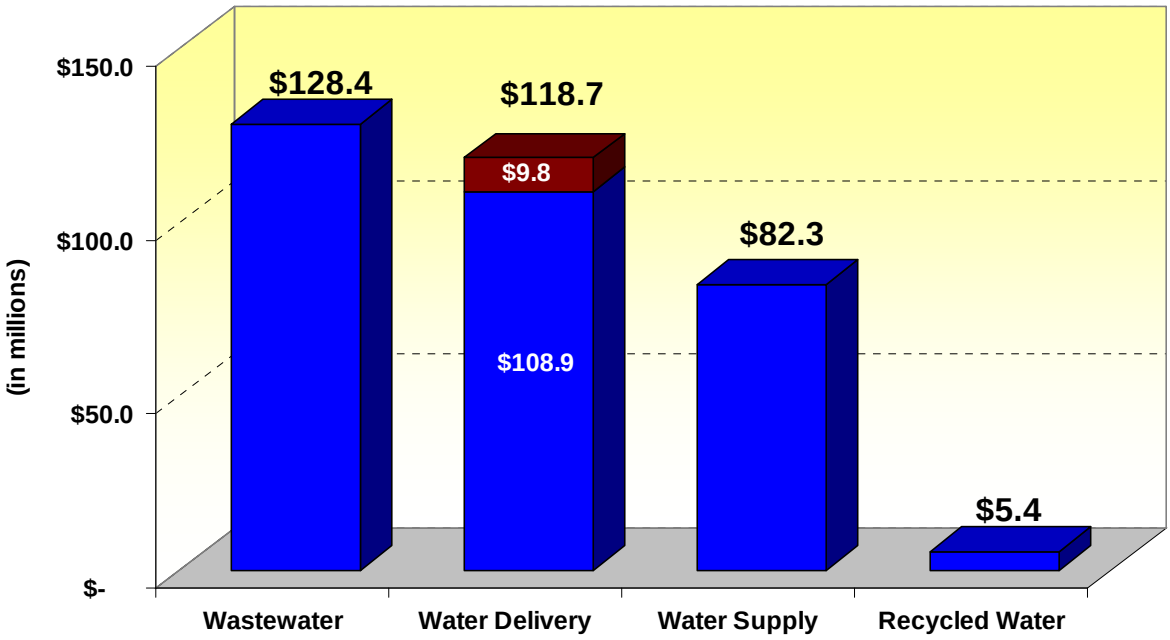
The next step in the rate setting process was the identification of revenue requirements. Revenue requirements include all operations and maintenance (O&M), capital financing, debt service, reserve funding, and financial coverage ratio costs incurred by SAWS to operate the water, wastewater and recycled water utilities. Revenue requirements not only represent the cash-needs of each utility but also the liquidity and debt coverage requirements. SAWS Staff had already developed two comprehensive models that identify revenue requirements. SAWS accounts for O&M costs by cost centers and then allocates the costs to the core businesses of SAWS. As a

last step in the allocation of revenue requirements to the each core business, SAWS Staff allocated the following revenue requirements by core business:

- Operating reserves;
- Debt service;
- Commercial paper;
- Notes payable;
- Rate funded capital outlay; and
- Rate funded CIP projects.

As shown in Exhibit 4, the 2009 budget net revenue requirements (after applying offsets such as interest earnings, etc.) to be recovered from all core businesses are $334.8 million.

Exhibit 4
Identification of Revenue Requirements



Note: Water Delivery includes $9.8 million of conservation costs that are budgeted as part of Water Supply but recovered from Water Delivery Rates.

Step 3: Allocation of Costs

Once the revenue requirements for each core business had been identified, the next step was to allocate costs set forth by state and local laws, AWWA, WEF and other authoritative bodies. The AWWA M-1 manual and the WEF Manual of Practice #27 provide detailed cost of service principals used to develop cost of service based rates. A detailed description of the allocation of costs is described in Section III-F and a brief overview of the methodology of allocating costs is

provided below. The allocation process was divided into two distinct steps: cost functionalization and cost classification.

Cost Functionalization: Each cost item used to develop the revenue requirements is allocated to one or more service functions depending upon its nature. Functional categories used include:

Water Delivery

- Source of Supply
- Treatment Plant
- Transmission
- Distribution
- Storage
- Customer Service/Billing
- Meters
- General & Admin
- Fire Protection
- Conservation

Wastewater

- Treatment
- Collection
- Disposal
- Customer Service/Billing
- Meters
- Admin & General

Cost Classification: Next, the current classification cost-causative parameters are reviewed and modified based on industry practices and experience in performing such classifications to ensure the appropriate assignment of costs. Cost assignment components include:

Water Delivery

- Base Demand
- Peak Demand (maximum day and hour)

Wastewater

- Volume
- Strength (BOD, TSS, FOG, etc.)

Step 4: Design Rate Structure

Once pricing objectives were prioritized and after data related to cost and usage characteristics were reviewed, RFC developed conceptual designs, or approaches that addressed as many of the pricing objectives as possible. The conceptual designs were developed based on input from SAWS Staff and stakeholders, specifically the RAC, and were reviewed and discussed with SAWS Staff to ensure the resulting rate structures were appropriate and could be implemented effectively by SAWS. Ordinances and the ability of readily available data were also considered. The conceptual design process provides an important opportunity to receive additional input from SAWS Staff and the RAC, and to identify additional features that may be desirable in developing viable alternative rate structures. The conceptual design process for each core business is provided within their respective Sections within this Report. Once the viable alternative rate structures are identified, the cost allocations from step 3 were used to calculate rates under each of the alternatives.

Step 5: Assess Effectiveness of Addressing Pricing Objectives

The final step in the rate setting process was to compare the results of each alterative rate structure relative to the pricing objectives identified in Step 1. The resulting rates and customer impacts for each alternative were compared to each of the pricing objectives in order to determine the effectiveness of each rate structure. The advantages and disadvantages for each rate structure were assessed and compared to the effectiveness of the existing rate structure. This step assists in identifying the rate structure that best addresses the pricing objectives and policies of the utility.

III. WATER DELIVERY

A. Water System

Water supply is provided primarily by water pumped from the Edwards Aquifer. Treatment efforts are minimized due to the high quality of water received from the Edwards Aquifer. The water service area is established by state permit and includes most of the City of San Antonio, plus several suburban municipalities and adjacent areas in Bexar County. SAWS also provides wholesale water to several smaller utilities located within the service area.

The Water Delivery system entails: (1) the treatment of the water pumped from the Edwards Aquifer and received from other smaller sources, and (2) the distribution system involved in sending treated water to approximately 350,000 customers. SAWS has an extensive network of water lines comprised of 4,700 miles of pipe. To maintain appropriate water distribution and pressure, SAWS utilizes 19 primary and 31 secondary pump stations, 27 booster stations and 65 elevated and ground storage tanks.

B. Drought

SAWS has experienced a fluctuation in weather patterns during fiscal years (FY) 2007 and 2008. During FY 2007, the city experienced a higher than average level of precipitation totaling 47.25 inches, compared to normal precipitation levels of 32.92 inches. This resulted in a lower than average consumption among all customer classes, especially in the Residential and Irrigation classes. Conversely, during FY 2008, the city experienced a lower than average level of precipitation of 13.76 inches and consequently a higher than average consumption by all classes. To approximate normal consumption, the consumption for both FY 2007 and 2008 were combined and averaged, and these levels were used for the rate study.

C. Customer Classes

There are four primary customer classes that receive service in SAWS' Water Delivery system: Residential, General, Irrigation, and Wholesale. There are two additional designations within each class based on location within the system: inside-city and outside-city. As previously mentioned, there are approximately 350,000 separate accounts. Exhibit 5 shows the number of customers and water usage by customer class. Residential customers account for approximately 92 % of all accounts and 55% of all water usage. Commercial customers account for 6.5% of all accounts and approximately 36% of water usage. Irrigation customers account for only 1.5% of customers but 8.3% of flow. There are only a few wholesale customers that account for less than 1% of water usage.

Exhibit 5
Customer Class Characteristics

Customer Class	Water Service	
	Billed Flow	Accounts
Residential	55.12%	91.91%
Commercial	36.38%	6.56%
Irrigation	8.32%	1.54%
Wholesale	0.18%	0.00%
	100.00%	100.00%

D. Existing Water Delivery Rate Structure

The existing Water Delivery rate structure for each customer class is comprised of both fixed and volumetric components. The customer classes typically have unique growth and usage characteristics and therefore, are justifiably assessed different Water Delivery volumetric rates over class-specific rate structures. The volumetric rate structures aggressively promote conservation by using a combination of tiered rates, seasonal rates, and individualized rates, making them among the more progressive rate structures in the U.S. when compared to rate structures used by other utilities.

Service Availability Fee

Each customer class is assessed a service availability fee, or fixed monthly meter charge. The bases for this charge are the size of the customer's water meter and the location of the customer: inside-city or outside-city. This fee is fixed because the city must have the facilities and infrastructure in place to serve that customer. Consequently, the city must incur these costs whether or not the customer uses its connected water service, and therefore, the fee is not based on flow. Furthermore, the larger meter sizes pay a higher fee because of the additional capacity that must be readily available to serve those customers.

These existing service availability fees are presented in Exhibit 6. As shown, the Residential and Wholesale customer classes are assessed the same fixed service availability fees. Likewise the General and Irrigation customer classes are assessed the same meter charge rates but different from those assessed to the Residential and Wholesale customers. The difference between the Residential/Wholesale monthly charges and those assessed to the General/Irrigation customers is the conservation component. SAWS incurs conservation costs associated with promoting water conservation. Residential customers pay a portion of conservation costs from revenues collected in the fourth block, whereas, General and Irrigation customers fund conservation costs through revenues collected from the monthly meter charges. There is a 1.3 times differential between inside-city and outside-city customers for both sets of meter rates.

Exhibit 6
Current Service Availability Fees

	Residential and Wholesale		General and Irrigation	
Meter Size	**Inside-City**	**Outside-City**	**Inside-City**	**Outside-City**
5/8”	$6.77	$8.78	$9.81	$11.83
3/4”	$8.59	$11.16	$13.16	$15.72
1”	$12.49	$16.23	$19.21	$22.94
1 1/2””	$22.25	$28.92	$35.03	$41.69
2”	$33.95	$44.14	$52.83	$63.01
3”	$61.27	$79.65	$106.92	$125.31
4”	$100.30	$130.39	$176.40	$206.48
6”	$197.89	$257.24	$350.03	$409.39
8”	$314.96	$409.45	$543.20	$637.69
10”	$451.57	$587.03	$755.89	$891.35
12”	$841.86	$1,094.42	$1,191.85	$1,444.41

Volumetric Rates
The volumetric rates for each customer class are assessed using an increasing block rate structure. The rate structures vary for each customer class to reflect the different usage patterns among the customer classes.

Residential Class
SAWS existing volumetric residential water delivery rate structure is comprised of an increasing volume charge per 100 gallons of water usage which includes four blocks. The increasing block rate structure is modified during the months of July through October to reflect seasonal rates for usage during peak months. To determine the seasonal rates, a rate differential of approximately 1.08 times is applied to the non-seasonal second and third block rates and a rate differential of 1.29 times is applied to the non-seasonal fourth block rate. No differential is applied to the non-seasonal first block rate. Both the seasonal and non-seasonal fourth block rates include a $0.09 conservation component that is applied toward funding operations and maintenance costs associated with conservation efforts. In addition, an outside-city rate differential of 1.3 times (or 130%) is applied to the volumetric charges for customers residing outside of the city limits. The consumption blocks and corresponding rates are presented below in Exhibit 7.

Exhibit 7
Current Residential Water Delivery Rates

Tiers	Inside-City		Outside-City	
	Standard	Seasonal	Standard	Seasonal
0 - 7,481	$0.0906	$0.0906	$0.1176	$0.1176
7,482 - 12,717	$0.1309	$0.1423	$0.1702	$0.1850
12,718 - 17,205	$0.2058	$0.2217	$0.2674	$0.2882
> 17,205	$0.3288	$0.4246	$0.4274	$0.5519

General Class

The current general class volumetric water delivery service rate structure is comprised of an increasing volume charge per 100 gallons of water usage, which includes five blocks. This rate structure is individualized, using each customer's annual average consumption to determine the base that serves as the first block cut-off. The base is equal to 90% of the customer's average annual water consumption. Blocks 1 through 5 are defined as follows:

Block 1 – Base is 90% of average annual usage;
Block 2 – 100% to 125% of Base;
Block 3 – 125% to 150% of Base;
Block 4 – 150% to 200% of Base; and
Block 5 – Over 200% of Base.

An outside-city rate differential of 1.3 (or 130%), as applied to the monthly meter charge, is also applied to the volumetric charges for customers residing outside of the city limits. The rates for General class customers are presented below in Exhibit 8.

Exhibit 8
Current General Water Delivery Rates

Tiers	Inside-City	Outside-City
	Standard	Standard
Base	$0.1086	$0.1410
> 100% - 125%	$0.1257	$0.1635
> 125% - 150%	$0.1633	$0.2121
> 150% - 200%	$0.2138	$0.2778
> 200%	$0.3160	$0.4109

Irrigation Class

The current water delivery landscape irrigation volumetric rate structure has an increasing volume charge per 100 gallons of water usage, which includes three blocks. The irrigation rate structure is applied to all customers with irrigation meters. For those General Class customers who have an in-ground sprinkler system but do not have an irrigation meter, an assumed irrigation factor of water consumption is applied in lieu of an engineering report that designates

the outdoor water usage. The irrigation factors used are 29% of water usage for the commercial and industrial water service customers, and 20% of the water usage for apartments. Likewise, among all classes, an outside-city rate differential of 1.3 (or 130%) is applied to the volumetric charges for customers residing outside of the city limits. The Irrigation class' existing consumption blocks and corresponding rates are presented below in Exhibit 9.

Exhibit 9
Current Irrigation Water Delivery Rates

Tiers	Inside-City	Outside-City
	Standard	Standard
0 - 12,717	$0.1526	$0.1982
12,718 - 17,205	$0.2290	$0.2976
> 17,205	$0.3160	$0.4109

Wholesale

The current wholesale volumetric rate structure is comprised of an increasing volume charge per 100 gallons of water usage, which includes five blocks. Analogous to the general class structure, the wholesale rate structure is individualized, using each customer's annual average consumption to determine the base that serves as the first block cut-off. The base is equal to 90% of the customer's average annual water consumption. The rates and blocks for wholesale customers are presented in Exhibit 10.

Exhibit 10
Current Wholesale Water Delivery Rates

Tiers	Inside-City	Outside-City
	Standard	Standard
Base	$0.0788	$0.1025
> 100% - 125%	$0.0983	$0.1279
> 125% - 150%	$0.1353	$0.1760
> 150% - 200%	$0.1804	$0.2346
> 200%	$0.2365	$0.3075

E. Water Delivery Revenue Requirements

Revenue requirements include all costs incurred by SAWS to operate the Water Delivery system. Revenue requirements not only represent the cash-needs of each utility but also the liquidity and debt coverage requirements. SAWS Staff had already developed two comprehensive EXCEL files that identify revenue requirements. SAWS Staff prepares an electronic data file titled "CY09 Allocations" that allocates operations and maintenance costs by core business. Within

each core business, the O&M expenses are further allocated using cost centers. SAWS Staff also prepares an electronic data file which calculates the majority of the revenue requirements other than O&M expenses. This file was used to obtain the following information for Water Delivery revenue requirements:

- Operating reserves;
- Debt service;
- Commercial paper;
- Notes payable;
- Rate funded capital outlay; and
- Rate funded CIP projects.

The above referenced electronic data file serves as a financial planning tool utilized by SAWS to identify the total revenue requirements for each core business. This file takes into account required debt service coverage requirements and the funding of the capital improvement plan. As such, RFC used this file to identify the revenue requirements for Water Delivery. This file also shows offsets used to reduce revenue requirements. For example, SAWS earns revenues from interest earnings and revenues from customer service charges such as opening new accounts, etc. These offsets are used to derive the net Water Delivery revenue requirements to be recovered from Water Delivery rates. As shown in Exhibit 11, the net revenue requirements to be recovered from Water Delivery for Fiscal Year 2009 (or "test year") is $118.7 million. This includes $9.8 million to fund conservation O&M costs, which are budgeted as part of Water Supply but funded through Water Delivery rates. This also includes a transfer to recycled water, which is discussed in more detail in Section VII of this report.

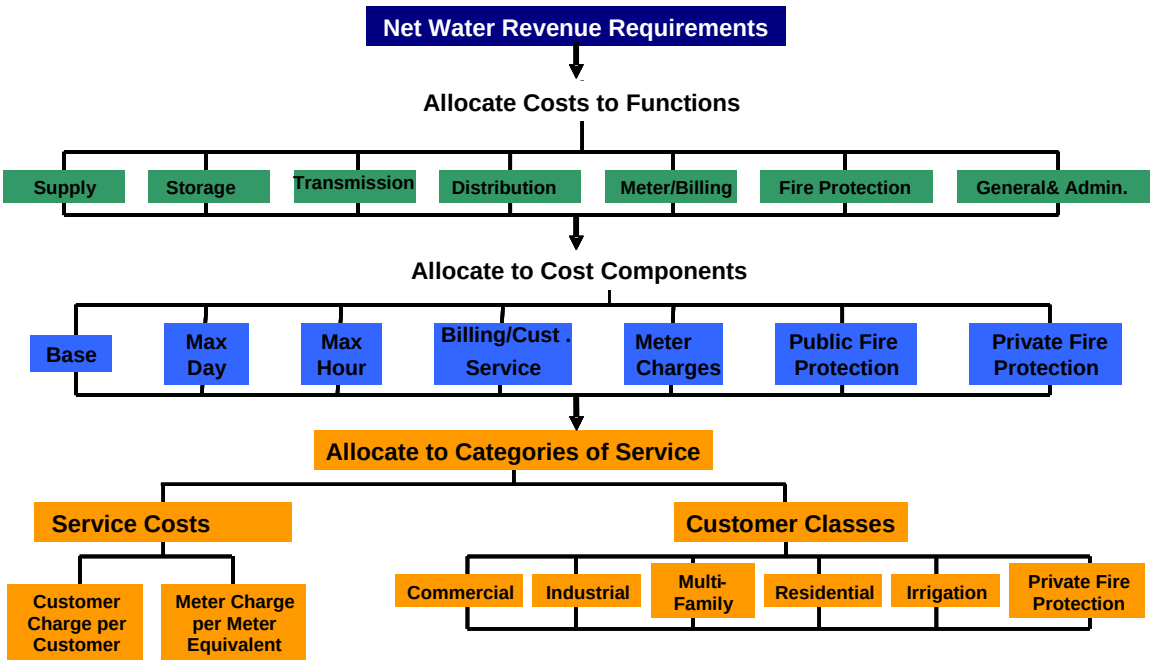
Exhibit 11
Water Delivery Revenue Requirements

	Operating Expense	Capital Cost	Total
O&M Expenses	$ 58,795,479	$ -	**$ 58,795,479**
Debt Service	$ -	$ 33,892,668	**$ 33,892,668**
Transfer to the City	$ 2,900,663	$ -	**$ 2,900,663**
Transfer to R&R	$ -	$ 5,670,159	**$ 5,670,159**
Capital Outlay	$ -	$ 6,172,977	**$ 6,172,977**
Transfers to Water Resources	$ -	$ -	**$ -**
Transfers to Conservation	$ -	$ -	**$ 9,781,555**
Transfers to Recylced Water	$ -	$ 5,800,000	**$ 5,800,000**
	$ 61,696,142	$ 51,535,805	**$ 123,013,502**
Less Revenue Requirements Met from Other Sources	$ (4,331,892)	$ -	**$ (4,331,892)**
Subtotal	**$ 57,364,250**	**$ 51,535,805**	**$ 118,681,610**

F. Cost of Service Analysis

The cost of service analysis is based on a detailed cost allocation and rate model (Model), developed specifically for SAWS. The Model was used to calculate average unit costs of service for Water Delivery rates. RFC used the cost of service methodology recommended in the AWWA M-1 Rate Manual to develop cost of service based rates. The M-1 Rate Manual specifies that a test year be established using revenue requirements, or the total cost of operating the system in that year. (The test year for the cost of service study was FY 2009). Exhibit 12 shows the steps used to conduct a comprehensive cost of service analysis, followed by a detailed description of each step.

Exhibit 12
Overview of Cost of Service Analysis



The allocation process begins with the identification of revenue requirements. Once the total revenue requirements are identified, the next step in the cost of service methodology is to allocate the Water Delivery revenue requirements into the following functional categories.

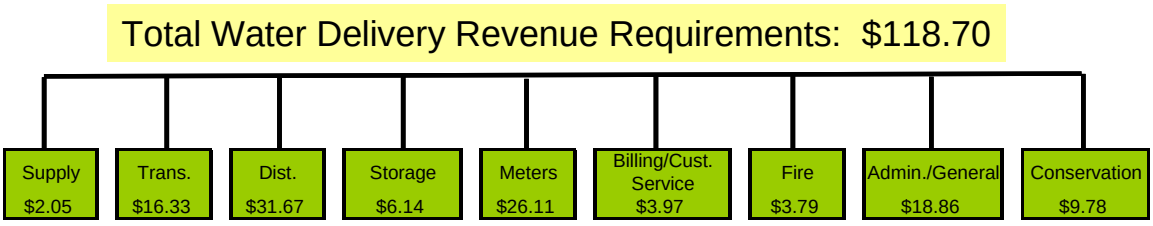
- Source of supply;
- Transmission;
- Distribution;
- Storage;
- Meters;
- Billing/Customer Service;

- Fire Protection;
- Administration/General; and
- Conservation.

Step 1: Categorize Costs to Functions

The Water Delivery test year revenue requirements were allocated to the functional categories listed above based on allocation factors developed by SAWS Staff. For example, data was gathered on various system assets like the percentage of transmission mains versus distribution mains and the percentage of total system assets in each functional category. Operational data was also gathered to determine appropriate allocation percentages for budget line items. SAWS Staff and RFC reviewed each revenue requirement line item (the detail of which was provided in the file title "CY09 Allocations") for the test year to ensure the appropriate allocation percentage was applied. The resulting allocations for each functional category are shown in Exhibit 13. It should be noted that typically costs are allocated to a functional category called "treatment." However, due to the high quality of water received from the Edwards Aquifer, SAWS' treatment costs are minimal. In addition, more costs are typically allocated to source of supply than shown below. However, SAWS has a separate core business (Water Supply) which captures the majority of the Water Supply costs. As a result, these costs are captured and discussed in the Water Supply section of this report.

