Austin Water

City of Austin

Study Report

Austin Water Utility Cost of Service Rate Study 2008

August 2009
2908083

Pathways to Lasting Solutions

REDOAK CONSULTING
A DIVISION OF MALCOLM PIRNIE

RED OAK CONSULTING
A DIVISION OF MALCOLM PIRNIE

August 17, 2009

Mr. Greg Meszaros
Director
Austin Water Utility
625 E. 10th Street, Suite 600
Austin, TX 78701

Re: Final Report: Volume I, Austin Water Utility Cost of Service Rate Study 2008

Dear Mr. Meszaros:

Attached is Volume I of the report on the Austin Water Utility Cost of Service Rate Study 2008. This report documents the study and presents our findings. In addition to this document, additional findings are presented in a separate volume. The separate volumes are:

- Volume I: *Austin Water Utility Cost of Service Rate Study 2008*. This volume contains the report of findings from the study.

- Volume II: *Issue Papers*. The Issue Papers presented to the Public Involvement Committee are included in this volume.

We sincerely appreciate the support we had throughout this study from you, your staff, and others at Austin Water Utility that assisted. Thank you for this opportunity to serve the City of Austin. Please call me if you have any questions

Very truly yours,

RED OAK CONSULTING

Paul L. Matthews
Principal Consultant

Enclosures
2908-083

Austin Water Utility
625 E. 10th Street, Suite 500 • Austin, TX 78701

Cost-of-Service Rate Study 2008

August 2009

Report Prepared By:

RED OAK CONSULTING
A DIVISION OF MALCOLM PIRNIE

100 Congress Avenue, Suite 1485
Austin, TX 78701
(512) 494-1165

In Association With:

Group Solutions

2908-083

Contents

Tables

Figures

Appendices

Austin Water Utility
Cost of Service Rate Study 2008

SECTION

1

Executive Summary

RED OAK CONSULTING
A DIVISION OF MALCOLM PIRNIE

1. Executive Summary

This Executive Summary presents the background and results of the water and wastewater rate and fee study conducted by Red Oak Consulting, a division of Malcolm Pirnie, Inc., for the Austin Water Utility (AWU).

1.1. Study Objectives

Section 2 of this report contains a detailed list of project objectives. These objectives can be summarized as:

- Conduct a comprehensive review of AWU's water and wastewater cost-of-service methodologies to determine if these methodologies are fair, promote conservation, and protect the financial feasibility of AWU.

- Review the findings of the Water Conservation Task Force and, where possible, incorporate its findings into AWU's methodologies.

- Conduct these reviews within a structured public process to allow meaningful participation by members of each of AWU's rate classes.

1.2. Overview of the Study

Based on the study objectives, the study consisted of four major elements. These elements are:

1. Public Involvement Process
2. Water Cost-of-Service Analysis
3. Wastewater Cost-of-Service Analysis
4. Reports and Presentations

Each of these major project elements supported the study objectives and provided the project team with a list of modifications to implement within AWU's cost-of-service methodologies.

1.3. Public Involvement Process

The public involvement process included three major elements. These elements were:

1. Executive Team. AWU formed an Executive Team for the project that provided project sponsorship and ultimately made methodological and other decisions that guided the project team's work.

2. Public Involvement Committee (PIC). The PIC consisted of members of each of AWU's customer classes (e.g., single-family residential, multifamily, commercial etc.) The PIC was the focal point of the public process and provided direct comments to the Executive Team.

3. Workshops, Briefings, and Issue Papers. The project team communicated the often complex cost-of-service methodological issues to the PIC and Executive Team through Issue Papers and presentations.

Within the process, the project team prepared Issue Papers which examined the findings of its review of AWU's current methodologies. Where appropriate, the project team presented alternative methodologies and evaluations of these methodologies in the Issue Papers. Volume II of the study report includes each of the Issue Papers presented to the PIC.

Once available, the PIC and Executive Team reviewed the Issue Papers and attended the facilitated workshops where the project team presented the information and answered questions from the PIC and public. Also during the workshops, individual PIC members were encouraged to present their thoughts for the consideration of the entire PIC. In addition, a public comment period was available at each workshop to allow the members of the public to provide direct comments to members of the PIC.

The goal of the Issue Papers and workshops was to provide the PIC with adequate information on the methodological issues under examination so its members could provide specific comments to the Executive Team. Also, after each workshop, members of the PIC were encouraged to provide written comments to the Executive Team on the issues presented in the Issue Papers and the workshops. This information was then presented to the Executive Team during its subsequent briefings. If enough information was available to the Executive Team, it would make a specific decision on the methodological options in question. Otherwise the Executive Team would defer its decision and instruct the project team to provide additional information. Once a decision was made by the Executive Team, the project team presented the decisions to the PIC during the next scheduled workshop.[1]

1.4. Significant Issues Examined

One key aspect of this study was the review of alternative approaches to determining water and wastewater rates. The study included the examination of 31 separate cost-of-service related issues. Of those examined, 11 issues are the most significant and are

[1] Members of the Executive Team attended each PIC workshop. The attendance of the Executive Team was invaluable since it allowed PIC members to ask questions directly of the Executive Team and allowed the Executive Team to hear the PIC members' comments and concerns firsthand.

discussed in this Executive Summary. [2] Appendix A contains the comprehensive list of issues examined during the study. This list also includes the final decisions of the Executive Team. The issues examined in this Executive Summary are presented in Table 1-1. Each is discussed below.

Table 1-1 Summary of Issues Examined

Issues	Previous Method	Proposed Method
Water Issues		
Which cost allocation method would be used?	Base/Extra-Capacity	Base/Extra-Capacity
How should the cost incurred by AWU to provide fire protection be recovered?	Indirectly	Fixed Charge
Should customers with separate irrigation meters be charged the highest residential block rate?	No	No
Should AWU implement a fifth block for its single-family residential customers?	4 Blocks	5 Blocks
What conservation incentives should exist for wholesale customers	Individual Rates	Individual Rates
Wastewater Issues		
Which cost allocation method would be used?	Design Basis	Functional and Design
How should the cost of inflow and infiltration be recovered?	50% Customer 50% Flow	System Cost
Common Issues		
Should the large-volume customer classes be separated?	Aggregated	Disaggregated
How could a low-income subsidy be provided?	No subsidies	Waive Customer Charge
Should the subsidy to the residential customer class continue?	Subsidized	Transition to COS
Should the inside-city and outside-city retail classes be combined?	Separate Classes	Merged

1.4.1. Water Issues

The primary issues examined during the water cost-of-service analysis were:

1. Which cost allocation method would be used?
2. How should the cost incurred by AWU to provide fire protection be recovered?
3. Should customers with separate irrigation meters be charged the highest residential block rate?
4. Should AWU implement a fifth block for its single-family residential customers?
5. What conservation incentives should exist for wholesale customers?

1.4.1.1. Cost Allocation Methods

The PIC examined alternative cost allocation procedures for the water cost-of-service analysis. Three alternative cost allocations were reviewed. Two of the methods were industry-standard approaches promulgated by the American Water Works Association (AWWA). These were the base/extra-capacity and commodity/demand approaches.

[2] Section 3 presents all of the issues reviewed. The issues presented in this executive summary are those that were most consequential to the study.

Additionally, AWU's Residential Rate Advocate suggested a third approach which allocated costs by mixing parts of the two standard approaches. The Executive Team reviewed all three approaches and instructed the Red Oak team to develop the cost-of-service model to allow comparisons of the results. After full consideration, the Executive Team chose the base/extra-capacity approach. The Executive Team's decision was based on technical and non-technical criteria. One important consideration is the Executive Team's preference for industry-standard approaches to ensure objectivity to the cost-of-service methodology.

1.4.1.2. Recovery of Fire Protection Costs

In addition to providing potable water for its customers, AWU provides facilities and capacity that provide water for fighting fires. The cost to provide the water used for fire protection includes both the cost of maintaining fire hydrants and other directly related facilities (called "direct fire costs"), and the cost of the capacity required to be available when fires occur (called "indirect fire costs").

As part of this study, the project team examined alternative methods of recovering these fire-related costs. Of the methods examined, the Executive Team decided to include the fire-related costs in the fixed monthly charges that vary by meter size. This method allocates more costs to meters of larger size to recognize the impact larger facilities have on the fire protection requirements of the system.

1.4.1.3. Customers with Separate Irrigation Meters

The City's Water Conservation Task Force directed AWU to:

> *Conduct a cost of service study to evaluate strategies to reduce water demands by at least 5 MGD, including … establishing commercial irrigation rates comparable to highest residential tiers…*[3]

The project team evaluated this water conservation strategy and determined that its implementation could significantly reduce rate equity among customers.[4] If implemented, the strategy would result in larger water bills for customers with a separate irrigation meter than those without a separate irrigation meter. If implemented, two customers with identical water use patterns would have differing total bills if one customer had an irrigation meter and the other received its irrigation water through its domestic meter. This difference in bill would provide a disincentive for commercial customers to install separate water meters for their irrigation use. Those commercial customers without separate irrigation meters would continue to receive water for irrigation use at the lower commercial rates.

[3] From *Water Conservation Strategies Policy Document*, Water Conservation Task Force, Austin, Texas, page 25.
[4] As used here, rate equity is a measure of proportionality of a customer's bill and the cost (on an average cost basis) a customer imposes on the system.

Table 1-2 presents a sample bill calculation for two hypothetical customers—one with a separate irrigation meter, and one without. In this hypothetical example, both customers have identical water consumption. In this example, that consumption is assumed to be 94 thousand gallons (kgal) in a month. For the customer with the combined meter, all water is priced at the peak-season rate of $4.58 per kgal. The total volume bill (excluding the fixed monthly charge) for the customer with the combined meter would be $430.52.

Table 1-2 Example of Potential Inequity

Customer Classes	Peak-Season Rate	Consumption (kgal)	Volume Charge
Customer A (Combined Meter)	$4.58	94	$430.52
Customer B (Separate Meters)			
Indoor	$4.58	56	$256.48
Irrigation	8.50	38	323.00
Total		94	$579.48
Additional Cost for Separate Meters			$148.96

The second customer is assumed to have a separate irrigation meter. Although the total consumption for this customer is the same as the first, part of this customer's bill is charged at the peak-season rate, and the remainder at the higher irrigation rate. In this example, the customer's assumed indoor use is 56 kgal. This is priced as if it runs through the non-irrigation meter at a rate of $4.58 per kgal. The remaining use is assumed to be measured by the irrigation meter and is priced at $8.50 per kgal. As shown in Table 1-2, the volume bill for this customer is $579.48, or $148.96 more than the customer without a separate meter. In this hypothetical example, the customer with a separate irrigation meter would have a bill 34.6 percent higher than the customer without the separate meter. Because each customer is assumed to have the same total water consumption, this difference in bill directly leads to rate inequity.

Several options were explored that would meet the objective of the Water Conservation Task Force's strategy without causing the rate inequity. Of those examined, the adoption of an excess-use rate structure for commercial customers was considered the most desirable. Under an excess-use rate structure, customers are charged for water using block rates similar to AWU's current block rates for single-family residential customers. The thresholds at which higher block rates are incurred are determined by each customer's individual water use throughout the year. Oftentimes the block thresholds are expressed as a percentage of a customer's average winter consumption.[5] With excess-use rates, customers without an irrigation meter, but which use water for irrigation, will pay

[5] Average winter consumption is a relatively good measure of water used for indoor use since it is measured during the winter period when outdoor water use is minimal.

higher rates for the water used during the peak season (i.e., outdoor water used for irrigation).

1.4.1.4. Residential Fifth Block

The City's Water Conservation Task Force also directed the utility to "Establish a residential fifth tier for use above 25,000 gallons per month." Red Oak and the utility analyzed likely consumption levels at differing thresholds for the fourth and fifth blocks to determine the expected level of conservation savings and the impact on the stability of AWU's revenues. The rates associated with the fifth block take into account the likely consumption within the fifth block without accounting for additional water conservation savings that might occur. Also, increasing the steepness of AWU's rate design will increase the impacts of weather on AWU's financial position. In other words, increasing the difference in rates between the higher and lower blocks will decrease AWU's revenue stability and put additional financial pressure on the utility during periods of lower than expected water sales.

As part of its analyses, Red Oak developed a conservation impact model (CIM) that AWU can use to analyze future rate design options.

Consistent with the Water Conservation Task force recommendations, the Executive Team directed that the five-block rate structure be used for single-family residential customers.

1.4.1.5. Conservation Incentives for Wholesale Customers

In addition to providing guidance on residential water rate design, the Water Conservation Task Force also recommended that AWU conduct a cost-of-service study that considers conservation rate structures for wholesale customers.

The three rate structures examined in this study include:

1. Uniform rates by wholesale class (current approach),
2. Seasonal rates, and
3. Excess-use rates.

Because each wholesale customer is treated as an individual customer class, each rate structure alternative will be designed to generate the same revenue consistent with the cost of service. The primary difference among the options is the impact on volatility of costs (for the wholesale customers) and revenues (for AWU). There may be an interim incentive to reduce consumption by wholesale customers during the implementation to avoid higher costs.

Red Oak recommended that AWU continue to use a uniform rate by customer class and work with its wholesale customers to achieve greater water conservation through other mechanisms. Red Oak's recommendation considered:

1. Several wholesale customers have implemented conservation rates.

2. Some of the existing wholesale agreements may prohibit the implementation of conservation rates. Introducing an inconsistent rate design for this class of customers may introduce equity concerns.

3. Rates for wholesale customers are based on each wholesale customer's individual peaking factors. Since these peaking factors directly affect the customer's rates, it provides each wholesale customer a direct incentive to manage its water demands during the peak season.

The Executive Team decided to maintain a uniform rate structure for wholesale customers.

1.4.2. Wastewater Issues

The primary issues examined during the wastewater cost-of-service analysis were:

1. Which cost allocation method should be used?

2. How should the cost of inflow and infiltration be recovered?

1.4.2.1. Cost Allocation Methods

As part of its cost-of-service methodology, AWU examined three methods to allocate wastewater collection and treatment costs. The three methods examined are:

1. Design basis[6],

2. Functional basis, and

3. Hybrid where O&M costs are allocated based on function, and capital costs based on design.

Under the design method, costs for each part of AWU's wastewater system are allocated based on the criteria used to design the facility. Under the functional approach, the costs are incurred based on the function associated with the costs. For example, a wastewater facility may be designed to allow the rate of flow through a portion of the plant to be such that solids can settle. In that situation, the design criteria would be the rate of flow and the functional criteria would be the settling of solids.

The primary difference among the alternative methods is that the design basis allocates costs based on engineering design criteria whereas the functional basis allocates costs

[6] Since its 1999 cost-of-service study, AWU allocated its wastewater-related costs using the design basis.

based on operational or functional purposes. The hybrid allocates O&M costs based on function and the capital costs based on design.

The Executive Team recommended the hybrid approach.

1.4.2.2. Recovery of Inflow and Infiltration Costs

Wastewater conveyed and treated by AWU consists of contributed waste from AWU's customers and other wastewater flows generally described as *inflow and infiltration* (I/I). Infiltration is the flow entering the sanitary sewer resulting from high groundwater or precipitation that occurred days or weeks before the observed flow in the sanitary sewer. Inflow results from rainfall that enters the sanitary collection system through a number of direct connections such as catch basins, roof drains, foundation drains, and manhole covers.

Because I/I has various sources, customers generally cannot influence the level of I/I in the system. Generally, the utility mitigates I/I to reduce the flow-related costs of treatment and allow the flow-related capacity of the facilities to be available to customers, thereby avoiding expansions of capacities.

The cost associated with collecting, conveying, and treating I/I must be allocated within the cost-of-service methodology. Currently the assumed I/I flow used to determine the cost of service in AWU's wastewater system is 10.5 percent of total flows.

As described in the Wastewater Cost Allocations issue paper (see Volume II of this report), the USEPA has issued guidelines on the allocation and recovery of I/I costs using several approaches. Based on these approaches, four alternatives were presented to the PIC and considered by the Executive Team.[7] These are:

1. Combined connections and volume (Current). Under this approach, I/I costs are treated as customer class-specific costs and allocated to each customer class based on a combined measure of each class' number of connections and volume of contributed wastewater volume.

2. Contributed wastewater volume. The contributed wastewater volume approach allocates the cost of I/I to all customers in proportion to the flow they contribute to the wastewater system. As such, the contributed wastewater volume approach treats I/I as a general cost of conveying wastewater.

3. Number of connections. Under this approach, I/I costs are allocated to each customer class based on the relative number of connections each class represents of the system total.

[7] Since AWU does not base its user charges on *ad valorem* property taxes, the value of property would not be consistent with USEPA guidelines. Therefore, it was not considered in this evaluation.

4. Land area. In some cases, I/I costs are allocated to customer classes (or customers) based on each class' share of the total land area served by the utility.

The primary differences among the alternatives are the alternative philosophies regarding the appropriate allocation of costs. AWU currently uses the combined approach which attributes 50 percent of the I/I flows to customer classes based on the number of connections and 50 percent based on the class' contributed wastewater flow. The other approaches are consistent with USEPA guidelines.

Red Oak recommended that AWU allocate and recover its I/I cost based on the contributed flow of each customer class. This recognizes the fact that individual customers cannot manage I/I, and that the cost of I/I is primarily in consuming flow-related capacity.

The Executive Team decided to allocate I/I as a system cost based on contributed volume. For analytical purposes, the Executive Team requested the model be developed with the capability of allocating I/I as a system cost or based on a ratio of volume and number of connections.

1.4.3. Issues Common to Both Water and Wastewater

Certain issues examined applied to both the water and wastewater utilities. These issues were:

1. Should the large-volume customer classes be separated?
2. How could a low-income subsidy be provided?
3. Should the subsidy to the residential customer class continue?
4. Should the inside-city and outside-city retail classes be combined?

1.4.3.1. Separation of Large-Volume Customers

AWU currently combines the use of all large-volume customers into one class. As such, the rates generated for this class are based on the average cost of serving the mix of large-volume customers. Because of their sizes, the study examined the feasibility of separating these customers into individual classes. The primary benefit of separating large-volume customers into separate classes is to enhance the pricing signal each customer receives. In other words, when separated, each customer realizes the benefits of modifying its usage patterns, etc., to lower the costs of operating the utility. This allows these customers to better justify expenditures that will save AWU money on capacity and treatment.

Red Oak recommended that AWU disaggregate its large-volume customers and establish individual rates for each customer based on that customer's estimated water and

wastewater usage characteristics. The Executive Team decided to disaggregate the large-volume customer class.

1.4.3.2. Low-Income Subsidy

Enhancing the affordability of water and wastewater services for customers of limited financial means has been an ongoing objective of AWU and its citizens. Ultimately, the approach that AWU uses to assist low-income customers must meet the social and political needs of the City rather than technical cost-of-service concerns.

Two issues were raised during the review of potential policies on low-income subsidies. First, AWU needs to identify the most appropriate method for providing a low-income subsidy. The second is how AWU should recover the costs that would otherwise be covered by customers receiving the low-income subsidy.

As part of the PIC process, AWU received comments from both members of the general public and the PIC that AWU should implement a low-income subsidy by eliminating the monthly customer charge. Furthermore, the PIC recommended that AWU recover the cost of the low-income subsidy as a general expense applied to all retail customers.

The Executive Team concurred and AWU has already implemented this policy in advance of adopting the full cost-of-service methodology.

1.4.3.3. Residential Subsidy

AWU has maintained a policy that its commercial and industrial customers pay water and sewer rates higher than their cost of service. The additional revenue generated from these customers has been used to reduce rates for single-family residential customers. This reduction in the charges to these customers was intended to make water more affordable to citizens.

AWU examined two options with regard to its subsidy of single-family residential customers. These were:

1. Maintain the current subsidy; or

2. Transition to cost of service (COS).

Currently AWU increases its charges to commercial and industrial customers by approximately 10 percent above the estimated cost to serve these customers. This revenue reduces rates charged to single-family residential customers. Although this policy makes water more affordable to single-family residential customers, it does not take into account the ability of some single-family residential customers to pay the full cost of providing water services. As discussed in Section 1.4.3.2 above, the Executive Team recommends using a low-income subsidy to provide affordable utility services to those customers most in need.

The Executive Team decided to transition to cost of service over five to seven years.

1.4.3.4. Combining Inside-City and Outside-City Retail Classes

Historically AWU has maintained separate customer classes for its inside-city and outside-city retail customers. For example, AWU maintained a class for inside-city residential and outside-city residential. The same is true for AWU's other retail customer classes (e.g., multifamily, commercial, etc.)

Over time, the difference in rates determined for these classes has become less material. This lessening of the difference is, in part, the result of AWU's steeply inclining block rate structure and the impact that structure has on revenues from AWU's customers. Because of differences in water and wastewater use between the two groups of customers, the revenue productivity of the inside-city and outside-city rate structures differed. When compared, the costs and revenues between the two groups of customers have converged over time resulting in very similar cost-of-service rates.

As part of this study, AWU considered the elimination of the inside-city and outside-city class distinction.

AWU examined two options for classifying its retail customers. These were:

1. Maintain the current separation of classes; or

2. Combine the inside- and outside-city classes.

The Executive Team decided to eliminate the inside-city and outside-city class distinction for AWU's retail customers.

1.5. Findings and Recommendations

1.5.1. Findings for Water

The water methodology used in this study follows the decisions of the Executive Team and the industry standard approaches described by the AWWA in its *Manual of Water Supply Practices: Principles of Water Rates, Fees, and Charges*.

The results presented in this report are based on AWU's revenue requirements for fiscal year ending (FY) 2009. These rates depict the impact that changes to AWU's cost-of-service approach would have on its customers. Where appropriate, results (both rates and revenue) from this study are compared to AWU's currently adopted rates and revenue for FY2009. Within this report, the current rates and revenue used for comparison are called AWU's *Existing Rates* or *Existing*. The rates and revenue calculated within this study, using the proposed methodology, are called AWU's *Computed Rates* or *Computed*.

Based on the analysis presented in Section 4, cost-of-service rates were calculated for AWU's various customer classes and meter sizes. Table 1-3 provides a summary of the existing and computed fixed monthly water charges by meter size. Appendix B of this report contains selected calculations for the water cost-of-service rate analysis.

Table 1-3 Existing and Computed Fixed Monthly Charges

Meter Size	Existing Rates	Computed Rates
5/8-Inch	$6.25	$6.58
3/4-Inch	7.21	7.78
1-Inch	8.55	9.24
1 1/4-Inch	10.47	11.79
1 1/2-Inch	12.39	14.36
2-Inch	16.23	21.44
3-Inch	33.13	38.92
4-Inch	52.33	75.93
6-Inch	100.33	152.09
8-Inch	148.33	859.64
10-Inch	196.33	897.18
12-Inch	225.13	919.71

The fixed monthly charges include an amount to recover both the direct and indirect fire costs. The increases proposed for larger meters recognize a greater burden for fire-related costs for these customers.

Table 1-4 provides a comparison of the existing and computed volume water rates by customer class. The computed rates include a full adjustment for the elimination of the residential subsidy. AWU's Executive Team proposed to phase the subsidy out over 5 to seven years.

Table 1-4 Existing and Computed Volume Water Rates

Volume Rates (per Kgal)	Existing Rates	Computed Rates
Residential		
Block 1	$0.98	$1.10
Block 2	2.59	3.00
Block 3	4.75	6.00
Block 4	8.50	8.62
Block 5	8.50	10.00
Multi Family		
Peak	$3.88	$3.66
Off-Peak	3.54	3.34
Commercial		
Peak	$4.58	$3.90
Off-Peak	4.20	3.56
Industrial		
Hospira		
Peak	$4.28	$5.01
Off-Peak	3.93	4.56
Spansion		
Peak	$4.28	$3.60
Off-Peak	3.93	3.26
Applied Materials		
Peak	$4.28	$3.74
Off-Peak	3.93	3.40
Freescale		
Peak	$4.28	$3.84
Off-Peak	3.93	3.48
Samsung		
Peak	$4.28	$3.76
Off-Peak	3.93	3.41
Sematech		
Peak	$4.28	$3.62
Off-Peak	3.93	3.30
University of Texas		
Peak	$4.28	$3.89
Off-Peak	3.93	3.53

As described in Section 1.4.1.4 on page 1-6, AWU examined the possibility of adding a fifth block to its residential water rate design. This fifth block applies to all consumption exceeding 25 kgal per month. The existing and proposed block thresholds are presented in Table 1-5.

Table 1-5 Existing and Proposed Block Thresholds (Kgal)

Block	1	2	3	4	5
Existing	2	9	15	Over	NA
Proposed	2	9	15	25	Over

Currently single-family residential customers with separate irrigation meters are allowed to purchase water at all blocks for both meters. That allows a single-family residential customer with an irrigation meter to purchase twice as much water in blocks 1 and 2. The cost of water in these first two blocks is priced at less than the average cost of service to allow low-income citizens to have more affordable water. The unintended consequence is that single-family customers with irrigation meters can receive up to twice the benefit as other single-family customers. To correct this situation, AWU has proposed pricing all irrigation water consumed by single-family customers in blocks 1 and 2 at the block 3 rate. This will improve equity and provide a greater conservation incentive.

A summary of the existing and computed wholesale water rates is provided in Table 1-6.

Table 1-6 Existing and Computed Wholesale Water Rates

Charge	Existing Rates	Computed Rates
Monthly Meter Charge - 5/8-inch meter	$6.25	$6.58
Volume Charge by Customer (per Kgal)		
Creedmore-Maha WSC	$2.88	$2.93
High Valley	2.75	2.80
Lost Creek MUD	3.02	3.06
Manor, City of	2.76	3.15
Manville WSC	3.27	3.32
Marsha Water	2.78	2.85
Nighthawk WSC	2.73	2.80
North Austin MUD	3.12	3.24
Northtown MUD	2.92	2.98
Rivercrest WSC	3.10	3.10
Rollingwood	3.33	3.39
Shady Hollow MUD	3.21	3.26
Sunset Valley MUD	3.19	3.29
Travis Co. Water District 10	3.13	3.19
Wells Branch MUD	2.80	2.84
Windermere Utility Co.	6.96	7.06

Calculating cost-of-service rates requires that both the use of the system and the cost of operations be estimated. In ratemaking, the costs of operating the utility are referred to as the utility's revenue requirements. The revenue requirements used in this analysis are described in Section 4.3 of this report.