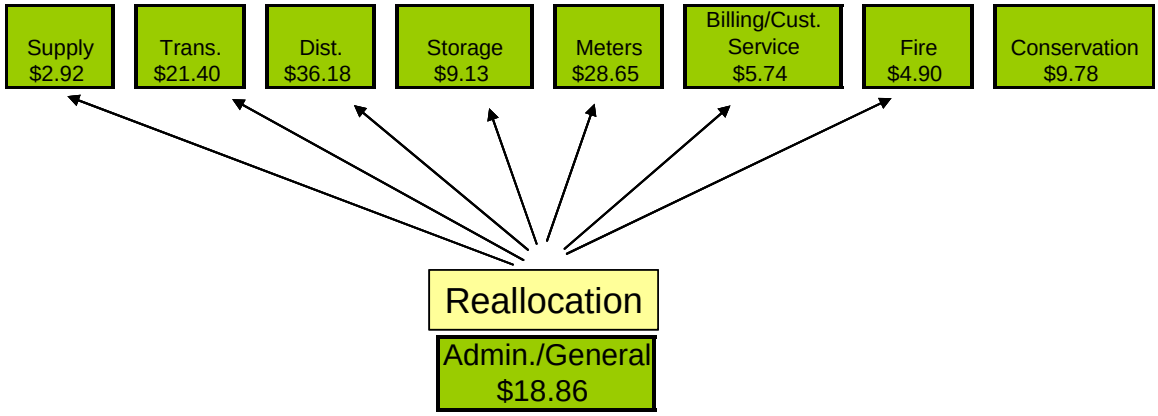
Exhibit 13
Categorize Costs to Functions (in Millions)



One sub-step that has to take place is the re-allocation of Administration/General costs to the other functions. This step is necessary because the costs captured in the Administration/General category cross functions. For example, costs for the Legal Department, Purchasing, etc. are captured in Administration/General. These costs are re-allocated based on the overall proportion of each function's costs to the total revenue requirements. The results of the re-allocation are shown in Exhibit 14.

Exhibit 14

Re-Allocation of Admin/General Costs to Functions (in Millions)



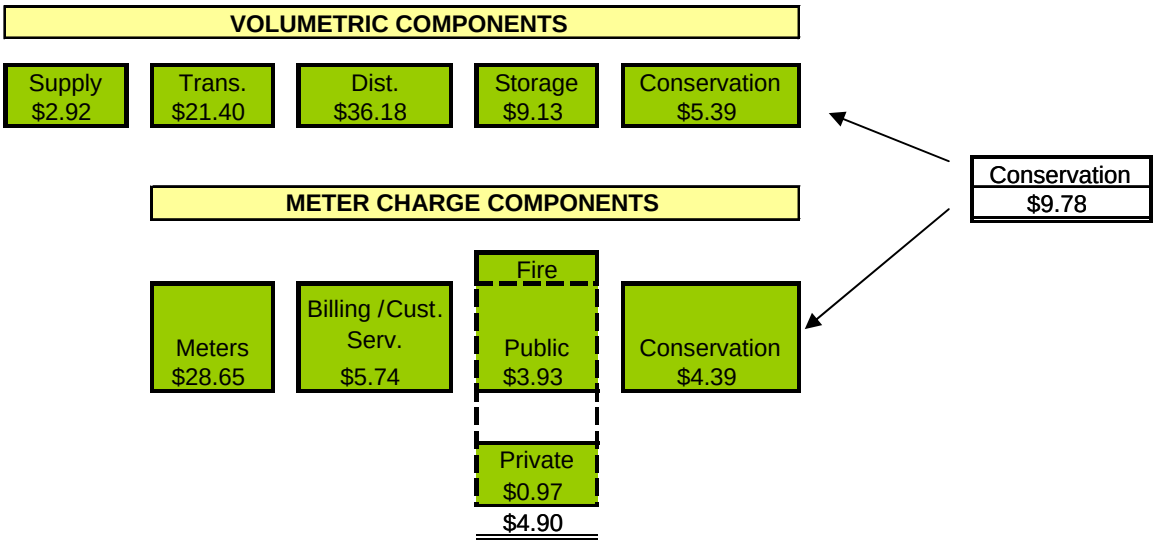
The functions are then categorized as either volumetric components or meter charge components. Those functions that are categorized as volumetric components will be used to determine the costs to be recovered from each tier. Those costs that are categorized as meter charges will be used to determine the costs to be recovered from each meter size (or monthly service availability fee).

SAWS currently recovers conservation costs from a portion of the monthly meter charges (for General and Irrigation class customers) and from a portion of the revenues generated from residential usage in the 4th block. To determine the allocation of conservation costs between the volumetric and meter charge components, the percentage of residential water usage to total usage (approximately 55%) was applied, which represents the amount to be recovered from the volumetric component (for residential customers). The remaining amount will be recovered from the meter charges. Exhibit 15 shows the resulting allocation of conservation costs.

In addition, fire protection costs must be allocated between those costs to be recovered from all users, and those that are to be recovered from customers that have private fire meters. SAWS Staff provided RFC with the number of public fire hydrants (26,552), as well as the number of public fire meters (3,823) by meter size. The public fire hydrants and the number of meters were converted to equivalent meters, which is accomplished by using the Hazen-Williams equation for flow through pressure conduits (raising the diameter of the meter to the 2.63 power) provided by the AWWA M1 manual (page 224). The resulting proportion of equivalent public fire hydrants is approximately 80%. As shown in Exhibit 15, 80%, or $3.93 million, of the fire protection costs are to be recovered from all water users and the remaining 20% of the fire protection costs will be recovered directly from those customers with private fire meters (discussed further in Section VIII-A of this report).

Exhibit 15

Re-Allocation of Conservation and Fire Protection Costs to Functions (in Millions)



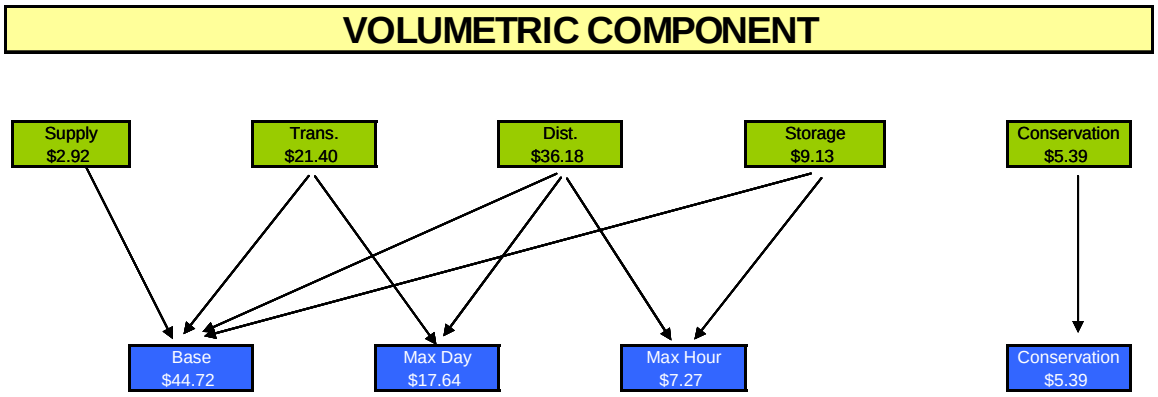
Step 2: Allocation of (Volumetric) Functions to Cost Components

Once the functional categories are segregated between volumetric components and meter charge components, system peaking factors are used to allocate the *volumetric* functions to base, max day, and max hour categories. System peaking factors for the past five years were obtained from SAWS' Comprehensive Annual Financial Reports ("CAFR") for 2007 and 2008. The CAFR data provided average day, max day and max hour information which was used to calculate a five-year average max day and max hour peaking factor. These system peaking factors were then used to determine the allocation between base, max day, and max hour. However, the peaking factors were slightly modified to more appropriately allocate the overall costs. The SAWS water system is somewhat unique in that it has a non-centralized Water Supply system. Water from the Edwards Aquifer is withdrawn at many sites in the service area. The well water is minimally treated and then distributed to the surrounding area. As a result, there is little difference between the transmission and distribution systems. Many assets that serve in the traditional transmission role are listed as distribution assets. By not modifying the peaking factors, too many costs would have been allocated to max hour, which would have skewed the calculated rates. The modified system peaking factors were then applied to the total revenue requirements of each functional category. Exhibit 16 shows the cost component used to allocate each functional category and Exhibit 17 shows the resulting costs.

Exhibit 16
Cost Components Used To Allocate Functional Costs

Function	Cost Component		
	Base	Max Day	Max Hour
Source of Supply	X		
Transmission	X	X	
Distribution	X	X	X
Storage	X		X
Conservation	conservation		

Exhibit 17
Resulting Allocation of Functional Costs to Cost Components (in Millions)



Step 3: Factors Used to Allocate Volumetric Cost Components to Customer Classes
The next step in the cost allocation includes further allocating the base, max day, and max hour costs to customer classes to determine the revenue requirements to be recovered by the volume charge for each customer class.

Similar to other utilities, SAWS does not have access to system capacity factor data. It is typical for cities to lack this data since acquiring it requires the installation of special meters for prolonged periods to measure the usage patterns of different customer classes. In the absence of measured capacity factors, it was necessary to develop capacity factors based on existing data. RFC developed estimates of these factors using procedures outlined in AWWA's M1 Rate Manual during the rate study that was conducted by RFC in 2003. In particular, the process

involved using SAWS monthly peaking data and high-level assumptions regarding customer class usage patterns. RFC re-calculated these capacity factors using current usage information and compared the factors to those established during the 2003 study. The factors were comparable with the exception of wholesale usage. The current wholesale data indicated wholesale usage has very similar characteristics to the residential usage. As a result the wholesale peaking factors were set equal to those used for the residential usage. The resulting capacity factors used are shown in Exhibit 18.

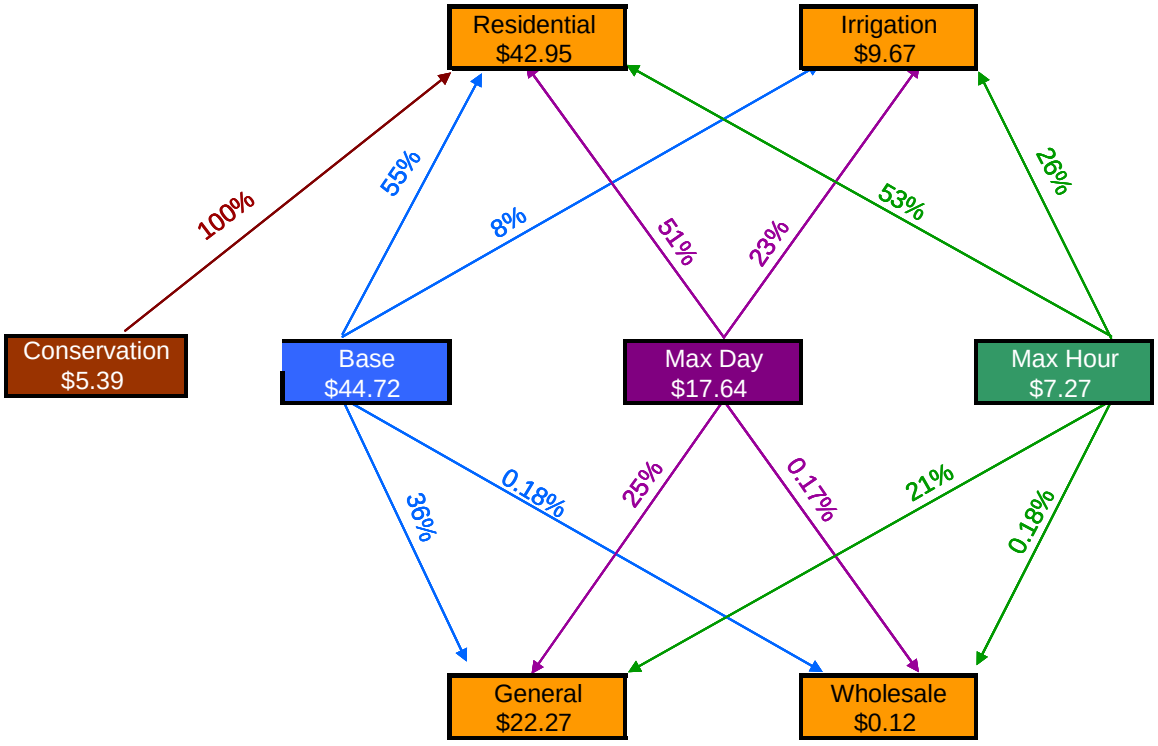
Exhibit 18
Factors Used to Allocated Volumetric Costs to Customer Classes

	Base	Max Day	Max Hour	Conserv - ation
	Percentage of Usage	Max Day Peaking Factors	Max Hour Peaking Factors	4th Tier
Residential	**55.12%**	**2.00**	**3.25**	**100%**
General	**36.38%**	**1.75**	**2.50**	**-**
Wholesale	**0.18%**	**2.00**	**3.25**	**-**
Irrigation	**8.32%**	**4.00**	**8.00**	**-**

The capacity factors for each customer class are multiplied by the average consumption for each class in order to determine the base, max day, and max hour allocation percentages. The average water usage for each customer class over FY 2007 and FY 2008 was used, which represents a wet year and dry year, respectively. Therefore, the allocation to base, max day, and max hour takes into account the total water consumption per customer class and the demand each customer class places on the system. The resulting allocation of volumetric costs to each customer class is shown in Exhibit 19.

Exhibit 19

Volumetric Costs Allocated to Customer Classes (In Millions)

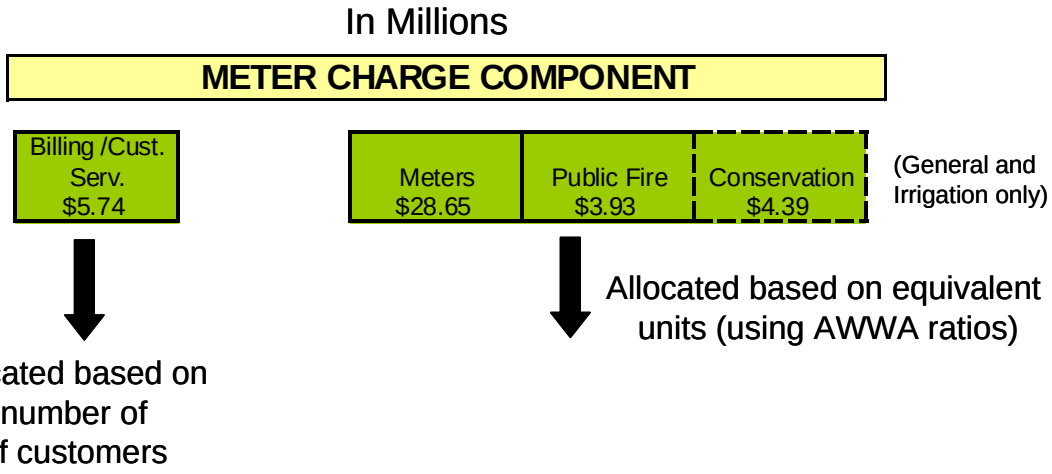


Step 4: Factors Used to Allocate Meter Charge Cost Components to Customer Classes

The meter charge cost components must also be allocated to customer classes. The billing and customer service costs are allocated to customer classes based on the percentage of meters for each customer class. The meter costs and public fire protection costs are allocated to each customer class based on the number of equivalent meters for each customer class. Equivalent meters are calculated by escalating each meter by the ratios provided in the AWWA M-1 Manual (using a 5/8" meter as the base), and as shown in Exhibit 20.

Exhibit 20

Meter Charge Component Costs Allocated to Customer Classes

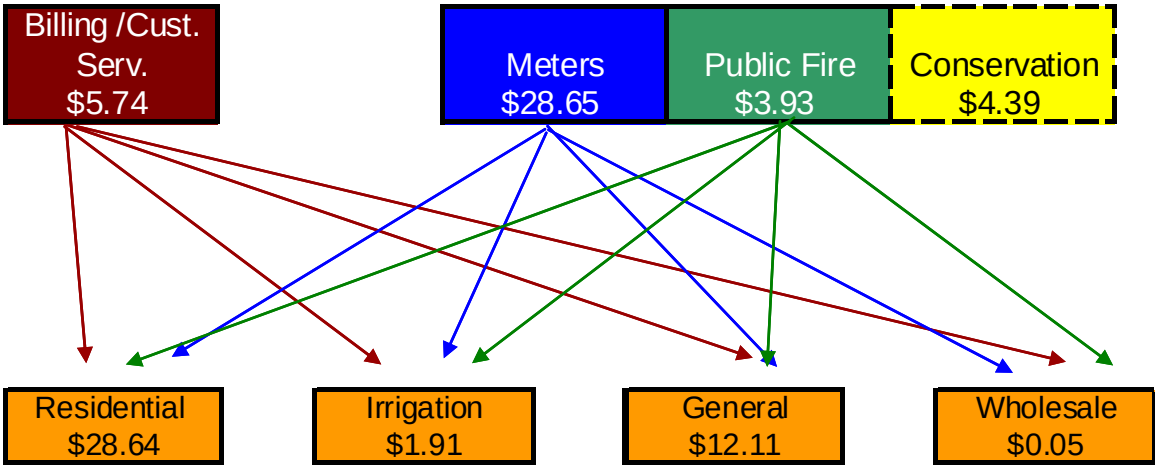


Meter Size	AWWA Ratios
5/8"	1.00
3/4"	1.50
1"	2.50
1 1/2"	5.00
2"	8.00
3"	15.00
4"	25.00
6"	50.00
8"	80.00
10"	115.00
12"	215.00

The resulting allocation of costs to each customer class is shown in Exhibit 21.

Exhibit 21

Meter Charge Components Allocated to Customer Classes (In Millions)



To determine the total revenue requirements to be recovered from each customer class, the allocated volumetric and monthly meter costs are summed. The resulting costs to be recovered from each customer class are shown in Exhibit 22. It should be noted private fire protection costs are excluded from the revenue requirements since these costs are recovered directly from private fire protection charges, which are discussed in Section VIII-A of this report.

Exhibit 22

Allocation of Water Delivery Revenue Requirements

Customer Class	Revenue Requirements (in Millions)
Residential	$71.6
General	$34.4
Wholesale	$0.17
Irrigation	$11.6
Total Revenue Requirements	**$117.7**

G. Conceptual Design

Using the results of the pricing objectives exercise conducted with the RAC (shown in Exhibit 3), RFC and SAWS Staff identified a comprehensive list of potential changes to the Water Delivery rate structure, which are listed below. These changes were identified as possible

modifications for all customer class rate structures because they would help to better address the RAC's top pricing objectives.

- **Modify number of blocks** – The number of blocks for each customer class under the existing rate structure varies. The number of blocks for each customer class could be either condensed or expanded to promote water conservation.
- **Modify block cut-offs** – The block-cut offs for each customer class vary but were originally established to reward those users that use water efficiently and discourage usage among those customers that use disproportionate amounts of water. The block cut-offs for each customer class could be altered to further reward those customers that use water efficiently and penalize those customers that use water disproportionately.
- **Increase rate differentials between blocks** – The rate differential between blocks could be altered to promote more conservation and reward those customers that use water efficiently.
- **Increase rate differentials between seasonal versus non-seasonal rates** – The rate differential between seasons could be altered to promote more conservation and help manage peak demand.
- **Expand "season" and apply seasonal rates to Irrigation class** – Seasonal rates are currently only applied to residential customers. Seasonal rates could be applied to other customer classes to further promote water conservation and assist in peak demand management.
- **Increase allocation to fixed component** – The monthly meter charges could be increased to promote more revenue stability and protect SAWS against the effect of weather on water usage.

SAWS Staff and RFC discussed the options above and identified those changes for each customer class's rate structure that would best meet the pricing objectives and balance competing pricing objectives. The conceptual design options were presented to the RAC in a workshop and are described in detail below. The conceptual design formed the basis for deliberations leading to the final RAC-recommended rate structure.

Residential Class Conceptual Design

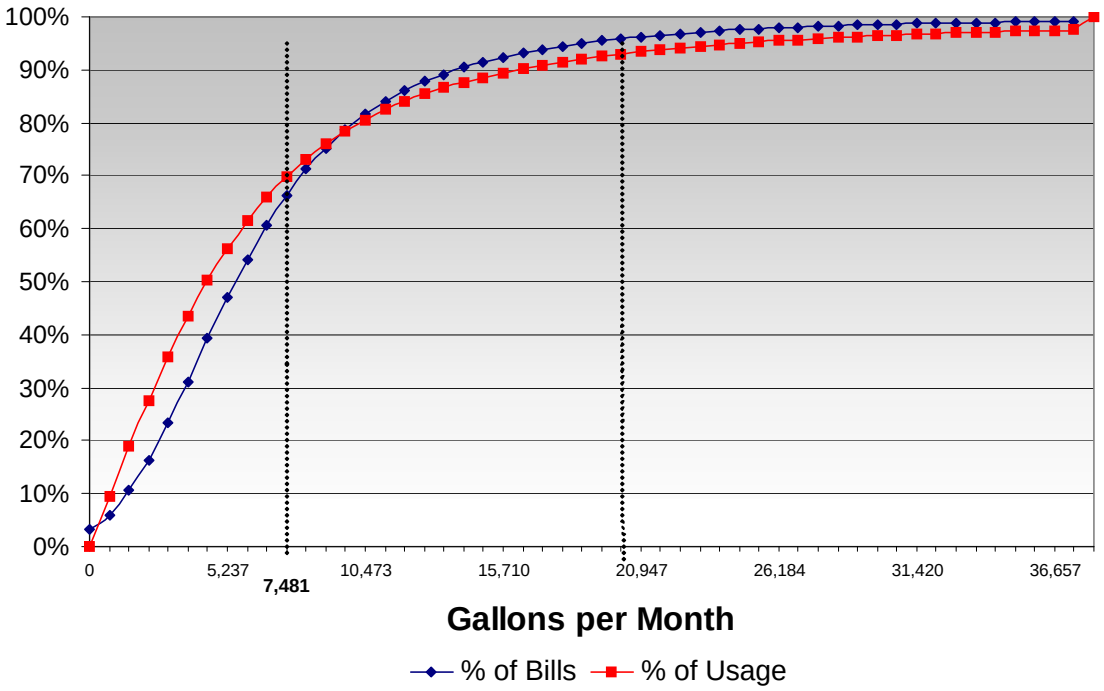
1. Modify Block Cut-Offs

SAWS Staff and RFC obtained a bill frequency file for all residential customers in order to understand customer usage patterns, the results of which are shown in Exhibit 23. The bill frequency analysis examines each residential customer's monthly bill for FY 2007 and FY 2008 and assists in analyzing the effectiveness of the existing blocks. About 68% of residential customer bills over this two-year period had monthly water usage which totaled less than 7,481

gallons. However, 5% of customer bills over this time period had usage in excess of 20,000 gallons per month.