Based on the analysis presented in this section, Table 1-7 below shows a summary of water revenue under existing and computed rates. This table is also provided in Appendix B as Table B-14.

Table 1-7 Water Revenue Under Existing and Computed Rates

Customer Class	Existing Rates	Computed Rates	Percent Difference
Residential	$78,810,693	$86,709,735	10.0%
Multi-Family	34,631,345	33,857,794	(2.2%)
Commercial	61,533,634	53,740,884	(12.7%)
Creedmore-Maha	178,719	179,953	0.7%
High Valley	18,859	18,865	0.0%
Lost Creek	887,545	891,647	0.5%
Manor, City of	729	642	(11.9%)
Manville WSC	280,479	280,725	0.1%
Marsha Water	28,059	28,378	1.1%
Nighthawk	29,375	29,606	0.8%
North Austin MUD	1,170,391	1,190,933	1.8%
Northtown MUD	627,063	629,259	0.4%
Rivercrest	317,685	311,953	(1.8%)
Rollingwood	434,825	434,956	0.0%
Shady Hollow	779,199	782,897	0.5%
Sunset Valley MUD	306,657	307,207	0.2%
Water District 10	2,633,503	2,650,573	0.6%
Wells Branch MUD	1,523,677	1,529,066	0.4%
Windermere	99,340	99,649	0.3%
Hospira	348,548	406,372	16.6%
Spansion	2,092,216	1,771,037	(15.4%)
Applied Materials	373,745	343,021	(8.2%)
Freescale	3,068,951	2,763,541	(10.0%)
Samsung	3,887,156	3,402,853	(12.5%)
Sematech	398,204	345,211	(13.3%)
University of Texas	1,946,422	1,804,453	(7.3%)
Totals	$196,407,020	$194,511,209	(1.0%)

1.5.2. Findings for Wastewater

Section 5 of this report documents the steps taken to calculate AWU's wastewater cost-of-service rates. Red Oak allocated the revenue requirements by categories and customer class to the customer characteristics, and determined the total cost of service by customer class. With that information, rates were developed for each customer class. Appendix C of this report contains selected calculations for the wastewater cost-of-service rate analysis. A summary of the existing and computed retail wastewater rates and fixed charges is provided in Table 1-8. The computed rates include a full adjustment for the elimination of the residential subsidy. AWU's Executive Team has decided to propose the complete elimination of the residential subsidy for wastewater in FY2010.

Table 1-8 Existing and Computed Retail Wastewater Rate

Charge	Existing Rates	Computed Rates
Monthly Meter Charge - All Sizes	$8.00	$8.00
Volume Charge by Customer (per Kgal)		
Residential		
Block 1	$3.29	$3.34
Block 2	7.44	7.49
Multi-Family	6.59	6.85
Commercial	7.23	6.86
Industrial		
Hospira	6.64	6.74
Spansion	6.64	5.81
Applied Materials	6.64	7.00
Freescale	6.64	6.42
Samsung	6.64	6.36
Sematech	6.64	5.99
University of Texas	6.64	6.73

A summary of the existing and computed wholesale wastewater rates is provided in Table 1-9.

Table 1-9 Existing and Computed Wholesale Wastewater Rates

Charge	Existing Rates	Computed Rates
Monthly Meter Charge - All Sizes	$8.00	$8.00
Volume Charge by Customer (per Kgal)		
Comanche Canyon (WCID#17)	$3.50	$3.65
Manor, City of	4.62	4.99
North Austin MUD #1	4.98	4.98
Northtown MUD	5.00	4.96
Rollingwood, City of	4.72	5.02
Shady Hollow MUD	4.62	4.99
Sunset Valley, City of	4.62	4.96
Steiner Ranch (WCID #17)	3.38	3.62
Wells Branch MUD	4.94	5.02
Westlake Hills, City of	4.49	4.79

Calculating cost-of-service rates requires that both the use of the system and the cost of operations be estimated. In ratemaking, the costs of operating the utility are referred to as the utility's revenue requirements.

Based on the analysis presented in this section, Table 1-10 is provided below showing a summary of revenues under existing and computed rates. This table is also provided in Appendix C as Table C-14.

Table 1-10 Wastewater Revenue Under Existing and Computed Rates

Customer Class	Existing Rates	Computed Rates	Percent Difference
Residential	$74,392,185	$74,692,011	0.4%
Multi-Family	46,253,768	47,729,253	3.2%
Commercial	47,639,158	45,285,030	(4.9%)
Comanche Canyon (WCID#17)	8,496	8,795	3.5%
Manor, City of	277,296	296,195	6.8%
North Austin MUD #1	1,473,619	1,466,614	(0.5%)
Northtown MUD	839,721	829,885	(1.2%)
Rollingwood, City of	178,512	188,051	5.3%
Shady Hollow MUD	411,264	439,208	6.8%
Sunset Valley, City of	330,645	351,229	6.2%
Steiner Ranch (WCID #17)	1,718	1,824	6.1%
Wells Branch MUD	1,919,935	1,938,903	1.0%
Westlake Hills, City of	141,900	149,433	5.3%
Hospira	992,737	1,002,277	1.0%
Spansion	3,100,976	2,733,719	(11.8%)
Applied Materials	332,097	347,172	4.5%
Freescale	2,988,288	2,885,391	(3.4%)
Samsung	4,714,496	4,513,542	(4.3%)
Sematech	464,896	421,414	(9.4%)
University of Texas	1,607,649	1,620,537	0.8%
Extra-Strength Surcharges	0	4,728,734	0.0%
Totals	$188,069,357	$191,629,215	1.9%

1.6. Other Recommendations

In addition to the recommendations presented above, Red Oak provides the following recommendations:[8]

1. AWU's proposed cost-of-service rates increase the volatility of revenue from year to year. Also, the new 5-block rate structure is based on estimated consumption for residential customers from past billing records. To mitigate risk to AWU's financial health, Red Oak recommends AWU closely track its revenue and accumulate sufficient reserves to allow for years with lower than expected revenue.

[8] Section 6.2 presents more information on our other recommendations.

2. Red Oak also recommends AWU consider implementing excess-use rates to achieve the goals set by the City's Water Conservation Task Force. Excess-use rates would allow AWU to provide a consistent conservation incentive to all of its customers without regard to separate irrigation meters.

3. AWU may want to consider transitioning to its new rate structures over time to mitigate significant swings in rates and customer bills.

SECTION

2

Introduction

2. Introduction

Austin Water Utility (AWU) provides municipal water and wastewater services to its citizens and other residents and businesses in the greater Austin, Texas area. AWU also provides wholesale water and wastewater service to a number of customers.

AWU engaged the services of Red Oak Consulting (Red Oak) to prepare cost-of-service rate analyses for its water and wastewater utilities. Additionally, Red Oak analyzed the impacts of a proposed conservation-oriented rate structure for AWU's residential water customers. This report documents the findings of the study.

The results presented in this report are based on AWU's revenue requirements for fiscal year ending (FY) 2009. These rates depict the impact that changes to AWU's cost-of-service approach would have on its customers. Where appropriate, result (both rates and revenue) from this study are compared to AWU's currently adopted rates and revenue for FY2009. Within this report, the current rates used for comparison are called AWU's *Existing Rates* or *Existing*. The rates calculated within this study, using the proposed methodology, are called AWU's *Computed Rates* or *Computed*.

2.1. Study Objectives

AWU set the following objectives for this study:

1. Update the AWU's water and wastewater rates to recover revenue requirements through a comprehensive cost-of-service rate study.
2. Review, assess, and provide feedback on potential issues with AWU's existing water and wastewater cost-of-service methodologies. AWU's methodologies should adhere to industry standards for setting equitable rates for all customer classes.
3. Review AWU's customer demand data, peaking factor calculations, and other cost allocation methodologies.
4. Perform a comprehensive cost-of-service analysis including a public involvement process to analyze alternative cost allocation methods, cost recovery methods, and conservation incentives.
5. Estimate the impacts that conservation-oriented rates have on AWU's residential customers.
6. Provide information and obtain feedback from AWU's residential rate advocate regarding the cost-of-service study.
7. Develop a computer spreadsheet model that incorporates the cost-of-service methodologies and findings from the public involvement process. The computer

spreadsheet model will be provided to AWU at the end of the study, along with training for AWU staff on the operation of the model.

8. Based on the findings of the study, recommend cost-based rates to the City Council.

2.2. Scope of the Project

The scope of this project can be summarized into four major components. They are as follows:

1. Public Involvement Committee (PIC) Workshops
2. Water Analysis
3. Wastewater Analysis
4. Reports and Presentations

Each is described below.

2.2.1. Public Involvement Committee (PIC) Workshops

Red Oak collaborated with the public involvement specialist at Group Solutions RJW to develop and prepare a public involvement plan to address roles and responsibilities and task assignments relating to public involvement and communication. Much of this plan was designed to meet the needs of the PIC and address the issues that the PIC would analyze.

With Group Solutions RJW, the Red Oak team conducted a PIC Orientation Workshop to initiate the public involvement portion of the cost-of-service rate study. The workshop was designed to provide the PIC with study information, including an introduction of the project team, the scope of work, an overview of the rate design process, and the study schedule.

Following the orientation, the PIC was involved in a series of professionally facilitated workshops which examined various issues regarding AWU's methods for recovering its costs. The issues examined are listed below by category. Each issue is described in greater detail in Section 3 of this report.

2.2.1.1. Revenue Requirements

- Issue 1: Which method of determining revenue requirements is most appropriate?
- Issue 2: How should future O&M expenses be projected?
- Issue 3: How should the rate of return be determined?
- Issue 4: How should the rate base be valued?
- Issue 5: How should construction work in progress be treated?

2.2.1.2. Water Cost Allocations and Fire Charges

- Issue 1: Which is the most appropriate overall method for allocating costs?
- Issue 2: What are the appropriate time steps for the cost allocation method?
- Issue 3: Should AWU charge private fire connections for both the direct and indirect fire costs?
- Issue 4: How should AWU recover its public fire cost in its cost-of-service methodology?

2.2.1.3. Wastewater Cost Allocations

- Issue 1: Which is the most appropriate overall method for allocating costs?
- Issue 2: What are the appropriate customer service characteristics to use for the cost allocation process (e.g., flow, BOD, TSS, etc.)?
- Issue 3: How should inflow and infiltration (I/I) be estimated and allocated in the cost allocation process?

2.2.1.4. Customer Classification

- Issue 1: Should the large-volume customer class be disaggregated?
- Issue 2: Should the threshold for inclusion in the large-volume class be adjusted?
- Issue 3: Should an irrigation class be created?

2.2.1.5. Rate Design

- Issue 1: What is the best method for providing a subsidy to low-income customers?
- Issue 2: How should AWU recover a subsidy to low-income customers?
- Issue 3: Should AWU introduce a fifth block for single family residential customers?
- Issue 4: What conservation incentives should exist for wholesale customers?

2.2.1.6. Rates for Irrigation Customers

- Issue 1: If AWU implements higher rates for irrigation users, how should the excess revenues generated by the higher rates be used?
- Issue 2: What is an appropriate level for non-residential irrigation rates?
- Issue 3: Should single-family residential customers with irrigation meters receive irrigation water at the block 1 and 2 rates?

As mentioned, Section 3 of this report describes each of these issues in greater detail. Section 3 also describes the PIC, its roles, and the process by which each of these issues were addressed.

2.2.2. Water Analysis

Red Oak developed a cost-of-service model and specifications to perform the cost-of-service analysis of the water utility. Red Oak reviewed the cost-of-service model specifications with the Project Team, and populated it with data provided by AWU. Major milestones and results of the model analysis were reviewed with the Project Team.

Red Oak used the cost-of-service model to estimate revenues under existing rates to determine the sufficiency of these rates to meet the projected revenue requirements. We allocated costs according to the accepted methodology to determine unit costs and customer class cost of service.

Red Oak developed a conservation impact model and specifications to determine the impact of the proposed rate design on customers. We reviewed the conservation impact model specifications with the Project Team. We populated the conservation impact model with data obtained from AWU and reviewed the results of the model analysis with the Project Team.

Red Oak integrated the results of the bill frequency analysis into the rate design model and developed alternative rate structures. We presented the alternative rate structures to the Executive Team and Project Team for consideration and recommended an appropriate rate structure to meet AWU's pricing objectives and evaluation criteria.

2.2.3. Wastewater Analysis

The analysis for AWU's wastewater utility was very similar as that for its water utility. The one major difference was that for the water, Red Oak developed a conservation impact model and specifications to determine the impact of the proposed rate design on customers. A similar service was performed for wastewater, but it was done so within the context of the cost-of-service model, rather than in a separate conservation impact model. Otherwise the two analyses were conducted concurrently with one another.

2.2.4. Reports and Presentations

The last major effort involved in this project is the documentation and presentation of results and recommendations. This report constitutes a large part of the project documentation, but there were also memos, presentations, and issue papers produced throughout the analysis period to keep AWU and the PIC informed on the progress and results of the various parts of this study.

2.3. Overview of the Report

The findings from the study are presented in two separate volumes. This report and appendices are the first volume. Each volume and its contents are listed below.

- Volume I – Austin Water Utility Cost of Service Rate Study 2008
    - Section 1: Executive Summary. The Executive Summary provides a brief summary of the important assumptions and findings of the report.

- Section 2: Introduction. The Introduction is the section you are now reading.
- Section 3: Public Involvement Program. This section describes the public involvement process, including the Public Involvement Committee (PIC), PIC roles, and the process by which each of the issues were addressed.
- Section 4: Water Rate Analysis. The methodology used to conduct the water cost-of-service analysis is described in this section. Also included is a description of the rate design analysis completed for this study.
- Section 5: Wastewater Rate Analysis. The methodology used to conduct the wastewater cost-of-service analysis is described in this section.
- Section 6: Findings and Recommendations. This section contains an overview of our findings and recommendations to AWU.
- Appendices:
  - Appendix A – Summary Table of Executive Team Decisions
  - Appendix B – Selected Tables from Water Cost-of-Service Model
  - Appendix C – Selected Tables from Wastewater Cost-of-Service Model

➢ Volume II – Issue Papers

- Section 1: Issue Papers. The issue papers presented to AWU and the PIC as part of the Public Involvement Program are contained here.
- Appendices:
  - Appendix A – Executive Team Briefing Minutes
  - Appendix B – PIC Meeting Minutes
  - Appendix C – PIC Meeting Presentations

2.4. Acknowledgements

Development of AWU's Water and Wastewater Rate Study was a team effort among AWU's Project Team, AWU's Executive Team, the members of the PIC, the professionals from Group Solutions RJW, and the members of Red Oak's team. We would like to thank the individuals listed below who contributed their time, expertise, and support to make the project a success.

AWU's Project Team included the following individuals:

- J. R. "Rusty" Cobern, CPA, Utility Budget & Finance Manager, AWU
- Michael Castillo, Utility Financial Manager, AWU

- Denise McDonald, Utility Financial Analyst Senior, AWU
- Darrel Culberson, Utility Financial Analyst Senior, AWU

The Executive Team included the following individuals:

- Greg Meszaros, Director, AWU
- Perwez Moheet, CPA, Deputy Director, AWU
- Daryl Slusher, Assistant Director, Environmental Affairs and Conservation, AWU
- David Anders, Assistant Director, Finance and Business Services, AWU

The PIC consisted of two representatives from each customer class and one water and wastewater commission member:

- Single-Family Residential
  - Lanetta Cooper
  - Angela Taylor Rubottom (Residential Rate Advocate)
- Multi-Family Residential
  - Kristan Arrona
  - Tom Graves
- Commercial
  - Gene McMenamin
  - Doris Williams
  - Nguyen Stanton[1]
- Large Volume
  - Dan Wilcox
  - Jeff Covington
- Wholesale
  - Joy Smith
  - Myra Salas
- Water & Wastewater Commission
  - Mario Espinoza

[1] Gene McMenamin attended the Revenue Requirements meeting and then resigned. Doris Williams attended the Water Cost Allocations, Wastewater Cost Allocations, Customer Classifications, and Rate Design meetings and then resigned. Nguyen Stanton joined the PIC for the Customer Classifications meeting and represented the commercial class for the remainder of the study.

Austin Water Utility
Cost of Service Rate Study 2008

SECTION

3

Public Involvement Process

3. Public Involvement Process

3.1. Overview of the Process

To enhance stakeholder involvement, AWU implemented an extensive public involvement process for the cost-of-service study. Red Oak incorporated the public involvement professionals from Group Solutions RJW to lead the public process and provide professional facilitation services. The process included a series of public meetings with a Public Involvement Committee (PIC) and AWU's Executive Team. Figure 3-1 presents an overview of the process.

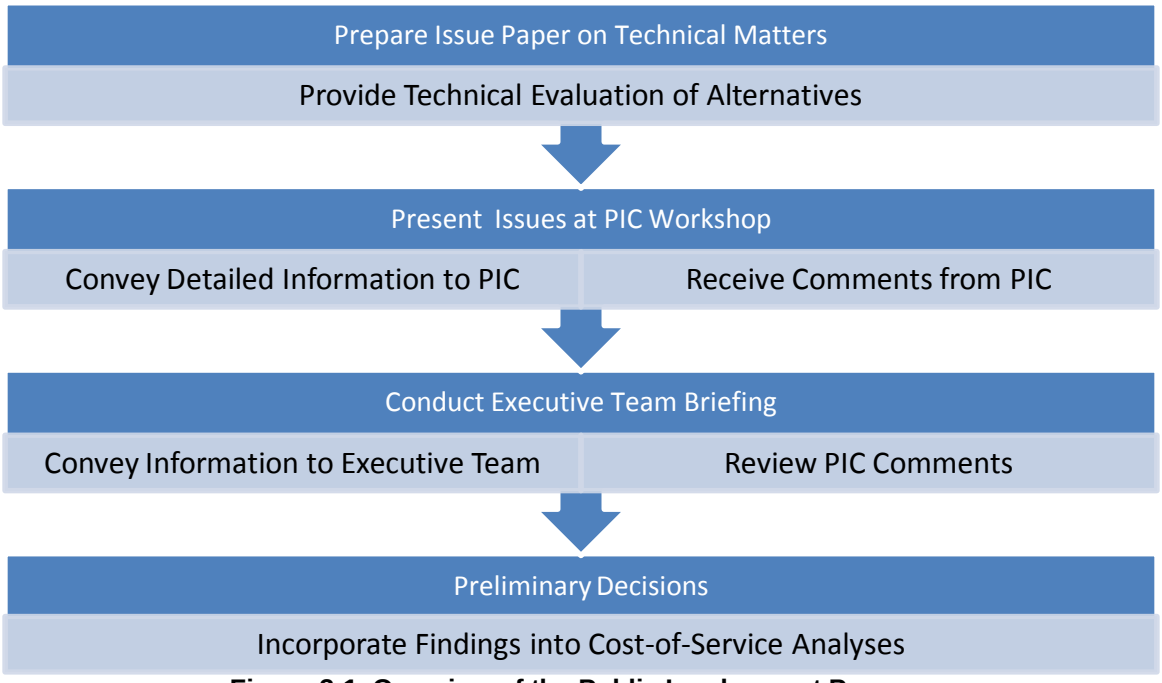


Figure 3-1 Overview of the Public Involvement Process

3.2. Participants

The participants in the public involvement process included the Executive Team, the PIC, the Project Team, and the consultants. Although the Executive Team made the decisions regarding the cost-of-service policies, it considered the comments of the PIC during its deliberations.

3.2.1. Executive Team

The Executive Team met after each PIC meeting to discuss the issues that were addressed by the PIC. The Executive Team encouraged PIC members to submit written comments following each PIC meeting. These comments were reviewed and considered by the

Executive Team during discussion of each issue. When necessary, the Executive Team deferred decisions until further information was received.

3.2.2. Public Involvement Committee

The PIC was designed to provide comments and recommendations to the Exectutive Team and to work with the constituents of their respective customer class.

The PIC consisted of two representatives from each customer class:

- Single family residential – Lanetta Cooper and Angela Taylor Rubottom (Residential Rate Advocate);
- Multifamily residential – Kristan Arrona and Tom Graves;
- Commercial – Gene McMenamin, Doris Williams, and Nguyen Stanton[1];
- Large Volume – Dan Wilcox and Jeff Covington;
- Wholesale – Joy Smith and Myra Salas;
- Water & Wastewater Commission – Mario Espinoza.

AWU retained Angela Taylor Rubottom, the Residential Rate Advocate, to represent the single-family residential class. In addition, Lanetta Cooper represented the Austin Neighborhood Council.

3.3. Evaluation Criteria

3.3.1. Overview

AWU developed a list of objective evaluation criteria to assist in the evaluation of proposed alternative cost-of-service policies. During the initial project meetings, Red Oak presented a preliminary list of evaluation criteria commonly used in this type of study. The City revised the preliminary list of evaluation criteria to more appropriately represent the City's values and goals. Then the Executive Team ranked the criteria individually, and these rankings were used to determine the weighting factors for the criteria.

3.3.2. Selected Criteria

The evaluation criteria are organized into five categories. These categories include:

- Implementation,
- Equity,
- Customer impact,
- Conservation, and
- Financial.

[1] Gene McMenamin attended the Revenue Requirements meeting and then resigned. Doris Williams attended the Water Cost Allocations, Wastewater Cost Allocations, Customer Classifications, and Rate Design meetings and then resigned. Nguyen Stanton joined the PIC for the Customer Classifications meeting and represented the commercial class for the remainder of the study.

Figure 3-2 presents these categories and the final criteria within them, as selected by the City.

Implementation	Equity	Customer	Conservation	Financial
Administrative Burden	Interclass	Affordability	Average-Day Savings	Revenue Sufficiency
Public Understanding	Intraclass	Economic Development	Peak-Season Savings	Revenue Stability
Public and Political Acceptance	Inter-generational	Rate Shock/ Volatility	Peak-Day Savings	Rate Stability
Risk of Implementation	Inside/ Outside City	Understand Bill	Sustainability	Rate Predictability
Legal Defensibility	Industry Standards			Financial Risk
Policy Durability				

Figure 3-2 Final Evaluation Criteria

Following is a brief description of each criterion by category.

3.3.2.1. Implementation

Criteria included in the implementation category are designed to compare the issues of implementing alternatives. Due to the nature of the criteria within this category, and the lack of an appropriate quantitative measure tool for many of them, these criteria are evaluated qualitatively.

ADMINISTRATIVE BURDEN

The amount of administrative burden required can vary greatly among alternatives. Additional data collection needs, changes to the accounting and budgeting system, or additional staff needs and training are a few examples of how administrative burden among alternatives can differ.

PUBLIC UNDERSTANDING

The public's ability to understand alternatives, the process by which they were developed, and the resulting cost consequences are imperative for successful implementation.

PUBLIC AND POLITICAL ACCEPTANCE

The selected alternative should be one the public and the City's elected officials will accept. Acceptance of a new alternative is typically tied to community values and goals. This criterion typically requires gathering information on likely customer responses and the involvement of elected officials.

RISK OF IMPLEMENTATION

The success of implementing any new alternative involves a degree of risk. The selected alternative should minimize risk that it may not be able to be implemented or can only be implemented outside an acceptable timeframe.

LEGAL DEFENSIBILITY

The proposed alternative must be legally defensible if challenged.

POLICY DURABILITY

The proposed alternative should remain viable as the utility's situation changes over time. Policies that are more likely to fair well considering an uncertain future are considered relatively more durable and receive a higher rating for *Policy Durability*.

3.3.2.2. Equity

INTERCLASS EQUITY

This type of equity assures that the alternative distributes the costs of services across customer classes in proportion to the cost of serving each class. Each customer class pays its fair share and no class provides or receives a subsidy from another class.

INTRACLASS EQUITY

This type of equity recognizes that alternatives will vary in their ability to assign costs to customers equitably within the same customer class.

INTERGENERATIONAL EQUITY

This type of equity recognizes that alternatives will vary in the degree which they compensate existing customers for investments already made in the system that will benefit new customers. Usually, intergenerational equity is managed by implementing appropriate system development charge methodologies.

INSIDE/OUTSIDE CITY

This type of equity measures the proportionality of costs to revenue for inside- and outside-city customers.

INDUSTRY STANDARDS

Industry standards have evolved to ensure the integrity of the cost-of-service process. The standards focus largely on ensuring proportionality of costs and revenue. These industry standards may guide the selection of alternatives.

3.3.2.3. Customer Impact

The customer impacts focus on the affects of an alternative on customers. Some criteria are very subjective and often require the direct participation of policymakers. Others, (e.g., rate shock), can be measured quantitatively.

AFFORDABILITY

In addition to promoting the health, general welfare, and fire protection needs of its customers, many utilities were formed by local governments to ensure that a minimum level of service is available to users who might not otherwise be able to afford them. This criterion focuses on the ability of residential customers to afford services.

ECONOMIC DEVELOPMENT

Water and sewer services are vital to local economic development. Also, local businesses are often affected by the cost of utility services. This criterion measures the relative impacts on economic development of the alternatives.

RATE SHOCK/VOLATILITY

Rate shock measures the significance of changes in customer bills because of a proposed alternative. Large, sudden increases in bills can impose economic difficulties that are harmful to local governments, businesses, and residents.

UNDERSTANDABILITY OF BILL

Public understanding of the service bill is an important criterion to consider when examining the likely customer impact of alternatives. Specifically, this criterion is tied to the complexity of the bill. Simpler rate designs will likely generate bills that are easier to read and understand by customers.

3.3.2.4. Conservation

Water savings is often a primary objective of modern rate designs. However, water savings can accumulate differently based on the type of rate structure selected. Therefore, the conservation criteria are selected to measure the types of water savings most important to AWU.

Often conservation criteria are considered to apply exclusively to water, and generally the criteria are more relevant to water. In some circumstances, however, conservation of water will reduce the cost of wastewater treatment.

AVERAGE-DAY SAVINGS

Some policies provide conservation incentives regardless of the time of year. These policies are best suited to reducing a utility's average-day water savings. These policies generally have greater impacts on wastewater flows than the criteria that include a focus on peaking. This criterion measures the reduction in average-day demands.