Exhibit 23

Residential Bill Frequency Analysis for FY 2007 and FY 2008



Upon review of the bill frequency analysis, it was recommended that the blocks for residential customers be modified in order to promote conservation among all users and to emphasize the reduction of discretionary water consumption. Exhibit 24 shows the rationale for modifying the block cut-offs. Block 1 should represent non-discretionary indoor usage, and therefore, should be set close to the median usage in the lowest month, which is 5,985 gallons. Block 2 should represent non-discretionary indoor and outdoor usage. The conservation staff at SAWS classifies reasonable, non-discretionary outdoor usage between 7,000 to 8,000 gallons per month. In the conceptual design, Block 2 was set equal to Block 1 plus 7,000 gallons, or approximately 13,000 gallons. Since this is close to the existing Block 2 cut-off of 12,717, it was decided the conceptual design Block 2 cut-off should remain unchanged. Block 3 begins to represent discretionary usage and was set in the conceptual design to be equal to the difference between the top consumption level of the Block 2 cutoff and the beginning of the top 5% of usage represented by Block 4. Block 4 should represent significant discretionary water use and,

therefore, RFC recommended in the conceptual design that it should be set to address the top 5% of users, which is usage above 19,451 gallons.

Exhibit 24

Rationale for Establishment of Block-Cut Offs for the Conceptual Design

	Description	Rationale
Block 1	Non-Discretionary indoor usage	Median Usage in Lowest Month*
Block 2	Non-Discretionary indoor and outdoor usage	Outdoor Usage 7,000 to 8,000 gallons per month
Block 3	Discretionary usage	Difference between 2nd and 4th blocks
Block 4	Disproportionate usage	Top 5% of customers

* Excludes customers with usage between zero and 748 gallons

Exhibit 25 shows the existing cut-offs and those suggested in the conceptual design by RFC and, ultimately those recommended by the RAC.. During workshops held with the RAC, it was determined the Block 1 cut-off should be reduced to 5,985 gallons to reward those customers that use water efficiently. It was also determined the Block 4 cut-off should remain unchanged (at 17,205) to address discretionary consumption for slightly more than just the top 5% of super-users. Exhibit 25 shows the final block cut-offs recommended by the RAC for the Residential rate structure.

Exhibit 25

Existing, Conceptual Design and RAC-Recommended Block Cut-Offs for Residential Rate Structure

	Existing Cut-Off	Conceptual Design	RAC Recommendation	% of Bills Ending in Block *	% of Usage Billed in Block *
Block 1	7,481	5,985	5,985	54.1%	60.1%
Block 2	12,717	12,718	12,717	31.6%	23.6%
Block 3	17,205	19,451	17,205	7.2%	5.6%
Block 4	> 17,205	> 19,451	> 17,205	7.1%	10.7%

* Based on 2007 and 2008 Consumption Data; Percentages based on RAC Recommendation Blocks

2. Modify Rate Differentials Between Blocks

Exhibit 26 shows the existing rate differentials among the residential rates in each block. For example, the Block 2 rate is 1.44 times more than the Block 1 rate. As a result of the cost-of-service analysis performed by RFC, the RAC determined that the block differentials should be modified slightly. The RAC's recommended differentials are shown in Exhibit 26

Exhibit 26

Existing and RAC-Recommended Residential Rate Differentials

Residential Inside-city	Existing Differential	RAC Recommendation
Block 1	1.00	1.00
Block 2	1.44	1.45
Block 3	2.27	2.04
Block 4	3.63	3.57

3. Modify Rate Differentials Between Seasonal Rates

Exhibit 27 shows the existing rate differentials between seasonal rates. As shown, there is currently not much differentiation between the Block 2 and Block 3 seasonal rates. Furthermore, the Block 4 seasonal rate is not significantly higher than the Block 4 standard rate. In order to reduce peak demand, higher block differentials were suggested by RFC but the RAC decided to recommend the seasonal rate differentials remain unchanged, given the change in the seasonal billing period recommended and approved as described in section 4 below.

Exhibit 27

Existing and Conceptual Seasonal Differentials

Residential Inside-city	Existing Differential and RAC Recommendation	RFC Suggested Differential
Block 1	1.00	1.00
Block 2	1.09	1.10
Block 3	1.08	1.25
Block 4	1.29	1.50

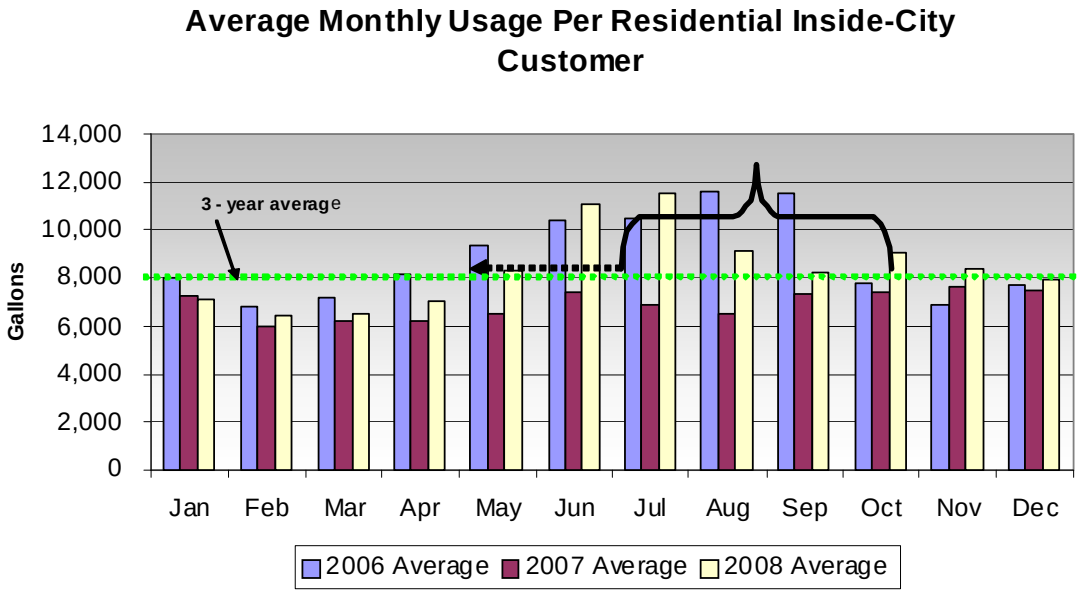
4. Increase Billing Season by Two Months

RFC and SAWS Staff also reviewed the average monthly use per customer for FY 2007 through FY 2008. The existing seasonal rates are applied to usage between July and October. As shown in Exhibit 28, irrigation usage peaks during this four-month period but irrigation usage also peaks in May and June. As a result, it was recommended the seasonal period be expanded by

two months for a total seasonal period starting in May and ending in October. The RAC approved this recommendation.

Exhibit 28

Seasonal Usage Analysis



General and Wholesale Class

5. Change base from 90 to 100%

The first block (or base) for general class customers is currently set at 90% of the previous year's average usage. Because irrigation usage for general class customers is charged at the irrigation rate, then the usage assessed for general class volumetric rates represents the usage needed to operate a business. As such the base should be increased from 90% to 100%. It is also recommended an appeal process be established for any general class customers that increase usage as a result of expanding their business (to acknowledge an increase in non-discretionary usage due to increased operations). The RAC approved submitting this recommendation.

6. Reduce the Number of Blocks

Exhibit 29 shows the existing blocks, the number of general class customers in each block and the usage billed in each block. As shown, 90% of all usage falls between the first and third blocks. Since the distribution of usage is not very different for the fourth and fifth blocks, it was determined the number of blocks should be reduced from five to four. Exhibit 30 shows the existing and proposed blocks and the rational for the new blocks. Again, since a portion of General Class usage is classified as irrigation usage, any usage above the base is discretionary. Therefore, the first block should represent non-discretionary indoor usage, which is the average usage over a one-year period. Block 2 should represent non-discretionary indoor and outdoor

usage. Block 3 should represent discretionary usage and Block 4 should represent disproportionate water usage since usage in this block is twice the average usage. The RAC approved submitting the recommendation to reduce the number of blocks from five to four.

Exhibit 29

Number of Customers and Usage in Existing General Class Blocks

Existing Rate Structure	90% Base	
Blocks	% of Customers Ending in Block	% of Usage Billed in each Block
100%	53.6%	76.3%
100% - 125%	19.8%	9.7%
125% - 150%	8.7%	4.3%
150% - 200%	7.4%	3.6%
>200%	10.5%	6.1%
	100%	100%

Exhibit 30

Proposed General Class Blocks and Rational for Blocks

	Existing Blocks*	Proposed Blocks**	Description
Block 1	100%	100%	Non-Discretionary indoor usage
Block 2	125%	125%	Non-Discretionary indoor and outdoor usage
Block 3	150%	175%	Discretionary usage
Block 4	200%	> 175%	Disproportionate usage
Block 5	> 200%	N/A	N/A

* Cut-offs are the percentage of Base which is 90% of average monthly consumption

** Cut-offs are the percentage of Base which is 100% of average monthly consumption

Irrigation Class

7. Modify Block Cut-offs

The existing irrigation rate cut-offs are tied to the residential block cut-offs. Currently the Block 1 irrigation cut-off is equal to the Block 2 residential cut-off, and the Block 2 irrigation cut-off is equal to the Block 3 residential cut-off. The irrigation block cut-offs should continue to tie to the residential block cut-offs but be based on *incremental* usage. Under the proposed *residential* rate structure the Block 2 cut-off represents the Block 1 usage plus non-discretionary outdoor usage. The Block 2 irrigation cut-off will therefore match the difference between the Block 1 and Block 2 cut-off for *residential* customers, which is basically the non-discretionary water use. (Block 1 will include zero usage to align with the Residential rate structure). The Block 3 irrigation cut-

off will include the difference between the Block 2 and Block 3 cut-offs for residential customers to represent discretionary outdoor usage. The existing and proposed blocks are shown in Exhibit 31. The RAC approved the recommended block cut-offs.

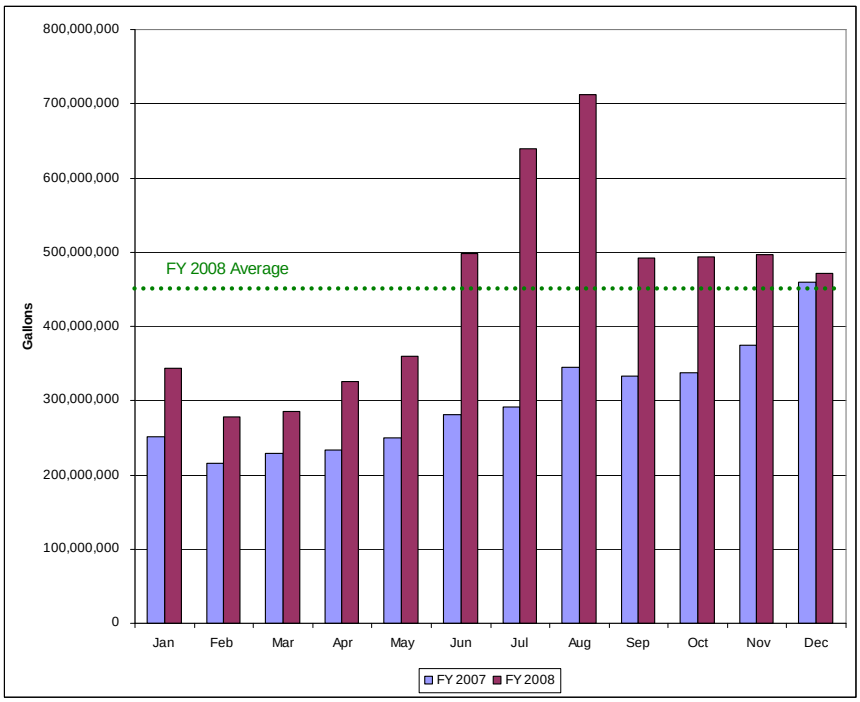
Exhibit 31
Proposed Irrigation Class Blocks and Rational for Blocks

	Existing Block Cut-Offs	Recommended Block Cut-Offs	Rationale
Block 1	12,717	zero	Align with number of Residential blocks
Block 2	17,205	6,732	Difference between Residential Block 1 and Block 2 Cut-off, or non-discretionary outdoor usage
Block 3	> 17,205	11,220	Difference between Blocks 2 and 3 , or discretionary outdoor usage
Block 4		> 11,220	All discretionary usage

8. Add Seasonality

Exhibit 32 shows the total water usage for irrigation customers by month for both FY 2007 and FY 2008. Irrigation peaks are illustrated best by the dry year data, FY 2008, but are also present in wet years as well (FY 2007). As shown, for FY 2008, irrigation usage peaked in June through December. In order to promote more water conservation and peak demand management, it is recommended that seasonal rates be implemented for irrigation rates. To be consistent with the residential seasonal rates, the seasonal period should cover the same period recommended for residential rates, which is May through October.

Exhibit 32
Irrigation Class Annual Usage Pattern



Conclusions for Conceptual Design
Upon discussing the options during the conceptual design workshop, the RAC made the following decisions:

1. **Overall:**
   - Concurrence with concept of discretionary versus non-discretionary water consumption as foundation for conceptual rate design
   - Resolved that rates should be based on cost of service principles to serve each class of customers
2. **Residential Class Rate Structure:**
   - Resolved that the Block One upper limit be moved to 5,985 but that the 4th block remain at 17,205
   - Resolved that it is appropriate to increase the length of the seasonal rates period by two months
   - Resolved to leave the current differentials between the non-seasonal and seasonal rates unchanged

3. **General/Wholesale Class Rate Structure:**
    - Resolved to change the base from 90% to 100% of average annual usage
    - Resolved to reduce the blocks from five to four and implement the new cut-offs
4. **Irrigation Class Rate Structure:**
    - Resolved to modify the block cut-offs to tie to the incremental differences in the residential block cut-offs and to align with the number of residential blocks
    - Resolved to add seasonal rates

H. Calculation of Rates Under Alternatives

Once the RAC had reached a consensus on the conceptual design, the cost of service analysis described in Section III-F was used to calculate rates under several rate structure alternatives:

- **Cost of service rates under existing rate structure** – The cost of service analysis was applied to the net revenue requirements for FY 2009 to determine rates under the *existing* Water Delivery rate structures.
- **Cost of service rates under conceptual design** – The cost of service analysis was applied to the net revenue requirements for FY 2009 to determine rates under the Water Delivery rates developed as part of the conceptual design process.
- **Cost of service rates under RFC recommendation** – The cost of service analysis was applied to the net revenue requirements for FY 2009 to determine rates under the Water Delivery rates developed as part of the conceptual design process, but modified. The modifications included:
    - **Residential Class:**
        - Lower Block 4 rate and push more costs to Block 3 rate to offset impact from Water Supply rate structure (discussed in next section)
    - **General Class:**
        - Tie Block 1 rate to existing Block 1 rate
    - **Irrigation Class:**
        - Tie Block 2 rate to Residential block rates, beginning with Block 2 Residential rate
- **Cost of service rates under Staff recommendation** – The cost of service analysis was applied to the net revenue requirements for FY 2009 to determine

rates under the Water Delivery rates developed as part of the conceptual design process, but modified. The modifications included:

- **Residential Class:**
  - Reduce Block 1 and Block 2 rates to reward customers using water efficiently and push more costs to block four to target disproportionate water users
- **General Class:**
  - Tie Block 1 rate to existing Block 1 rate
- **Irrigation Class:**
  - Tie Block 1 rate to Residential block rates, beginning with Block 2 Residential rate

Calculation of Service Availability Fee (Monthly Meter Charge)

The existing monthly meter charge is assessed to each customer and varies depending on the customer's meter size. The revised monthly meter charge was developed to include a billing component and a "readiness-to-serve" component. The results of the cost of service allocation, as described in Section III-F, were used to calculate the monthly meter charges. Exhibit 20 in Section III-F shows the allocation of costs to the fixed monthly meter charge components of billing/customer service, meter charges, fire protection and conservation. The customer service/billing category was used to determine the billing component, and the meter costs, fire protection costs, and conservation costs categories were used to calculate the readiness-to-serve component.

The billing component recovers expenses associated with billing, collection, and customer service. This component is the same for all customers regardless of meter size, but does vary based on whether the customer is located inside or outside of the city. The customer service/billing costs determined from the allocation to functional categories are divided by the total number of SAWS customers to calculate the monthly billing component.

In addition to the meter repair and replacement costs and the fire protection costs, the "readiness-to-serve" component recovers a portion of debt service costs (approximately 39%) allocated to the water utility. Conceptually, this charge can be thought of as recovering a portion of the costs needed to provide the basic infrastructure required to provide service. The "readiness-to-serve" component varies based on meter size by reflecting the difference in potential demand that can be placed on the system by larger meters. To determine the demand based on meter size, AWWA industry standard meter ratios were used, as shown in Exhibit 20. These ratios were applied to the number of meters of each size to calculate the equivalent meters. In addition, the calculation of equivalent meters included an adjustment to reflect the outside-city differential.

The total readiness-to-serve costs were then divided by the number of equivalent meters to calculate the "readiness-to-serve" component.

To calculate the total monthly meter charge per meter size, the billing component is added to the "readiness-to-serve" component. The calculated rate is applicable to all customer classes. However, the monthly meter charge for the general class and irrigation customers includes an additional component which recovers a portion of the conservation costs. Approximately 45% of the conservation costs are to be recovered through the monthly meter charge for the general and Irrigation class customers. (The 45% is based on the proportion of General/Irrigation class usage to total usage). This portion of the conservation costs are divided by the number of equivalent general class and irrigation customers, based on the existing ratios between the conservation meter charges. The resulting conservation monthly meter charge is added to the billing component and the "readiness-to-serve" component to calculate the total monthly meter charge for the General and Irrigation classes. The monthly meter charges recommended by the RAC are shown in Exhibit 33. A table comparing current and RAC-recommended meter charges is provided in Appendix B.

Exhibit 33

RAC Recommended Service Availability Fees

	Residential and Wholesale		General and Irrigation	
Meter Size	**Inside-City**	**Outside-City**	**Inside-City**	**Outside-City**
5/8"	$6.76	$8.79	$9.38	$12.20
3/4"	$9.47	$12.32	$13.41	$17.44
1"	$14.90	$19.37	$21.46	$27.90
1 1/2""	$28.47	$37.02	$41.59	$54.07
2"	$44.75	$58.18	$65.75	$85.48
3"	$82.74	$107.57	$122.11	$158.75
4"	$137.01	$178.12	$202.63	$263.42
6"	$272.69	$354.50	$403.93	$525.11
8"	$435.51	$566.17	$645.49	$839.14
10"	$625.46	$813.10	$927.31	$1,205.51
12"	$1,168.18	$1,518.64	$1,732.51	$2,252.27

Calculation of Water Delivery Volumetric Rates

The revenue requirements to be recovered from volumetric rates, as described in detail in the cost of service allocation in Section III-F, are used to develop tiered rate structures for each customer class. Exhibit 19, in Section III-F shows the resulting Base, Max Day and Max Hour costs. These costs were developed for each customer class. The Base, Max Day and Max Hour costs were allocated to the number of blocks in each customer classes' rate structure. Base costs represent the costs associated with operating the system during average conditions. Base costs

were allocated to each block based on the proportional usage used by customers in each block. Max day costs represent the costs to operate the system during the day with the highest consumption during a one-year period. Max hour costs represent the costs to operate the system during the peak hour of the day with the highest consumption during a one-year period. The majority of max day and max hour costs are allocated to the higher blocks to reflect the discretionary nature of usage in the higher tiers which cause the usage to peak. However, a portion is still allocated to the first block. Users that have low non-discretionary usage can still have discretionary usage that would fall within the first block. In addition, conservation costs for residential customers get allocated to the fourth block. This is consistent with SAWS' existing policy of recovering conservation costs from the fourth block for residential customers. Once costs were allocated, several policy decisions were made which modified the allocations, such as:

- The Block 1 rate for General Class customers was set equal to the existing Block 1 rate; and
- Irrigation rates were tied to the Residential rates beginning with the Block 2 rate.

The rates under each alternative were calculated and shared with the RAC, however, the RAC recommended Rate Structure was approved by the RAC on August 20, 2009 (5 votes in favor and 2 votes against). The resulting rates under the RAC recommended Rate Structure is shown in Exhibit 34.

Exhibit 34

RAC Recommended Volumetric Water Delivery Rates

Tiers	Inside-City		Outside-City	
RESIDENTIAL	Standard	Seasonal	Standard	Seasonal
0 - 5,985	$0.0897	$0.0897	$0.1167	$0.1167
5,986 - 12,717	$0.1298	$0.1412	$0.1688	$0.1836
12,718 - 17,205	$0.1831	$0.1974	$0.2381	$0.2567
> 17,205	$0.3206	$0.4141	$0.4168	$0.5384
GENERAL	Standard	Seasonal	Standard	Seasonal
Base	$0.1086		$0.1412	
> 100% - 125%	$0.1298		$0.1687	
> 125% - 175%	$0.1821		$0.2367	
> 175%	$0.2666		$0.3466	
IRRIGATION	Standard	Seasonal	Standard	Seasonal
0	-	-	-	-
> 0 - 6,732	$0.1298	$0.1412	$0.1688	$0.1836
6,733 - 11,220	$0.1831	$0.1974	$0.2381	$0.2567
> 11,220	$0.3206	$0.4141	$0.4168	$0.5384
WHOLESALE	Standard	Seasonal	Standard	Seasonal
Base	$0.0753		$0.0979	
> 100% - 125%	$0.1132		$0.1472	
> 125% - 175%	$0.1634		$0.2124	
> 175%	$0.2311		$0.3004	

Advantages of RAC Recommended Rate Structure:

1. Effectively addresses top pricing objective of conservation/demand management
    - Expanding season by two months for Residential customers, and addition of 6 months of seasonal rates for Irrigation customers, will assist in managing peak demand
    - Targeting discretionary water used by top 5% of users promotes water conservation efforts and per gallons per capita per day ("gpcd") goal of 116 established by SAWS conservation staff
    - Reducing the Block 1 cut-off will promote conservation for residences with low occupancy but high discretionary water use
2. Effectively addresses the top pricing objective of revenue stability
    - Increasing the monthly meter charges for larger meter sizes ensures a higher level of revenues from fixed monthly charges

3. Effectively addresses the pricing objective of affordability
    - Reducing the Block 1 rate will reward those customers that use water efficiently
4. Effectively addresses the pricing objective of cost of service based allocations
    - Using the cost allocation methodology from the AWWA M-1 manual ensures that rates reflect cost of service allocation principals

IV. WATER SUPPLY

A. Water Supply System

The city presently has 136 wells tapped into the Edwards Aquifer that pump for usage on average 168 MGD. Although, the majority of SAWS Water Supply is and will continue to be pumped from the Edwards Aquifer, the city is exploring new sources to ensure a lasting supply of water for future generations. To date, SAWS has invested over $600 million into other sources. With the addition of Canyon Lake, Local Carrizo, Trinity, and Recycled Water, as well as one of the nation's largest aquifer storage and recovery projects, SAWS has provided more diversity in the city's Water Supply portfolio.

The availability and use of recycled water for commercial and industrial customers has been an incredible stride in relieving some of the burden on Edwards Aquifer. With recycled water infrastructure in place, since the source of recycled water is SAWS wastewater treatment facilities, the cost per acre-foot of water will be considerably less than ongoing annual water purchases. These additional water sources and the recycled water system are significant supplemental sources to the main supply pumped from the Edwards Aquifer.

B. Existing Rate Structure

The existing customer classes, described in detail in Section III-C, have different Water Delivery rates. However, currently all customer classes are assessed the identical volumetric Water Supply rate of $0.1529 per 100 gallons. The existing rate structure provides no distinction among customer classes or usage characteristics. Exhibit 35 below presents the uniform volumetric Water Supply rate which exists currently.

Exhibit 35
Existing Water Supply Charges

Class	Inside-City	Outside-City
	Per 100 gal	Per 100 gal
Residential	$0.1529	$0.1529
General	$0.1529	$0.1529
Irrigation	$0.1529	$0.1529
Wholesale	$0.1529	$0.1529

C. Revenue Requirements

Revenue requirements include all costs incurred by SAWS to operate the Water Supply utility. As previously mentioned, SAWS Staff prepares an electronic data file which calculates the majority of the revenue requirements other than O&M expenses. This file was used to obtain the following information for Water Supply:

- Operating reserves;
- Debt service;
- Commercial paper;
- Notes payable;
- Rate funded capital outlay; and
- Rate funded CIP projects.

The electronic data file is a financial planning tool used by SAWS to identify the total revenue requirements for each core business. This file includes required debt service coverage requirements and the funding of the capital improvement plan. As such, RFC used this file to identify the revenue requirements for Water Supply. This file also shows offsets that are used to reduce revenue requirements. For example, SAWS earns revenues from interest earnings. It also includes revenues from Water Delivery that are used to fund the conservation costs that are budgeted in Water Supply. These offsets are used to derive the net Water Supply revenue requirements to be recovered from Water Supply rates. As shown in Exhibit 36, the net revenue requirements to be recovered from Water Supply for Fiscal Year 2009 (or "test year") is $82.3 million.

Exhibit 36

Water Supply Revenue Requirements

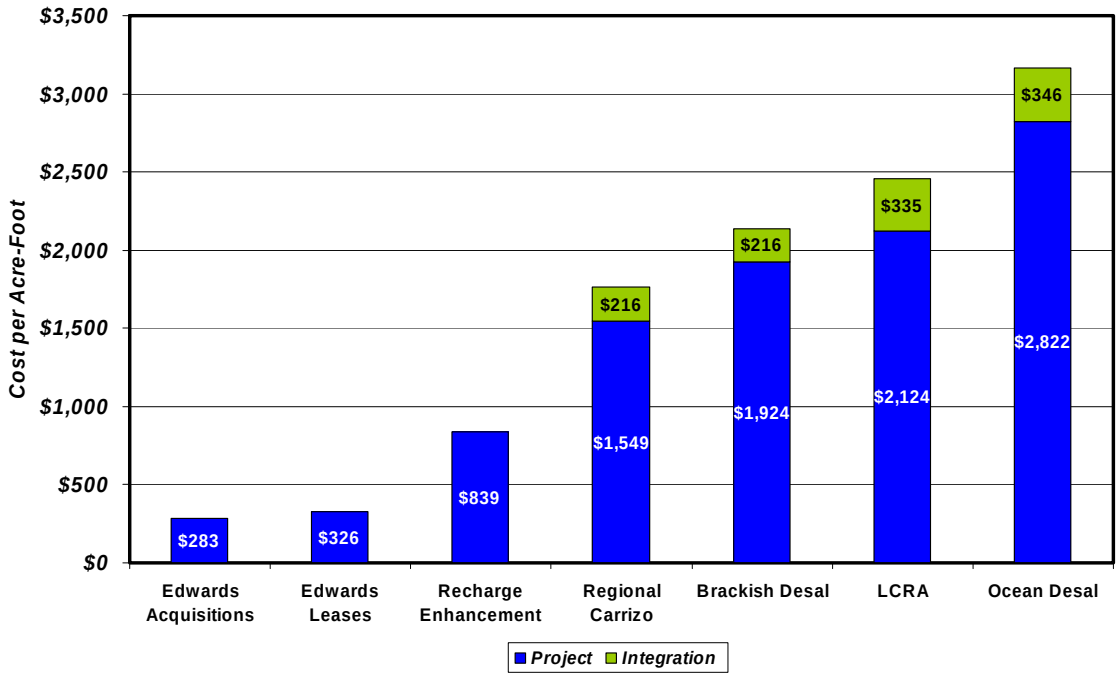
	Operating Expense	Capital Cost	Total
O&M Expenses	$ 54,841,048	$ -	**$ 54,841,048**
Debt Service	$ -	$ 25,426,773	**$ 25,426,773**
Transfer to the City	$ 2,700,345	$ -	**$ 2,700,345**
Transfer to R&R	$ -	$ 6,868,200	**$ 6,868,200**
Capital Outlay	$ -	$ 1,157,486	**$ 1,157,486**
Transfers out	$ 3,941,000	$ -	**$ 3,941,000**
	$ 61,482,393	$ 33,452,458	**$ 94,934,852**
Less Revenue Requirements Met from Other Sources	$ (12,680,307)	$ -	**$ (12,680,307)**
Total	**$ 48,802,086**	**$ 33,452,458**	**$ 82,254,544**

D. Conceptual Design

Exhibit 37 shows the cost per acre foot of obtaining various Water Supply sources. Future Water Supply sources, such as brackish and ocean desalinization, are more expensive than existing Water Supply sources such as those from the Edwards Aquifer. Based on discussions with Staff and the RAC, it was determined that all alternative Water Supply rate structures should incorporate a tiered rate structure to acknowledge the increase in costs associated with obtaining future Water Supply sources.

Exhibit 37

Water Supply Costs



Based on discussions with Staff and the RAC, five alternative tiered Water Supply rate structures were identified. The Water Supply revenue requirements were used to determine volume charges under each of the five rate structure alternatives. The five Water Supply Rate Structures that were considered based on input from SAWS Staff, the RAC, and RFC were as follows:

- **Alternative 1: Four blocks tied to Water Delivery differentials (Conceptual Design rate structure)** – The Water Supply rate structure will have the same block cut-offs, number of blocks, and block differentials as those established in the Water Delivery conceptual design alternative.

- **Alternative 2: Four blocks tied to future Water Supply cost differentials** - The Water Supply rate structure will have the same block cut-offs and number of blocks as those established in the Water Delivery conceptual design alternative; however, the block differentials will be based on future Water Supply costs. The capital improvement plan for the next ten years was reviewed and the estimated cost per future Water Supply source was used to calculate rate differentials.
- **Alternative 3: Four blocks using uniform differentials** – The Water Supply rate structure will have the same block cut-offs and number of blocks as those established in the Water Delivery conceptual design alternative; however, the block differentials will be uniform for all customer classes.
- **Alternative 4: Two blocks tied to Water Supply costs (RFC Recommended rate structure)** – The Water Supply rate structure for all customer classes will be comprised of 2 tiers. The block cut-off for the first block will tie to the Block 1 cut-off established for each customer class in the Water Delivery conceptual design.
- **Alternative 5: Four tiers tied to Water Delivery differentials with modifications (RAC Recommendation)** - The Water Supply rate structure for all customers classes, with the exception of General and Wholesale Class customers, will have the same block cut-offs, number of blocks, and block differentials as those established in the RAC recommended Water Delivery approved alternative. However, the General and Wholesale Class customers will have one uniform rate instead of tiered rates and this rate will be equal to the existing Water Supply rate. In addition, the Block 2 rate for irrigation customers will tie to the Block 2 rate for residential customers.

After considerable deliberation, the RAC decided to recommend Alternative 5. The RAC found that the nature of General Class consumption is different from that of the Residential Class. Water used by General Class customers is needed primarily to support operational business needs and is much less discretionary in nature. Implementation of a tiered-water supply rate structure for the General Class would not serve the same purpose that it would for the Residential Class – namely to discourage discretionary water usage. For General Class customers, discretionary water usage often is in the form of increased irrigation of their adjacent properties – to address this type of usage, separate Irrigation rates exist which provide disincentives to discretionary overuse of water.

E. Calculation of Water Supply Rates

To calculate the Water Supply rates, the usage was converted to equivalent usage. This was accomplished by multiplying the usage in each block by the rate differential between each block. The net revenue requirements were then divided by the sum of the equivalent usage in order to derive a unit cost per 100 gallons. The unit rate was then escalated by the rate differential for each block. This methodology was used to calculate the Water Supply rates for each alternative. The rates for each alterative were shared with the RAC, and the RAC approved the Water Supply rates under Alternative 5 (Staff recommended Rate Structure), which are shown in Exhibit 38.

Exhibit 38
RAC Recommended Water Supply Rate Structure and Rates

Tiers	Inside-City	Outside-City
RESIDENTIAL	Standard	Standard
0 - 5,985	$0.0994	$0.0994
5,986 - 12,717	$0.1438	$0.1438
12,718 - 17,205	$0.2028	$0.2028
> 17,205	$0.3550	$0.3550
GENERAL	Standard	Standard
Base	$0.1529	$0.1529
> 100% - 125%	$0.1529	$0.1529
> 125% - 175%	$0.1529	$0.1529
> 175%	$0.1529	$0.1529
IRRIGATION	Standard	Standard
0	-	-
> 0 - 6,732	$0.1438	$0.1438
6,733 - 11,220	$0.2028	$0.2028
> 11,220	$0.3550	$0.3550
WHOLESALE	Standard	Standard
Base	$0.1529	$0.1529
> 100% - 125%	$0.1529	$0.1529
> 125% - 175%	$0.1529	$0.1529
> 175%	$0.1529	$0.1529

Advantages of RAC Recommended Water Supply Rate Structure:

1. Effectively addresses top pricing objective of conservation/demand management
    - Tiering the Water Supply rate structure for Residential and Irrigation customers targets discretionary water use
    - Promotes water conservation goal of 116 gpcd established by SAWS conservation staff

2. Effectively addresses top pricing objective of affordability
    - Reducing the Block 1 and Block 2 rates will reward those customers that use water efficiently
3. Effectively addresses the pricing objective of revenue sufficiency
    - Tiering the Water Supply rates acknowledges the additional cost to obtain future water supply sources

V. WATER DELIVERY AND WATER SUPPLY COMBINED RATES AND CUSTOMER IMPACTS

A. Combined Rates

SAWS currently segregates the Water Delivery and Water Supply rates. For presentation purposes, the RAC-recommended rates for Water Delivery and Water Supply are summed and shown below, followed by a detailed explanation of the resulting customer impacts. For more detail, refer to Appendix B, which shows the comparison of rates under the existing rates structure to rates under the RAC recommended rate structure.

Exhibit 39

Combined Water Delivery and Water Supply Rates

Tiers	Inside-City		Outside-City	
RESIDENTIAL	Standard	Seasonal	Standard	Seasonal
0 - 5,985	$0.1891	$0.1891	$0.2161	$0.2161
5,986 - 12,717	$0.2736	$0.2850	$0.3126	$0.3274
12,718 - 17,205	$0.3859	$0.4002	$0.4409	$0.4595
> 17,205	$0.6756	$0.7691	$0.7718	$0.8934
GENERAL	Standard	Seasonal	Standard	Seasonal
Base	$0.2615		$0.2941	
> 100% - 125%	$0.2827		$0.3216	
> 125% - 175%	$0.3350		$0.3896	
> 175%	$0.4195		$0.4995	
IRRIGATION	Standard	Seasonal	Standard	Seasonal
0	-	-	-	-
> 0 - 6,732	$0.2736	$0.2850	$0.3126	$0.3274
6,733 - 11,220	$0.3859	$0.4002	$0.4409	$0.4595
> 11,220	$0.6756	$0.7691	$0.7718	$0.8934
WHOLESALE	Standard	Seasonal	Standard	Seasonal
Base	$0.2282		$0.2508	
> 100% - 125%	$0.2661		$0.3001	
> 125% - 175%	$0.3163		$0.3653	
> 175%	$0.3840		$0.4533	

B. Customer Impacts Under Combined Rates

One of the most important components of the rate study was an analysis of how the proposed rate structure would impact the monthly bills of water customers. RFC worked closely with Staff to ensure that appropriate revenue requirements would be recovered, while monitoring related impacts on customers.

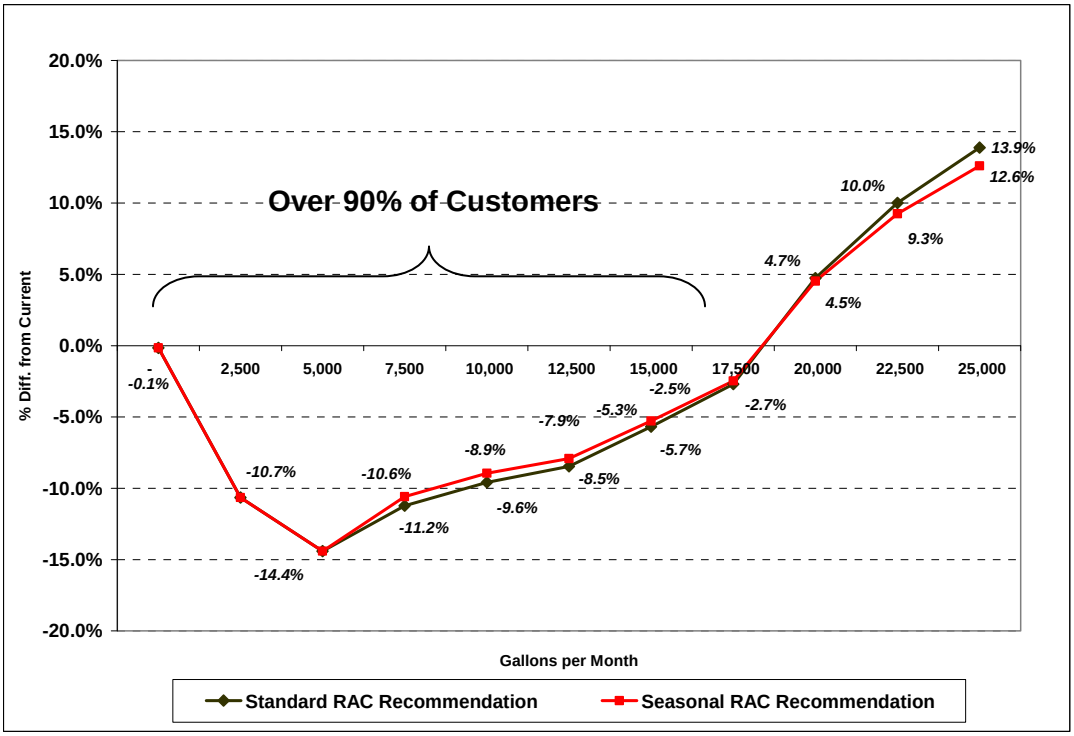
Residential Class

Because of the multiple parameters that have been modified in the water rate structure, the best comparison between existing and RAC recommended rates is to show the percentage difference between the monthly charges calculated for the recommended standard and seasonal rates, respectively, with charges calculated for the current rates. Exihibit 40 shows the percent change in a customer's monthly bill at different consumption levels for monthly Water Delivery and Water Supply charges.

It is important to observe in Exhibit 40 that over 90% of residential customers are receiving some form of savings compared to their current bill under the combined RAC approved Water Delivery and Water Supply rate structures. In line with SAWS top rated pricing objective, conservation, the higher usage customers are bearing the majority of the increased impacts.

Exhibit 40

Residential Customer Impacts under Recommended Water Delivery and Water Supply Rates (5/8" Inch Meter – No EAA Fee)

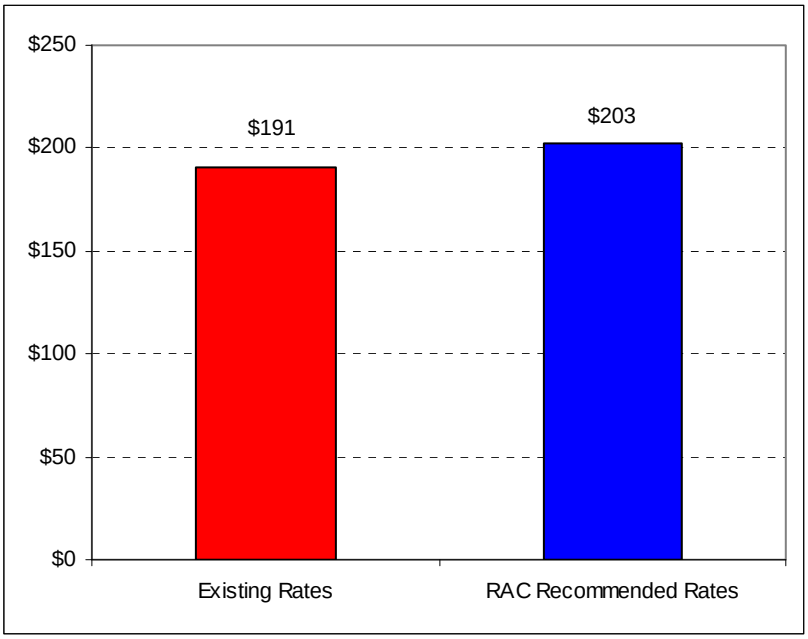


General Class

Because of the individualized nature of the General Class rate structure and the proposed modifications to the rate structure rate comparisons, the rate comparisons are based on the average General Class customer (using a 2" meter and 50,000 gallons). As shown in Exhibit 41, under the recommended rate structure and rates, the average General Class customer will experience a slight increase in their monthly bill because of the recommended change in the meter charges.

Exhibit 41

General Class Customer Impacts under Recommended Water Delivery and Water Supply Rates (50,000 gallons Per Month, 2" Meter)

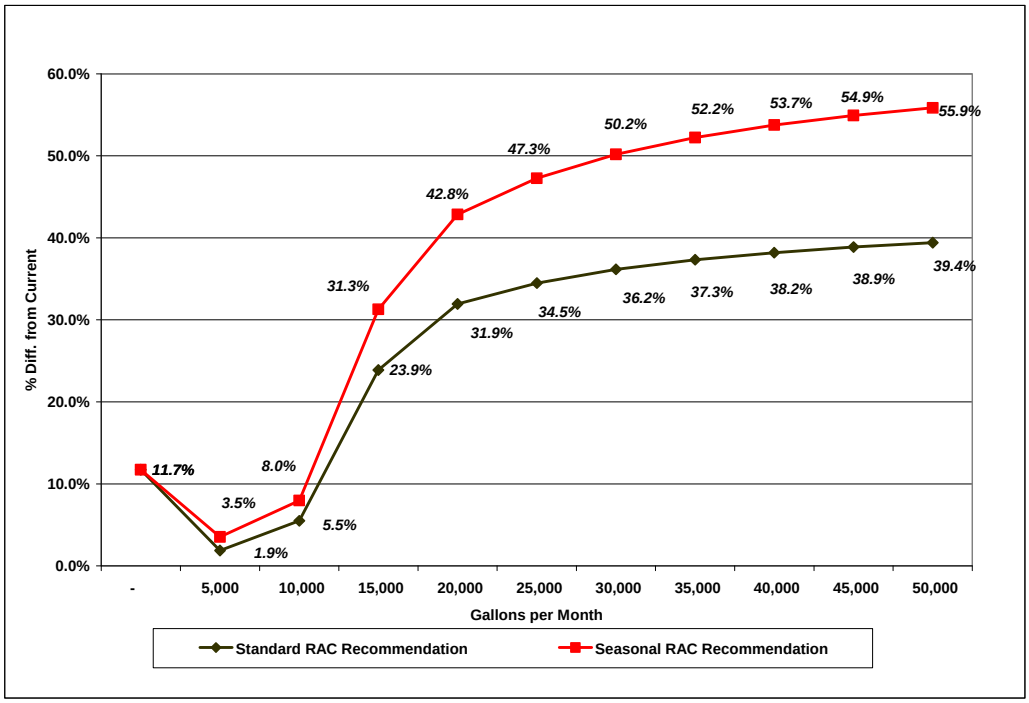


Irrigation Class

The RAC recommended rate structure for Irrigation customers also include seasonality, which is a new approach to assessing rates to Irrigation customers. Because of this, it is necessary to show the impacts of both the recommended standard and seasonal rates relative to the existing rate structure, as was the practice with the Residential rate comparisons. Exhibit 42 below shows the comparison for an irrigation customer with a 1" meter. Since irrigation is discretionary water usage, the pricing objective of encouraging conservation was a prime consideration in the development of a proposed rate structure for irrigation. The RAC recommended rate structure meets this consideration by focusing on those irrigation customers that place high demands on the water system. The same block cut-off's proposed for Residential customers are also recommended for use in structuring the Irrigation Class rates

Exhibit 42

Irrigation Customer Impacts under Recommended Water Delivery and Water Supply Rates (1" Meter – No EAA Fee)



C. Comparison with other Communities

Comparing water and sewer bills with other representative communities can provide insights regarding a utility's pricing policies related to water and sewer services. However, care should be taken in drawing conclusions from such a comparison, as higher bills may not necessarily mean the utilities are operated and managed poorly. Many factors affect the level of costs and the pricing structure employed to recover those costs. Some of the most prevalent factors include geographic location, demand, customer constituency, level of treatment, level of grant funding, age of system, level of general fund subsidization, and rate setting methodology. SAWS' Staff provided a list of regional and national utilities that were used to conduct a rate comparison for monthly bills under the approved RAC recommended Rate Structures.

The first set of exhibits below demonstrates a residential customer's monthly charge for 7,788 gallons of consumption. This level of consumption is representative of the average Residential customer usage for SAWS. SAWS' current and recommended standard and seasonal monthly charges are presented in perspective of select utilities in the state of Texas, Exhibit 43, and to

select utilities nationally, Exhibit 44. SAWS' recommended rates, when applied to this consumption level are lower than SAWS' current rates and the rates of several Texas and national utilities.