PEAK-SEASON SAVINGS

A commonly used criterion is the reduction in peak usage because reducing peak demands often results in a reduction in long-term capital costs. One factor driving the sizing of certain parts of a water system is peak-season demands. Policies that affect the amount of outdoor water use can impact peak-season savings.

PEAK-DAY SAVINGS

Like peak-season savings, reduction in peak-day demands can also result in reductions of long-term capital costs.

SUSTAINABILITY

The proposed alternative should promote the sustainability of the region's resources. Again, this may relate to promoting efficiency by the selected alternative, or in by the extent which growth is required to pay for itself.

3.3.2.5. Financial

REVENUE SUFFICIENCY

The proposed alternative needs to provide sufficient revenues to meet AWU's capital-related revenue requirements (i.e., fund the capital projects needs of AWU.) All alternatives proposed in this study will generate sufficient revenues for the utilities in the long run. However, the amount of system development fees generated as a source of revenues will vary between alternatives. Some alternatives may require additional revenues from rates to meet AWU's capital plan. Also this criterion measures the impact of assumptions on AWU's service expansion policies.

REVENUE STABILITY

The proposed alternative should minimize fluctuations in revenues due to changes in growth or other factors outside the control of AWU. This criterion measures the degree of volatility in resulting revenues from a propose alternative.

RATE STABILITY

Rate stability measures the volatility in the rates from year to year. Customers have a difficult time adjusting their budgets when rates are unstable. Steady rate increases over time are generally favored when compared to large, one-time adjustments.

RATE PREDICTABILITY

The proposed alternative should minimize the unpredictability in the total bill and fee. A customer will have a hard time predicting his/her bill and fees in the future if changes in use cause significant changes in the total bill. In contrast to the revenue sufficiency criterion, where the criterion is evaluated from the point of view of the utility, this criterion is evaluated from a customer's perspective.

FINANCIAL RISK

Notably for growth-related improvements, AWU takes on financial risk when anticipating growth and the expectation that new customers will connect to its systems, thereby helping to fund the improvements. The proposed alternative should minimize the risk AWU incurs when adding new infrastructure to its systems.

3.4. Issue Papers

3.4.1. Overview

Prior to each PIC meeting, Red Oak prepared an "issue paper" or "white paper" to discuss the topic that would be presented. The purpose of the issue papers was to provide the PIC members with information on the topics so they would be prepared to discuss the issues at the PIC meetings. This enabled a more focused discussion on the issues and ensured that the PIC members were knowledgeable about the issues and alternatives.

The Issue Papers were organized by theme and contained a series of policy questions and options. For each policy question, Red Oak provided a detailed evaluation using the weighted evaluation criteria discussed in Section 3.3 on Page 3-2.

The final copy of each Issue Paper is provided in Volume II of this report. Each issue is discussed below.

3.4.2. Revenue Requirements

3.4.2.1. Issue 1: Which Method of Determining Revenue Requirements Is Most Appropriate?

DESCRIPTION

The first revenue requirement policy issue to resolve was which industry standard approach to determining revenue requirements would be best for AWU and its customers. The alternative selected determines the method of setting the total revenue recovered from the cost-of-service analyses.

The three available alternative methodologies are:

1. Cash basis,
2. Utility basis, and
3. Utility basis with cash residual.

The primary difference among the alternatives is the concept of ownership and the method of consumer protection. Under the cash basis, consumer protection is provided by the budgeting oversight of the elected officials. These officials act both as a representative of the customers and the utility. Most often, the elected officials are elected by the citizens that act as the owners of the utility. Under this approach, ownership and consumer protection are combined into one elected body.

Under the utility basis, the consumer protection is often provided by public utility commissions or public service commissions. These regulatory bodies establish rates of return that provide consumer protection.

In situations where municipally owned utilities provide services to customers outside their corporate jurisdictions, consumer protection is often provided by explicit contractual agreements that specify the conditions under which utility rates are determined. This is

the situation most commonly found when the *Utility Basis with Cash Residual* method is used.

RECOMMENDATIONS

Red Oak recommended AWU use the cash basis for determining revenue requirements. This method is consistent with current practices and requires data that are readily available and dependable.

EXECUTIVE TEAM DECISION

The Executive Team decided to continue using the cash basis for determining revenue requirements.

3.4.2.2. Issue 2: How Should Future O&M Expenses Be Projected?

DESCRIPTION

All three methods of determining revenue requirements include an amount to recover O&M expenses. The method of projecting the O&M expenses influences the total revenue requirements.

Two alternatives are generally considered in projecting O&M expenses. These are:

- Historical test year with adjustments for known and measurable changes, and
- Future budgeted O&M expenses.

Under the first alternative, the allowance for O&M expenses is determined by using actual expenditures during a recent 12-month period for which detailed expenditure records are available. Because of the intricacies of municipal budgeting requirements, the 12-month period is generally the most recently completed fiscal year. The expenditures during the historical test year are then adjusted for what are called *known and measurable changes.* These adjustments to historical costs typically include allowances for changes in labor agreements, changes in utility rates, etc.

The alternative approach is to project future O&M expenses based on the utility's adopted annual budget. This approach depends on the municipal budgeting process to evaluate the reasonableness of projections of future O&M expenditures.

The compatibility of the methods used to project future O&M expenses may vary depending on the overall approach used to determine revenue requirements (i.e., cash basis, utility basis, and utility basis with cash residual.) One potential criticism of using the budget to project future O&M expenses is that municipal utilities generally cannot exceed their budget authorization. This restriction would indicate that budgeted O&M would exceed actual O&M. When the utility is on the cash basis, however, unspent O&M expenses result in additional ending fund cash balances which are available to offset future O&M expenses or capital expenditures.

RECOMMENDATIONS

Red Oak recommended that the utility use the future budget to project O&M expenses. The future budget approach is more consistent with the municipal nature of AWU's operations than the historical test year.

EXECUTIVE TEAM DECISION

The Executive Team decided to continue using the future budget to project O&M expenses.

3.4.2.3. Issue 3: How Should the Rate of Return Be Determined?

DESCRIPTION

When using either the utility basis or utility basis with cash residual method of determining revenue requirements, the utility must determine its rate of return. This process can be extremely controversial since the impact on non-owner customers and the utility can be significant.

Regulated utilities generally are required to determine the rate of return based on their weighted average cost of capital. This approach is designed to meet the unique needs of regulated utilities that are subject to economic regulation.[2] If economic or market conditions change, the rates charged by the utility may need adjustment to maintain an equitable value of the company's shares.

Three alternatives are evaluated for determining the revenue requirements. These are:

- Weighted average cost of capital,
- Indexed return, and
- Fixed return.

The weighted average cost of capital is the typical approach used by regulated utilities. Under the weighted average cost of capital, the rate of return has two components. The first component is an allowance for debt. The return allowed for the allowance for debt is based on the effective interest rate on debt.[3] The second component is the return ascribed to equity. This return is calculated using sophisticated financial models that evaluate the relative risks associated with investing in an enterprise with comparable risks. The two

[2] Economic regulation is the approach used to ensure that investor-owned utilities earn a fair return but do not exploit their position as a natural monopolist. The standards for a fair rate of return commonly include the requirement that the utility earn profits at a rate comparable to other investors with similar risks and that the utility will attract sufficient capital to maintain its economic viability and value. These standards are less important to municipal utilities since municipal utilities do not have a requirement to maintain the price of their traded shares. Changing market and economic conditions can adversely affect consumers and/or shareholders and are generally reviewed when a regulated utility presents its rates for adjustment to its economic regulator.

[3] The effective interest rate on debt normally includes adjustments for the amortization of issuance costs and other similar expenses.

components are weighted based on the percentage of the value of the utility provided by debt versus equity.

The indexed return is a simpler method commonly used by municipal utilities that do not have easily evaluated costs for equity. Under this simple approach, the utility adopts an index with an allowance for equity. For example, the utility may tie its rate of return to the return on a municipal bond index with an allowance of 200 basis points[4] to account for additional risk associated with equity. If the bond index had an effective return of 4.5 percent, the rate of return would be set at 6.5 percent (i.e., 4.5 percent plus 2.0 percent equals 6.5 percent.) If the return for the bond index dropped to 4.0 percent, the rate of return used by the utility would be reduced to 6.0 percent. Similarly, if the return for the bond index rose to 5.0 percent, the rate of return used by the utility would increase to 7 percent.

The last alternative is a fixed rate of return. A fixed rate of return is generally used when a utility provides service on a wholesale basis to another utility. Under a fixed rate of return, the utility sets its return when it establishes its agreement with its wholesale customer. This return is fixed for the term of the agreement.

RECOMMENDATIONS

This issue is relevant only if the utility basis or utility basis with cash residual is chosen. If AWU uses the cash basis, as recommended by Red Oak, this issue is moot and there is no need to determine a rate of return. However if the utility uses a revenue requirement method that includes a rate of return, Red Oak recommended establishing a fixed rate of return. A fixed rate of return minimizes the volatility in revenue requirements and reduces the overall uncertainty for both owner and non-owner customers.

EXECUTIVE TEAM DECISION

The Executive Team chose to use the cash basis for determining revenue requirements. Therefore, this issue is moot.

3.4.2.4. Issue 4: How Should the Rate Base Be Valued?

DESCRIPTION

When using the utility basis or utility basis with cash residual, the utility must establish an approach to valuing the assets that serve its customers. During periods of high inflation, some utilities adopted an approach to value their fixed assets at reproduction costs rather than original costs. Under both alternatives, the value of the accumulated depreciation (at reproduction cost or original cost, as appropriate) is subtracted to provide the rate base.

These utilities restate their rate bases at reproduction costs to account for the impact that inflation has on the cost of replacing infrastructure. Generally as inflation rates declined

[4] A *basis point* is one one-hundredth of a percentage point. Therefore, 100 basis points equal 1 percent point.

during the 1980s, the interest in using reproduction costs for rate base also declined. Recent increases in the price for construction materials may prompt interest in this issue.

When the reproduction cost approach is used, the rate of return is generally reduced to exclude an inflationary component. This ensures the utility does not over collect as the cost of its rate base is restated due to inflation.

Two alternatives are examined here. The first is the traditional original cost approach. Under the original cost approach, the rate base is set at the net book value of the assets that are used and useful in providing utility services. The net book value is determined by subtracting the accumulated depreciation from the original cost.[5]

The second approach is to use the reproduction costs to determine the value of rate base. Under this approach, the reproduction costs would be net of accumulated depreciation (calculated at reproduction costs.) Also, the rate of return would be reduced to exclude an allowance for inflation. In other words, the rate of return would be a *real rate of return.*

RECOMMENDATIONS

If a determination of rate base is required, Red Oak recommended the use of original cost to determine rate base. However, this issue is moot if the cash basis is used to determine revenue requirements.

EXECUTIVE TEAM DECISION

The Executive Team chose to use the cash basis for determining revenue requirements. Therefore, this issue is moot.

3.4.2.5. Issue 5: How Should Construction Work In Progress Be Treated?

DESCRIPTION

Construction work in progress (CWIP) is the value of expenditures the utility has made in construction projects that have not been completed, and therefore, are not included as a fixed asset on the utility's books. Regardless of the status of booking the assets, the utility has carrying costs for these expenditures and the treatment of those carrying costs is the issue examined here.

Generally the carrying cost for CWIP is the interest expense (or interest earnings forgone) by having spent money on the project under construction. The longer the construction period is the greater the carrying costs will be, and the more important this issue will be.

This issue is only important if the utility uses either the utility basis or the utility basis with cash residual method of determining revenue requirements.

[5] Other adjustments for contributed capital and construction work in progress are also included.

Two alternatives are available for treating CWIP in the utility's rate base. The first option is to capitalize the interest during construction and include the capitalized interest in the asset value. Under this approach, the utility recovers the carrying cost of the CWIP over the life of the asset and earns a return on the outstanding investment in the carrying costs.

The second approach is to include CWIP in the rate base and allow the utility to earn a rate of return on CWIP during the construction itself.

The difference between the two approaches is primarily one of timing of receipt of the carrying costs and the impact that timing has on inter-generational equity. Generally, capitalizing the carrying costs spreads the carrying costs to those future users that benefit from the asset but delays the recovery of the investment by the utility.

RECOMMENDATIONS

Red Oak recommended using the capitalized interest approach to treat CWIP in the rate base. This approach follows industry standards, provides greater inter-generational equity, and is consistent with most utility's fixed asset accounting policies. However, if the cash basis is used to determine revenue requirements, this issue is moot.

EXECUTIVE TEAM DECISION

The Executive Team chose to use the cash basis for determining revenue requirements. Therefore, this issue is moot.

3.4.3. Water Cost Allocations and Fire Charges

3.4.3.1. Issue 1: Which Is the Most Appropriate Overall Method for Allocating Costs?

DESCRIPTION

The first cost-allocation policy to resolve is which overall cost allocation method is best for AWU and its customers. The alternative selected will determine the method of allocating costs to each of the customer classes.

The two available alternative methods are:

1. Commodity/demand, and
2. Base/extra-capacity (current approach).

These methods are fully described in the Water Cost Allocations and Fire Charges issue paper provided in Volume II of this report.

Figure 3-3 presents a hypothetical cross section of a water system asset that is sized to meet multiple demands of the water system. This figure illustrates the cost allocation differences between the base/extra-capacity method and the commodity/demand method.

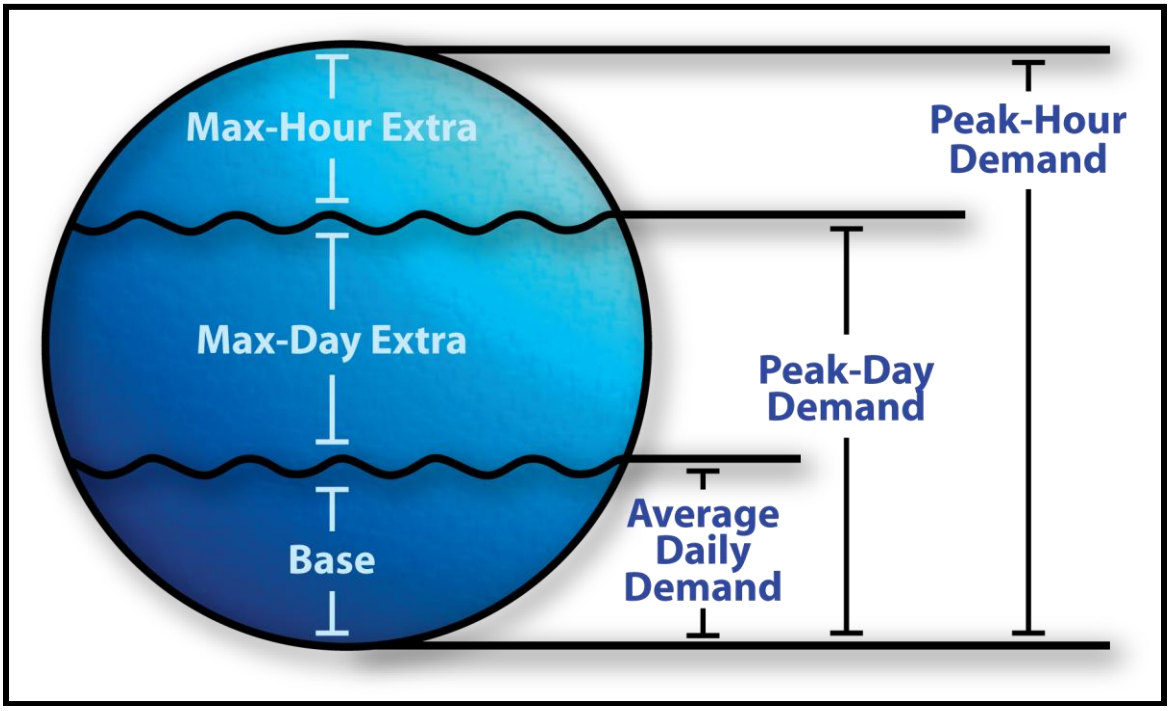


Figure 3-3 Hypothetical Water System Asset

The primary difference between the alternatives is the treatment of peak-related costs. The commodity/demand method more strictly follows the peak-load pricing model. The base/extra-capacity method is a deviation from the strict peak-load pricing model that accounts for the benefits that customers with lower peaking factors experience by the investment in capital-intensive facilities that lower the utility's overall costs for off-peak users.[6] Because the utility must select its production technologies from those that are effective and available but differ in their intensity of use of capital and O&M, the optimal technology may not be the technology chosen if it were merely used to meet peak-period demands. For instance, when planning future capacity with multiple technologies, a water utility will often select a technology based on its total costs (i.e., O&M and capital costs)[7] compared to the total costs of other technologies, given the utility's forecast of water demands.

For example, a water utility may have two options in meeting the demands of its customers. One option may be a conventional filtration facility using surface water with

[6] As the literature on peak-load pricing has matured, some authors suggest that, under certain conditions, non-peaking customers should pay a portion of the capacity-related costs of peak-related facilities. For example, if the production function for a utility allows for the substitution of O&M expenses for capital (i.e., a neoclassical production function), the peak-load pricing allocation approach may charge a portion of the capacity costs to non-peaking customers. See Elizabeth E. Bailey and Erick B. Lindenberg, "Peak Load Pricing Principles: Past and Present," in *New Dimensions in Public Utility Pricing*, ed. Harry M. Trebing (East Lansing, Michigan: Institute of Public Utilities, Graduate School of Business Administration, Michigan State University, 1976, 10. See also John C. Panzar, "A Neoclassical Approach to Peak Load Pricing", *The Bell Journal of Economics*, 7(2) (Autumn 1976): 521-30.

[7] These *total costs* are often called present worth estimates, which take into account the time-value of money.

a relatively low per unit variable cost but a relatively high fixed cost. The alternative option may be a smaller treatment facility augmented with supplies from a ground water system. In this case, assume the cost of pumping and the limitations on supplies makes the groundwater system have higher operating costs than the larger filtration facility option. It may be cheaper for those customers with higher peaks for the utility to use the ground water to meet their peak capacity so that the smaller filtration facility would be a non-peaking facility. This would reduce the cost attributed to the peak users under the strict peak-load pricing model. However, this outcome may be less efficient if the marginal cost of the larger filtration facility is lower than that of the groundwater system. In that instance, the alternative with the lowest overall costs may be the option with the larger filtration facility (which is sized larger to meet the peak-day demands.)

This finding is often the case for water utilities. As such, the larger filtration facility (which tends to be more capital intensive with lower marginal unit costs for operations) provides value to both those customers who peak on the facility and those that do not.[8] The base/extra-capacity method deviates from the strict peak-load pricing model to account for this possibility.

RECOMMENDATIONS

Red Oak recommends AWU use the base/extra-capacity method for allocating costs. This method is consistent with current practices and future uncertainties.

EXECUTIVE TEAM DECISION

The Executive Team decided to use the base/extra-capacity method for allocating water costs.

3.4.3.2. Issue 2: What Are the Appropriate Time Steps for the Cost Allocation Method?

DESCRIPTION

Regardless of cost allocation approach selected, the cost-of-service analyses will require the selection of time steps for the cost allocations. The time steps are used to determine which peak demands are included in the cost allocations.

Many alternative time steps exist in theory. But only two alternatives are relevant to AWU. These are:

1. Peak-day and peak-hour demands (current approach), and
2. Peak-season, peak-day, and peak-hour demands.

The selection of appropriate time steps for a cost-of-service analysis depends on the design and operation of the water system.

[8] Almost all customers have a peak demand that exceeds their average demand. However, the relative portions of the peak-related costs attributable to customer classes vary. For example, some large customers may have a peak-day demand that is 125 percent of their average-day demand, while other customers my have a peak-day demand that is more than 250 percent of their average-day demand.

RECOMMENDATIONS

Red Oak recommended that AWU use peak-day and peak-hour time steps for the cost-of-service analysis. These time-steps are consistent with AWU operations and facilities. Introducing an additional time step may diminish the accuracy of the cost allocations.

EXECUTIVE TEAM DECISION

The Executive Team decided to use peak-day and peak-hour time steps for the cost-of-service analysis.

3.4.3.3. Issue 3: Should AWU Charge Private Fire Connections for Both the Direct and Indirect Fire Costs?

DESCRIPTION

AWU incurs costs to provide fire protection to its customers. These costs are incurred both as direct and indirect fire costs. Water utilities throughout the industry have differing approaches to charging for private fire connections. Some utilities determine the charges for private fire connections to recover only the direct costs (e.g., billing, cross-connection controls, meter reading, billing, etc.) of the service. Other utilities include some of the indirect fire costs (e.g., the cost of over-sizing facilities, etc.) in the charge.

AWU does not charge separately for private fire connections. Two approaches to private fire lines are generally available in the industry. These are:

1. Charge private fire connections for the direct costs of providing the service (current approach); and

2. Charge private fire connections both the direct and indirect costs of providing the service.

The primary difference in the approaches is philosophical. Under the first alternative, private fire connections do not place an additional burden on the indirect fire costs of the system merely because they have a private fire connection. In fact, everything else being equal, private fire connections generally reduce the fire flow requirements of a facility and reduce the burden on the indirect fire costs of the utility.

Alternatively, private fire connections provide a service to private properties that benefit directly through lower insurance premiums and/or the ability to meet certain fire codes in a cost-effective manner. Additionally, many of those properties with private fire connections have those connections because of the disproportionate burden they place on the firefighting capabilities of the City. Including both the direct and indirect fire costs in the private fire connection charges for these customers may enhance the overall fairness of the charges.

RECOMMENDATIONS

Red Oak recommended AWU not charge private fire connections separately.

EXECUTIVE TEAM DECISION

The Executive Team decided to continue with the current methodology of not charging private fire connections separately.

3.4.3.4. Issue 4: How Should AWU Recover Its Public Fire Cost in Its Cost-of-Service Methodology?

DESCRIPTION

AWU has made significant investments in its infrastructure to provide fire protection services to its customers. These investments include over-sizing transmission and distribution mains, pumping facilities, and finished water reservoirs. A specific charge to customers for fire protection could more equitably recover these costs.

Additionally, as AWU pursues rate designs that provide greater water conservation, its revenue may become less stable. Designing a charge structure that provides more fixed revenue from fire protection charges may allow AWU to be more aggressive with its conservation efforts while maintaining the necessary financial health of the utility.

Red Oak identified four options that AWU can use to recover some or all of its fire-related costs. These options include:

1. Recover indirectly through the cost of water services (current approach);
2. Assess a fixed charge based on the value of the real property improvements;
3. Assess a fixed charge that varies by fire customer class; and
4. Assess a fixed charge based on the size of the water meter.

The first alternative is the most commonly used method of recovering fire charges. Under this alternative, fire-related costs are treated like overhead costs and embedded in the overall costs of water.

The second alternative establishes a charge based on the value of the real property improvements (excluding land.) The rationale for a charge based on real property improvements is that properties which are more valuable require greater fire protection. This alternative is very similar to an *ad valorem* property tax and may be considered a tax rather than a fee in some jurisdictions. Such a determination may affect the legality of the fee for AWU.

The third and fourth alternatives are designed to avoid the tax versus fee controversy. Under these alternatives, AWU's fire-related costs are recovered in a fixed monthly charge. Under alternative 3, the fixed monthly charge is based on a classification of each customer's fire flow requirements. The fourth alternative recovers the fire-related costs as a portion of AWU's fixed charge based on the size of the customer's water meter.

RECOMMENDATIONS

Red Oak recommended that AWU recover some or all of its fire-related costs in a fixed monthly charge based on meter size. While meter size may not be the best proxy for fire flow demands, the two alternatives that improve upon meter size have significant implementation issues.

EXECUTIVE TEAM DECISION

The Executive Team decided to recover fire protection costs with a fixed monthly charge based on meter size.

3.4.4. Wastewater Cost Allocations

3.4.4.1. Issue 1: Which Is the Most Appropriate Overall Method for Allocating Costs?

DESCRIPTION

The first wastewater cost allocation policy to resolve is which overall cost allocation method is best for AWU and its customers. The alternative selected will determine the method of allocating costs to each of the customer classes. The Water Environment Federation (WEF) has identified three fundamental cost allocation approaches for allocating a utility's costs and, thereby, determining wastewater rates.

The three available alternative methods are:

1. Design basis (current approach),

2. Functional basis, and

3. Hybrid where O&M costs are allocated based on function, and capital costs based on design.

The primary difference among the alternative methods is that the design basis allocates costs based on engineering design criteria whereas the functional basis allocates costs based on operational or functional purposes. The hybrid allocates O&M costs based on function and the capital costs based on design. Examples of how the allocations would be done under both approaches are discussed in the Issue Paper entitled *Water Cost Allocations and Fire Charges* presented under separate cover as Volume II of this report.

RECOMMENDATIONS

Red Oak recommended AWU use the hybrid approach for allocating costs. This method appears more equitable to AWU's customers and does not introduce significant administrative burden.

EXECUTIVE TEAM DECISION

The Executive Team decided to use the hybrid approach to allocate wastewater costs.

3.4.4.2. Issue 2: What Are the Appropriate Customer Service Characteristics to Use for the Cost Allocation Process (E.g., Flow, BOD, TSS, Etc.)?

DESCRIPTION

Regardless of cost allocation approach selected, the cost-of-service analyses will require the selection of customer service characteristics for the cost allocations. The selection of the customer service characteristics determines which measures of wastewater strength are included in the cost allocations.

In developing an appropriate list of customer service characteristics, the analyst may consider the following standards:

1. Does the utility incur cost to treat the constituent that comprises the customer service characteristic?

2. Do customers vary in their contribution of the constituent under consideration? Is the contribution by customers closely correlated with another customer service characteristic already being used?

3. Can the utility measure the differences in the contributions by customer class with reasonable accuracy?

The first standard considers costs. Since the purpose of identifying a customer service characteristic and the corresponding wastewater constituent is to allocate costs, those constituents that are not treated or controlled may not warrant including in the cost allocations. The constituents that are responsible for costs vary by utility. For example, some utilities are required to control the total heat load they place on their receiving waters. In these cases, utility may incur significant costs to manage the heat of its wastewater discharge and temperature may be an important customer service characteristic. On the other hand, other utilities may not be required to control temperature and spend very little to mitigate this characteristic of wastewater. In some cases, wastewater utilities incur costs to treat a constituent in wastewater even if that constituent is not regulated as part of the utility's discharge permit.

The second standard addresses the variation in contributions of a constituent by customer class. If all customers contribute an equal concentration of the constituent measured by the customer service characteristic in question, then very little benefit would be derived by separating the costs for this additional customer service characteristic. Similarly, if the contribution of a constituent under consideration as a customer service characteristic is correlated to another constituent being measured, then the costs of the correlated constituent can be allocated according to the contributions of the original constituent. In general, because of the administrative cost of conducting testing, etc., adding constituents to the list of customer service characteristics should be carefully considered.

The final standard is the ability to accurately measure variations in wastewater contributions by class. Using tests that are subject to significant sampling error may

reduce the overall accuracy of the resulting cost allocations. Therefore, the impact of the sampling error should be incorporated in any decision regarding the selection of customer service characteristics.

Many alternative measures of wastewater strength exist. However, considering the three standards listed above, three alternatives appear most relevant to AWU. These are:

1. Flow, BOD, and TSS only (current);

2. Add Total Kjeldahl Nitrogen (TKN)[9]; and

3. Add Phosphorus.

For this evaluation, the current approach is compared to approaches that add either TKN or Phosphorus to the list of customer service characteristics included in the cost allocations. The selection of appropriate customer service characteristics for the cost-of-service analysis depends on the design and operation of the wastewater system.

RECOMMENDATIONS

Red Oak recommended that AWU continue allocating wastewater costs based on flow, BOD, and TSS only. Red Oak also recommended that AWU implement a sampling protocol to develop data on TKN and Phosphorus for its industrial pretreatment program. Once data are available, Red Oak recommends that AWU consider adding these customer service characteristics to its cost-of-service methodology. Red Oak further recommends that the cost-of-service model be developed to facilitate the introduction of these customer service characteristics.

EXECUTIVE TEAM DECISION

The Executive Team decided to use flow, BOD, and TSS only as customer service characteristics for wastewater cost allocation but requested that Red Oak develop the model with the capability to add either TKN or Phosphorus allocations in the future. The Executive Team also decided not to implement a sampling protocol to gather data on TKN and Phosphorus in the system until required by future regulations.

3.4.4.3. Issue 3: How Should I/I Be Estimated and Allocated In the Cost Allocation Process?

DESCRIPTION

The total volume of wastewater at AWU's wastewater treatment plants consists of contributed wastewater and inflow and infiltration (I/I). Infiltration is the flow entering the sanitary sewer resulting from high groundwater or precipitation that occurred days or weeks before the observed flow in the sanitary sewer. Inflow results from rainfall that

[9]Total Kjeldahl Nitrogen (TKN) is the sum of organic nitrogen, ammonia, NH_3, and ammonium, NH_{4+} in biological wastewater treatment. TKN is determined in the same manner as organic nitrogen, except that the ammonia is not driven off before the digestion step.

enters the sanitary collection system through a number of direct connections such as catch basins, roof drains, foundation drains, and manhole covers. The I/I in the system may be estimated based on available studies or comparisons of contributed wastewater and metered plant flows[10]. Customers generally cannot influence the level of I/I in the system. Generally, the utility mitigates I/I to reduce the flow-related costs of treatment and allow the flow-related capacity of the facilities to be available to customers, thereby avoiding expansions of capacities. Utilities generally establish a threshold for cost-effectiveness of I/I abatement measures based on the present worth cost of conveying and treating I/I.

The cost associated with collecting, conveying, and treating I/I must be allocated within the cost-of-service methodology. Currently the assumed I/I flow used to determine the cost of service in AWU's wastewater system is 10.5 percent of total flows.

As described in the Wastewater Cost Allocations issue paper (see Volume II of this report), the USEPA has issued guidelines on the allocation and recovery of I/I costs using several approaches. Based on these approaches, four alternatives are evaluated here.[11] These are:

1. Combined connections and volume (Current),
2. Contributed wastewater volume,
3. Number of connections, and
4. Land area.

As described in the Wastewater Cost Allocations issue paper, the primary differences among the alternatives are based on alternative philosophies regarding the appropriate allocation of costs. AWU currently uses the combined approach which attributes 50 percent of the I/I flows to customer classes based on the number of connections and 50 percent based on the class' contributed wastewater flow. The other approaches are consistent with USEPA guidelines.

RECOMMENDATIONS

Red Oak recommended that AWU allocate and recover its I/I cost based on the contributed flow of each customer class. This recognizes the fact that individual customers cannot manage I/I, and that the cost of I/I is primarily in consuming flow-related capacity.

[10] Water Environment Federation, *Financing and Charges for Wastewater Systems*, Manual No. 27, (Alexandria, VA: Water Environment Federation, 2004).
[11] Since AWU does not base its user charges on *ad valorem* property taxes, the value of property would not be consistent with USEPA guidelines. Therefore, it is not considered in this evaluation.

EXECUTIVE TEAM DECISION

The Executive Team decided to allocate I/I as a system cost based on contributed volume. For analytical purposes, the Executive Team requested the model be developed with the capability of allocating I/I as a system cost or based on a ratio of volume and number of connections.

3.4.5. Customer Classification

3.4.5.1. Issue 1: Should the Large-Volume Customer Class Be Disaggregated?

DESCRIPTION

As the name implies, large-volume customers have a significant impact on the total water and wastewater services provided by AWU. In the past, these seven customers have been grouped into one customer class and their demands aggregated to calculate a class-average peaking factor. Accordingly, the cost-of-service rates for these customers were based on the average cost of serving the customer class as a whole.

The 20 wholesale customers, on the other hand, are each treated as a single customer class within AWU's rate setting process. The question addressed here is whether a similar approach should be used for large-volume customers.

Two alternatives are evaluated:

1. Maintain one class (current approach), or
2. Separate classes for each large-volume customer.

RECOMMENDATIONS

Red Oak recommended that AWU disaggregate its large-volume customers and establish individual rates for each customer based on that customer's estimated water and wastewater usage characteristics.

EXECUTIVE TEAM DECISION

The Executive Team decided to disaggregate the large-volume customer class.

3.4.5.2. Issue 2: Should the Threshold for Inclusion in the Large-Volume Class Be Adjusted?

DESCRIPTION

AWU historically has placed customers with demands exceeding 85 million gallons per year in its large-volume class. This threshold was set to balance the administrative burden of managing a large-volume class with the relatively few customers that use water for significant industrial processes. Generally, large industrial customers have lower peaking factors, and therefore, a lower cost of service. The large-volume threshold was set, in part, to identify these types of customers. As industries have implemented conservation measures, concerns have been raised regarding their abilities to meet the threshold requirements with diminished water demands.

Three alternatives are evaluated:

1. Maintain 85 MG per year as the threshold (current approach), or
2. Increase the threshold to 100 MG per year, or
3. Reduce the threshold to 50 MG per year.

During its routine review of customer water sales, AWU has determined that the number of customers potentially impacted by a change in definition of alternative threshold is quite small. No compelling purpose was identified to change the threshold for inclusion as a large-volume customer.

RECOMMENDATIONS

Red Oak recommends AWU maintain its current thresholds.

EXECUTIVE TEAM DECISION

The Executive Team decided to maintain the 85 MG per year threshold.

3.4.5.3. Issue 3: Should an Irrigation Class be Created?

DESCRIPTION

AWU currently uses increasing block rates to send conservation pricing signals to its single-family residential customers. Much of the water consumed in the upper tiers is for lawn irrigation and other outdoor uses. AWU uses seasonal rates to provide a conservation price incentive for its other retail customers.

The City's Water Conservation Task Force has identified water conservation potential from changes in water rate design. Some of the proposals are dependent on implementing a new utility billing system that will support more complex water rate designs. In the interim, however, the Water Conservation Task Force has identified changes in the water rates applied to irrigation accounts as a potential source of water savings.

Since 1998, AWU has required all commercial and multi-family customers connecting to its system to install a separate irrigation meter for water used for outdoor irrigation. As of September 1, 2007, AWU provides these separate irrigation meters to approximately 3,000 customers. Other customers have opted to install separate irrigation meters for various reasons. Some reasons for installing separate irrigation meters include:

1. Eliminate wastewater charges for water that is not returned to the wastewater system.

2. Provide alternative points of connection to AWU's system. This may be true for some residential customers that have large irrigation demands that cannot be met by a single ¾-inch meter.

3. Other reasons identified by the customer.

Because of the mandatory irrigation meter policy for non-residential customers, AWU currently has a mix of customers within each of its customer classes that have, and do not have, separate irrigation meters. The incomplete implementation of the separate irrigation meter policy means that, out of necessity, some customers will use their single connection to AWU's system for both indoor and outdoor uses. Other customers will use two meters. This presents a significant challenge to AWU in implementing an irrigation rate that applies to some members of a class—but not all. The incomplete implementation of its separate irrigation meter policy may require establishing a separate irrigation customer class to assess specific rates for irrigation accounts.

Two alternatives are evaluated:

1. Do not implement an irrigation class (current approach), or
2. Implement an irrigation class.

RECOMMENDATIONS

Red Oak recommended that AWU not create an irrigation class at this time. Rather, Red Oak recommended that AWU consider using rate design alternatives within the existing customer classes until a new utility billing system is in place. Many of the objectives of creating the irrigation class can be addressed through the rate design process. In addition, this approach will allow AWU to be more deliberate in its future policy development on irrigation water use without the implementing alternatives that will likely be significantly revised within a few years.

Implementing a separate irrigation rate and class would introduce inequities between customers having irrigation meters and those that receive their outdoor water through a traditional domestic meter.

EXECUTIVE TEAM DECISION

The Executive Team decided not to create an irrigation customer class. AWU will instead implement a revised rate structure that will encourage conservation among irrigation customers.

3.4.6. Rate Design

3.4.6.1. Issue 1: What Is the Best Method for Providing a Subsidy to Low-Income Customers?

DESCRIPTION

Enhancing the affordability of water and wastewater services for customers of limited financial means has been an ongoing objective of AWU and its citizens. Ultimately, the approach that AWU uses to assist low-income customers must meet the social and political needs of the City rather than technical cost-of-service concerns. The reader should consider the nature of this policy question when reviewing our recommendations.

The two available alternative methodologies are:

1. Provide a discounted rate for consumption in blocks 1 and 2 (current approach).
2. Waive the fixed charge for customers that qualify as low-income households.

The primary difference between the options is the degree of administrative burden and the effectiveness of the policy. The current approach is quite easy to implement and works easily within AWU's current rate structure. However, the benefits are distributed indiscriminately and provide the same discount for users with low incomes and those without. This broad distribution limits AWU's ability to lower the cost of water for customers of limited means in a way that a more focused program would not.

Unfortunately, a more focused program may require substantial effort to pre-qualify customers as "low-income". AWU is collaborating with Austin Energy to identify qualifying customers.

RECOMMENDATIONS

The question of low-income subsidies is inherently a public policy issue. Although our evaluation framework explicitly incorporates the criteria developed by the Executive Team, Red Oak feels less prepared to offer opinions in this area. Considering these caveats, Red Oak recommends AWU consider waiving the fixed charges for low-income customers through a cooperative program with Austin Energy.

EXECUTIVE TEAM DECISION

The Executive Team decided to waive the fixed charge for qualified low-income residential customers. This was implemented November 1, 2008.

3.4.6.2. Issue 2: How Should AWU Recover a Subsidy to Low-Income Customers?

DESCRIPTION

If AWU has a program that reduces the costs for low-income customers, that revenue requirement will need to be recovered from other customers. Like the issue of a low-income subsidy, the allocation of burden of the subsidy is a public policy issue. Essentially, a low-income subsidy does not change the overall cost of operating the utility. Rather it redistributes the burden of the utility to other customers. The question presented here is how that burden should be redistributed.

The two available alternative methods are:

1. Recover the subsidy within the residential class (current approach), or
2. Recover the subsidy from all classes.

The difference between the alternatives is fairly clear. Under the first alternative, the entire cost of a low-income subsidy program is recovered from other single-family residential customers. This is the current policy of AWU. The subsidy incurred to keep blocks 1 and 2 below the cost of service is recovered within blocks three and four.

As an alternative, the burden of the subsidy could be allocated to all customer classes.

RECOMMENDATIONS

Like the question of low-income rates, how a utility recovers a subsidy burden is inherently a public policy issue. Although our evaluation framework explicitly incorporates the criteria developed by the Executive Team, we feel less prepared to offer opinions in this area.

Considering these caveats, Red Oak recommended AWU recover the burden of its low-income program from all customer classes except where prohibited by contract or other legal requirement. There was clear a consensus of the PIC supporting this recommendation through the members' comments and discussions.

EXECUTIVE TEAM DECISION

The Executive Team decided to recover the low-income residential subsidy from all retail customer classes. This was implemented November 1, 2008.

3.4.6.3. Issue 3: Should AWU Introduce a Fifth Block for Single-Family Residential Customers?

DESCRIPTION

The City formed a Water Conservation Task Force as part of its efforts to enhance the conservation of water. This task force produced a set of far reaching proposals for AWU. One of the Task Force's proposals was the implementation of a fifth residential rate block for consumption above 25 thousand gallons (kgal) per month. The Task Force's goal is to implement the new rate block to provide an enhanced incentive to conserve water.

The three alternative methods are:

1. 4-block structure (current);
2. New 5th Block for consumption exceeding 25 kgal per month; and
3. Revised 4-block structure.

The exact details of the rate structure alternatives were developed with staff and presented to the PIC using a conservation-impact model developed by Red Oak. The alternatives described here are hypothetical alternatives, designed to present the general concepts.

The revised 4-block option might be designed to achieve the conservation benefits of a fifth block without the diminishment in customer understanding that a 5-block structure can create. A conservation rate structure is most effective when it serves as an efficient consumer price signal about the true cost of water. Complicated rate structures can reduce the conservation effectiveness if customers do not or cannot understand the relationship between usage and cost. In some regards, a simpler rate structure can

provide greater consumer confidence in that they are interpreting the price signals appropriately and let the price signals influence their consumption decisions.

RECOMMENDATIONS

Red Oak recommends AWU implement a 5-block rate structure for single-family residential customers.

EXECUTIVE TEAM DECISION

The Executive Team decided to implement a fifth block for single-family residential customers.

3.4.6.4. Issue 4: What Conservation Incentives Should Exist for Wholesale Customers?

DESCRIPTION

In addition to providing guidance on residential water rate design, the Water Conservation Task Force also recommended that AWU conduct a cost-of-service study that considers conservation rate structures for wholesale customers.

The three available alternative methods are:

1. Uniform rates by wholesale class (current approach),
2. Seasonal rates, and
3. Excess-use rates.

Each of these rate designs is discussed in the Rate Design issue paper provided in Volume II of this report. Because each wholesale customer is its own customer class, each rate structure alternative will be designed to generate the same revenue requirement consistent with the cost of service. The primary differences will be in the interim incentive to reduce consumption, avoid potentially higher costs, and to decrease both the volatility of costs for the wholesale customers and revenues for AWU.

RECOMMENDATIONS

Red Oak recommends that AWU continue to use its uniform rate by customer class and work with its wholesale customers to achieve greater water conservation through other mechanisms. Red Oak's recommendation considered:

1. Several wholesale customers have implemented conservation rates.

2. Some of the existing wholesale agreements may prohibit the implementation of conservation rates. Introducing an inconsistent rate design for this class of customers may introduce equity concerns.

3. Rates for wholesale customers are based on each wholesale customers individual peaking factors. Since these peaking factors directly affect their rates, it provides

each wholesale customer a direct incentive to manage its water demands during the peak season.

If AWU does pursue a conservation rate for wholesale customers, Red Oak recommends it adopt a seasonal rate until its new billing system is in place.

EXECUTIVE TEAM DECISION

For the reasons stated above, the Executive Team decided to maintain a uniform rate structure for wholesale customers.

3.4.7. Rates for Irrigation Customers

3.4.7.1. Issue 1: If AWU Implements Higher Rates for Irrigation Users, How Should the Excess Revenues Generated by the Higher Rates Be Used?

DESCRIPTION

The Water Conservation Task Force recommends that AWU establish "commercial irrigation rates comparable to highest residential tiers".[12] The highest residential tiers, however, are established to generate sufficient revenues to subsidize the rates of blocks 1 and 2. The highest residential block exceeds the cost of providing irrigation water in the peak season. Since that is the case, pricing irrigation water at the highest residential block will generate excess revenues.

The five available alternative methodologies are:

1. Use the excess revenues to reduce the rate for indoor water use for irrigation customers;
2. Use the excess revenues to reduce the rates for all customers;
3. Set the irrigation rate at the cost of service to eliminate excess revenues;
4. Set the excess revenues aside for other designated purposes; and
5. Do not establish an irrigation rate (current approach).

Alternatives 1 and 3 require AWU to establish a new customer class or classes for its irrigation customers. Although the Water Conservation Task Force discussed irrigation rates for commercial customers only, AWU has irrigation meters for single-family residential, multi-family residential, and industrial customers too. Approximately 1.5 percent of AWU's meters are separate irrigation meters. From a practical standpoint, AWU would likely be required to treat all non single-family residential classes the same.

The first alternative would determine the amount of revenue that irrigation rate generates for each of the irrigation classes (e.g., single-family, multi-family, commercial, etc.). The excess revenue generated from the irrigation rate would then be used to reduce the non-irrigation water used by those irrigation customers as a class.

[12] See Policy CI-3, page 25 of the *Water Conservation Strategies Policy Document, Water Conservation Task Force.*

As an alternative, AWU could use the excess revenues generated from irrigation rates to reduce the rates for all customers within the customer classes to which the irrigation customers belong. Under this approach, AWU would not establish separate irrigation customer classes. Rather, AWU would use the excess revenue generated from, for example, the commercial irrigation rates, to subsidize the other commercial rates.

AWU could establish a cost-of-service rate for irrigation customers that did not generate excess revenues. Under this approach, irrigation meters would be charged their cost of service and other customers would not be affected. This approach requires that AWU create one or more irrigation classes.

AWU could designate specific purposes that the excess revenue would fund. For example, AWU could designate revenue from irrigation customers that exceed the cost of service be dedicated to funding its reuse program.

Finally, AWU could maintain the status quo and not create an irrigation rate.

RECOMMENDATIONS

Red Oak recommended that AWU continue its current practice and not adopt an irrigation rate. Red Oak recommends AWU consider adopting an excess-use rate structure for its non-residential customers that recovers the cost of service when its billing system can accommodate it.

If AWU does adopt an irrigation rate before implementing its new billing system, Red Oak recommends that AWU either set the irrigation rate at the cost of service, or dedicate the excess revenue for a specific purpose.

EXECUTIVE TEAM DECISION

The Executive Team decided not to adopt an irrigation rate pending the implementation of excess-use rates. However, if excess-use rates are not implemented and irrigation rates are adopted, the Executive Team decided to set aside excess revenues received from the irrigation customers for other designated purposes. The Executive Team will decide annually how the excess revenues should be used. Potential uses for the excess revenues are the reclaimed water system, water conservation programs, and a rate stabilization fund.

3.4.7.2. Issue 2: What Is an Appropriate Level for Non-Residential Irrigation Rates?

DESCRIPTION

The Water Conservation Task Force directed AWU to evaluate various strategies to reduce water demand within AWU's service area. One of the strategies the Task Force identified was "establishing commercial irrigation rates comparable to highest residential tiers." In addition, the Water Conservation Task Force directed AWU to "Establish a residential fifth tier for use above 25,000 gallons per month." Determining the irrigation rate, therefore, may require the determination of the residential fifth-block rate. The

residential fifth-block rate was discussed in the Rate Design issue paper provided in Volume II of this report.

Complicating the setting of irrigation rates is the linkage to the highest "residential tiers." The rate for the highest residential tiers currently does not reflect the cost of providing irrigation water. Rather, the rate for the highest residential tiers is determined to recover the total revenue requirement for the residential class. This rate likely exceeds the cost of service to maintain the affordability of water consumed in blocks 1 and 2. As described in the Issue Paper, setting the rate equal to the highest residential rate will likely generate revenues exceeding the cost of service.

The three available alternative methods are:

1. Set the irrigation rate equal to the highest residential block rate;
2. Set the rate equal to the cost-of-service rate for irrigation; or
3. Do not have an irrigation rate (current approach).

These alternatives are closely related to the alternatives presented for Issue 1 in Section 3.4.7.1 on page 3-27. However, the perspective is different. For this issue, we are examining the impact of the rate alone, not the additional revenue it may generate.

The first alternative implements the Water Conservation Task Forces strategy directly. It presents significant equity concerns that may provide difficulty in implementing the approach. The second alternative will provide less conservation incentive than the first, but it ensures that customers pay their fair share of AWU's costs. Finally, the last alternative maintains the status quo.

RECOMMENDATIONS

Red Oak recommended that AWU implement excess-use rates for non-residential customers. However, if excess-use rates cannot be implemented, Red Oak recommends AWU set the non-residential irrigation rate equal to the highest residential block rate.

EXECUTIVE TEAM DECISION

The Executive Team decided to implement excess-use rates for non-residential customers.

3.4.7.3. Issue 3: Should Single-Family Residential Customers with Irrigation Meters Receive Irrigation Water at the Block 1 and 2 Rates?

DESCRIPTION

Currently single-family residential customers with separate irrigation meters receive the advantages of block rates for both their domestic meter (i.e., the meter used to supply their indoor water use) and irrigation meter. In other words, the residential customer with two meters pays the lower block 1 rate for consumption up to 2,000 gallons per month on both meters. This means the customer has the potential to receive a total of 4,000 gallons of water per month priced at the block 1 rate.

AWU currently prices its first two blocks (i.e., consumption from 0 to 2,000 gallons and from 2,000 to 9,000 gallons) at less than the average cost of service to make water more affordable for its customers. Also, the higher block rates are designed to encourage the wise use of water during AWU's peak season. The current rate structure for single-family irrigation accounts sends an improper price signal to those limited number of single-family residential customers with a separate irrigation meter.

Attachment B to the Rates for Irrigation Customers Issue Paper, provided in Volume 2 of this report, presents an analysis of irrigation customers. Of the approximately 180,000 residential customers, approximately than 140, or 0.08 percent, have a separate irrigation meters. Of those single-family residential customers inside the city limits with separate irrigation meters, the average consumption from June 2007 through September 2007 was approximately 19,000 gallons per month. Approximately 47 percent of this water is priced at the discounted block 1 and 2 rates.

The two available alternative methods are:

1. Provide block 1 and 2 discounted water (current approach); or
2. Price all water at the rates for block 3 and above.

The first alternative maintains AWU's current policy. The second method sets the rate for all water at a minimum of AWU's block 3 rate, thereby eliminating the discounted water.

RECOMMENDATIONS

Red Oak recommended that AWU charge the block three rate for all consumption below 9,000 gallons per month for water through a dedicated irrigation meter for single family residential customers. Furthermore, Red Oak recommended that AWU adjust this policy and the rate thresholds to prevent subsidized water being served through irrigation meters.

EXECUTIVE TEAM DECISION

The Executive Team decided to price all water usage in blocks 1 through 3 from a residential irrigation meter at the block 3 rate.

Austin Water Utility
Cost of Service Rate Study 2008

SECTION

4

Water Rate Analysis

REDOAK CONSULTING
A DIVISION OF MALCOLM PIRNIE

4. Water Rate Analysis

4.1. Introduction

Figure 4-1 illustrates the basic steps to generate cost-of-service water rates described in the following subsections. These steps are:

1. Establish customer characteristics.
2. Calculate revenue requirements.
3. Allocate costs to water system functions.
4. Allocate costs to customer cost pools[1].
5. Allocate costs by water system functions and cost pools to cost categories.
6. Allocate costs to customer service characteristics.
7. Allocate costs by customer service characteristics to customer classes.
8. Design rates.

4.2. Customer Characteristics

Customers of a water utility are often identified according to customer class. Each customer class has unique water demand and usage characteristics. Table B-1 in Appendix B provides, by customer class, summaries of numbers of accounts, estimated water sales, and estimated water production.[2]

Because cost-of-service is based on the concept of proportionality, customer service characteristics for each customer class must be analyzed to allocate the system revenue requirements equitably.

Determining customer service characteristics varies with the cost allocation methodology used. One such methodology is the base/extra-capacity cost allocation method, which is described by the AWWA. This method often includes the following customer service characteristics:

- Base
- Extra-Capacity Demands (maximum-day and maximum-hour)
- Customer
- Meter
- Fire Flow

[1] A cost pool is a group of customers or group of customer classes that share responsibility in a specific classification of costs. For example, wholesale customers would not be part of a "Retail-only" cost pool, in which facilities and associated costs necessary to serve retail customers are shared only by the retail customer classes.

[2] Estimated water production includes a percentage over water sales to account for water losses.

Base demands are average water demand conditions. They are the demands a water utility would experience if water consumption occurred evenly from day-to-day and hour-to-hour. Base demands can be calculated by dividing the total annual consumption of a customer class by 365 days.

Extra-capacity demands are water demands that exceed average levels of water usage by system customers. Such demands are directly related to customer's water consumption characteristics.