Exhibit 43

Residential Monthly Water Delivery and Water Supply Charges for 7,788 gallons for Select Texas Utilities (Smallest Available Meter)

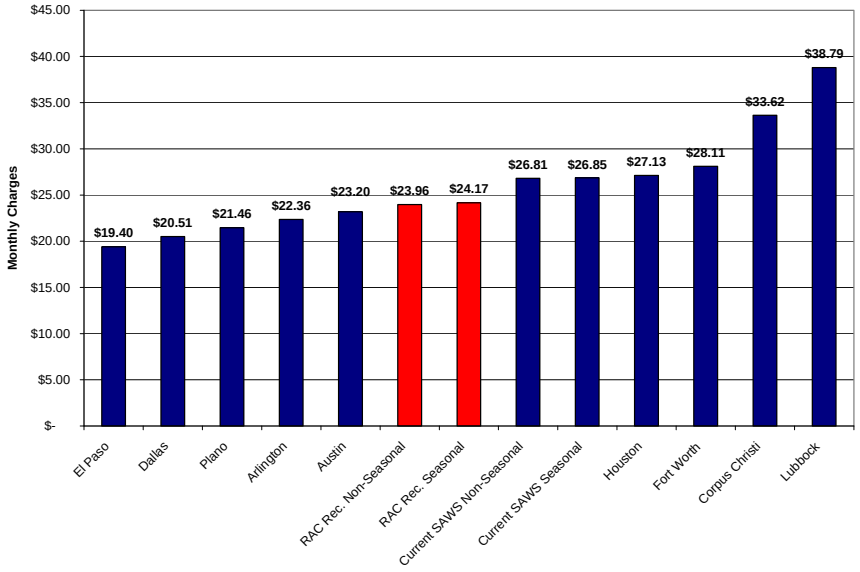
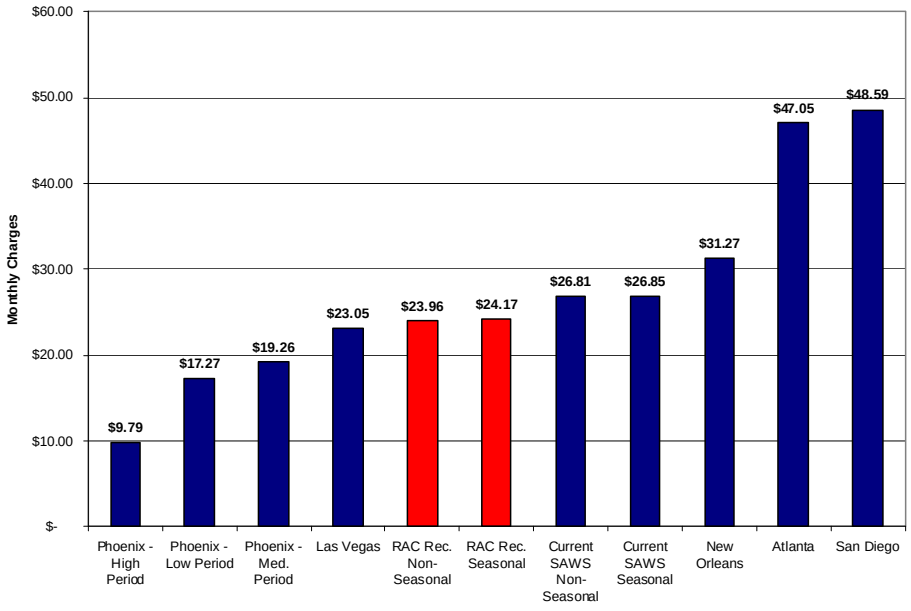


Exhibit 44

Residential Monthly Water Delivery and Water Supply Charges for 7,788 gallons for Select National Utilities (Smallest Available Meter)



The second set of exhibits demonstrates a Residential customer's monthly charge for 20,000 gallons of consumption. SAWS' current and recommended standard and seasonal monthly charges are presented in perspective of select utilities in the state of Texas in Exhibit 45, and to select utilities nationally in Exhibit 46. SAWS' conservation objectives begin to impact a customer at this level of monthly consumption; however, both SAWS' existing and recommended standard and seasonal rates are well within the mid range of both the Texas and national utility benchmarking groups.

Exhibit 45

Residential Monthly Water Delivery and Water Supply Charges for 20,000 gallons for Select Texas Utilities (Smallest Available Meter)

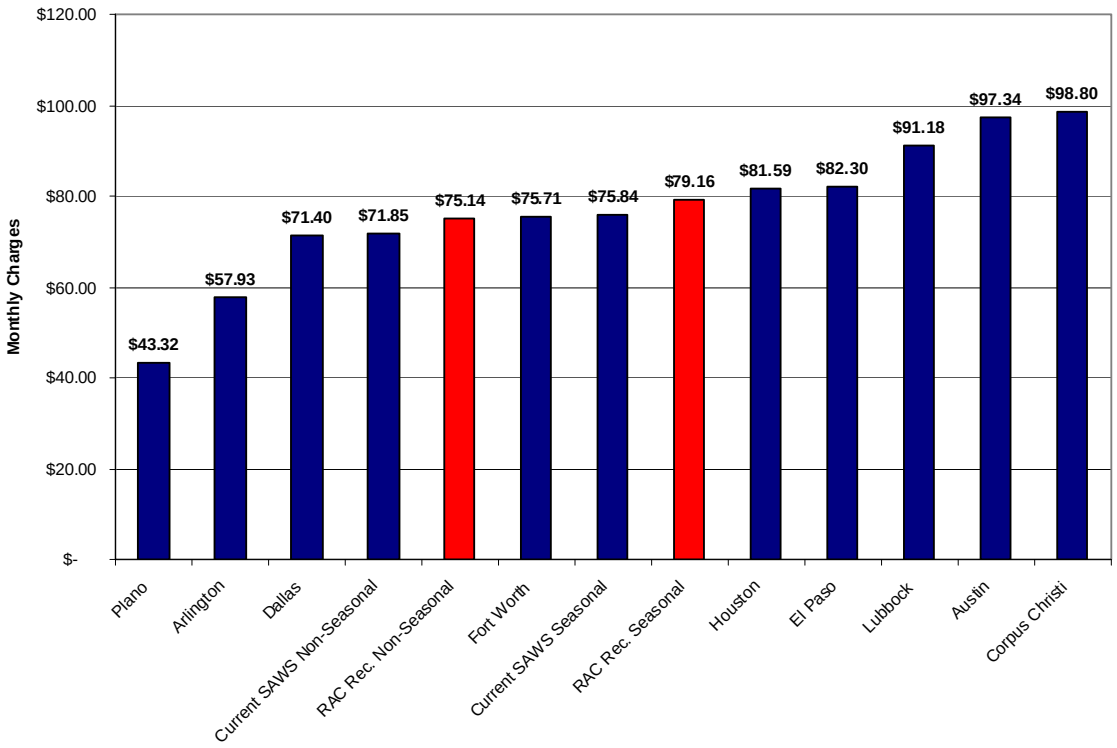
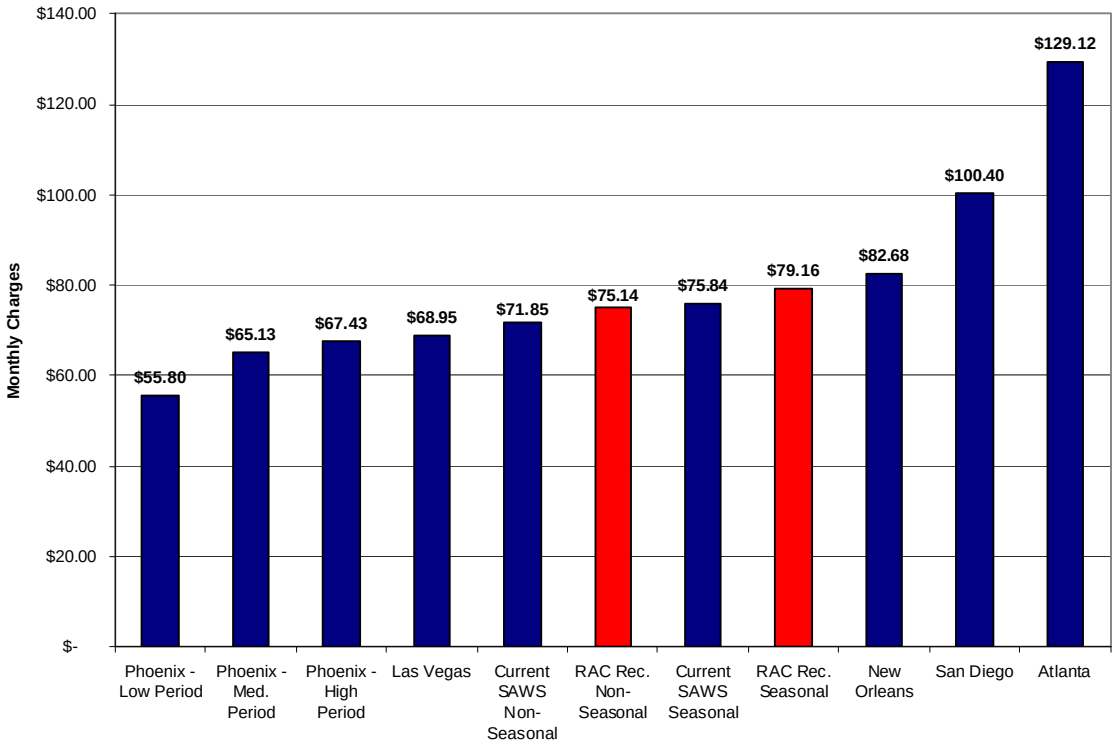


Exhibit 46

Residential Monthly Water Delivery and Water Supply Charges for 20,000 gallons for Select National Utilities (Smallest Available Meter)



The third and final set of Residential exhibits below demonstrates a high-use residential customer with a monthly usage of 50,000 gallons. Exhibit 47 presents SAWS comparison to Texas utilities, and Exhibit 48 presents the national comparison. The trend in both the state and nationwide comparison is that the RAC recommended rate structure shifts SAWS position from the middle of the benchmarking groups to the higher end. This demonstrates that SAWS and the RAC have determined high-usage customers will bear a significant impact on their bill and will become one of the higher monthly charges within its peer utilities.

Exhibit 47

Residential Monthly Water Delivery and Water Supply Charges for 50,000 gallons for Select Texas Utilities (Smallest Available Meter)

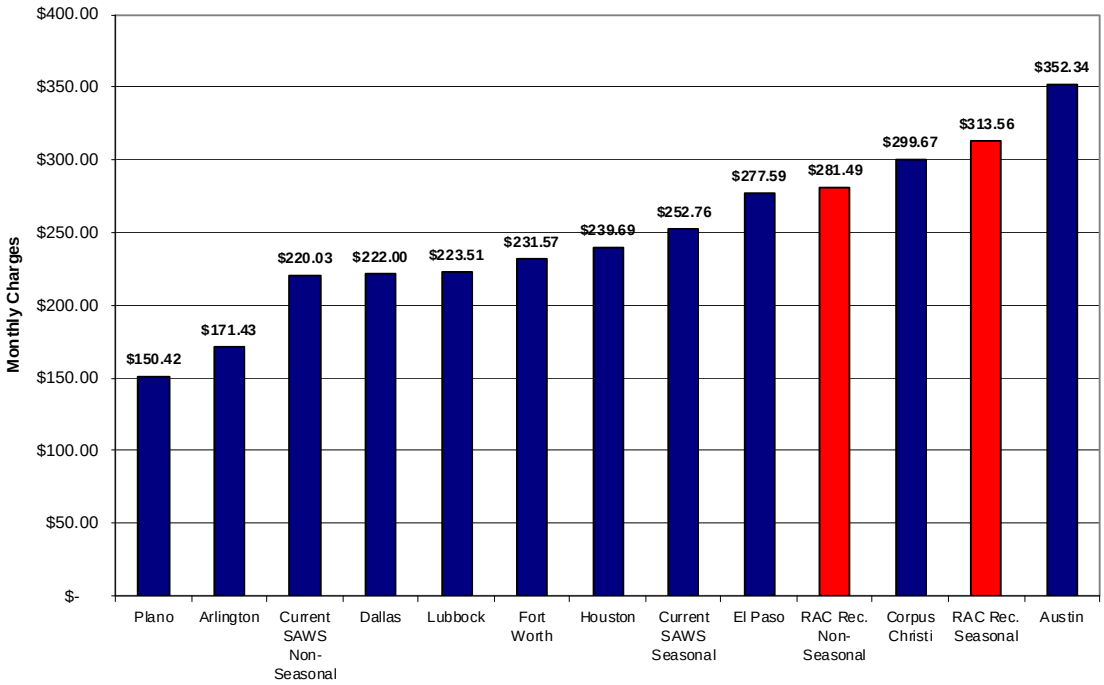
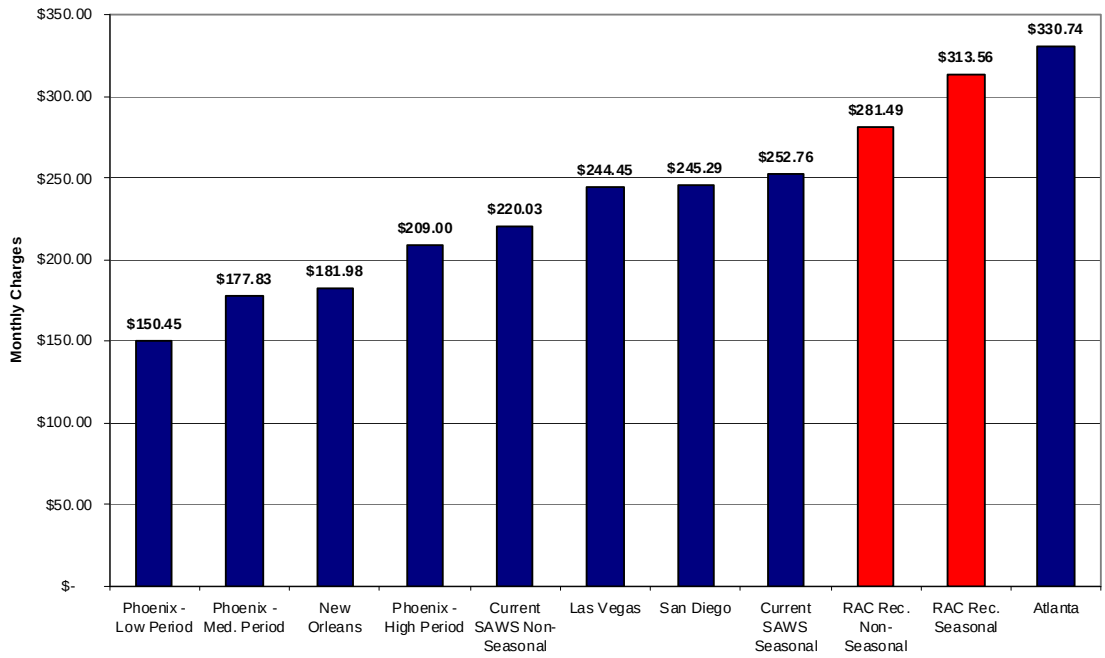


Exhibit 48

Residential Monthly Water Delivery and Water Supply Charges for 50,000 gallons for Select National Utilities (Smallest Available Meter)



Similarly, for the General Class, the existing rates and recommended rates are compared to the same group of state and national benchmarking utilities. For this comparison, two customer groups were used: those with average monthly usage of 50,000 gallons and a 2" meter and those with average monthly usage of 850,000 gallons and a 6" meter. State-level benchmarking comparisons are provided in Exhibits 49 and 51 and national comparisons are provided below in Exhibits 50 and 52. SAWS existing and recommended rates are in the mid range for both comparisons.

Exhibit 49

General Class Monthly Water Delivery and Water Supply Charges for 50,000 gallons for Select Texas Utilities (Base = 50,000 Gallons, 2" Meter)

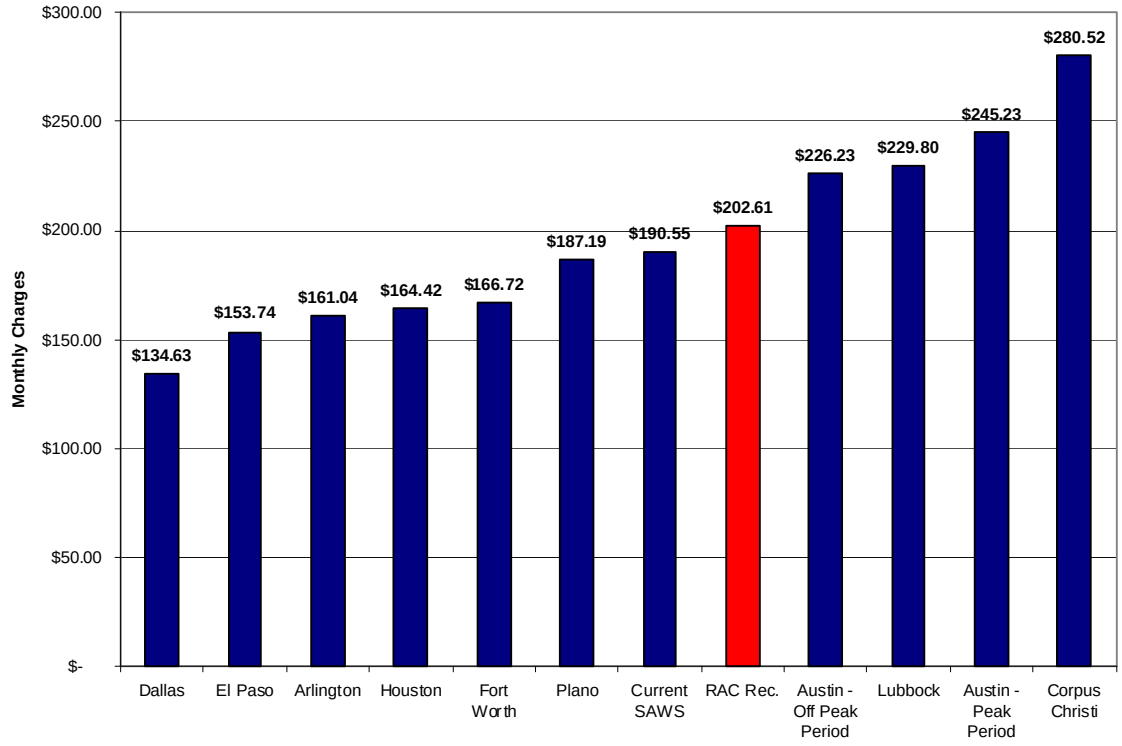


Exhibit 50

General Class Monthly Water Delivery and Water Supply Charges for 50,000 gallons for Select National Utilities (Base = 50,000 Gallons, 2" Meter)

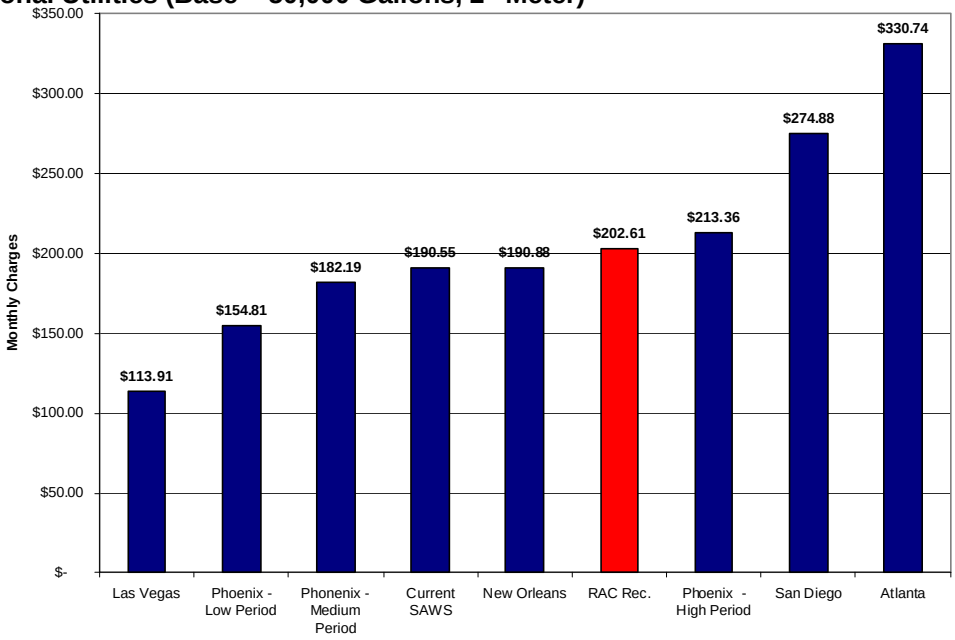


Exhibit 51

General Class Monthly Water Delivery and Water Supply Charges for 850,000 gallons for Select Texas Utilities (Base = 665,809 gallons, 6" Meter)

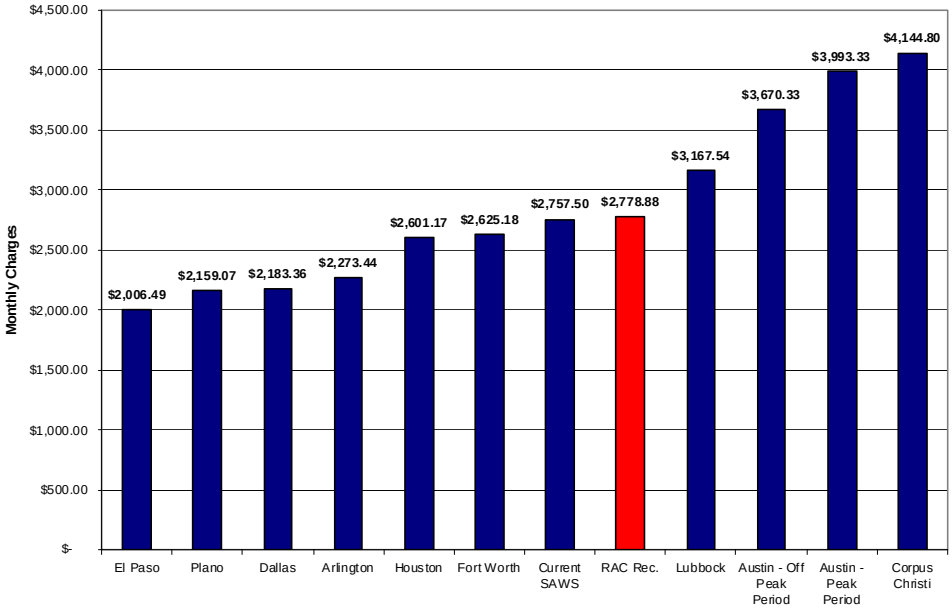
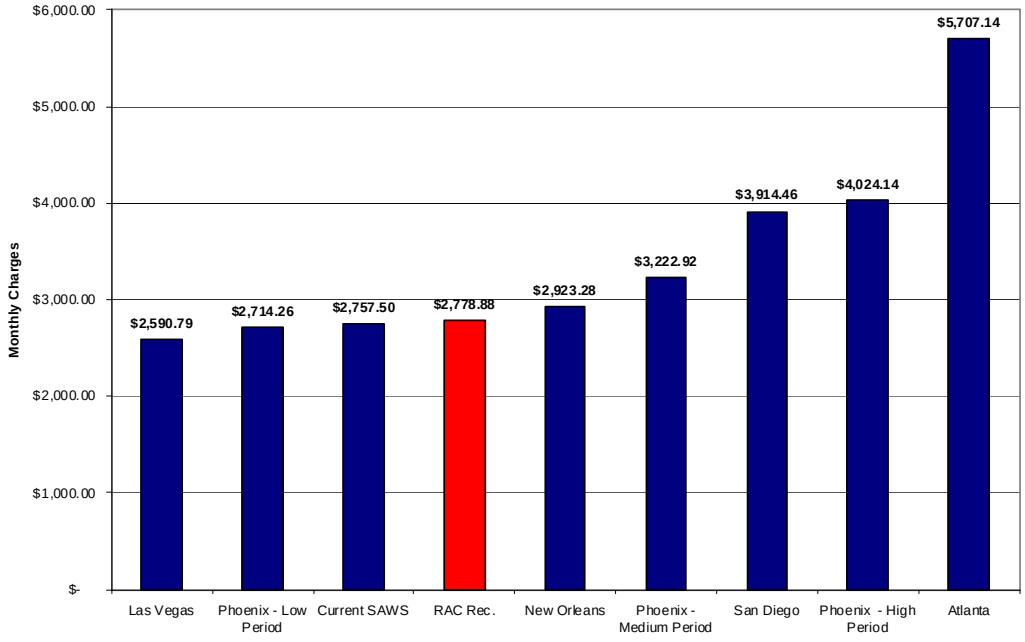


Exhibit 52

General Class Monthly Water Delivery and Water Supply Charges for 850,000 gallons for Select National Utilities (Base = 665,809 gallons, 6" Meter)



VI. WASTEWATER

A. Wastewater System

SAWS has three major wastewater treatment facilities that have the capability to treat over 200 million gallons of wastewater a day. In 2008, the plants treated a combined 50 billion gallons of wastewater. SAWS' wastewater collection system consists of 5,000 miles of pipe and 162 lift stations. SAWS connects to approximately 390,000 customers in the city and outlying areas. A portion of these customers receive wastewater service from SAWS but water service from BexarMet. BexarMet is responsible for providing water usage data to SAWS so that SAWS can estimate the wastewater bills for these customers. Exhibit 53 provides some insight regarding the customer class characteristics, including the BexarMet customers. As shown, residential customers account for approximately 94% of all accounts and 56% of billed flow. Commercial customers account for approximately 6% of customers and 39% of billed flow. There are a handful of wholesale customers that account for approximately 5% of billed flow.

Exhibit 53
Customer Class Characteristics

Customer Class	Wastewater Service	
	Billed Flow	Accounts
Residential	55.92%	93.81%
Commercial	39.31%	6.19%
Irrigation	0.00%	0.00%
Wholesale	4.77%	0.00%
	100.00%	100.00%

B. Existing Wastewater Rate Structure

Exhibit 54 shows SAWS' existing rate structure for each customer class. The existing rate structure is comprised of a fixed minimum monthly charge and a volumetric charge.

Minimum Charge

All customer classes are assessed a minimum monthly charge that includes the first 1,496 gallons of water use. This minimum is assessed even if a customer uses less than 1,496 gallons. Outside-city minimum charges are 120% higher than inside-city rates.

Volumetric Charge

SAWS assesses a uniform volumetric charge to all usage above 1,496 gallons. To determine the amount of water returned to the wastewater system from Residential customers, SAWS calculates each residential customer's winter average water usage for 90 days during three consecutive billing periods between November 15th and March 15th. For General Class customers, the average annual water usage is used to estimate the amount returned to the wastewater system. However, the amount assumed for irrigation (29% of usage of the commercial and industrial water service customers, and 20% for apartments) is excluded since

this water usage is not returned to the wastewater system. The volumetric rate is assessed to usage returned to the system above the 1,496 gallons included as part of the minimum charge. Outside-city uniform volumetric rates are 120% higher than inside-city rates.

Exhibit 54
Current Wastewater Rates

Class	Inside-City		Outside-City	
	Minimum Charge	Volumetric Charge	Minimum Charge	Volumetric Charge
Residential	$7.76	$0.2057	$9.32	$0.2468
General	$7.76	$0.2057	$9.32	$0.2468
Wholesale	-	$0.1854	$91.11	$0.2226
	Includes 1,496 gal	per 100 gal	Includes 1,496 gal	per 100 gal

C. Revenue Requirements

Revenue requirements include all costs incurred by SAWS to operate the Wastewater utility. Revenue requirements not only represent the cash-needs of each utility but also the liquidity and debt-coverage requirements. SAWS Staff has already developed two comprehensive EXCEL files that identify revenue requirements, referenced earlier in Section II. These files were used to obtain the following information for Wastewater:

- Operating reserves;
- Debt service;
- Commercial paper;
- Notes payable;
- Rate funded capital outlay; and
- Rate funded CIP projects.

RFC also used these files to factor in the offsets used to reduce Wastewater revenue requirements. For example, SAWS earns revenues from interest earnings and from industrial surcharges, etc. These offsets are used to derive the net Wastewater revenue requirements to be recovered from Wastewater rates. As shown in Exhibit 55, the net revenue requirements to be recovered from Wastewater for Fiscal Year 2009 (or "test year") is $128.4 million.

Exhibit 55
Wastewater Revenue Requirements

	Operating Expense	Capital Cost	Total
O&M Expenses	$ 70,514,327		$ 70,514,327
Debt Service		$ 54,196,972	$ 54,196,972
Transfer to the City	$ 3,759,958		$ 3,759,958
Transfer to R&R		$ 4,374,168	$ 4,374,168
Capital Outlay		$ 6,412,287	$ 6,412,287
	$ 74,274,285	$ 64,983,427	$ 139,257,712
Less Revenue Requirements Met from Other Sources	$ (10,901,133)		$ (10,901,133)
Subtotal	$ 63,373,152	$ 64,983,427	$ 128,356,580

D. Cost of Service Allocation

Wastewater Rate Design

The city's wastewater budget for FY 2009 served as the test year for this study. Budget detail was taken from the "CY09 Allocations" file provided by the SAWS in order to provide an adequate level of detail to allocate costs to the various treatment plant functions, such as primary treatment, secondary treatment, tertiary treatment, disinfection, solids handling, etc. Pro Ops, a sub-consultant for the cost of service study, is a professional engineering firm with experience in wastewater treatment design and operations. Pro Ops performed an analysis to allow for the allocation of plant costs. The Pro Ops analysis allocated costs to the treatment plant functions noted above and then allocated those plant functions to the removal of wastewater pollutants. Ultimately, from the analysis, an allocation table was developed that converts treatment plant operations and maintenance costs to wastewater pollutants. Pollutant costs divided by the total pounds of those pollutants discharged into the wastewater system equals the cost per pound to treat pollutants. All costs not allocated to pollutants, have historically been allocated to volume for inclusion in the volumetric component of the SAWS uniform wastewater rate. RFC has taken the additional step of allocating some of the remaining costs to be recovered through the fixed monthly component.

Volumetric/Strength Cost Allocation

The Volumetric/Strength method of cost allocation as described in the Manual of Practice #27 from the Water Environment Federation recognizes that wastewater systems are designed to handle volumetric flow as well as pollutant strength. Typical Volumetric/Strength cost categories include:

- Volumetric: costs related to meeting average and peak day demands.
- Strength: costs incurred at the treatment plants related to meeting discharge permit limits for removal of pollutants.
- Customer Service: costs associated with metering, billing, and collections.

Our cost of service analysis process consisted of two steps. First, O&M costs were allocated among the three cost categories above. Then, a COS-based rate was calculated for strength components and customer service components. Projected revenue from these rates reduces revenue requirements to be recovered through the city's volumetric charge.

Industrial Surcharges

The current wastewater rate structure includes a volumetric component charged to all customers based on usage and a high strength component charged to customers whose wastewater includes pollutant levels in excess of normal domestic wastewater. The surcharges are intended to recover direct plant O&M costs associated with removal of biological oxygen demand (BOD) and total suspended solids (TSS). Surcharges also recover direct cost to administer the city's pretreatment program. Without a surcharge, industrial and commercial facilities would be subsidized by residential customers. While Pro Ops assisted in identifying those costs that would be incorporated in industrial surcharges, SAWS will be undergoing a more comprehensive study in the near future to potentially switch from sampling BOD to chemical oxygen demand (COD). If this switch is made, SAWS will bill based on COD rather than BOD. As a result, it was assumed SAWS would continue to charge the existing industrial surcharges to high strength customers. However, Pro Ops still had to allocate costs in order to determine the total costs to be recovered from the volumetric rate.

Treatment Cost Allocation

Pro Ops evaluated each wastewater treatment plant in order to equitably allocate cost activity to each removal process. Objectives of the analysis included determining a correlation between each of the treatment plant's influent pollutant loads and the annual O&M costs and relating the reduction of these pollutants in the liquid and solids treatment processes to the corresponding O&M costs for each process. RFC, with input from SAWS Staff, assigned O&M activity into functional allocation categories or cost pools. Data collected from the analysis performed by Pro-Ops was used in determining equitable allocation of treatment plant activity to functional allocation categories. Units of service were obtained from historical operating reports and then divided by the net operating cost per cost class to determine a unit cost.

Analysis Results

Application of the cost of service analysis for the test year to O&M data resulted in costs being allocated to the categories above in the percentages shown in Exhibit 56. These test year allocations can be applied to subsequent O&M projections in order to determine the cost of service.

Exhibit 56
O&M Cost Allocation Results

Cost Category	Allocation Percentage
Volumetric	82%
Meter	12%
Billing/Customer Service	6%
Total	100%

E. Conceptual Design

RFC and SAWS Staff identified several wastewater rate structure modifications based on the top pricing objectives as identified by the RAC.

- **Modify Basis for Estimating Wastewater Usage** – SAWS currently estimates residential wastewater use on winter average water use. Other methods used to estimate wastewater returned to the system include: average annual water usage, total water usage, or a flat percentage of water usage. Using a different basis for estimating water use can encourage various levels of water conservation.

- **Eliminate the minimum usage** – The minimum monthly charge currently includes the first 1,496 gallons of usage. A customer using less than 1,496 is penalized since they are paying for more wastewater than they are returning to the system. To be more equitable and address affordability for those economically disadvantaged customers with low water use, the volumetric rate could be assessed to actual usage.

- **Establish a base charge by meter size** – Currently the minimum charge does not vary by meter size. In order to reflect the available capacity provided by different meter sizes, the monthly meter charge could vary by meter size to reflect the available capacity for those customers with larger meters.

F. Alternative Rate Structures

RFC and SAWS Staff discussed the conceptual design options and identified several viable alternative rate structures. These alternatives were chosen based on the customer data that was available at the time of the study. SAWS could not obtain meter size information for each BexarMet account and therefore, it was not possible to calculate a base charge by meter size for wastewater customers. In addition, RFC recommended the winter average water use continue to remain the basis of estimating residential water returned to the wastewater system. Using a different basis for estimating wastewater could encourage more water conservation. However, SAWS is already effective in promoting water conservation through their existing tiered and seasonal residential water rate structure. Furthermore, the winter average usage is a justifiable and equitable measure for estimating water usage returned to the system. Using an alternative basis such as total water use or the average annual use is less equitable since it captures more water than what is actually returned to the wastewater system. Therefore, it was recommended the winter average usage remain the basis for estimating residential wastewater use for each alternative.

Alternative 1: Retain existing rate structure but reflect cost of service principals – This alternative would include applying the cost of service analysis to the net FY 2009 revenue requirements and determining rates under the existing rate structure. This alternative would re-calculate the minimum monthly charge that includes the first 1,496 gallons of usage and the volumetric rate for all usage above 1,496 gallons.

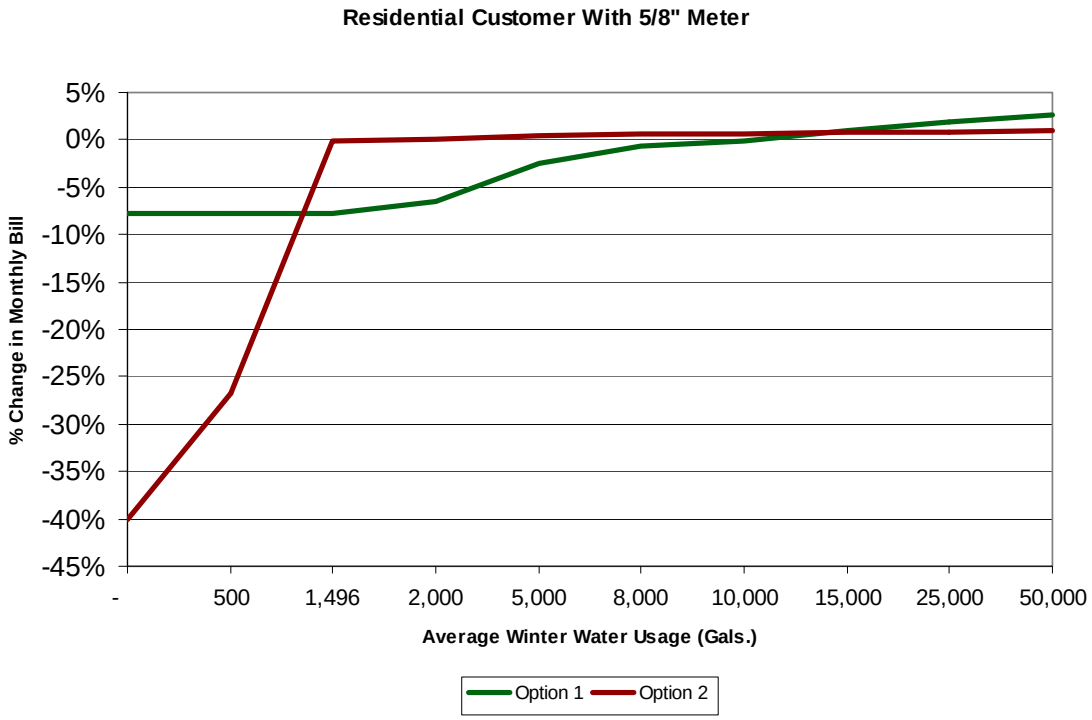
Alternative 2: Eliminate the minimum usage – This alternative would include applying the cost of service analysis to the net FY 2009 revenue requirements and determine rates under the existing rate structure, but would eliminate the minimum allowed usage of 1,496 gallons. All customers would continue to be assessed a monthly charge but the volumetric rate would be assessed to all usage.

The resulting wastewater rates under each option are shown in Exhibit 57 and the resulting customer impacts in Exhibit 58. As shown, under alternative 1, those residential customers who use less than 9,000 gallons of water (winter average) will see a decrease in their bill ranging from 0% to 10%, while those using more than 9,000 gallons will see an increase ranging from 0% to 3%. Under alternative 2, those customers using less than the minimum, (1,496 gallons) will see a decrease in their monthly bill ranging from 0% to 40%. Approximately 11% of customers use less than 1,496 gallons of water (winter average use).

Exhibit 57
Alternative Rates for Wastewater

	Existing Rates	Option 1	Option 2
Inside-City			
Base Charge			
Residential and General Class	$7.76	$7.16	$4.65
Wholesale Class			
Volumetric Charge (per 100 gallons)			
Residential and General Class	$0.2057	$0.2126	$0.2077
Wholesale Customers	$0.1854	$0.1900	$0.1856
Outside City			
Base Charge			
Residential and General Class	$9.32	$8.59	$5.58
Wholesale Class	$91.11	$81.64	$81.64
Volumetric Charge (per 100 gallons)			
Residential and General Class	$0.2468	$0.2551	$0.2492
Wholesale Customers	$0.2226	$0.2280	$0.2227

Exhibit 58
Residential Customer Impacts under Alternative Rate Options



While alternative 2 would provide more affordable rates for customers with low usage, the lower base charge would jeopardize SAWS' revenue stability. Under alternative 2, the revenues from base charges would decrease from 29.3% to 17.6%. The RAC, along with RFC and SAWS Staff, concluded that the alternative rate structures did not provide enough advantages to warrant a change. As a result, the RAC voted to keep the wastewater rate structure unchanged at a RAC meeting held on October 1, 2009.

Exhibits 59 through 68 show comparisons of monthly wastewater bills for various customers under the existing wastewater rate structure. Exhibits 59 and 60 show the comparison of monthly bills for residential customers that represent SAWS average residential wastewater customer who has a winter average water usage of 6,178. As shown, the average SAWS residential wastewater customer has monthly bills that are lower than bills of most of the select Texas and national utilities.

Exhibit 59

Residential Monthly Wastewater Charges for 6,178 gallons (winter average) for Select Texas Utilities

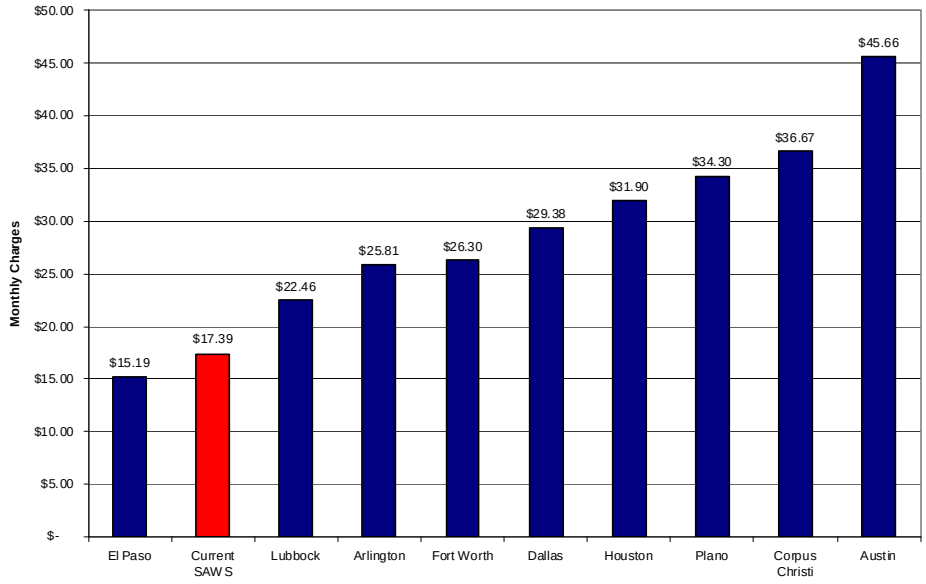
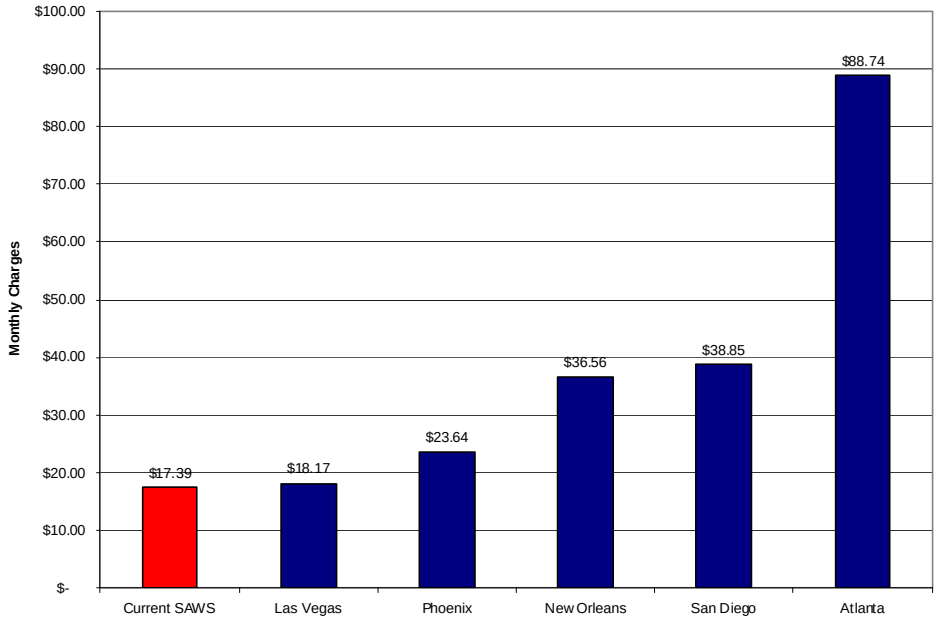


Exhibit 60

Residential Monthly Wastewater Charges for 6,178 gallons (winter average) for Select National Utilities



Exhibits 61 and 62 show the comparison of monthly bills for residential customers that have a winter average water usage of 30,000. As shown, the monthly bills for these customers are in the lower range of the comparison for both the select Texas and national utilities.