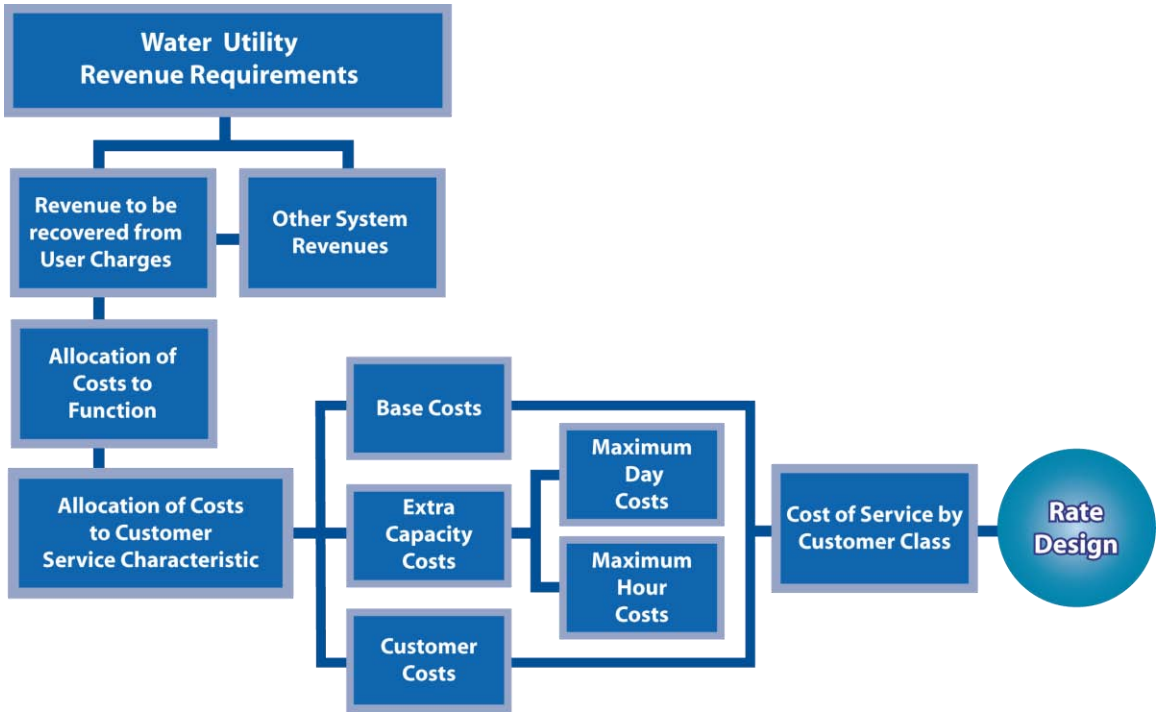


Figure 4-1 Cost-of-Service Process

The customer designation or characteristic represents the number of customers in a customer class. The meter characteristic is the number of equivalent meters served in a customer class. For cost allocation purposes, the number of equivalent meters is calculated to equitably assign the higher costs of larger meters to those customers with meters larger than a standard single-family residential meter.

Each customer class' proportion of the customer service characteristics is calculated to determine each class' demands placed on the water system. AWU's water customer service characteristics are summarized by customer class in Table B-2 in Appendix B.

An additional component of customer characteristics is the cost pools to which a customer class belongs. Customer classes vary in their use of the system, with costs frequently shared among all customer classes. Often, one or more customer classes may

use a part of the system exclusively and therefore would be held responsible for the associated costs. All customers belong to the joint cost pool, but other specific cost pools, such as retail only, wholesale, etc., may exist. A summary of cost pool participation by customer class is provided in Table B-3 in Appendix B.

4.3. Revenue Requirements

The second element of information for a cost-of-service rate analysis is an estimate of system revenue requirements. The AWWA Manual M1 describes two methods of determining the revenue requirements of a water utility. These are:

1. Cash Basis, and
2. Utility Basis

A third method is a hybrid of the two and is called the Utility Basis with Cash Residual. Each method is described below.

4.3.1. Cash Basis

Because government-owned utilities are required to maintain a cash budget, revenues and expenses must balance. Unlike investor-owned utilities, government-owned utilities generally do not have access to sources of capital other than retained earnings and formally issued debt. Therefore, the total revenues collected from all customers must equal budgeted expenses. This balancing of cash revenues with cash expenses for the current period is the foundation for the cash basis. Common cash basis revenue requirements include the following. Each is described in greater detail below:

- Operations & Maintenance (O&M) Costs
- Debt Service
- Capital Expenditures (Not Debt Financed)
- Transfers to Capital Reserves and Other Funds

Implicit in the cash-basis method is the concept of self-regulation. Accordingly, most municipal utilities are regulated by their boards or city councils. Economic regulation by a public service commission (PSC) occurs at times, but is normally not required. As such, the cash basis is a good method for utilities that operate under the oversight of a publicly elected city council or similar government body. The cash basis is a commonly accepted approach to determine revenue requirements for customers within the municipal boundaries that are directly served by the utility and are owners of the system's assets.

4.3.1.1. Operations & Maintenance Costs

O&M costs account for most of the day-to-day expenditures for operating a water utility. O&M costs include, for example, labor, benefits, insurance, utilities, water purchases, etc. The projected annual O&M expenditures for FY2009 are provided in Table B-4 in Appendix B. The O&M expenditures for FY2009 were based on AWU's budget projections. Consistent with industry standards, these expenditures exclude depreciation expenses.

4.3.1.2. Debt Service Costs

Debt service costs are the costs associated with financing major capital improvements which are usually identified in a utility's capital improvements plan (CIP). Utilities frequently finance major capital improvements by issuing long-term financial instruments for two primary reasons. First, the financial resources required for these types of projects typically exceed the utility's available resources from the normal operation of its system. Second, spreading the debt service costs for the project over the repayment period effectively spreads the financial burden of financing large improvements to both existing and future users of the system. This burden sharing allows the utility to better match the cost of improvements with those customers using the improvements. Capital improvement projects are designed to fulfill a range of needs including:

- Compliance with new state and federal regulations,
- Enhancement of the level and reliability of the service provided,
- Meet ongoing demands of system growth and economic development, and
- Replacement and refurbishment of existing system infrastructure.

AWU's debt service requirements include debt service for revenue bonds, commercial paper, G.O bonds, and water district bonds. For FY2009, the total cost is estimated to be over $78.6 million. The total cost is included in Table B-5 in Appendix B.

4.3.1.3. Capital Expenditures (not Debt Financed)

Some capital expenditures may be funded directly from the utilities revenues or operating fund. In fact, AWU's financial policies suggest that 20 percent of capital expenditures be funded by equity rather than debt. AWU's capital expenditures from rates is estimated to be over $12.3 million for FY2009. The total cost is included in Table B-5 in Appendix B.

4.3.1.4. Transfers to Capital Reserves and Other Funds

In addition to funding AWU's Water Construction Fund, AWU's water utility provides funding for the City of Austin General Fund, Sustainability Fund, Radio Communications Fund, Public Improvement District, and Environmental Remediation Fund. For FY2009, these additional transfers are estimated to be nearly $15.5 million. The transfers are included in Table B-5 in Appendix B.

4.3.2. Utility Basis

To protect consumers, investor-owned utilities are subject to economic regulation. Because most privately owned utilities are themselves natural monopolies, a government oversight agency, typically a PSC, regulates their profits to prevent overcharging of their customers.

To implement the economic regulation of investor-owned utilities, PSCs typically require utilities to use the utility basis to determine revenue requirements. This method allows for a fair rate of return that the utility should earn on the investments it makes in providing service to its customers. This return compensates the utility for its investments

and provides cash flow for operations of the utility. The rate of return is often a weighted average of the utility's interest cost on debt and an allowed return on equity. The return is then multiplied by the rate base of the utility to calculate the revenue, in addition to all other allowable expenses the utility must earn in order to provide the return component allowed by the PSC.

In addition to a return on rate base, under the utility basis, an investor-owned utility is allowed to collect revenues to recover O&M costs, depreciation on plant in service, as well as taxes and/or miscellaneous expenses.

Table 4-1 compares the utility and cash basis by showing the comparable category for each method. Both methods recover the utility's O&M costs and taxes, but the two differ in the way they recover capital costs. Using the cash basis, interest and principal on debt and other capital expenditures are explicit in revenue requirements. Using the utility basis, these costs are recovered through annual depreciation and the return on the rate base.

Table 4-1 Comparison of Cash and Utility Basis

Cash Basis	Utility Basis
O&M Costs	O&M Costs
Capital Expenditures	Depreciation Expense
Amortization of Debt	Depreciation Expense
Interest on Debt	Return on Rate Base
Franchise Fees / Taxes	Franchise Fees / Taxes

4.3.3. Utility Basis with Cash Residual

The utility basis with cash residual method is an appropriate method when a municipal utility serves users outside its corporate boundaries, such as a wholesale customer. The AWWA recognizes the use of the utility basis for determining the revenue requirements for these ex-corporate users because "this situation is similar to the relationship of an investor-owned utility to its customers since the owner (municipality) provides service to non-owner customers . . ."

Unlike investor-owned utilities, the municipal utilities are often subject to local governmental budget laws that require balanced budgets. To accommodate this constraint, a hybrid method of calculating revenue requirements is often required. This method uses the utility basis for determining the outside users' revenue requirements and the cash basis for the inside users'. To accommodate the balanced-budget constraint, the rate of return applied to the utility's inside users is determined so that the total revenues equal the utility's residual cash-basis needs. Using this method, the rates for the inside and outside users can vary, recognizing the past investments made by the ratepayers inside the utility's corporate boundaries.

4.3.4. Findings for AWU

As described in Section 3, Red Oak presented the revenue requirement options to both the PIC and Executive Team. Consistent with the Executive Team's decision, Red Oak used the cash-basis method of determining revenue requirements for this study. Also, after detailed analyses, the differences in costs, rates, and revenues between inside- and outside-city retail customers did not justify the continuing segregation of these customers by customer class. Based on this finding, the inside-city and outside-city retail classes were combined. Therefore, the computed rates in this report do not distinguish between inside- and outside-city retail customers and should be applied to all customers regardless of location.[3]

4.4. User Charge Revenue Requirements

The portion of annual system revenue requirements to be recovered through water rates depends on a utility's financing policy and its other sources of income. To determine the amount of revenue that rates must generate annually, the total revenue requirements must be reduced by non-rate or other system revenues. These non-rate revenues may include, but are not limited to, miscellaneous charges and interest earnings on unrestricted fund balances. Capital reserve funds may also provide revenue to offset costs of capital improvements.

The FY2009 non-rate revenues are provided in Table B-6 in Appendix B. Approximately 40 percent of the total non-rate revenues offset O&M costs, the rest offset capital costs in this analysis. A summary of user charge revenue requirements by customer class is provided in Table B-7. The total revenue requirements of $194.3 million presented in Table B-7 equals the total O&M of $94.7 million (Table B-4) plus the total cash basis capital costs of $106.4 million (Table B-5) less the non-rate revenues of $6.8 million (Table B-6).

4.5. Cost Allocations

The cost-of-service methodology described in this section uses the base/extra-capacity method for allocating costs among customer classes, as described in the AWWA Manual M1. In theory, each customer could be charged according to the actual cost of providing water service to that customer; however, it is impractical to estimate the cost of serving each of AWU's customers. As part of a cost-of-service study, analysts classify customers into relatively few, somewhat homogeneous, groups called customer classes, and then estimate the cost of serving each class.

Water systems are designed to meet both the average and peak demands of their customers. Therefore, data on total annual consumption and contributions to system peak demands, as mentioned in the section on customer characteristics, are needed to allocate

[3] Because of the differences in services, wholesale customer class distinctions are maintained in this report. Only retail classes were combined.

costs fairly among customer classes. Data on the number of customers with meters of various sizes must also be available to allocate customer-related and meter-related costs.

Equitably allocating the water system's user charge revenue requirements to the customer classes involves a multi-step process. Beginning with O&M costs, the following steps were completed. Allocations of capital costs and depreciation expenses are described later in this section.

- Step 1 functionalizes the costs;
- Step 2 assigns the functionalized costs to cost pools (e.g., joint—benefiting all customer classes, or as specific—benefiting one or more cost pools);
- Step 3 allocates the joint and specific costs by cost pools to cost categories;
- Step 4 then distributes the categorized costs to customer service characteristics;
- Finally, Step 5 distributes the O&M costs to customer classes by pool based on each class' proportion of the customer service characteristics.

These steps are described in more detail in the following subsection.

4.5.1. Step 1: Functionalization of Costs

A water utility's O&M expenditures may be allocated to functions such as source of supply, transmission and distribution, pumping, customer services, general administration, etc. Functionalizing costs in this manner enhances the accuracy and equity of the water system cost allocation to the customer classes. AWU's O&M expenditures and rate base are allocated to the following system functions:

- Raw Water (Production and Transmission)
- Treatment – Average Day
- Treatment Facilities
- Pump Stations & Booster Stations
- Pump Stations Power
- Tanks/ Reservoirs
- Transmission Mains
- Distribution Mains
- Direct Fire
- Retail Meters & Services
- Meters & Services
- Watershed Land Purchases
- LCRA Water Rights
- Customer Service
- Small Calls

- Wholesale Services
- Revenue-Based Volume Charge
- Indirect Costs (e.g., administrative and general)

Each of these functions is described below.

4.5.1.1. Raw Water (Production and Transmission)

Raw water typically consists of costs related to the procurement and transmission of raw water to a treatment facility.

4.5.1.2. Treatment – Average Day

Costs functionalized as *Treatment – Average Day* include direct costs related to treatment facilities. Treatment plant operations costs, maintenance, power, and chemicals were all included in this function. Costs related to AWU's water conservation program were also included here under the rationale that water conservation reduces the need for treated water, thereby reducing treated water costs.

4.5.1.3. Treatment Facilities

A small portion of treatment plant operations costs, including the indirect costs of utility administration and support, were included in this function. For rate base, laboratory equipment was functionalized as a *Treatment Facilities* asset along with all treatment plant facilities.

4.5.1.4. Pump Stations & Booster Stations

The costs of maintaining pump stations and booster stations were included here with the net plant in service.

4.5.1.5. Pump Stations Power

The cost of electricity is the major cost item included as part of this function.

4.5.1.6. Tanks/ Reservoirs

The costs of maintaining AWU's finished water storage facilities were included here with the net plant in service.

4.5.1.7. Transmission Mains

Transmission main maintenance costs, along with the net plant in service on the mains themselves, constitute this function.

4.5.1.8. Distribution Mains

Distribution main maintenance costs, along with the net plant in service on the mains themselves, constitute this function. These costs are not allocated to wholesale customers.

4.5.1.9. Direct Fire

Maintenance costs associated with fire hydrants, along with the net plant in service on the hydrants, constitute this function.

4.5.1.10. Retail Meters & Services

Costs such as building plan review, land use review, and site inspections were included in this function. These costs were segregated from the next function, *Meters & Services*, because they only apply to retail customers.

4.5.1.11. Meters & Services

The costs of maintaining customer meters, along with the meters and services net plant in service, were included in this function.

4.5.1.12. Watershed Land Purchases

This function includes only a watershed land purchase.

4.5.1.13. LCRA Water Rights

This function represents the costs of raw water from LCRA and a proposed debt service payment from AWU's budget fund summary. The debt service is for refunding subordinate lien bond Series 2001B. Future wholesale customers may provide their own raw water, and in that case, would not pay the cost associated for LCRA Water Rights.

4.5.1.14. Customer Service

The labor and benefits of AWU's billing department are included in this function. This function also includes the charges by Austin Energy to provide certain billing services.

4.5.1.15. Small Calls

The labor and benefits for small call distribution system support are included in this function.

4.5.1.16. Wholesale Services

Operations costs related to AWU's Strategic Resources Services for Wholesale are included in this function. These costs are borne exclusively by AWU's wholesale customers.

4.5.1.17. Revenue-Based Volume Charge

Revenue Allocated Volume Charge is not a system function. This function was included in the analysis as a way of allocating the costs of transfers to the City of Austin General Fund and Sustainability Fund. These costs are allocated to each customer class using the proportionate share of each class' historical revenue as the basis. Historical revenues from the last three fiscal years were used in this part of the analysis.

4.5.1.18. Indirect Costs

Indirect costs that were not directly accountable to any of the functions were allocated proportionally to some or all of the functions based on weighted averages of the costs included in those functions. Costs that were allocated indirectly include most of AWU's administration and support services.

4.5.2. Step 2: Assignment of Costs to Cost Pools

Step 2 assigns costs to cost pools. A cost pool is a grouping of costs and one or more customer classes that share responsibility for that grouping of costs. AWU's costs are assigned to one of the following cost pools:

- Joint
- Retail Only
- Wholesale
- Watershed Land
- LCRA
- Indirect Fire

The *Joint* cost pool includes costs common to all customer classes. Joint costs are those costs that are shared by all customers of the water system in proportion to their respective use of the system. Other cost pools include costs specific to certain groups of customer classes. For example, costs associated with distribution are specific costs associated with serving retail rather than wholesale customer classes. Wholesale customers that provide their own raw water will not participate in the LCRA costs charged to AWU. Watershed land debt service costs are allocated to retail customers only. Specific pools, therefore, can be divided into retail customers and wholesale customers.

Table B-8 in Appendix B provides a summary of functionalized O&M costs by cost pool. Table B-9 provides a summary of specially allocated items by cost pool. Table B-10 shows those costs that are allocated based on historical revenues (as opposed to water use). These costs are described as *Revenue-Based* Volume Chargecosts and were allocated to the Joint cost pool. The general fund transfer is an example of a revenue based cost. The allocation of the cost to customer classes is consistent with the method of determining the amount of the transfer (i.e., three-year historical average revenues). Table B-11 shows how functionalized net plant in service was allocated to cost pool.

4.5.3. Step 3: Allocation of Costs by Pools to Cost Categories

To facilitate the allocation of costs by pools to customer service characteristics, costs are allocated to cost categories in Step 3. AWU's functionalized costs are allocated to the following cost categories:

- Raw Water
- Treatment Facilities
- Chemicals & Power

- Pump & Booster Stations
- Tanks/ Reservoirs
- Transmission Mains
- Distribution Mains
- Fire
- Meters & Services
- Customer Service
- Wholesale Services
- Revenue-Based Fixed Charge
- Revenue-Based Volume Charge
- Indirect Costs (e.g., administrative and general)

Cost categories provide a way to further aggregate similar types of costs after functionalized costs have been disaggregated to cost pools. For example, the functions of *Retail Meters & Services* and *Meters & Services* can both be categorized as *Meters & Services*.

4.5.4. Step 4: Allocation of Costs to Customer Service Characteristics

The assignment of costs to customer service characteristics varies with the allocation methodology used. As described in Section 3, the base/extra-capacity cost allocation method is used in this study. Under this method, costs are assigned to the following customer service characteristics based on an engineering analysis of the system:

- Base
- Extra-Capacity Demands (maximum-day and maximum-hour)
- Customer
- Meter
- Fire Flow (or Indirect Fire)

Base costs vary with water consumption under average demand conditions. They are the costs that would be incurred if water consumption occurred evenly from day-to-day and hour-to-hour and the system did not need to invest in additional capacity to meet peak requirements.

Extra-capacity costs represent costs incurred to meet water demands that exceed average levels of water usage. Extra-capacity costs are incurred because of water usage variations and peak demands imposed on a water system. Such demands are directly related to customer water consumption characteristics and fire-flow demands. Extra-capacity costs are typically divided into costs incurred to meet maximum-day and maximum-hour water demands of system customers.

Customer costs are those incurred in serving customers, regardless of water demand. Such costs include billing, customer service, and meter reading.

Meter costs are those costs that vary with the size of the meter used to serve a customer. Examples of equivalent meter costs include meter replacement and maintenance.

Fire flow costs are those related to the fire protection responsibilities of a water utility. Included in this classification are the costs of fire meters and hydrants, as well as the portion of system capacity reserved for fire suppression.

The distribution of system costs to base and extra-capacity customer service characteristics varies by water utility and can usually be determined by an analysis of the system's design features and operating history. A summary of user charge revenue requirements by customer class and customer service characteristic is provided in Table B-12 in Appendix B.

4.5.5. Step 5: Distribution of Costs to Customer Classes

The next step involves the projections of customer class water demands and their respective consumption characteristics. Typically, there are several customer classes, such as single-family residential, multi-family residential, commercial, and industrial. Table B-1 in Appendix B provides the list of customer classes used for this analysis. Each class uses a different portion of total annual water consumption. In addition, the way in which each customer class uses water is different. Consistent with the direction from the Executive Team, each of AWU's industrial and wholesale customers is identified as a unique customer class. In other words, the industrial customer class was disaggregated so that each industrial customer is now its own customer class. This is consistent with the prior treatment of wholesale customers. Identifying individual large users in this way ensures that each user is only responsible for its impact on and requirements of AWU's system. This improves the equity of the cost-of-service analyses and provides industrial customers with a direct incentive to manage its impact on AWU. Figure 4-2 outlines the procedure for allocating costs to customer classes.

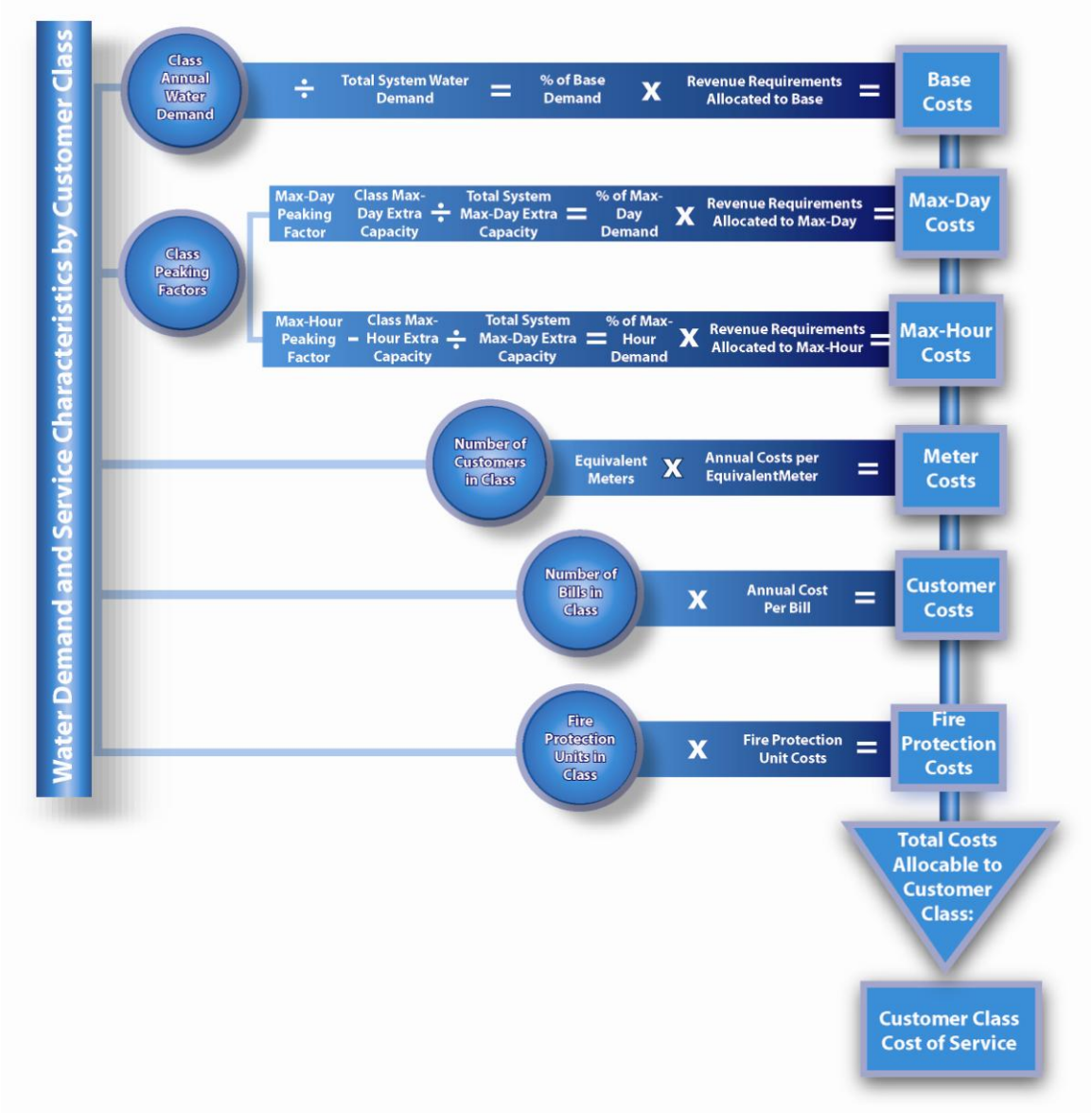


Figure 4-2 Allocation of Costs to Customer Class

Variations in water demand require the installation of sufficient capacity to meet peak uses. If a water utility's customers used water evenly throughout the year, and throughout each day, the costs of service associated with the provision, maintenance, and operation of the system would be lower.

Therefore, peaking factors that describe each customer class' variation in water demand are used to allocate system costs equitably. Generally, a review of water utility consumption and production records and other empirical evidence can be used to estimate each customer class' base, maximum-day, and maximum-hour rates of water use.

Water consumption records are usually available for customer classes only on a monthly bi-monthly, or quarterly basis, and seldom on a daily or hourly basis. Peaking factors are imputed from monthly billing records and system-wide factors and attributed to each customer class. Estimated peaking factors, together with projected water consumption, are then used to establish the costs of service by customer class. A summary of the peaking factors by customer class which are used in this analysis is provided in Table B-13 in Appendix B.

Base costs are allocated to each customer class in proportion to their average daily or annual water consumption (see Figure 4-2). Extra-capacity costs are allocated in proportion to the extra-capacity demands put on the water system above the average daily water use. Peak-usage characteristics are used to determine the portion of extra-capacity costs allocable to each user or class of users. Customer and meter costs are typically allocated on the basis of factors such as number and size of meters and services. In Figure 4-2, meter costs are allocated on the basis of 5/8-inch equivalent meters, while customer costs are allocated based on the number of accounts.

4.6. Additional Steps for Allocating Capital Costs

Allocating capital costs involves steps in addition to those outlined above. Capital costs are allocated by allocating the assets that serve customers. When using the cash-basis method of determining revenue requirements, the cash basis capital costs are recovered in a manner similar to that used for the utility basis. Under the cash-basis method, the total capital costs (e.g., debt service, non-debt finance capital improvements, etc.) is recovered as two elements. These elements include a portion recovered in proportion to the utility's depreciation expense, and a portion that is recovered in proportion to the utility's net fixed assets. The amount recovered based on the utility's net fixed assets equals the cash-basis capital cost recovered from user charges less the utility's estimated depreciation expense. The depreciation portion is based on the estimated depreciation expense. Each of these portions is explained below.

Determining the value of assets that serve each customer class is accomplished by allocating the water system's net fixed assets (i.e., fixed assets net of accumulated depreciation and contributions). Net fixed assets are allocated to functions, pools, categories, and customer service characteristics as in Steps 1 through 5 above. The

following additional steps result in an allocation of the return on rate base to customer classes.

4.6.1. Step 6: Determine Rate Base by Customer Class

The first part of determining the rate base for each customer class is to summarize the net fixed assets allocated by category and cost pool to customer service characteristics and customer class. The fixed assets allocated to each customer class are the net plant in service used and useful for that customer class. The second part of determining rate base by customer class is to calculate an allowance for working capital, or a percentage of the O&M costs allocated to each customer class. The allowance for working capital accounts for the utility's investments in working capital necessary for the operation of the utility.

Adding the net plant in service to the allowance for working capital results in the rate base attributable to each customer class.

4.6.2. Step 7: Determine Rate of Return

Because AWU uses the cash-basis method, the rate of return is determined by dividing the portion of the capital costs by the net plant in service (including the allowance for working capital.)

4.6.3. Step 8: Allocation of Return on Rate Base to Customer Classes

The final step in allocating capital costs is to allocate the return on rate base to each of the customer classes. The return on rate base for each customer class is calculated by multiplying the rate base allocated to each customer class in Step 6 by the respective rate of return from Step 7. Percentages for allocation purposes are calculated by dividing the amount of fixed assets allocated to each customer class by the total fixed assets in the system (i.e. - a prorated share). The result of Step 8 is the return on rate base attributable to each customer class. The total return included in this analysis is nearly $56 million. Table B-7 in Appendix B provides the distribution of this cost to customer class.

4.6.4. Allocating Depreciation Expenses

The portion of its cash-basis capital costs that are recovered in proportion to the depreciation expense are allocated following the same steps as for O&M costs. Depreciation is allocated on the same basis as the asset associated with each line item. Table B-7 in Appendix B shows that the total depreciation expense included in the water analysis is over $23 million.

4.7. Cost-of-Service by Customer Class

After the revenue requirements have been allocated by categories and customer class to the customer characteristics, the O&M, special costs, revenue-based allocation costs, return on rate base, and depreciation expenses are summed to determine the total cost of service by customer class. Appendix B of this report contains detailed calculations for the water cost-of-service rate analysis.

The results presented in this report are based on AWU's revenue requirements for FY2009. These rates depict the impact that changes to AWU's cost-of-service approach would have on its customers. Where appropriate, results (both rates and revenue) from this study are compared to AWU's currently adopted rates and revenue for FY2009. Within this report, the current rates and revenue used for comparison are called AWU's *Existing Rates* or *Existing*. The rates and revenue calculated within this study, using the proposed methodology, are called AWU's *Computed Rates* or *Computed*.

A summary of the existing and computed retail fixed charges is provided in Table 4-2.

Table 4-2 Existing and Computed Fixed Monthly Charges

Meter Size	Existing Rates	Computed Rates
5/8-Inch	$6.25	$6.58
3/4-Inch	7.21	7.78
1-Inch	8.55	9.24
1 1/4-Inch	10.47	11.79
1 1/2-Inch	12.39	14.36
2-Inch	16.23	21.44
3-Inch	33.13	38.92
4-Inch	52.33	75.93
6-Inch	100.33	152.09
8-Inch	148.33	859.64
10-Inch	196.33	897.18
12-Inch	225.13	919.71

Table 4-3 provides a comparison of the existing and computed volume rates by customer class.

Table 4-3 Existing and Computed Volume Water Rates

Volume Rates (per Kgal)	Existing Rates	Computed Rates
Residential		
Block 1	$0.98	$1.10
Block 2	2.59	3.00
Block 3	4.75	6.00
Block 4	8.50	8.62
Block 5	8.50	10.00
Multi Family		
Peak	$3.88	$3.66
Off-Peak	3.54	3.34
Commercial		
Peak	$4.58	$3.90
Off-Peak	4.20	3.56
Industrial		
Hospira		
Peak	$4.28	$5.01
Off-Peak	3.93	4.56
Spansion		
Peak	$4.28	$3.60
Off-Peak	3.93	3.26
Applied Materials		
Peak	$4.28	$3.74
Off-Peak	3.93	3.40
Freescale		
Peak	$4.28	$3.84
Off-Peak	3.93	3.48
Samsung		
Peak	$4.28	$3.76
Off-Peak	3.93	3.41
Sematech		
Peak	$4.28	$3.62
Off-Peak	3.93	3.30
University of Texas		
Peak	$4.28	$3.89
Off-Peak	3.93	3.53

A summary of the existing and computed wholesale rates is provided in Table 4-4.

Table 4-4 Computed Wholesale Water Rates

Charge	Existing Rates	Computed Rates
Monthly Meter Charge - 5/8-inch meter	$6.25	$6.58
Volume Charge by Customer (per Kgal)		
Creedmore-Maha WSC	$2.88	$2.93
High Valley	2.75	2.80
Lost Creek MUD	3.02	3.06
Manor, City of	2.76	3.15
Manville WSC	3.27	3.32
Marsha Water	2.78	2.85
Nighthawk WSC	2.73	2.80
North Austin MUD	3.12	3.24
Northtown MUD	2.92	2.98
Rivercrest WSC	3.10	3.10
Rollingwood	3.33	3.39
Shady Hollow MUD	3.21	3.26
Sunset Valley MUD	3.19	3.29
Travis Co. Water District 10	3.13	3.19
Wells Branch MUD	2.80	2.84
Windermere Utility Co.	6.96	7.06

The computed wholesale rates in the table above were calculated for each individual wholesale customer. The computed volume rates shown for wholesale customers are uniform rates that apply to all levels of water consumed during a billing period.

Note that the computed rates in Table 4-2, Table 4-3, and Table 4-4 are based on the cost-of-service methodologies and calculations described in this section. As such, the computed volume rates shown for multi-family, commercial, and industrial customers are seasonal rates that apply to any level of water consumed during a specific period. Peak months include July through October; off-peak months include November through June.

4.8. Rate Design

Red Oak developed a conservation impact model for AWU that allowed it to measure the likely conservation and revenue impacts of various increasing block rate designs. Based on direction from AWU, Red Oak developed a number of alternative rate analyses using the conservation impact model. Based on the review and decisions of AWU, Red Oak and AWU have identified a solution which is presented in the following subsections.

4.8.1. Residential Customers

4.8.1.1. Source of Data

AWU provided its billing data for the study. The billing data consisted of individual customer accounts for the utility from FY2003 through FY2007. This provided five historical years for the analyses.

Historically, AWU's residential customers were billed a fixed monthly charge that varied by meter size, and an inclining block volume rate for four different blocks of water use. Based on the decisions of the Executive Team, AWU is now considering an increasing block volume rate structure of five blocks for its residential customers.

Based on the proposed methodology, the computed fixed monthly charges by meter size shown in Table 4-2 above. These computed fixed charges by meter size were calculated in the cost-of-service analysis described previously in this section, and did not change as a result of the conservation impact model.

The conservation impact model was designed to calculate volume rates and block thresholds for an increasing block rate structure. Red Oak recommends AWU implement the following thresholds for the residential volume rates:

- Block 1: 0 to 2,000 gallons
- Block 2: 2,001 to 9,000
- Block 3: 9,001 to 15,000
- Block 4: 15,001 to 25,000
- Block 5: Consumption greater than 25,000.

These block thresholds, which were used in the analyses, represent a shift from a four block inclining volume rate towards a more conservation-oriented five block inclining residential rates for AWU. The existing and computed volume rates from the conservation impact model are shown in Table 4-5.

Table 4-5 Existing and Computed Block Rates for Residential Customers

	Volume Rates ($ per Kgal)		Thresholds (Kgal)	
Block	Existing Rates	Computed Rates	Existing Rates	Computed Rates
Block 1	$0.98	$1.10	2	2
Block 2	2.59	3.00	9	9
Block 3	4.75	6.00	15	15
Block 4	8.50	8.62	Over	25
Block 5		10.00	NA	Over

4.8.1.2. Limitations

Many assumptions are employed in a study like this. For this reason, results are not concrete in nature but are necessarily estimates. Red Oak assumes that the customer data it received from AWU is accurate and representative of the number and types of customers that are actually in AWU's service areas. This assumption includes the accurate identification of customers by customer class.

The price elasticity of demand is another important assumption in these analyses. The price elasticity of demand is a measure of the responsiveness of AWU's customers to changes in the cost of water. Economic theory suggests that increases in water rates reduce water demands. Similarly, decreases in water rates increase water demands. Although economic theory suggests the direction of these changes in demands, empirical analyses of customer reactions to changes in price are quite difficult to prepare. Many factors other than price affect customers' consumption decisions. The other factors also interact with price and make the determination of the price elasticity of demand quite difficult. A specific impact on sales cannot be predicted within the scope of our analyses. Due to all of the variables involved when changing rates, it will likely take a significant amount of time to get a reliable projection of the results (i.e., more than three years.)

4.8.2. Non-Residential Retail Customers

Red Oak recommends that for the non-residential retail customers AWU use the computed seasonal cost-of-service rates. The computed fixed charges and volume rates for non-residential and seasonal retail customers are shown in Table 4-2 and Table 4-3.

4.9. Findings

4.9.1. Introduction

The methodology used in this study follows the industry standard approaches described by the AWWA in its *Manual of Water Supply Practices: Principles of Water Rates, Fees, and Charges* and the directions from the Executive Team.

Using a cost-of-service analysis, the rates AWU charges will be in proportion to AWU's cost of providing service to each class of customers. This proportionality is a central theme in cost-of-service studies—customers pay in proportion to the cost of serving them, with no customer classes receiving a subsidy from or providing a subsidy to another customer class.

4.9.2. Findings

Calculating cost-of-service rates requires that both the use of the system and the cost of operations be estimated. In ratemaking, the costs of operating the utility are referred to as the utility's revenue requirements. The revenue requirements used in this analysis are described in Section 4.3 of this report.

Based on the analysis presented in this section, is provided below showing a summary of revenues under existing and computed rates. This table is also provided in Appendix B as Table B-14.

Table 4-6 Revenue Under Existing and Computed Rates

Customer Class	Existing Rates	Computed Rates	Percent Difference
Residential	$78,810,693	$86,709,735	10.0%
Multi-Family	34,631,345	33,857,794	(2.2%)
Commercial	61,533,634	53,740,884	(12.7%)
Creedmore-Maha	178,719	179,953	0.7%
High Valley	18,859	18,865	0.0%
Lost Creek	887,545	891,647	0.5%
Manor, City of	729	642	(11.9%)
Manville WSC	280,479	280,725	0.1%
Marsha Water	28,059	28,378	1.1%
Nighthawk	29,375	29,606	0.8%
North Austin MUD	1,170,391	1,190,933	1.8%
Northtown MUD	627,063	629,259	0.4%
Rivercrest	317,685	311,953	(1.8%)
Rollingwood	434,825	434,956	0.0%
Shady Hollow	779,199	782,897	0.5%
Sunset Valley MUD	306,657	307,207	0.2%
Water District 10	2,633,503	2,650,573	0.6%
Wells Branch MUD	1,523,677	1,529,066	0.4%
Windermere	99,340	99,649	0.3%
Hospira	348,548	406,372	16.6%
Spansion	2,092,216	1,771,037	(15.4%)
Applied Materials	373,745	343,021	(8.2%)
Freescale	3,068,951	2,763,541	(10.0%)
Samsung	3,887,156	3,402,853	(12.5%)
Sematech	398,204	345,211	(13.3%)
University of Texas	1,946,422	1,804,453	(7.3%)
Totals	$196,407,020	$194,511,209	(1.0%)

4.9.2.1. Customer Demands

One of the key elements to any cost-of-service analysis is an estimate of the likely customer demands. Estimating these demands, and subsequently, rates, is complex and subject to uncertainty. The forecast of demands in this analysis is based on recent water sales trends that may change due to external factors. External factors that impact water demands for AWU include weather, economic growth or recession, and public attitudes. The factor that varies most dramatically in Austin is the weather. Because AWU, like most water utilities, has primarily fixed costs (i.e., costs the utility incurs regardless of

water sales, such as salaries, capital improvements, etc.), the impact that a cool and/or wet summer has on revenues is not offset by a natural reduction in its costs. Therefore, the revenues of the utility are at risk from unusual summer demands. To mitigate this risk, Red Oak suggests AWU monitor its revenues closely and revise its rates and financial plan as necessary to be consistent with future circumstances.

4.9.2.2. Rate Design

Key findings from the conservation impact model include the following:

1. Due to the nature of the revenue adjustments computed in this study, AWU will need to closely watch its revenues from year-to-year. Many variables can alter a utility's revenue stream, including changes in weather, the local and regional economy, and customers' reaction to rate adjustments.

2. One of the challenges in adjusting rates is accurately predicting a revenue neutral rate design, where revenues earned after a rate adjustment equal those prior to the rate adjustment. Without a precise count of customers by meter size, it is more difficult to project a utility's total revenues.

Although AWU appears to have a solution for conservation-oriented residential rates, AWU should take great care to mitigate risk by following prudent management practices. This includes reviewing rates and revenues at least annually to see if additional adjustments are necessary.

In the process of cost-of-service analysis, Red Oak found that the cost and revenue difference between the inside- and outside-city customers were negligible. The Executive Team agreed with this finding. The computed rates in this report combine the inside- and outside-city customers and should be applied to all customers regardless of location.

Austin Water Utility
Cost of Service Rate Study 2008

SECTION

5

Wastewater Rate Analysis

REDOAK CONSULTING
A DIVISION OF MALCOLM PIRNIE

5. Wastewater Rate Analysis

5.1. Introduction

As part of its standard business practices, AWU periodically updates its sanitary sewer charges. AWU assesses these charges to fund the cost of wastewater treatment and conveyance. As in the past, AWU follows generally accepted industry standards in setting its wastewater rates. These industry standards were developed so that the resulting rates are proportionate to the cost AWU incurs to serve its customer classes.

Figure 5-1 on the next page illustrates the basic steps to generate cost-of-service water rates. The process is similar for the wastewater utility. The steps are described in the following subsections. These steps are:

1. Establish customer characteristics.
2. Calculate revenue requirements.
3. Allocate costs to wastewater system functions.
4. Allocate costs to customer cost pools.[1]
5. Allocate costs by wastewater system functions and cost pools to cost categories.
6. Allocate costs to customer service characteristics.
7. Allocate costs by customer service characteristics to customer classes.
8. Design rates.

5.2. Customer Characteristics

5.2.1. Customer Classes

Customers of a water utility are often identified according to customer class. Each customer class has unique wastewater flows and strength characteristics. Table C-1 in Appendix C provides a summary of the number of connections by customer class.

Because cost-of-service is based on the concept of proportionality, customer service characteristics for each customer class must be analyzed to allocate the system revenue requirements equitably.

Determining customer service characteristics varies with the cost allocation methodology used. As in the water study, customer and meter are relevant characteristics. The methodology used in this study also focuses on wastewater flows and strengths.

[1] A cost pool is a group of customers or group of customer classes that share responsibility in a specific classification of costs. For example, wholesale customers would not be part of a "Retail-only" cost pool, in which facilities and associated costs necessary to serve retail customers are shared only by the retail customer classes.

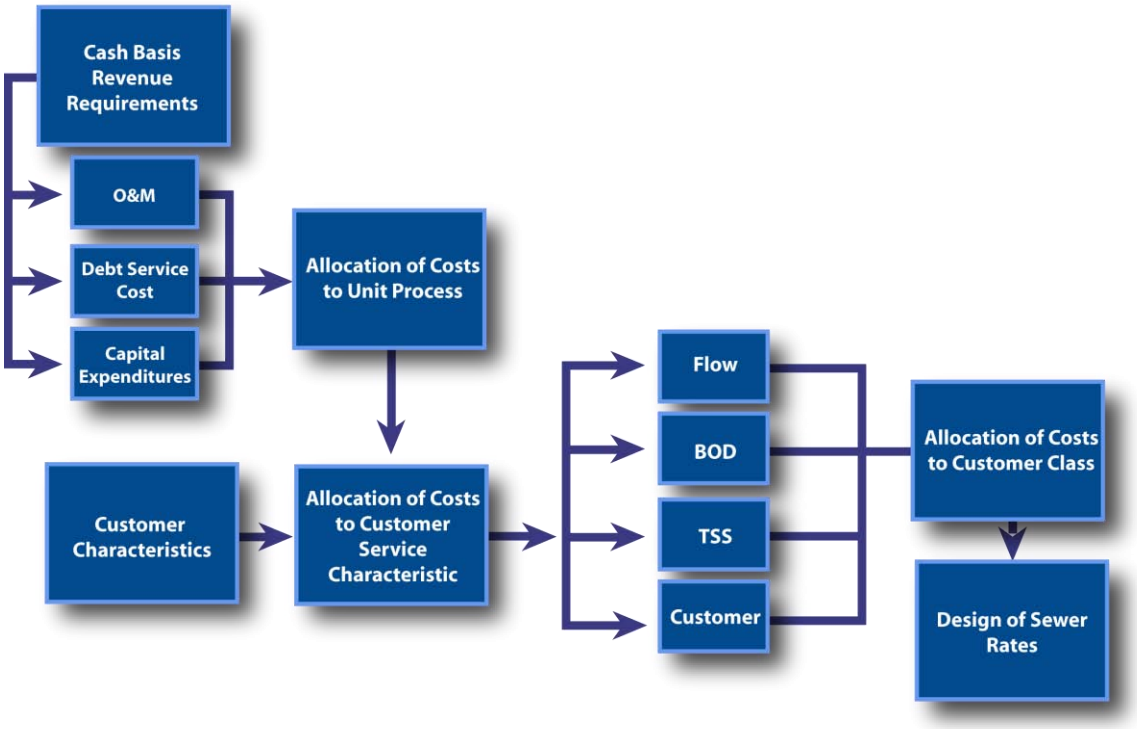


Figure 5-1 Wastewater Cost-of-Service Process

5.2.2. Measures of Wastewater Strength

Following the projection of system revenue requirements is the allocation of revenue requirements to the measures of wastewater strength that drive costs for the utility. These measures of wastewater strengths are sometimes referred to as customer service characteristics or wastewater parameters. In setting wastewater rates, the selected measures of strength are those items that drive the costs of owning and operating the wastewater utility. The wastewater parameters for AWU are:

- Flow
- Biochemical Oxygen Demand (BOD)
- Total Suspended Solids (TSS)
- Customer
- Meter

Flow costs are costs that vary with the volume of flow contributed to the system. Therefore, the relative strength of sewage does not affect flow costs. Typically, flow costs include the cost of operating lift stations and the capital costs for assets that are designed based on flow requirements. A summary of flows by customer class is provided in Table C-1 in Appendix C.

Sewage strength costs, including BOD and TSS, represent costs incurred to treat wastewater of various qualities. Examples of strength-related costs are certain chemicals and electrical costs associated with operation of the aeration basins, etc. Table C-2 in Appendix C provides a summary of wastewater strength by customer class. BOD and TSS are measured in pounds-per-day. The totals provided in Table C-2 include the BOD and TSS of each class' I&I flows.

Customer costs are those costs incurred to serve customers, regardless of wastewater flows or strengths. Customer costs are those costs that vary with the number of customers. The costs of billing and administration are examples of customer costs.

The meter characteristic is the number of equivalent meters served in a customer class. For cost allocation purposes, the number of equivalent meters is calculated to equitably assign the higher costs of larger meters to those customers with meters larger than a standard single-family residential meter.

Each customer class' proportion of the customer service characteristics is calculated to determine each class' demands placed on the water system. AWU's water customer service characteristics are summarized by customer class in Table C-3 in Appendix C.

An additional component of customer characteristics is the cost pools to which a customer class belongs. Customer classes vary in their use of the system, with costs frequently shared among all customer classes. Often, one or more customer classes may use a part of the system exclusively and therefore would be held responsible for the associated costs. All customers belong to the joint cost pool, but other specific cost pools, such as retail only, wholesale, etc., may exist. A summary of cost pool participation by customer class is provided in Table C-4 in Appendix C.

5.3. Revenue Requirements

The second element of information for a cost-of-service rate analysis is an estimate of system revenue requirements. As described in Section 4, the AWWA Manual M1 describes two methods of determining the revenue requirements of a water utility. The same methods are used for a wastewater cost-of-service analysis. These are:

1. Cash Basis, and
2. Utility Basis

A third method is a hybrid of the two and is called the Utility Basis with Cash Residual. Each method is described in Section 4.

5.3.1. Revenue Requirement Cost Components

Because government-owned utilities are required to maintain a municipal-like budget, revenues and expenses must balance. Unlike investor-owned utilities, government-operated utilities generally do not have access to sources of capital other than retained

earnings and formally issued debt. Therefore, the total revenues collected from all customers must equal budgeted revenues. AWU's revenue requirements for its wastewater utility consist of the following cost components. Each is described in greater detail below.

- Operations & Maintenance (O&M) Costs
- Debt Service
- Capital Expenditures (Not Debt Financed)
- Transfers to Capital Reserves and Other Funds

5.3.1.1. Operations & Maintenance Costs

O&M costs account for most of the day-to-day expenditures for operating a water utility. O&M costs include, for example, labor, benefits, insurance, utilities, etc. The projected annual O&M expenditures for FY2009 are provided in Table C-5 in Appendix C. The O&M expenditures for FY2009 were based on AWU's budget projections. Consistent with industry standards, these expenditures exclude depreciation expenses.

5.3.1.2. Debt Service Costs

Debt service costs are the costs associated with financing major capital improvements which are usually identified in a utility's capital improvements plan (CIP). AWU finances approximately 80 percent of its capital expenditures by issuing long-term financial instruments. It funds the remaining 20 percent from current operating revenues. This practice is typical in the utility industry for two primary reasons. First, the financial resources required for these types of projects typically exceed the utility's available resources from the normal operation of its system. Second, spreading the debt service costs for the project over the repayment period effectively spreads the financial burden of financing large improvements to both existing and future users of the system. This burden sharing allows the utility to better match the cost of improvements with those customers using the improvements. Capital improvement projects are designed to fulfill a range of needs including:

- Compliance with new state and federal regulations,
- Enhancement of the level and reliability of the service provided,
- Meet ongoing demands of system growth and economic development, and
- Replacement and refurbishment of existing system infrastructure.

AWU's debt service requirements include debt service for revenue bonds, commercial paper, G.O bonds, and water district bonds. For FY2009, the total cost is estimated to be over $82.8 million. The total cost is included in Table C-6 in Appendix C.

5.3.1.3. Capital Expenditures (not Debt Financed)

Some capital expenditures may be funded directly from the utilities revenues or operating fund. In fact, AWU's financial policies suggest that 20 percent of capital expenditures be funded by equity rather than debt. AWU's, capital expenditures from rates is estimated

to be nearly $35.5 million for FY2009. The total cost is included in Table C-6 in Appendix C.

5.3.1.4. Transfers to Capital Reserves and Other Funds

In addition to funding AWU's Water Construction Fund, AWU's water utility provides funding for the City of Austin General Fund, Sustainability Fund, Radio Communications Fund, Public Improvement District, and Environmental Remediation Fund. For FY2009, these additional transfers are estimated to be nearly $15.3 million. The transfers are included in Table C-6 in Appendix C.

5.3.2. Findings for AWU

As described in Section 3, Red Oak presented the revenue requirement options to both the PIC and Executive Team. Consistent with the Executive Team's decision, Red Oak used the cash-basis method of determining revenue requirements for this study. Also, after detailed analyses, the differences in costs, rates, and revenues between inside- and outside-city retail customers did not justify the continuing segregation of these customers by customer class. Based on this finding, the inside-city and outside-city retail classes were combined. Therefore, the computed rates in this report do not distinguish between inside- and outside-city retail customers and should be applied to all customers regardless of location.[2]

5.4. User Charge Revenue Requirements

The portion of annual system revenue requirements to be recovered through wastewater rates depends on a utility's financing policy and its other sources of income. To determine the amount of revenue that rates must generate annually, the total revenue requirements must be reduced by non-rate or other system revenues. These non-rate revenues may include, but are not limited to, miscellaneous charges and interest earnings on unrestricted fund balances. Capital reserve funds may also provide revenue to offset costs of capital improvements.

The FY2009 non-rate revenues are provided in Table C-7 in Appendix C. Approximately 45 percent of the total non-rate revenues offset O&M costs; the rest offset capital costs in the wastewater analysis. A summary of user charge revenue requirements by customer class is provided in Table C-8. The total revenue requirements of $191.4 million presented in Table C-8 equals the total O&M of $78.2 million (Table C-5) plus the total cash basis capital costs of $133.6 million (Table C-6) less the non-rate revenues of $20.3 million (Table C-7).[3]

5.5. Cost Allocations

The cost-of-service methodology described in this section uses the base/extra-capacity method for allocating costs among customer classes, as described in the AWWA Manual

[2] Because of the differences in services, wholesale customer class distinctions are maintained in this report. Only retail classes were combined.
[3] Amounts summarized within the text of this section include the effects of rounding.

M1. In theory, each customer could be charged according to the actual cost of providing wastewater service to that customer; however, it is impractical to estimate the cost of serving each of AWU's customers. As part of a cost-of-service study, analysts classify customers into relatively few, somewhat homogeneous, groups called customer classes, and then estimate the cost of serving each class.

Equitably allocating the water system's user charge revenue requirements to the customer classes involves a multi-step process. Beginning with O&M costs, the following steps were completed. Allocations of capital costs and depreciation expenses are described later in this section.

- Step 1 functionalizes the costs;
- Step 2 assigns the functionalized costs to cost pools (e.g., joint—benefiting all customer classes, or as specific—benefiting one or more cost pools);
- Step 3 allocates the joint and specific costs by cost pools to cost categories;
- Step 4 then distributes the categorized costs to customer service characteristics;
- Finally, Step 5 distributes the O&M costs to customer classes by pool based on each class' proportion of the customer service characteristics.

These steps are described in more detail in Section 4. The steps taken to allocate user charge revenue requirements do not differ between utilities. Descriptions of the functions developed for the wastewater analysis follow. However, for more detail on the steps listed above, please refer to Section 4.