Exhibit 61

Residential Monthly Wastewater Charges for 30,000 gallons (winter average) for Select Texas Utilities

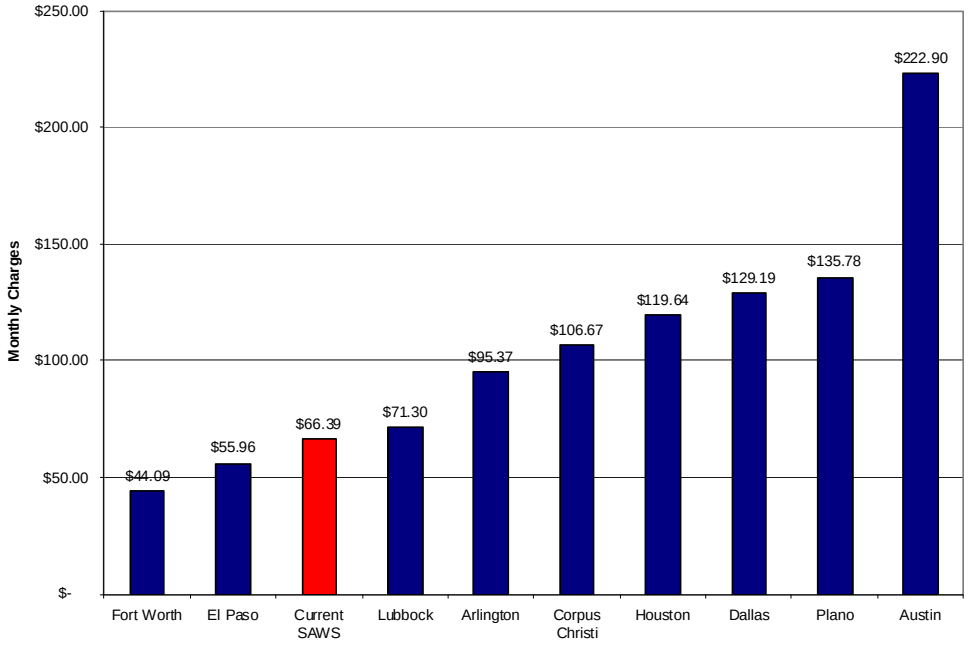
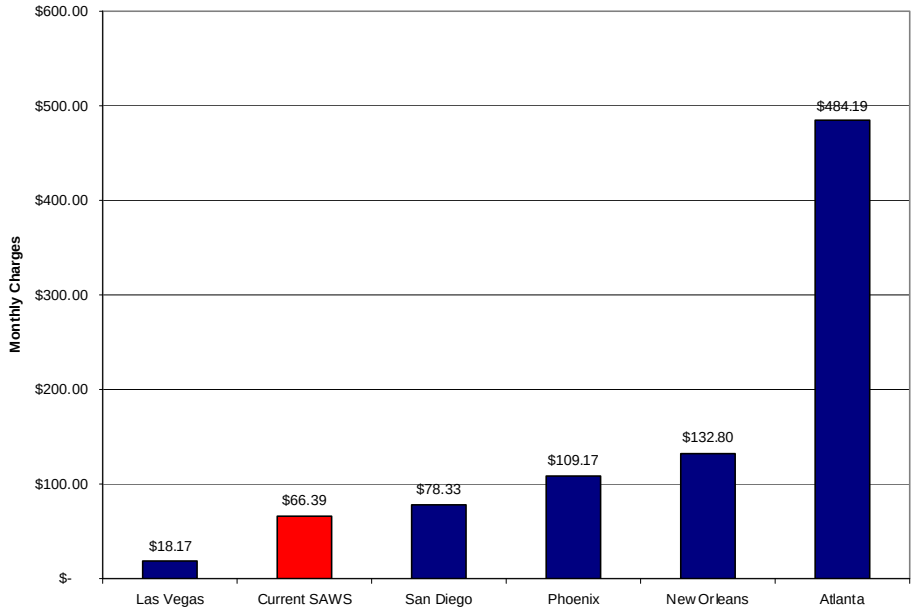


Exhibit 62

Residential Monthly Wastewater Charges for 30,000 gallons (winter average) for Select National Utilities



Exhibits 63 and 64 show the comparison of monthly bills for residential customers that have a winter average water usage of 50,000. As shown, the monthly bills for these customers are in the lower range of the comparison for both the select Texas and national utilities.

Exhibit 63

Residential Monthly Wastewater Charges for 50,000 gallons (winter average) for Select Texas Utilities

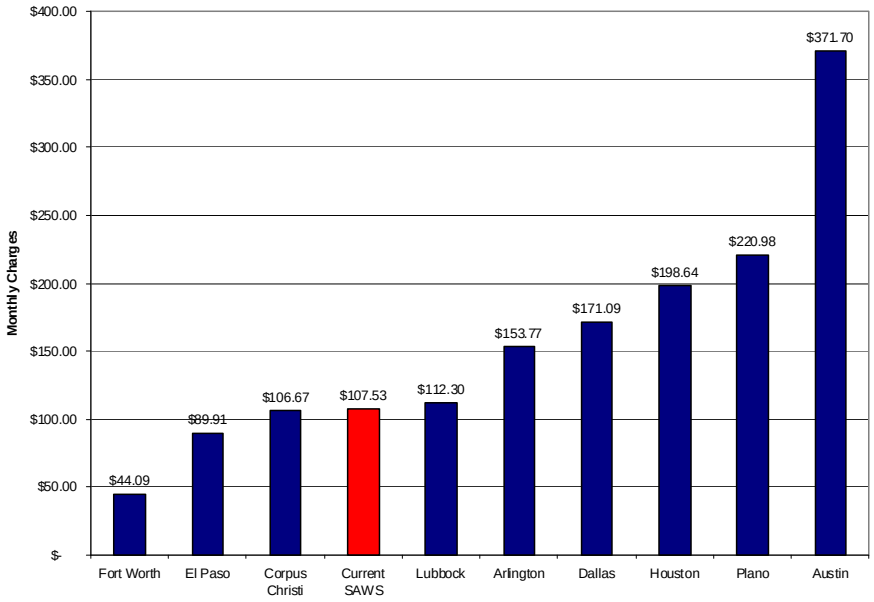
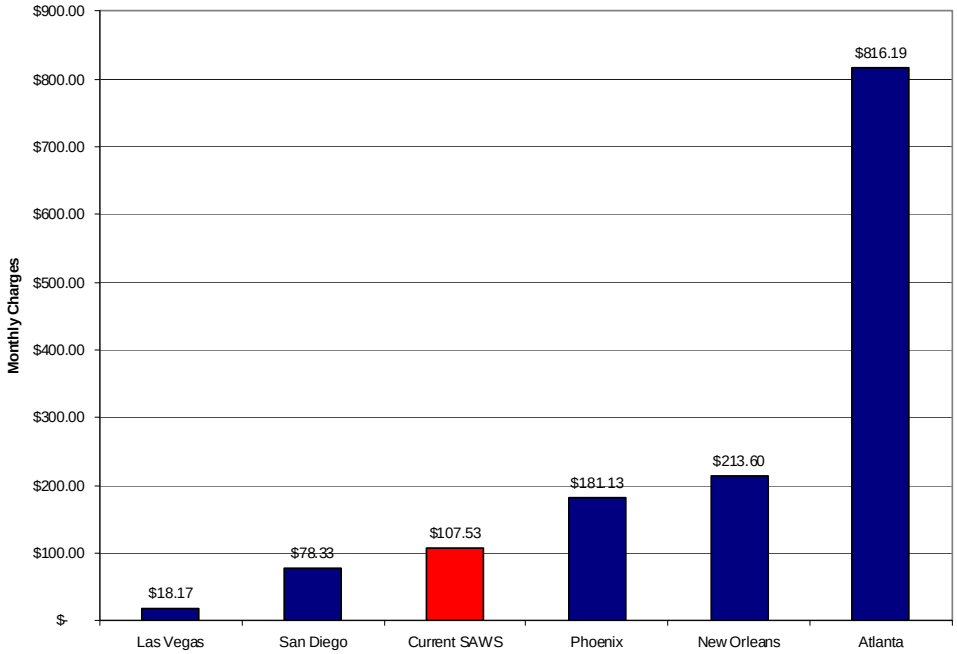


Exhibit 64

Residential Monthly Wastewater Charges for 50,000 gallons (winter average) for Select National Utilities



Similarly, for the General Class, the existing rates and recommended rates are compared to the same group of state and national benchmarking utilities. For this comparison, two customer groups were used: those with average monthly usage of 50,000 gallons and a 2" meter, and those with average monthly usage of 850,000 gallons and a 6" meter. State-level benchmarking comparisons are provided in Exhibits 65 and 67 and national comparisons are provided in Exhibits 66 and 68. SAWS existing and recommended rates are in the low range for both comparisons.

Exhibit 65

General Class Monthly Wastewater Charges for 50,000 gallons for Select Texas Utilities

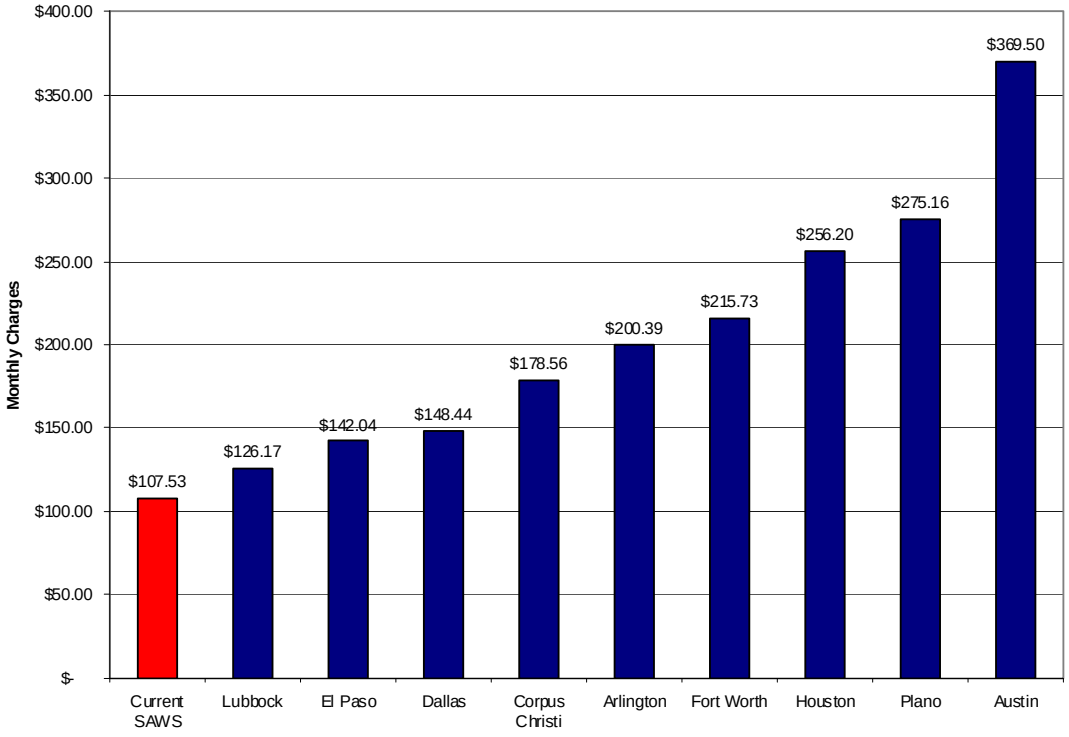


Exhibit 66

General Class Monthly Wastewater Charges for 50,000 gallons for Select National Utilities

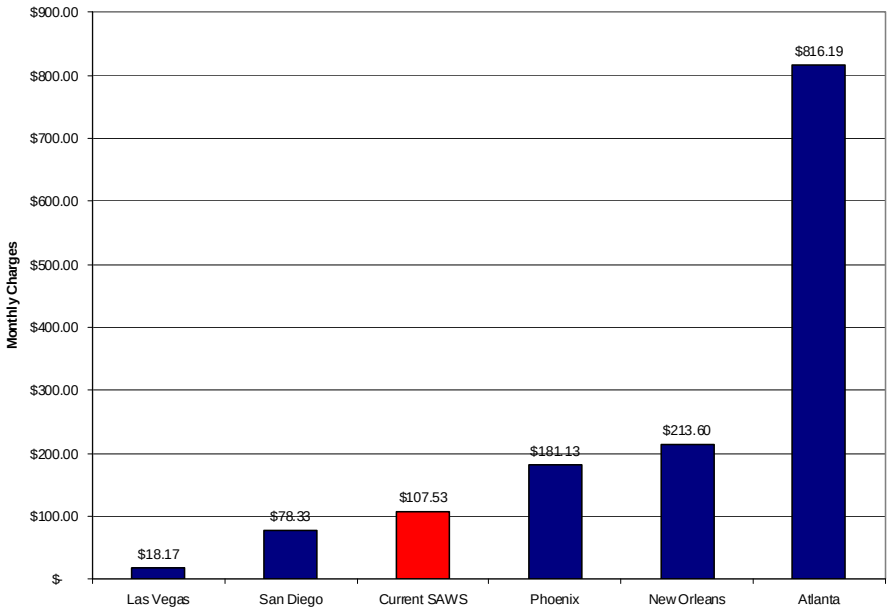


Exhibit 67

General Class Monthly Wastewater Charges for 850,000 gallons for Select Texas Utilities

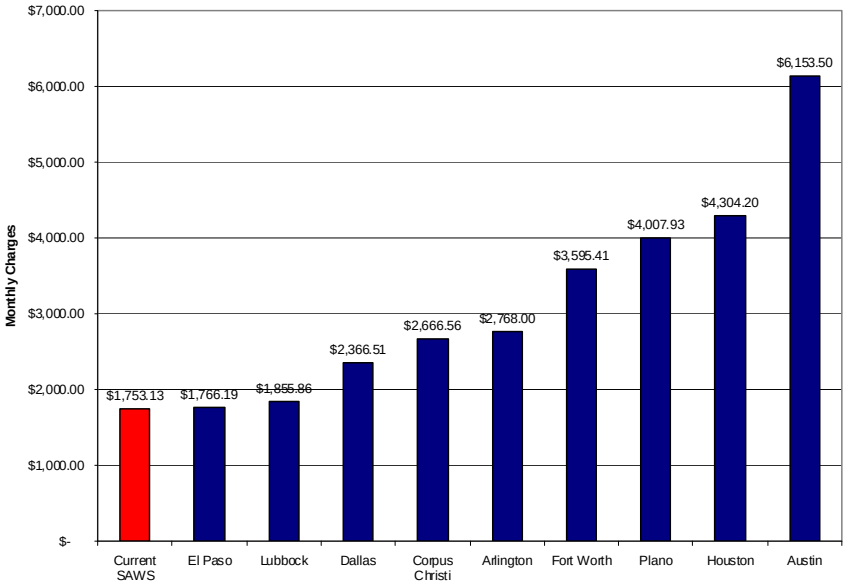
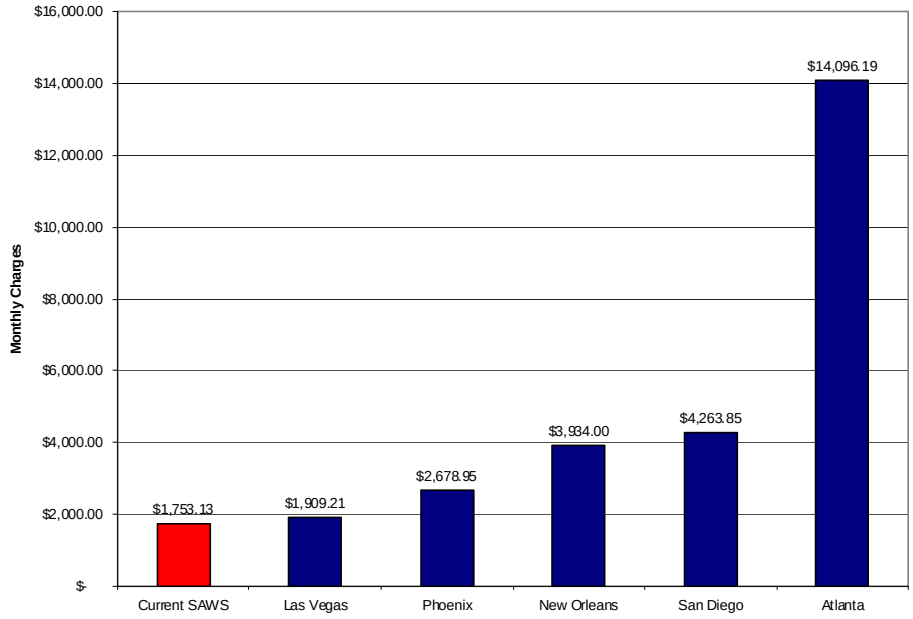


Exhibit 68

General Class Monthly Wastewater Charges for 850,000 gallons for Select National Utilities



VII. RECYCLED WATER

A. Recycled Water System

SAWS has been leading the nation in treating and reusing wastewater for irrigation, commercial, and industrial purposes. Recycled water is wastewater that is highly treated through a tertiary treatment process to be released to the environment and used in the recycled water system. SAWS continues to observe an increase in the demand for recycled water. Three Water Recycling Centers are owned and operated by SAWS to provide this service, which helps conserve potable water drawn from Edwards Aquifer. Recycled water cannot flow through the potable water system. Therefore, SAWS has invested millions of dollars in building the necessary infrastructure to provide this service. The SAWS' recycled water system is comprised of nearly 80 miles of pipeline to distribute up to 35,000 acre-feet per year to customers. While the initial investment was significant, SAWS is committed to conservation and believes this system will continue to pay dividends as a valuable alternative source of water.

B. Existing Rate Structure

The recycled water rate structure is comprised of a monthly service availability fee that varies by meter size and a two-tiered volumetric rate structure, provided in Exhibit 69. Seasonal volumetric rates apply to recycled usage between July 1 and October 31st. Standard volumetric rates are applied to usage in the other months.

SAWS has two different tiered rate structures. SAWS has several recycled water customers that transferred their Edwards Aquifer rights (in acre feet or "AF") to SAWS. In exchange for these rights, SAWS charges these customers the "Edwards Exchange Customer" Block 1 rate for all usage that is up to the amount of AF transferred to SAWS. The customer is then assessed the Block 2 rate for all usage above the AF transferred to SAWS. The majority of SAWS' customers are Non-Edwards Exchange Customers. These customers are assessed a tiered standard and seasonal volumetric rate structure. The block cut-off for these customers is 748,000 gallons.

Exhibit 69
Existing Recycled Water Rate Structure

Service Availability Fee		Volumetric Rates		
Meter Size	Charge	***Edwards Exchange Customers***		
5/8"	$8.74	Rate Category	Standard	Seasonal
3/4"	$11.37	Transferred Amount	$0.0230	$0.0230
1"	$14.81	All Excess	$0.0863	$0.0917
1 1/2""	$23.55			
2"	$34.44			
3"	$91.60	***Non-Edwards Exchange Customers***		
4"	$136.14	Rate Tier	Standard	Seasonal
6"	$259.71	Tier 1 - First 748,000 gal	$0.0924	$0.0992
8"	$391.47	Tier 2 - Above 748,000 gal	$0.0943	$0.1002
10"	$536.79			
12"	$662.31			

C. Revenue Requirements

Revenue requirements include all costs incurred by SAWS to operate the Recycled Water system. RFC obtained revenue requirements and offsets allocated to Recycled Water from the aforementioned file, "FP09 B Session", prepared by SAWS Staff. In particular, this file was used to obtain the following revenue requirements information for Recycled Water System:

- Operating reserves;
- Debt service;
- Commercial paper;
- Notes payable;
- Rate funded capital outlay; and
- Rate funded CIP projects.

Exhibit 70 presents the Recycled Water revenue requirements. However, offsets are used to reduce revenue requirements. For example, SAWS earns revenues from other core businesses. Currently, Recycled Water is being supported in part by revenues generated from Water Delivery and Water Supply. It is a common practice among utilities throughout the country to support recycled water operations in this way. The net revenue requirement to be recovered from recycled rates is approximately $3.9 million. However, a portion (or 70% of these revenues) is fixed due to contracts.

Exhibit 70

Recycled Water Revenue Requirements

		Total
O&M Expenses	$	2,959,688
Debt Service	$	11,975,149
Transfer to the City	$	91,645
Transfer to R&R	$	453,153
Capital Outlay	$	178,486
Transfers Out	$	-
Total Revenue Requirements - No Subsidy	**$**	**15,658,120**
Less Revenue Requirements Met from Other Core Sources		
Transfer from Water Supply	$	(3,941,000)
Transfer from Water Delivery	$	(5,800,000)
Subtotal Revenue Requirements	$	5,917,120
Less Fund Transfers		
Transfer from R&R Fund	$	(1,984,000)
Subtotal Revenue Requirements - With Subsidy	$	3,933,120
Contractual Revenue		
CPS Contracts	$	(2,720,450)
Subtotal Revenue Requirements	$	1,212,670
Net Revenue Requirements	**$**	**1,212,670**

The recycled water system provides SAWS with an alternative Water Supply source and delays the need to pursue other Water Supply sources that are more expensive. Exhibit 71 shows a comparison of the capital costs and available acre feet for alternative Water Supply sources. As shown, recycled water (capital cost/AcFt) is the second least expensive Water Supply source.

Exhibit 71

Water Resource Capital Cost Comparison (as of October 2009)

Comparison of Water Resource Capital Costs

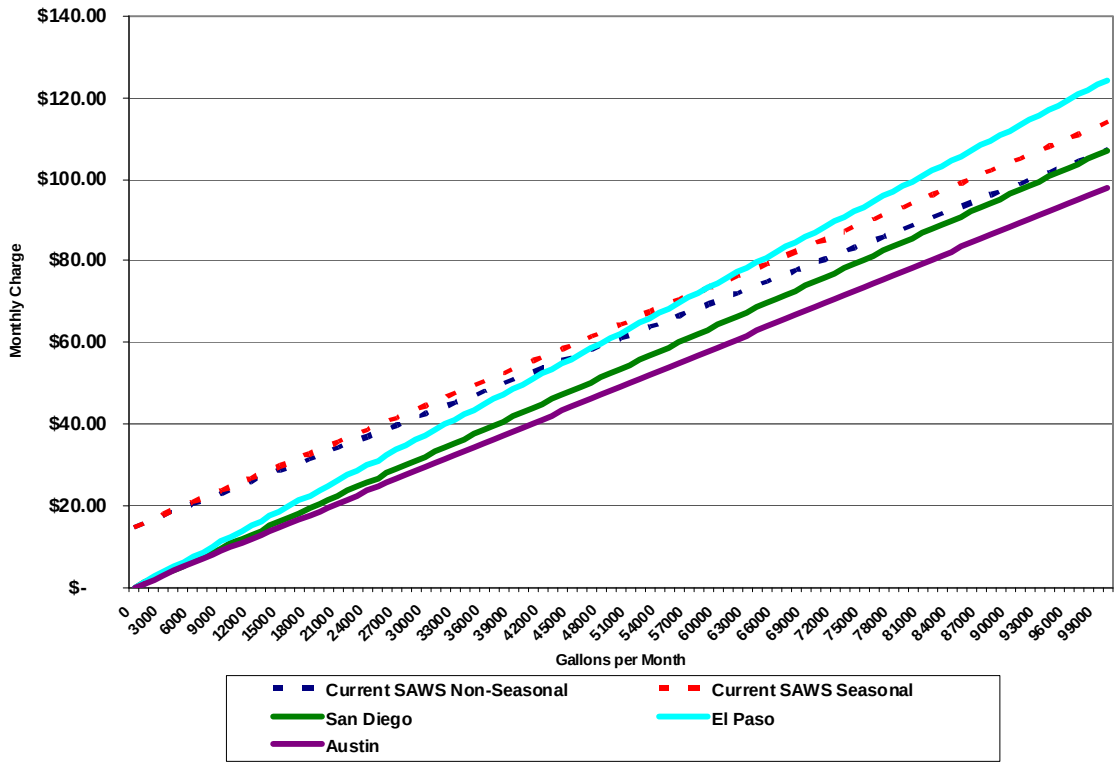
	Capital $	Capacity (Ac.Ft.)	Capital $/Ac.Ft.
Recycled Water	$ 134,829,275	35,000	$ 3,852
Edwards Acquisitions	$ 87,418,645	60,000	$ 1,457
Brackish Groundwater Desal[(1)]	$ 216,203,715	11,800	$ 18,322
Additional Recharge	$ 141,568,199	13,451	$ 10,525
Ocean Water Desal	$ 3,288,752,697	120,000	$ 27,406

(1) Includes 50% of the costs of the Integration Pipeline

The existing recycled rates (Non-Edwards Exchange Rates) are comparable to those assessed by other utilities similar in size to SAWS, as shown in Exhibit 72. Because the existing rates are comparable to other utilities, and because recycled water is a less expensive source of water, the recycled rates should continue to be subsidized. However, it was recommended that increases in recycled water rates be considered whenever increases are proposed for Water Delivery and Water Supply rates. On October 15, 2009, the RAC approved this recommendation and the recommendation to retain the current Recycled Water rate structure..