5.5.1. Step 1: Functionalization of Costs

Functionalizing costs enhances the accuracy and equity of the wastewater system cost allocation to the customer classes. AWU's wastewater O&M expenditures and rate base are allocated to the following system functions:

- Collection
- Interceptors
- Lift Stations (Conveyance)
- Plant Raw Wastewater Pumping
- Preliminary Treatment
- Industrial Waste Control
- Bar Screens
- Grit Removal
- Primary Clarifiers
- Flow Equalization Basins
- Aeration Basins
- Secondary Clarifiers

- Return Sludge Pumping
- Waste Sludge Pumping
- Filters
- Disinfection and Outfall
- Revenue Allocated Costs
- Sludge Thickening
- Biosolids Management
- Wholesale & Industrial Services
- Customer Service
- Indirect Treatment
- Indirect Costs (e.g., administrative and general)

Each of these functions is described below.

5.5.1.1. Collection

O&M costs functionalized as *Collection* include those related to the maintenance of the wastewater collection system. The rate base for this function is calculated based mostly on the value of the pipes, with indirect costs of administration, land, and easements included as well. These costs are not allocated to wholesale customers.

5.5.1.2. Interceptors

This function includes the same types of costs as *Collection*. Engineering is also included in the rate base calculation for *Interceptors*.

5.5.1.3. Lift Stations (Conveyance)

Lift Station O&M includes electricity and maintenance costs. Rate base is calculation on AWU's lift station facilities.

5.5.1.4. Plant Raw Wastewater Pumping

Electricity for pumping and some maintenance costs at AWU's treatment plants are functionalized as *Plant Raw Wastewater Pumping*. The rate base costs are calculated based on influent facilities and primary effluent pumping at the treatment plants.

5.5.1.5. Preliminary Treatment

Preliminary Treatment costs include a portion of O&M at the treatment facilities.

5.5.1.6. Industrial Waste Control

This function includes the O&M costs of AWU's pretreatment program for industrial waste control. No specific assets were allocated to the AWU's rate base for this function.

5.5.1.7. Bar Screens

There are no O&M costs allocated to *Bar Screens*. The value of the screens themselves is the basis for calculating rate base for this function.

5.5.1.8. Grit Removal

There are no O&M costs allocated to *Grit Removal*. The value of the degritters is the basis for calculating rate base for this function.

5.5.1.9. Primary Clarifiers

The cost of *Primary Clarifiers* includes a portion of O&M at the treatment facilities. The value of the primary clarifiers is the basis for calculating rate base for this function.

5.5.1.10. Flow Equalization Basins

The cost of *Flow Equalization Basins* includes a portion of O&M at the treatment facilities. The value of the basins is the basis for calculating rate base for this function.

5.5.1.11. Aeration Basins

Aeration Basins costs include a portion of O&M at the treatment facilities. The value of the basins is the basis for calculating rate base for this function.

5.5.1.12. Secondary Clarifiers

The cost of *Secondary Clarifiers* includes a portion of O&M at the treatment facilities. The value of the secondary clarifiers is the basis for calculating rate base for this function.

5.5.1.13. Return Sludge Pumping

Return Sludge Pumping costs include a small portion of O&M at the treatment facilities. The value of the assets that serve to pump sludge is the basis for calculating rate base for this function.

5.5.1.14. Waste Sludge Pumping

Waste Sludge Pumping costs include a small portion of O&M at the treatment facilities.

5.5.1.15. Filters

The cost of *Filters* includes a portion of O&M at the treatment facilities.

5.5.1.16. Disinfection and Outfall

The cost of chemicals for treatment is allocated to this function, along with the values of the facilities used in the disinfection and outfall processes.

5.5.1.17. Revenue Allocated Costs

Revenue Allocated Costs is not a system function. This function was included in the analysis as a way of allocating the costs of transfers to the City of Austin General Fund and Sustainability Fund. These costs are allocated to each customer class using the proportionate share of each class' historical revenue as the basis. Historical revenues from the last three fiscal years were used in this part of the analysis.

5.5.1.18. Sludge Thickening

Sludge Thickening includes a portion of O&M at the treatment facilities, along with the rate base costs of the sludge thickening assets and equipment at the treatment facilities.

5.5.1.19. Biosolids Management

The primary O&M costs associated with this function include all O&M from AWU's Hornsby Biosolids Plant. There are also a host of facilities that form the basis for the rate base for this function. These facilities include sludge digestion, dewatering, odor control, lagoons, drying beds, composting, and land application.

5.5.1.20. Wholesale & Industrial Services

Support service costs for wholesale customers are included in this function.

5.5.1.21. Customer Service

Customer service costs include an indirect portion of administrative and support services, and most of AWU's costs for billing and customer services.

5.5.1.22. Indirect Treatment

This function includes indirect allocations of administrative and support services, and some O&M costs from AWU's treatment facilities.

5.5.1.23. Indirect Costs (e.g., administrative and general)

Costs that were not directly accountable to any of the functions were allocated proportionally to some or all of the functions based on weighted averages of the costs included in those functions. Costs that were allocated indirectly include most of AWU's administration and support services.

5.5.2. Step 2: Assignment of Costs to Cost Pools

Step 2 assigns costs to cost pools. A cost pool is a grouping of costs and one or more customer classes that share responsibility for that grouping of costs. AWU's costs are assigned to one of the following cost pools:

- Joint
- Retail Only
- Wholesale
- Contract Revenue Bonds
- Commercial & Industrial
- Surcharge Customers

The *Joint* cost pool includes costs common to all customer classes. Joint costs are those costs that are shared by all customers of the water system in proportion to their respective use of the system. Other cost pools include costs specific to certain groups of customer classes. For example, costs associated with collection are specific costs associated with

serving retail rather than wholesale customer classes. Specific pools, therefore, could be divided into retail customers and wholesale customers.

Table C-9 in Appendix C provides a summary of functionalized O&M costs by cost pool. Table C-10 provides a summary of specially allocated items by cost pool. Table C-11 shows those costs that are allocated based on historical revenues (as opposed to water use). These costs are described as *Revenue Allocated Costs* and were allocated to the Joint cost pool. The general fund transfer is an example of a revenue based cost. The allocation of the cost to customer classes is consistent with the method of determining the amount of the transfer (i.e., three-year historical average revenues). Table C-12 shows how functionalized net plant in service was allocated to cost pool.

5.5.3. Step 3: Allocation of Costs by Pools to Cost Categories

To facilitate the allocation of costs by pools to customer service characteristics, costs are allocated to cost categories in Step 3. AWU's functionalized costs are allocated to the following cost categories:

- Mains
- Lift Stations
- Preliminary Treatment
- Primary Treatment
- Aeration
- Secondary Treatment
- Sludge Pumping
- Other Sludge-Related
- Effluent Disposal
- Biosolids Management
- Services
- Industrial Waste Control
- Customer Services
- Revenue Allocated Costs

Cost categories provide a way to further aggregate similar types of costs after functionalized costs have been disaggregated to cost pools.

5.5.4. Step 4: Allocation of Costs to Customer Service Characteristics

The assignment of costs to customer service characteristics varies with the allocation methodology used. As described in Section 3, the base/extra-capacity cost allocation method is used in this study. Under this method, costs are assigned to the following customer service characteristics based on an engineering analysis of the system:

- Flow
- Biochemical Oxygen Demand (BOD)
- Total Suspended Solids (TSS)

- Customer
- Meter

Flow costs are costs that vary with the volume of flow contributed to the system. Therefore, the relative strength of sewage does not affect flow costs. Typically, flow costs include the cost of operating lift stations and the capital costs for assets that are designed based on flow requirements.

Sewage strength costs, including BOD and TSS, represent costs incurred to treat wastewater of various qualities. Examples of strength-related costs are certain chemicals and electrical costs associated with operation of the aeration basins, etc.

Customer costs are those costs incurred to serve customers, regardless of wastewater flows or strengths. Customer costs are those costs that vary with the number of customers. Examples of these costs include water meter reading (to bill sewage flow) and billing costs.

Meter costs are those costs that vary with the size of the meter used to serve a customer. Examples of equivalent meter costs include meter replacement and maintenance.

The distribution of system costs to wastewater flow and strength characteristics varies by wastewater utility and can usually be determined by an analysis of the system's design features and operating history. A summary of user charge revenue requirements by customer class and customer service characteristic is provided in Table C-13 in Appendix C.

5.5.5. Step 5: Distribution of Costs to Customer Classes

As mentioned previously, Steps 1 through 5 are described in more detail in Section 4. The steps taken to allocate user charge revenue requirements generally do not differ between water and wastewater utilities. For more detail on this, and the other steps listed above, please refer to Section 4.

5.6. Additional Steps for Allocating Capital Costs

Allocating capital costs involves steps in addition to those outlined above. Capital costs are allocated by allocating the assets that serve customers. The steps involved (Steps 6 through 8) are described in more detail in Section 4.

5.6.1. Allocating Depreciation Expenses

The portion of its cash-basis capital costs that are recovered in proportion to the depreciation expense are allocated following the same steps as for O&M costs. Depreciation is allocated on the same basis as the asset associated with each line item.

5.7. Cost-of-Service by Customer Class

After the revenue requirements have been allocated by categories and customer class to the customer characteristics, the O&M, special costs, revenue-based allocation costs, return on rate base, and depreciation expenses are summed to determine the total cost of service by customer class. Appendix C of this report contains detailed calculations for the wastewater cost-of-service rate analysis.

The results presented in this report are based on AWU's revenue requirements for FY2009. These rates depict the impact that changes to AWU's cost-of-service approach would have on its customers. Where appropriate, results (both rates and revenue) from this study are compared to AWU's currently adopted rates and revenue for FY2009. Within this report, the current rates and revenue used for comparison are called AWU's *Existing Rates* or *Existing*. The rates and revenue calculated within this study, using the proposed methodology, are called AWU's *Computed Rates* or *Computed*.

A summary of the existing and computed retail rates and fixed charges is provided in Table 5-1.

Table 5-1 Existing and Computed Retail Rates

Charge	Existing Rates	Computed Rates
Monthly Meter Charge - All Sizes	$8.00	$8.00
Volume Charge by Customer (per Kgal)		
Residential		
Block 1	$3.29	$3.34
Block 2	7.44	7.49
Multi-Family	6.59	6.85
Commercial	7.23	6.86
Industrial		
Hospira	6.64	6.74
Spansion	6.64	5.81
Applied Materials	6.64	7.00
Freescale	6.64	6.42
Samsung	6.64	6.36
Sematech	6.64	5.99
University of Texas	6.64	6.73

In addition to the rates presented above, extra-strength surcharges were calculated for AWU's wastewater utility. For BOD, the extra-strength surcharge is $0.692 per pound. For TSS, the surcharge is $0.375 per pound.

A summary of the existing and computed wholesale rates is provided in Table 5-2.

Table 5-2 Existing and Computed Wholesale Rates

Charge	Existing Rates	Computed Rates
Monthly Meter Charge - All Sizes	$8.00	$8.00
Volume Charge by Customer (per Kgal)		
Comanche Canyon (WCID#17)	$3.50	$3.65
Manor, City of	4.62	4.99
North Austin MUD #1	4.98	4.98
Northtown MUD	5.00	4.96
Rollingwood, City of	4.72	5.02
Shady Hollow MUD	4.62	4.99
Sunset Valley, City of	4.62	4.96
Steiner Ranch (WCID #17)	3.38	3.62
Wells Branch MUD	4.94	5.02
Westlake Hills, City of	4.49	4.79

The computed wholesale rates in the table above were calculated for each individual wholesale customer. The computed volume rates shown for wholesale customers are uniform rates that apply to all levels of water consumed during a billing period.

5.8. Findings and Recommendations

5.8.1. Findings

Calculating cost-of-service rates requires that both the use of the system and the cost of operations be estimated. In ratemaking, the costs of operating the utility are referred to as the utility's revenue requirements.

Based on the analysis presented in this section, Table 5-3 is provided below showing a summary of revenues under existing and computed rates. This table is also provided in Appendix C as Table C-14.

Table 5-3 Revenue Under Existing and Computed Rates

Customer Class	Existing Rates	Computed Rates	Percent Difference
Residential	$74,392,185	$74,692,011	0.4%
Multi-Family	46,253,768	47,729,253	3.2%
Commercial	47,639,158	45,285,030	(4.9%)
Comanche Canyon (WCID#17)	8,496	8,795	3.5%
Manor, City of	277,296	296,195	6.8%
North Austin MUD #1	1,473,619	1,466,614	(0.5%)
Northtown MUD	839,721	829,885	(1.2%)
Rollingwood, City of	178,512	188,051	5.3%
Shady Hollow MUD	411,264	439,208	6.8%
Sunset Valley, City of	330,645	351,229	6.2%
Steiner Ranch (WCID #17)	1,718	1,824	6.1%
Wells Branch MUD	1,919,935	1,938,903	1.0%
Westlake Hills, City of	141,900	149,433	5.3%
Hospira	992,737	1,002,277	1.0%
Spansion	3,100,976	2,733,719	(11.8%)
Applied Materials	332,097	347,172	4.5%
Freescale	2,988,288	2,885,391	(3.4%)
Samsung	4,714,496	4,513,542	(4.3%)
Sematech	464,896	421,414	(9.4%)
University of Texas	1,607,649	1,620,537	0.8%
Extra-Strength Surcharges	0	4,728,734	0.0%
Totals	$188,069,357	$191,629,215	1.9%

5.8.2. Recommendations

The computed wastewater rates are based on various assumptions that may need revision in the future. Accordingly, Red Oak recommends that AWU update its cost and revenue estimates on an annual basis. The rates determined in these analyses depend on the assumptions contained in the wastewater financial plan presented in Section 3 of this report. Should changes in customer usage or costs occur, AWU may need to adjust its rates differently than those predicted in this study. Many factors impact the cost to serve customers, and those factors will change over time in a manner that may not be possible to predict.

Red Oak recommends that AWU continue to collect additional wastewater samples to further improve the accuracy of AWU's current customer sample used in this study.

Austin Water Utility
Cost of Service Rate Study 2008

SECTION

6

Findings and Recommendations

REDOAK CONSULTING
A DIVISION OF MALCOLM PIRNIE

6. Findings and Recommendations

This section presents the findings and recommendations for the water and wastewater cost-of-service analyses.

6.1. Findings

The methodology developed for the water and wastewater utilities resulted in findings applicable to both utilities, to water alone, and wastewater alone. Each group of findings is discussed below.

6.1.1. Findings Common to Both Water and Wastewater

The following findings were common to both water and wastewater utilities.

6.1.1.1. Consolidation of Retail Customer Classes

Prior to the current study, AWU's cost-of-service methodology included differing costs for its inside- and outside-city residential customers. Also, because of differences in water and wastewater use between the two groups of customers, the revenue productivity of the inside-city and outside-city rate structures differed. When compared, the costs and revenues between the two groups of customers have converged over time resulting in very similar cost-of-service rates. Based on this finding, Red Oak recommended AWU consider consolidating these classes to simplify its rate setting process.

6.1.1.2. Disaggregation of Large-Volume Customer Class

AWU has several large-volume customers that use water primarily for industrial purposes. Prior to the current study, these customers were in one customer class so that reductions in costs by one large-volume customer were shared by all. Disaggregating the large-volume class provides greater incentive for individual large-volume customers to reduce the costs it imposes on AWU. This direct incentive will allow large-volume customers to benefit from investments they make in their systems that improve water conservation, wastewater pretreatment, etc.

6.1.1.3. Low-Income Subsidy

AWU and its citizens support the principle that its services should be affordable for all of its customers. To improve the affordability of water and wastewater services, AWU can implement a low-income waiver of its fixed monthly charges for its customers with limited financial resources. AWU can team with Austin Energy to implement this program and avoid adding significant administrative burdens for the program.

6.1.2. Findings for Water

The water methodology used in this study follows the industry standard approaches described by the AWWA in its *Manual of Water Supply Practices: Principles of Water Rates, Fees, and Charges* and the decisions of the Executive Team.

The results presented in this report are based on AWU's revenue requirements for FY2009. These rates depict the impact that changes to AWU's cost-of-service approach would have on its customers. Where appropriate, results (both rates and revenue) from this study are compared to AWU's currently adopted rates and revenue for FY2009. Within this report, the current rates and revenue used for comparison are called AWU's *Existing Rates* or *Existing*. The rates and revenue calculated within this study, using the proposed methodology, are called AWU's *Computed Rates* or *Computed*.

Using a cost-of-service analysis, the rates AWU charges will be in proportion to AWU's cost of providing service to each class of customers. This proportionality is a central theme in cost-of-service studies—customers pay in proportion to the cost of serving them, with no customer classes receiving a subsidy from or providing a subsidy to another customer class.

Based on the analysis presented in Section 4, cost-of-service rates were calculated for AWU's various customer classes and meter sizes. Table 6-1 provides a summary of the existing and computed fixed monthly water charges by meter size. Appendix B of this report contains the detailed calculations for the water cost-of-service rate analysis.

Table 6-1 Existing and Computed Fixed Monthly Water Charges

Meter Size	Existing Rates	Computed Rates
5/8-Inch	$6.25	$6.58
3/4-Inch	7.21	7.78
1-Inch	8.55	9.24
1 1/4-Inch	10.47	11.79
1 1/2-Inch	12.39	14.36
2-Inch	16.23	21.44
3-Inch	33.13	38.92
4-Inch	52.33	75.93
6-Inch	100.33	152.09
8-Inch	148.33	859.64
10-Inch	196.33	897.18
12-Inch	225.13	919.71

The fixed monthly charges include an amount to recover both the direct and indirect fire costs.

Table 6-2 provides a comparison of the existing and computed volume water rates by customer class. The computed rates include a full adjustment for the elimination of the residential subsidy. AWU's Executive Team proposed to phase the subsidy out over five to seven years.

Table 6-2 Existing and Computed Volume Water Rates

Volume Rates (per Kgal)	Existing Rates	Computed Rates
Residential		
Block 1	$0.98	$1.10
Block 2	2.59	3.00
Block 3	4.75	6.00
Block 4	8.50	8.62
Block 5	8.50	10.00
Multi Family		
Peak	$3.88	$3.66
Off-Peak	3.54	3.34
Commercial		
Peak	$4.58	$3.90
Off-Peak	4.20	3.56
Industrial		
Hospira		
Peak	$4.28	$5.01
Off-Peak	3.93	4.56
Spansion		
Peak	$4.28	$3.60
Off-Peak	3.93	3.26
Applied Materials		
Peak	$4.28	$3.74
Off-Peak	3.93	3.40
Freescale		
Peak	$4.28	$3.84
Off-Peak	3.93	3.48
Samsung		
Peak	$4.28	$3.76
Off-Peak	3.93	3.41
Sematech		
Peak	$4.28	$3.62
Off-Peak	3.93	3.30
University of Texas		
Peak	$4.28	$3.89
Off-Peak	3.93	3.53

To meet the goals of the City's Conservation Task Force, AWU examined the possibility of adding a fifth block to its residential water rate design. This fifth block applies to all consumption exceeding 25 kgal per month. The existing and computed block thresholds are presented in Table 6-3.

Table 6-3 Existing and Computed Block Thresholds (Kgal)

Block	1	2	3	4	5
Existing	2	9	15	Over	NA
Proposed	2	9	15	25	Over

Currently single-family residential customers with separate irrigation meters are allowed to purchase water at all blocks for both meters. That allows a single-family residential customer with an irrigation meter to purchase twice as much water in blocks 1 and 2. The cost of water in these first two blocks is priced at less than the average cost of service to allow low-income citizens to have more affordable water. The unintended consequence is that single-family customers with irrigation meters can receive up to twice the benefit as other single-family customers. To correct this situation, AWU has computed pricing all irrigation water consumed by single-family customers in blocks 1 and 2 at the block 3 rate. This will improve equity and provide a greater conservation incentive.

The Conservation Task Force also recommended analyzing the benefits of establishing a higher rate for customers with irrigation meters. After examining the approaches to implementing this recommendation, the consultants, PIC, and Executive Team recommended against its creation. One major concern of establishing a rate for irrigation meters is the inequity that would result for these customers. This inequity is caused by the partial implementation of a separate irrigation metering program. Those customers with separate irrigation meters would be chared rates substantially higher than the cost of service while similarly situated customers without a separate irrigation meter would continue to receive water intended for outdoor use at a lower, domestic meter rate.

As an alternative, AWU is investigating the option of implementing an excess-use rate design that will allow higher rates for irrigation meters without the negative impact to equity.

A summary of the existing and computed wholesale water rates is provided in Table 6-4.

Table 6-4 Existing and Computed Wholesale Water Rates

Charge	Existing Rates	Computed Rates
Monthly Meter Charge - 5/8-inch meter	$6.25	$6.58
Volume Charge by Customer (per Kgal)		
Creedmore-Maha WSC	$2.88	$2.93
High Valley	2.75	2.80
Lost Creek MUD	3.02	3.06
Manor, City of	2.76	3.15
Manville WSC	3.27	3.32
Marsha Water	2.78	2.85
Nighthawk WSC	2.73	2.80
North Austin MUD	3.12	3.24
Northtown MUD	2.92	2.98
Rivercrest WSC	3.10	3.10
Rollingwood	3.33	3.39
Shady Hollow MUD	3.21	3.26
Sunset Valley MUD	3.19	3.29
Travis Co. Water District 10	3.13	3.19
Wells Branch MUD	2.80	2.84
Windermere Utility Co.	6.96	7.06

The City's Conservation Task Force suggested AWU study the possibility of using conservation-oriented rates to improve water conservation among AWU's wholesale customers. As part of this study, Red Oak found:

1. Because each wholesale customer is its own customer class, each customer has an incentive to conserve—especially during AWU's peak season. The cost allocations for wholesale customers include the consequences of each customer's peaking factors.

2. Through the PIC process, the wholesale class expressed concern that a conservation-oriented rate design would not provide an incentive toward conservation but would increase the volatility of costs for the wholesale customer, and, consequently, revenues for AWU.

For these reasons, conservation incentives for wholesale customers are more likely to be successful through other means than rates.

Calculating cost-of-service rates requires that both the use of the system and the cost of operations be estimated. In ratemaking, the costs of operating the utility are referred to as the utility's revenue requirements. The revenue requirements used in this analysis are described in Section 4.3 of this report.

Based on the analysis presented in this section, Table 6-5 below shows a summary of water revenue under existing and computed rates. This table is also provided in Appendix B as Table B-14.

Table 6-5 Water Revenue Under Existing and Computed Rates

Customer Class	Existing Rates	Computed Rates	Percent Difference
Residential	$78,810,693	$86,709,735	10.0%
Multi-Family	34,631,345	33,857,794	(2.2%)
Commercial	61,533,634	53,740,884	(12.7%)
Creedmore-Maha	178,719	179,953	0.7%
High Valley	18,859	18,865	0.0%
Lost Creek	887,545	891,647	0.5%
Manor, City of	729	642	(11.9%)
Manville WSC	280,479	280,725	0.1%
Marsha Water	28,059	28,378	1.1%
Nighthawk	29,375	29,606	0.8%
North Austin MUD	1,170,391	1,190,933	1.8%
Northtown MUD	627,063	629,259	0.4%
Rivercrest	317,685	311,953	(1.8%)
Rollingwood	434,825	434,956	0.0%
Shady Hollow	779,199	782,897	0.5%
Sunset Valley MUD	306,657	307,207	0.2%
Water District 10	2,633,503	2,650,573	0.6%
Wells Branch MUD	1,523,677	1,529,066	0.4%
Windermere	99,340	99,649	0.3%
Hospira	348,548	406,372	16.6%
Spansion	2,092,216	1,771,037	(15.4%)
Applied Materials	373,745	343,021	(8.2%)
Freescale	3,068,951	2,763,541	(10.0%)
Samsung	3,887,156	3,402,853	(12.5%)
Sematech	398,204	345,211	(13.3%)
University of Texas	1,946,422	1,804,453	(7.3%)
Totals	$196,407,020	$194,511,209	(1.0%)

6.1.3. Findings for Wastewater

Section 5 of this report documents the steps taken to calculate AWU's wastewater cost-of-service rates. Red Oak allocated the revenue requirements by categories and customer class to the customer characteristics, and determined the total cost of service by customer class. With that information, rates were developed for each customer class. Appendix C of this report contains the detailed calculations for the wastewater cost-of-service rate analysis.

The results presented in this report are based on AWU's revenue requirements for FY2009. These rates depict the impact that changes to AWU's cost-of-service approach would have on its customers. Where appropriate, results (both rates and revenue) from this study are compared to AWU's currently adopted rates and revenue for FY2009. Within this report, the current rates and revenue used for comparison are called AWU's *Existing Rates* or *Existing*. The rates and revenue calculated within this study, using the proposed methodology, are called AWU's *Computed Rates* or *Computed*.

A summary of the existing and computed retail wastewater rates and fixed charges is provided in Table 6-6. The computed rates include a full adjustment for the elimination of the residential subsidy. AWU's Executive Team has decided to propose the complete elimination of the residential subsidy for wastewater in FY2010.

Table 6-6 Existing and Computed Retail Wastewater Rates

Charge	Existing Rates	Computed Rates
Monthly Meter Charge - All Sizes	$8.00	$8.00
Volume Charge by Customer (per Kgal)		
Residential		
Block 1	$3.29	$3.34
Block 2	7.44	7.49
Multi-Family	6.59	6.85
Commercial	7.23	6.86
Industrial		
Hospira	6.64	6.74
Spansion	6.64	5.81
Applied Materials	6.64	7.00
Freescale	6.64	6.42
Samsung	6.64	6.36
Sematech	6.64	5.99
University of Texas	6.64	6.73

A summary of the existing and computed wholesale wastewater rates is provided in Table 6-7.

Table 6-7 Existing and Computed Wholesale Wastewater Rates

Charge	Existing Rates	Computed Rates
Monthly Meter Charge - All Sizes	$8.00	$8.00
Volume Charge by Customer (per Kgal)		
Comanche Canyon (WCID#17)	$3.50	$3.65
Manor, City of	4.62	4.99
North Austin MUD #1	4.98	4.98
Northtown MUD	5.00	4.96
Rollingwood, City of	4.72	5.02
Shady Hollow MUD	4.62	4.99
Sunset Valley, City of	4.62	4.96
Steiner Ranch (WCID #17)	3.38	3.62
Wells Branch MUD	4.94	5.02
Westlake Hills, City of	4.49	4.79

Calculating cost-of-service rates requires that both the use of the system and the cost of operations be estimated. In ratemaking, the costs of operating the utility are referred to as the utility's revenue requirements.