Exhibit 72

Benchmarking Recycled Water Rates with Peer Utilities



VIII. OTHER SYSTEM-WIDE FEES

A. Private Fire Protection Costs

As described in Section III-F of this report, the cost of service allocation process identified those costs to be recovered from customers who have standby water pressure provided by SAWS to support private fire service systems. Added to this cost, is approximately $385,000 for the maximum day and maximum hour demand that can be placed on the system to actually fight a fire. (These costs are based on assuming 4,000 gallons of water flow per minute to fight a fire multiplied by the calculated max day and max hour costs developed in Section III). The total costs to be recovered from private fire protection are therefore $1,385,000. SAWS currently generates approximately $1,500,000 from private fire service customers who pay an annual fee based on meter size. While the cost of service analysis does not justify increasing the revenues collected from these customers, the private fire service rate structure could be modified, while still collecting the same level of revenues.

Private fire protection charges are assessed by meter size. The meter ratios are based on the Hazen-Williams equation for flow through pressure conduits, which raises the diameter of the meter to the 2.63 power (provided by the AWWA M1 manual, page 224). Since the current fire protection charges are based on a 4" meter, the meter differentials using the Hazen-Williams equation are set relative to a 4" meter. Exhibit 73 shows the existing differential and those calculated using the Hazen-Williams equation, relative to a 4" meter. The calculated differentials are applied to SAWS' number of private fire protection meters by meter size to derive equivalent units. The revenues under existing rates are divided by the equivalent units to derive a unit cost of $77.50. This unit cost represents the annual cost for a private fire protection meter 4" in size (or smaller). The proposed differentials shown in Exhibit 73 are then applied to the unit cost to determine the rates for the other meter sizes. This alternative private fire protection rate structure will recover the same amount of revenues as currently generated, but a larger percentage of the revenues will come from those customers with larger meters. Private fire protection customers with smaller meters will see a decrease in their bill, but private fire protection customers with larger meters will see a significant increase in their annual bill.

Exhibit 73
Private Fire Protection Charges

Meter Size	Existing Rate (Inside-City)	Calculated Rate (Inside-City)	Existing Differentials	Proposed Differentials	Number of Private Fire Protection Accounts (includes Outside-City)
1"	$ 250.00	$ 77.50	1.00	1.00	**18**
1 1/2"	$ 250.00	$ 77.50	1.00	1.00	**21**
2"	$ 250.00	$ 77.50	1.00	1.00	**16**
4"	$ 250.00	$ 77.50	1.00	1.00	**238**
6"	$ 345.00	$ 225.20	1.38	2.91	**1,631**
8"	$ 420.00	$ 479.80	1.68	6.19	**1,690**
10"	$ 485.00	$ 862.80	1.94	11.13	**59**
12"	$ 580.00	$ 1,393.60	2.32	17.98	**149**
14"	$ 580.00	$ 2,090.30	2.32	26.97	**1**
					3,823

It is also recommended future fire protection rates should be tied to increases in Water Delivery and Water Supply rates in order to offset increase in fire protection costs resulting from inflation. On October 15, 2009, The RAC approved the recommendation to submit a change in the rate structure and to tie future rate increases with those implemented for Water Delivery and Water Supply.

B. Lift Station Maintenance Fee

When new development is connected to the water or wastewater systems, SAWS takes ownership of the water and wastewater infrastructure used to serve that new development and also takes on the responsibility of operating, maintaining and repairing that infrastructure. In cases where the infrastructure contributed consists predominantly of water and wastewater pipes, the incremental cost associated with those pipes is relatively small, and SAWS absorbs those costs into its overall cost structure and recovers those costs from its entire rate base through its water and wastewater rates. However, in cases where the contributed assets include wastewater lift stations, the incremental cost of operating, maintaining and repairing the assets is significant and recovery of these costs to serve a relatively small number of customers from the entire customer base through rates could lead to rate equity issues. To avoid this problem, SAWS assesses a Lift Station Maintenance Fee on all wastewater lift stations contributed to the SAWS system. This fee is designed to offset the additional costs SAWS will incur as a result of owning and operating the lift stations. Presently, the fee is based on a projection of the annual operating and maintenance costs that SAWS will incur over a ten year period. These costs are then discounted back to the current year using a discount factor that approximates the risk-free cost of capital.

At the request of SAWS, RFC reviewed the logic behind the Lift Station Maintenance Fee and the methodology used to calculate the fee. Based on this review it is our opinion the Lift Station Maintenance Fee represents a fair and equitable approach to recovering the costs associated with contributed wastewater lift stations and the methodology SAWS currently uses to calculate the

fee results in a fair and equitable charge to the parties that contributed the assets. Therefore, RFC recommends SAWS continues to assess the fee and continues to use the methodology currently used to calculate the fee.

C. Edwards Aquifer Recharge Zone Charge

The Edwards Aquifer is numerous layers of predominantly limestone which serves as the primary source of water for SAWS and several other water utilities that serve south central Texas. The recharge zone for the Edwards Aquifer extends in a generally east-northeast to west-southwest trending arc north of San Antonio and underlies a significant portion of the SAWS service area. In an effort to protect the quality of the aquifer, state and local regulators have imposed strict regulations to prevent the discharge of contaminants within the recharge zone and these regulations require SAWS to incur more costs associated with the maintenance and repair of wastewater infrastructure located within the Edwards Recharge Zone.

At SAWS request, RFC analyzed the possibility of developing a special charge that would be assessed to sewer customers located within the Edwards Recharge Zone. The purpose of this charge would be to recover the additional costs associated with sewer infrastructure located with the recharge zone from the specific customers served by that infrastructure. Our analysis in this regard focused on answering two questions. First, while it is known the more stringent regulatory requirements for infrastructure within the recharge zone require SAWS to incur additional costs, is it possible to accurately isolate these costs and assign them to a special charge? Second, is it within the bounds of standard industry practice to develop a special charge to recover costs associated with a customer's geographic location?

With regard to the first question, RFC found that SAWS could, with some degree of accuracy, identify the incremental costs associated with meeting the stricter regulatory requirements governing the maintenance and repair of infrastructure within the Edwards Recharge Zone.

When considering the second question, it is important to recognize that many geographically-based cost differences exist within all utilities. For example, a customer located 10 miles from the utility's wastewater treatment facilities uses more of the wastewater collection system than does a customer located 5 miles from the plant. Similarly, in order to treat wastewater generated by customers situated at elevations lower than the elevation of the wastewater treatment facilities, the utility must incur costs associated with pumping the wastewater up to the treatment plant. In theory, separate charges could be developed to address each of these cost differences and others that exist within the system, but the result would be an incredibly complex set of rates and charges that would often result in next-door neighbors being assessed different charges for essentially the same service.

RFC's analysis determined that while there are some utilities that take a customer's geographic location into account when developing rates, it is not a widely used practice. The vast majority of

utilities have determined that the limited gains with respect to equitable cost recovery these types of charges provide do not justify the additional effort associated with calculating, maintaining, assessing, and explaining these geographically based charges. Therefore, RFC recommended to SAWS Staff and the RAC that SAWS should not pursue the development of a special charge for customers located within the Edwards Recharge Zone.

Appendix A: List of Rates Advisory Committee (RAC) Members

RAC Member	Representing	Occupation	District
Arce, Fred (appointed Feb 09)	OCL Customers	Engineer	OCL
Coronado, Gil	Large Lot Owner	Retired Federal Executive	8
Estrada, Kathie	Multi-Family	Retirement Home Executive	OCL
Gallardo, Antonio (appointed Dec 09)	Comm. Volunteer	Retired	6
Harris, Mike	Industrial	SAMA President	OCL
Kindle, Keith	Engineering	Engineer	9
Morales, Ron	Affordability	Social Worker	1
Patmon, Steve	Neigh. Association	Architect	10
Soules, Joe	Residential/Family	Retired	10
Townsend, Allen	Environmentalists	Educator	5
Tullis, Liz	OCL Customers	Bank Executive	OCL

Appendix B: Rate Structure Comparison of Existing and RAC Recommended Rates

Existing and Recommended Residential Rate Structure

	WATER DELIVERY					WATER SUPPLY		
	Existing Cut-Off	Recommended	Description	Rationale	Seasonality	Existing Cut-Off	Recommended	Rationale
Block 1	7,481	5,985	Non-discretionary indoor use	Median usage in lowest month	Expand seasonal period by two months (May until October)	N/A (uniform rate)	5,985 (Tie to Water Delivery Cut-offs)	Tiered rates to reflect same block-cut-off's as those for the recommended Water Delivery Rates
Block 2	12,717	12,717	Non-discretionary indoor and outdoor use	Outdoor usage typically 7,000 to 8,000 gallons per month	Expand seasonal period by two months (May until October)	N/A (uniform rate)	12,717	
Block 3	17,205	17,205	Discretionary	Difference between 2nd and 4th blocks (still within 95% of customers)	Expand seasonal period by two months (May until October)	N/A (uniform rate)	17,205	
Block 4	> 17,205	> 17,205	Disproportionate water use	Top 5% of customers	Expand seasonal period by two months (May until October)	N/A (uniform rate)	> 17,205	

Existing and Proposed General Class Rate Structure

WATER DELIVERY				WATER SUPPLY		
	Existing Block Cut-Offs	**Recommended Block Cut-Offs**	**Description**	**Existing Cut-Off**	**Recommended**	**Rationale**
Base	90% of Average Annual Usage	100 % of Average Annual Usage		N/A (uniform rate)	N/A (uniform rate equal to existing rate)	Combined water delivery and water supply rate should not be less than existing rates
Block 1	100% of Base	100% of Base	Non-discretionary indoor usage	N/A (uniform rate)	N/A (uniform rate equal to existing rate)	
Block 2	125% of Base	125% of Base	Non-discretionary indoor and outdoor usage	N/A (uniform rate)	N/A (uniform rate equal to existing rate)	
Block 3	150% of Base	175% of Base	Discretionary	N/A (uniform rate)	N/A (uniform rate equal to existing rate)	
Block 4	200% of Base	>175% of Base	Disproportionate water use	N/A (uniform rate)	N/A (uniform rate equal to existing rate)	
Block 5	> 200% of Base			N/A (uniform rate)		

Existing and Proposed Irrigation Class Rate Structure

WATER DELIVERY					WATER SUPPLY		
	Existing Block Cut-Offs	**Recommended Block Cut-Offs**	**Rationale**	**Seasonality**	**Existing Block Cut-Offs**	**Recommended Block Cut-Offs**	**Rationale**
Block 1	12,717	0	Align with Residential rate structure		N/A (uniform rate)	0	Align with Residential rate structure
Block 2	17,205	6,732	Difference between Residential Block 1 and Block 2 Cut-off, or non-discretionary outdoor usage	Add seasonal rates which will be applied from May until October	N/A (uniform rate)	6,732	
Block 3	> 17,205	11,220	Difference between Blocks 2 and 3 ,or discretionary outdoor usage	Add seasonal rates which will be applied from May until October	N/A (uniform rate)	11,220	
Block 4		> 11,220	All discretionary usage	Add seasonal rates which will be applied from May until October		> 11,220	

Water Delivery – Monthly Meter Charge

Meter Size	Inside-City			
	Existing Rate Structure		RAC Recommended Rate	
	Residential/ Wholesale	General/ Irrigation	Residential/ Wholesale	General/ Irrigation
5/8”	$6.77	$9.81	$6.76	$9.38
3/4”	$8.59	$13.16	$9.47	$13.41
1”	$12.49	$19.21	$14.90	$21.46
1 1/2””	$22.25	$35.03	$28.47	$41.59
2”	$33.95	$52.83	$44.75	$65.75
3”	$61.27	$106.92	$82.74	$122.11
4”	$100.30	$176.40	$137.01	$202.63
6”	$197.89	$350.03	$272.69	$403.93
8”	$314.96	$543.20	$435.51	$645.49
10”	$451.57	$755.89	$625.46	$927.31
12”	$841.86	$1,191.85	$1,168.18	$1,732.51

(Outside-City rates are 1.3 times inside-City rates)

Water Delivery – Volumetric Rates

Existing Rate Structure			RAC Recommended Rate Structure		
Tiers	Inside-City		Tiers	Inside-City	
RESIDENTIAL	Standard	Seasonal	**RESIDENTIAL**	Standard	Seasonal
0 - 7,481	$0.0906	$0.0906	0 - 5,985	$0.0897	$0.0897
7,482 - 12,717	$0.1309	$0.1423	5,986 - 12,717	$0.1298	$0.1412
12,718 - 17,205	$0.2058	$0.2217	12,718 - 17,205	$0.1831	$0.1974
> 17,205	$0.3288	$0.4246	> 17,205	$0.3206	$0.4141
GENERAL	Standard	Seasonal	**GENERAL**	Standard	Seasonal
Base	$0.1086		Base	$0.1086	
> 100% - 125%	$0.1257		> 100% - 125%	$0.1298	
> 125% - 150%	$0.1633		> 125% - 175%	$0.1821	
> 150% - 200%	$0.2138		> 175%	$0.2666	
> 200%	$0.3160				
IRRIGATION	Standard	Seasonal	**IRRIGATION**	Standard	Seasonal
0 - 12,717	$0.1526		0	-	-
12,718 - 17,205	$0.2290		> 0 - 6,732	$0.1298	$0.1412
> 17,205	$0.3160		6,733 - 11,220	$0.1831	$0.1974
			> 11,220	$0.3206	$0.4141
WHOLESALE	Standard	Seasonal	**WHOLESALE**	Standard	Seasonal
Base	$0.0788		Base	$0.0753	
> 100% - 125%	$0.0983		> 100% - 125%	$0.1132	
> 125% - 150%	$0.1353		> 125% - 175%	$0.1634	
> 150% - 200%	$0.1804		> 175%	$0.2311	
> 200%	$0.2365				

(Outside-City rates are 1.3 times inside-City rates)

Water Supply

Existing Rate Structure		RAC Recommended Rate Structure	
Tiers	**Inside-City**	**Tiers**	**Inside-City**
RESIDENTIAL	Standard	**RESIDENTIAL**	Standard
0 - 7,481	$0.1529	0 - 5,985	$0.0994
7,482 - 12,717	$0.1529	5,986 - 12,717	$0.1438
12,718 - 17,205	$0.1529	12,718 - 17,205	$0.2028
> 17,205	$0.1529	> 17,205	$0.3550
GENERAL	Standard	**GENERAL**	Standard
Base	$0.1529	Base	$0.1529
> 100% - 125%	$0.1529	> 100% - 125%	$0.1529
> 125% - 150%	$0.1529	> 125% - 175%	$0.1529
> 150% - 200%	$0.1529	> 175%	$0.1529
> 200%	$0.1529		
IRRIGATION	Standard	**IRRIGATION**	Standard
0 - 12,717	$0.1529	0	-
12,718 - 17,205	$0.1529	> 0 - 6,732	$0.1438
> 17,205	$0.1529	6,733 - 11,220	$0.2028
		> 11,220	$0.3550
WHOLESALE	Standard	**WHOLESALE**	Standard
Base	$0.1529	Base	$0.1529
> 100% - 125%	$0.1529	> 100% - 125%	$0.1529
> 125% - 150%	$0.1529	> 125% - 175%	$0.1529
> 150% - 200%	$0.1529	> 175%	$0.1529
> 200%	$0.1529		

(Outside-City rates are equal to the inside-City rates)

COMBINED Water Delivery and Water Supply – Volumetric Rates

Existing Rate Structure			RAC Recommended Rate Structure		
Tiers	**Inside-City**		**Tiers**	**Inside-City**	
RESIDENTIAL	Standard	Seasonal	**RESIDENTIAL**	Standard	Seasonal
0 - 7,481	$0.2435	$0.2435	0 - 5,985	$0.1891	$0.1891
7,482 - 12,717	$0.2838	$0.2952	5,986 - 12,717	$0.2736	$0.2850
12,718 - 17,205	$0.3587	$0.3746	12,718 - 17,205	$0.3859	$0.4002
> 17,205	$0.4817	$0.5775	> 17,205	$0.6756	$0.7691
GENERAL	Standard	Seasonal	**GENERAL**	Standard	Seasonal
Base	$0.2615		Base	$0.2615	
> 100% - 125%	$0.2786		> 100% - 125%	$0.2827	
> 125% - 150%	$0.3162		> 125% - 175%	$0.3350	
> 150% - 200%	$0.3667		> 175%	$0.4195	
> 200%	$0.4689				
IRRIGATION	Standard	Seasonal	**IRRIGATION**	Standard	Seasonal
0 - 12,717	$0.3055		0	-	-
12,718 - 17,205	$0.3819		> 0 - 6,732	$0.2736	$0.2850
> 17,205	$0.4689		6,733 - 11,220	$0.3859	$0.4002
			> 11,220	$0.6756	$0.7691
WHOLESALE	Standard	Seasonal	**WHOLESALE**	Standard	Seasonal
Base	$0.2317		Base	$0.2282	
> 100% - 125%	$0.2512		> 100% - 125%	$0.2661	
> 125% - 150%	$0.2882		> 125% - 175%	$0.3163	
> 150% - 200%	$0.3333		> 175%	$0.3840	
> 200%	$0.3894				

Wastewater (same as existing rate structure and rates)

Class	Inside-City	
	Minimum Charge	Volumetric Charge
Residential	$7.76	$0.2057
General	$7.76	$0.2057
Wholesale	-	$0.1854
	Includes 1,496 gal	per 100 gal

(Outside-City rates are 1.2 times the inside-City rates)

Recycled Water (same as existing rate structure and rates)

Service Availability Fee

Meter Size	Charge
5/8”	$8.74
3/4”	$11.37
1”	$14.81
1 1/2””	$23.55
2”	$34.44
3”	$91.60
4”	$136.14
6”	$259.71
8”	$391.47
10”	$536.79
12”	$662.31

Volumetric Rates

Edwards Exchange Customers

Rate Category	Standard	Seasonal
Transferred Amount	$0.0230	$0.0230
All Excess	$0.0863	$0.0917

Non-Edwards Exchange Customers

Rate Tier	Standard	Seasonal
Tier 1 - First 748,000 gal	$0.0924	$0.0992
Tier 2 - Above 748,000 gal	$0.0943	$0.1002

Fire Protection

Meter Size	Existing Rate Structure Inside-City	RAC Recommended Rate Structure Inside City
1"	$250.00	$77.50
1 1/2"	$250.00	$77.50
2"	$250.00	$77.50
4"	$250.00	$77.50
6"	$345.00	$225.20
8"	$420.00	$479.80
10"	$485.00	$862.80
12"	$580.00	$1,393.60
14"	$580.00	$2,090.30

(Outside-City rates are 1.3 times the inside-City rates)

Appendix C: Glossary of Terms

Administration/General – Operations that involve areas that serve all areas of the organization such as human resources, legal departments, etc.

American Water Works Association (AWWA) – AWWA is the authoritative resource on safe water, with more than 60,000 members worldwide sharing knowledge on water resource development, water and wastewater treatment technology, water storage and distribution, and utility management and operations.

Base costs – Costs associated with operating the system during average conditions.

Billing/Customer Service – Operations that involve billing customers for services received, collecting and processing payments from customers, and responding to customer issues/requests.

Block (tiers) – Water usage that has been classified based on customer characteristics and is assessed a specific rate per unit to encourage or discourage water usage patterns.

Conservation – The practice of encouraging customers to use water efficiently. Conservation includes pricing tactics, incentives such as rebates on water efficient fixtures, as well as educational materials that promote the efficient use of water.

Cost of service – The industry approved methodology of allocating water and wastewater costs as explained in the American Water Works Association M-1 Manual and the Water Environment Federation Manual of Practice #27, respectively.

Cut-offs – The maximum water usage allowed within each block, with the exception of the final cut-off which represents the minimum water usage within that block.

Distribution – Smaller water mains that transport treated water from transmission mains to the customer.

Edwards Aquifer – The Edwards Aquifer is carbonate limestone, and its catchment area, about 4,400 square miles, contains the drainage basins of the streams that recharge the Edwards aquifer.

General class customers – Includes commercial and industrial businesses and multi-family apartments and condominiums.

Irrigation – Water used to irrigate lawns and is typically not returned to the wastewater system.

Lift Stations – Infrastructure that assists in transporting wastewater from customers' homes and businesses to SAWS wastewater treatment plants.

Max day costs – Costs to operate the system during the day with the highest consumption during a one-year period.

Max hour costs – Costs to operate the system during the peak hour of the day with the highest consumption during a one-year period.

Meter – A devise used to measure the volume of water used within a specific period of time.

Non-discretionary water usage – For the purpose of this Rate Study, non-discretionary water usage refers to a reasonable and responsible amount of outdoor irrigation per property. However, in the event of a severe water shortage, non-discretionary water usage would represent water needed for health and human safety.

Private fire protection – Customers who have standby water pressure provided by SAWS to support private fire service systems.

Recycled water – Recycled water is wastewater that is treated highly through a tertiary treatment process to be released to the environment and used in the recycled water system. SAWS recycled water system is comprised of three water recycling centers.

Revenue requirements – The total annual cash needs of the utility including operating costs, capital costs, reserve fund requirements and debt service coverage requirements.

Service Availability Fee (Monthly Meter Charge) – A monthly charge that is assessed by meter size and does not depend on water use.

Source of supply – Water supply sources can include groundwater (aquifers), surface water (lakes), or water rights (purchased water).

Storage – Infrastructure such as tanks that store water within the distribution and transmission system.

Transmission – The transportation of water from the treatment facility through major trunk mains/lines to locations within the distribution system.

Wastewater – The wastewater system includes the collection lines that transport wastewater to three treatment facilities that have the capability to treat over 200 million gallons of wastewater a day.

Water Environment Federation (WEF) – Formed in 1928, the Water Environment Federation is a not-for-profit technical and educational organization with 35,000 individual members and 75 affiliated member associations representing water quality professionals around the world.

Water delivery – The water delivery system entails the treatment of the water pumped from the Edwards Aquifer and received from other smaller sources, and the distribution system involved in sending treated water to approximately 350,000 customers.

Water supply – The water supply system is comprised of wells that tap into the Edwards Aquifer, as well as other water sources.