Based on the analysis presented in this section, Table 6-8 is provided below showing a summary of revenues under existing and computed rates. This table is also provided in Appendix C as Table C-14.

Table 6-8 Wastewater Revenue Under Existing and Computed Rates

Customer Class	Existing Rates	Computed Rates	Percent Difference
Residential	$74,392,185	$74,692,011	0.4%
Multi-Family	46,253,768	47,729,253	3.2%
Commercial	47,639,158	45,285,030	(4.9%)
Comanche Canyon (WCID#17)	8,496	8,795	3.5%
Manor, City of	277,296	296,195	6.8%
North Austin MUD #1	1,473,619	1,466,614	(0.5%)
Northtown MUD	839,721	829,885	(1.2%)
Rollingwood, City of	178,512	188,051	5.3%
Shady Hollow MUD	411,264	439,208	6.8%
Sunset Valley, City of	330,645	351,229	6.2%
Steiner Ranch (WCID #17)	1,718	1,824	6.1%
Wells Branch MUD	1,919,935	1,938,903	1.0%
Westlake Hills, City of	141,900	149,433	5.3%
Hospira	992,737	1,002,277	1.0%
Spansion	3,100,976	2,733,719	(11.8%)
Applied Materials	332,097	347,172	4.5%
Freescale	2,988,288	2,885,391	(3.4%)
Samsung	4,714,496	4,513,542	(4.3%)
Sematech	464,896	421,414	(9.4%)
University of Texas	1,607,649	1,620,537	0.8%
Extra-Strength Surcharges	0	4,728,734	0.0%
Totals	$188,069,357	$191,629,215	1.9%

As part of the study, Red Oak examined AWU's allocation of the costs of inflow and infiltration (I/I). As described in Section 3, four alternatives for allocating I/I costs were examined. The Executive Team decided to allocation I/I costs as a system-wide costs based on contributed flow.

6.2. Recommendations

6.2.1. Recommendations for Water

6.2.1.1. Customer Demands

One of the key elements to any cost-of-service analysis is an estimate of the likely customer demands. Estimating these demands, and subsequently, rates, is complex and subject to uncertainty. The forecast of demands in this analysis is based on recent water sales trends that may change due to external factors. External factors that impact water demands for AWU include weather, economic growth or recession, and public attitudes.

The factor that varies most dramatically in Austin is the weather. Because AWU, like most water utilities, has primarily fixed costs (i.e., costs the utility incurs regardless of water sales, such as salaries, capital improvements, etc.), the impact that a cool and/or wet summer has on revenues is not offset by a natural reduction in its costs. Therefore, the revenues of the utility are at risk from unusual summer demands. To mitigate this risk, Red Oak suggests AWU monitor its revenues closely and revise its rates and financial plan as necessary to be consistent with future circumstances.

6.2.1.2. Rate Design

Key findings from the conservation impact model include the following:

1. Due to the nature of the revenue adjustments computed in this study, AWU will need to closely watch its revenues from year-to-year. Many variables can alter a utility's revenue stream, including changes in weather, the local and regional economy, and customers' reaction to rate adjustments.

2. One of the challenges in adjusting rates is accurately predicting a revenue neutral rate design, where revenues earned after a rate adjustment equal those prior to the rate adjustment. Without a precise count of customers by meter size, it is more difficult to project a utility's total revenues.

Although AWU appears to have a solution for conservation-oriented residential rates, AWU should take great care to mitigate risk by following prudent management practices. This includes reviewing rates and revenues at least annually to see if additional adjustments are necessary.

In the process of cost-of-service analysis, Red Oak found that the cost and revenue difference between the inside- and outside-city customers were negligible. The Executive Team agreed with this finding. The computed rates in this report combine the inside- and outside-city customers and should be applied to all customers regardless of location.

6.2.1.3. Transition

The impact on AWU's customers of changing in water rates may be significant. AWU may consider transitioning from its current rates to the rates generated by the proposed methodology over several years. This transitional period may reduce the unintended consequences of adjusting rates to the cost of service.

6.2.2. Recommendations for Wastewater

6.2.2.1. Cost and Revenue Estimates

The computed wastewater rates are based on various assumptions that may need revision in the future. Accordingly, Red Oak recommends that AWU update its cost and revenue estimates on an annual basis. The rates determined in these analyses depend on the assumptions contained in the wastewater financial plan presented in Section 3 of this

report. Should changes in customer usage or costs occur, AWU may need to adjust its rates differently than those predicted in this study. Many factors impact the cost to serve customers, and those factors will change over time in a manner that may not be possible to predict.

Red Oak recommends that AWU continue to collect additional wastewater samples to further improve the accuracy of AWU's current customer sample used in this study

6.2.2.2. Transition

The impact on AWU's customers of changing in water rates may be significant. AWU may consider transitioning from its current rates to the rates generated by the proposed methodology over several years. This transitional period may reduce the unintended consequences of adjusting rates to the cost of service.

Austin Water Utility
Cost of Service Rate Study 2008

APPENDIX

A

Summary Table of Executive Team Decisions

REDOAK CONSULTING
A DIVISION OF MALCOLM PIRNIE

2908083 / POR

Cost of Service Study 2007-08
Executive Review / Decision Summary

#1	**Category / PIC Meeting Date:**	Public Involvement Committee Process and Schedule - 11/27/2007
	Decision Needed:	Release of the Cost of Service Model to the PIC
	Options Available:	Several Members of the PIC expressed interest in receiving copies of the COS model once it has been supplied by the consultants. Staff offered to model various alternatives for the committee members, but not release working copies of the model.
	Executive Decision:	The Utility decided not to release the model to PIC members or the general public. However, the Utility committed to provide a comprehensive overview of the model as part of a future PIC meeting. The Utility provided all PIC members and interested parties with an opportunity to view the model via online meetings to see the consultants walk through all of the components of the model. The Utility provided "what if" scenarios for the PIC members to compare impacts of various changes in model inputs, and provided full printouts of the model in .pdf format on compact disks.

#2	**Category / PIC Meeting Date:**	Public Involvement Committee Process and Schedule - 11/27/2007
	Decision Needed:	Whether or not to modify the PIC meeting schedule to hold multiple sessions to discuss Water/Wastewater Allocation Methodologies
	Options Available:	PIC members expressed concern over whether the current schedule allows enough time to adequately discuss the issue of Water/Wastewater Allocation Methodologies. They suggested that this topic is too large to be covered in a single evening. The current schedule calls for this meeting to be held on January 7, 2008.
	Executive Decision:	The Executive Team decided to separate this into two meetings. The first meeting on Water Allocations and Fire Charges was held on January 7, 2008, and Wastewater Allocation and Inflow and Infiltration workshop was held on January 22, 2008.

#3	**Category / PIC Meeting Date:**	Public Involvement Committee Process and Schedule - 11/27/2007
	Decision Needed:	Whether or not to solicit and use customer supplied data to support the analysis of peaking factors.
	Options Available:	At the first PIC meeting, the industrial class representative introduced the concept of having the consultant review meter information supplied by customers that monitor their water usage throughout the day. Later two other members of the PIC expressed support for this idea.
	Executive Decision:	The Executive Team decided toconsider only data collected by the City and not consider other data or information provided by third parties. Data produced by customers or classes cannot be controlled or verified by the City. Also, more specific data for one customer or class as compared to the other classes may introduce inconsistencies into the calculations.

#4	**Category / PIC Meeting Date:**	Executive Committee Review Process and Procedures - 11/27/2007
	Decision Needed:	Criteria Weighting Factors
	Options Available:	The consultants asked for the Executive committee to determine the relative importance of the evaluation criteria on a 1-10 (1=Not Important, 10=Very Important).
	Executive Decision:	The Executive Team provided weighting factors which were included in the appendices to later issue papers.

#5	**Category / PIC Meeting Date:**	Revenue Requirements -12/17/2007
	Decision Needed:	Which Method of determining revenue requirements is most appropriate?
	Options Available:	Cash basis Utility basis Utility basis with cash residual
	Executive Decision:	The Executive Team decided to use the cash basis method for determining revenue requirements.

* AWU's Current Methodology
# Red Oak Recommendation

Cost of Service Study 2007-08
Executive Review / Decision Summary

#6	**Category / PIC Meeting Date:**	Revenue Requirements -12/17/2007
	Decision Needed:	How should future O&M expenses be projected?
	Options Available:	Historical test year with adjustments for known and measurable changes Future budgeted O&M expenses
	Executive Decision:	The Executive Team decided to use future budgeted O&M expenses to calculate revenue requirements.

#7	**Category / PIC Meeting Date:**	Revenue Requirements -12/17/2007
	Decision Needed:	How should the Rate of Return be determined?
	Options Available:	Weighted average cost of capital Indexed return Fixed return N/A if use cash basis
	Executive Decision:	N/A since the Executive Team decided to use the cash basis.

#8	**Category / PIC Meeting Date:**	Revenue Requirements -12/17/2007
	Decision Needed:	How should construction work in progress be treated?
	Options Available:	Capitalize the interest during construction Include CWIP in the rate base N/A if use cash basis
	Executive Decision:	N/A since the Executive Team decided to use the cash basis.

#9	**Category / PIC Meeting Date:**	Water Cost Allocations - 01/07/2008
	Decision Needed:	Which method of determining water cost allocations is most appropriate?
	Options Available:	Commodity / Demand Base / Extra-Capacity *# Rubottom "Hybrid" method
	Executive Decision:	The Executive Team selected the Base / Extra-Capacity method for determining water cost allocations.

#10	**Category / PIC Meeting Date:**	Water Cost Allocations - 01/07/2008
	Decision Needed:	What are the appropriate Time Steps?
	Options Available:	Peak-day and peak-hour demands *# Peak-season, peak day, and peak-hour demands
	Executive Decision:	The Executive Team decided to continue using the peak-day and peak-hour demand methodology.

#11	**Category / PIC Meeting Date:**	Water Cost Allocations - 01/07/2008
	Decision Needed:	Should private fire connections be charged for direct and indirect fire costs?
	Options Available:	No separate charge for private fire connections * Charge private fire connections for direct fire costs only # Charge private fire connections for direct and indirect fire costs
	Executive Decision:	The Executive Team decided to continue with the current methodology - no separate charges for private fire connections.

* AWU's Current Methodology
\# Red Oak Recommendation

Cost of Service Study 2007-08
Executive Review / Decision Summary

#12	**Category / PIC Meeting Date:**	Water Cost Allocations - 01/07/2008
	Decision Needed:	How should public fire cost be recovered?
	Options Available:	Recovered indirectly * Fixed charge based on property value Fixed charge based on fire customer class Fixed charge based on water meter size #
	Executive Decision:	The Executive Team selected the fixed charge based on water meter size.

#13	**Category / PIC Meeting Date:**	Wastewater Cost Allocations - 01/22/2008
	Decision Needed:	Which is the most appropriate overall method for allocating costs?
	Options Available:	Design basis * Functional basis Hybrid, where O&M costs are allocated based on function, and capital costs based on design #
	Executive Decision:	The Executive Team decided to use the Hybrid method, allocating O&M costs based on function and capital costs based on design.

#14	**Category / PIC Meeting Date:**	Wastewater Cost Allocations - 01/22/2008
	Decision Needed:	What are the appropriate customer service characteristics to use for the cost allocation process (e.g., flow, BOD, TSS, etc.)?
	Options Available:	Flow, BOD, and TSS only *# Add Total Kjeldahl Nitrogen (TKN) # Add Phosphorus#
	Executive Decision:	The Executive Team decided to use flow, BOD, and TSS only as customer service characteristics for wastewater cost allocation. The model was built with the capability to add TKN allocations in the future. AWU will not implement a sampling protocol to gather TKN data until future regulations require it.

* AWU's Current Methodology
\# Red Oak Recommendation

#15	**Category / PIC Meeting Date:**	Wastewater Cost Allocations - 01/22/2008
	Decision Needed:	How should I/I be allocated in the cost allocation process?
	Options Available:	Combined connections and volume * Contributed wastewater volume # Number of connections Land area
	Executive Decision:	The Executive Team decided to allocate inflow and infiltration (I/I) as a system cost (based on contributed volume).

#16	**Category / PIC Meeting Date:**	Customer Classification - 02/19/2008
	Decision Needed:	Should the large-volume customer class be disaggregated?
	Options Available:	Maintain one class* Separate classes for each large-volume customer #
	Executive Decision:	The Executive Team decided to disaggregate the large-volume (industrial) customer class.

#17	**Category / PIC Meeting Date:**	Customer Classification - 02/19/2008
	Decision Needed:	Should the threshold for inclusion in the large-volume class be adjusted?
	Options Available:	Maintain 85 MG per year as the threshold *# Increase the threshold to 100 MG per year Reduce the threshold to 50 MG per year (or 30 MG per year per request from Industrial PIC member)
	Executive Decision:	The Executive Team decided to maintain the 85 MG per year threshold.

#18	**Category / PIC Meeting Date:**	Customer Classification - 02/19/2008
	Decision Needed:	Should an irrigation class be created?
	Options Available:	Do not implement an irrigation class *# Implement an irrigation class
	Executive Decision:	The Executive Team decided not to implement an irrigation class and to further investigate the implementation of an excess-use rate design for commercial and multifamily customers.

* AWU's Current Methodology
\# Red Oak Recommendation

Note: Irrigation issues from 03/17/08 meeting shown before Rate Structure issues from 03/03/08 meeting since 02/19/08 issues discusses irrigation class.

#19	**Category / PIC Meeting Date:**	Rates for Irrigation Customers - 03/17/2008
	Decision Needed:	If AWU implements higher rates for irrigation services, how should the excess revenue generated by the higher rates be used?
	Options Available:	Use the excess revenues to reduce the rate for indoor water use for irrigation customers Use the excess revenues to reduce the rates for all customers Set the irrigation rate at the cost of service to eliminate excess revenues Set the excess revenues aside for other designated purposes Do not establish an irrigation rate *#
	Executive Decision:	The Executive Team decided not to establish an irrigation rate.

#20	**Category / PIC Meeting Date:**	Rates for Non-residential Irrigation Customers - 03/17/2008
	Decision Needed:	What is an appropriate level for the non-residential irrigation rates?
	Options Available:	Set the irrigation rate equal to the highest residential block rate Set the rate equal to the cost-of-service rate for irrigation # Do not establish an irrigation rate *#
	Executive Decision:	The Executive Team decided not to establish an irrigation rate.

#21	**Category / PIC Meeting Date:**	Rates for Irrigation Customers - 03/17/2008
	Decision Needed:	Should single family residential customers with irrigation meter receive irrigation water at the block 1 & 2 rates?
	Options Available:	Provide block 1 and 2 discounted water * Price all water at the same rates for block 3 and above #
	Executive Decision:	The Executive Team decided to include irrigation accounts within the excess-use rate structure for the respective classes (commercial and multifamily) associated with each irrigation account.

#22	**Category / PIC Meeting Date:**	Rate Structures - 03/03/2008
	Decision Needed:	What is the best method for providing a subsidy to low-income customers?
	Options Available:	Discounted rates for Block 1 and Block 2 * Waive the fixed charge for qualified low-income residential customers #
	Executive Decision:	The Executive Team decided to waive the fixed charge for qualified low-income residential customers.

#23	**Category / PIC Meeting Date:**	Rate Structures - 03/03/2008
	Decision Needed:	How should AWU recover a subsidy to low-income customers?
	Options Available:	Recover the subsidy within the single family residential class* Recover the subsidy from all retail customer classes #
	Executive Decision:	The Executive Team decided to recover the low-income residential subsidy from all retail customer classes. AWU will extend the program to outside-city residential customers who qualify. The cost to administer the subsidy program will be identified and included in the allocation to the retail customer classes.

#24	**Category / PIC Meeting Date:**	Rate Structures - 03/03/2008
	Decision Needed:	Should AWU introduce a 5th block for single family residential customers?
	Options Available:	Current 4-block structure* Create a 5-block structure Create a revised 4-block structure #
	Executive Decision:	The Executive Team decided to implement a 5-block structure for residential rates.

* AWU's Current Methodology
\# Red Oak Recommendation

#25	**Category / PIC Meeting Date:**	Rate Structures - 03/03/2008
	Decision Needed:	What conservation incentives should exist for wholesale customers?
	Options Available:	Uniform rates by wholesale class *# Seasonal rates Excess-use rates
	Executive Decision:	The Executive Team decided to continue the use of uniform rates for wholesale customers.

#26	**Category / PIC Meeting Date:**	Rate Structures - Not an original issue paper decision
	Decision Needed:	Should the Residential Class subsidy continue?
	Options Available:	Status quo * All at COS Transition to COS
	Executive Decision:	The Executive Team decided to transition all customers classes to cost of service. The transition will be done over several years in an effort to avoid "Rate Shock" for any particular class.

#27	**Category / PIC Meeting Date:**	Excess-Use Rate Structure - 03/03/2008 Issue Paper, but not identified as major decision issue
	Decision Needed:	Should AWU implement an excess-use rate design for its non-residential retail customers to meet the conservation objectives of the Water Conservation Task Force?
	Options Available:	Use the excess-use rate design to achieve the goals of the Water Conservation Task Force Do not establish an excess-use rate design *
	Executive Decision:	The Executive Team decided to pursue implementation of an excess-use rate structure to achieve the goals of the Water Conservation Task Force. The excess-use rate structure will be implemented at a later date, after the conversion and reprogramming of the existing billing system and development of a public information and outreach program.

#28	**Category:**	Customer Classification - No Issue Paper
	Decision Needed:	Should the Outside City and Inside City retail classes be combined?
	Options Available:	Maintain status quo - Inside City and Outside City retail customer classes separated * Combine the Inside City and Outside City retail customer classes
	Executive Decision:	The Executive Team decided to combine the Inside City and Outside City retail customer classes.

#29	**Category:**	General Fund Transfer Allocation
	Decision Needed:	Should the General Fund Transfer be allocated to customer classes based on revenues rather than allocated invested capital?
	Options Available:	Maintain status quo - General Fund Transfer allocated based on three year history of revenue by class Allocate General Fund Transfer based on invested capital
	Executive Decision:	The Executive Team decided to allocate the General Fund Transfer based on three years of historical revenues by class.

Cost of Service Study 2007-08
Executive Review / Decision Summary

#30	**Category:**	Rate Structures
	Topic	How should the wastewater strengths for large-volume customers be calculated?
	Options Available:	Maintain status quo - one year strengths 3-year average of historical sewage strengths
	Executive Decision:	The Executive Team decided to use a three-year average of historical samples to estimate sewage strengths for the large-volume customers.

#31	**Category:**	Allocation of Water Treatment Plant Maintenance Costs
	Decision Needed:	How should water treatment plant maintenance costs be allocated?
	Options Available:	Allocated to Base and Max Day Allocated to Base only
	Executive Decision:	The Executive Team decided to allocate the water treatment plant maintenance costs to Base only.

Austin Water Utility
Cost of Service Rate Study 2008

APPENDIX

B

Water Cost-of-Service Results

RED OAK CONSULTING
A DIVISION OF MALCOLM PIRNIE

2908083 / POR

Table B-1
Austin Water Utility
Water Cost of Service Model
Number of Water Accounts & Estimated Sales and Production by Customer Class

Customer Class	Accounts	Estimated Water Sales (Kgal)	Estimated Water Production (Kgal)	Estimated Unaccounted For Water (Kgal)
Residential	185,620	18,637,701	19,214,125	576,424
Multi-Family	5,738	9,109,523	9,391,261	281,738
Commercial	15,881	13,493,324	13,910,643	417,319
Creedmore-Maha	3	61,702	61,702	0
High Valley	1	6,787	6,787	0
Lost Creek	1	293,109	293,109	0
Manor, City of	1	120	120	0
Manville WSC	1	85,582	85,582	0
Marsha Water	1	10,023	10,023	0
Nighthawk	1	10,615	10,615	0
North Austin MUD	6	370,964	370,964	0
Northtown MUD	6	210,499	210,499	0
Rivercrest	3	100,896	100,896	0
Rollingwood	3	129,493	129,493	0
Shady Hollow	2	241,991	241,991	0
Sunset Valley MUD	7	93,090	93,090	0
Water District 10	1	840,512	840,512	0
Wells Branch MUD	7	541,063	541,063	0
Windermere	1	14,100	14,100	0
Hospira	1	85,973	88,631	2,659
Spansion	2	516,000	531,959	15,959
Applied Materials	9	90,193	92,983	2,789
Freescale	6	756,000	779,381	23,381
Samsung	1	960,000	989,691	29,691
Sematech	1	97,642	100,662	3,020
University of Texas	14	474,635	489,315	14,679
Totals	207,318	47,231,535	48,599,194	1,367,659

Table B-2
Austin Water Utility
Water Cost of Service Model
Summary of Customer Service Characteristics

Customer Class	Base	Max-Day	Max-Hour	Customer	Meter	Fire
Residential	39.54%	45.97%	42.10%	89.53%	62.50%	28.03%
Multi-Family	19.32%	12.57%	16.85%	2.77%	12.81%	37.23%
Commercial	28.62%	27.67%	28.20%	7.66%	23.23%	31.05%
Creedmore-Maha	0.13%	0.14%	0.13%	0.00%	0.01%	0.00%
High Valley	0.01%	0.01%	0.01%	0.00%	0.00%	0.00%
Lost Creek	0.60%	0.76%	0.65%	0.00%	0.03%	0.00%
Manor, City of	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Manville WSC	0.18%	0.31%	0.22%	0.00%	0.01%	0.00%
Marsha Water	0.02%	0.02%	0.02%	0.00%	0.00%	0.00%
Nighthawk	0.02%	0.02%	0.02%	0.00%	0.00%	0.00%
North Austin MUD	0.76%	1.17%	0.90%	0.00%	0.17%	0.00%
Northtown MUD	0.43%	0.50%	0.45%	0.00%	0.16%	0.00%
Rivercrest	0.21%	0.30%	0.24%	0.00%	0.06%	0.00%
Rollingwood	0.27%	0.49%	0.34%	0.00%	0.05%	0.00%
Shady Hollow	0.50%	0.80%	0.59%	0.00%	0.03%	0.00%
Sunset Valley MUD	0.19%	0.31%	0.23%	0.00%	0.13%	0.00%
Water District 10	1.73%	2.51%	1.99%	0.00%	0.04%	0.00%
Wells Branch MUD	1.11%	1.03%	1.08%	0.00%	0.11%	0.00%
Windermere	0.03%	0.23%	0.10%	0.00%	0.02%	0.00%
Hospira	0.18%	0.40%	0.26%	0.00%	0.03%	0.21%
Spansion	1.09%	0.61%	0.91%	0.00%	0.05%	0.42%
Applied Materials	0.19%	0.14%	0.17%	0.00%	0.10%	0.46%
Freescale	1.60%	1.33%	1.47%	0.00%	0.13%	0.86%
Samsung	2.04%	1.67%	1.88%	0.00%	0.03%	0.21%
Sematech	0.21%	0.13%	0.18%	0.00%	0.03%	0.21%
University of Texas	1.01%	0.92%	0.97%	0.01%	0.25%	1.33%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Table B-3
Austin Water Utility
Water Cost of Service Model
Assignment of Classes to Cost Pools

Customer Class	Joint	Retail Only	Wholesale	Watershed Land Purchase	LCRA	Indirect Fire
Residential	100%	100%	0%	100%	100%	100%
Multi-Family	100%	100%	0%	100%	100%	100%
Commercial	100%	100%	0%	100%	100%	100%
Creedmore-Maha	100%	0%	100%	0%	100%	100%
High Valley	100%	0%	100%	0%	100%	100%
Lost Creek	100%	0%	100%	0%	100%	100%
Manor, City of	100%	0%	100%	0%	100%	100%
Manville WSC	100%	0%	100%	0%	100%	100%
Marsha Water	100%	0%	100%	0%	100%	100%
Nighthawk	100%	0%	100%	0%	100%	100%
North Austin MUD	100%	0%	100%	0%	100%	100%
Northtown MUD	100%	0%	100%	0%	100%	100%
Rivercrest	100%	0%	100%	0%	100%	100%
Rollingwood	100%	0%	100%	0%	100%	100%
Shady Hollow	100%	0%	100%	0%	100%	100%
Sunset Valley MUD	100%	0%	100%	0%	100%	100%
Water District 10	100%	0%	100%	0%	100%	100%
Wells Branch MUD	100%	0%	100%	0%	100%	100%
Windermere	100%	0%	100%	0%	100%	100%
Hospira	100%	100%	0%	100%	100%	100%
Spansion	100%	100%	0%	100%	100%	100%
Applied Materials	100%	100%	0%	100%	100%	100%
Freescale	100%	100%	0%	100%	100%	100%
Samsung	100%	100%	0%	100%	100%	100%
Sematech	100%	100%	0%	100%	100%	100%
University of Texas	100%	100%	0%	100%	100%	100%

Table B-4
Austin Water Utility
Water Cost of Service Model
Actual O&M Costs

Item	Class Code Description	Computed
WATER TREATMENT		
Environmental & Regulatory Support	Treatment	$679,203
Water Treatment Laboratory	Treatment	1,418,359
Water Treatment Engineering		
Process Engineering	Treatment	375,259
Facility Engineering - Treatment	Treatment	717,487
Green WTP Maintenance	Treatment	551,455
Davis WTP Maintenance	Treatment	1,377,682
Ullrich WTP Maintenance	Treatment	1,143,020
Electrical Maintenance	Treatment	945,738
Instrumentation & Control Maintenance	Treatment	794,249
Admin Support	Treatment	347,213
Systems Support	Treatment	105,869
Green WTP Operations		
Electrical	Treatment	0
Chemical	Treatment	0
Other	Treatment	1,401,457
Davis WTP Operations		
Electrical	Treatment	3,925,517
Chemical	Treatment	2,188,168
Other	Treatment	1,445,910
Ullrich WTP Operations		
Electrical	Treatment	5,066,711
Chemical	Treatment	2,630,195
Other	Treatment	1,842,177
PIPELINE OPERATIONS		
Pump Station & Reservoir Maintenance (+SCADA)		
Electrical	Transmission & Distr.	3,042,783
Other	Transmission & Distr.	2,796,817
Distribution Pipeline Maintenance	Transmission & Distr.	0
Management Services	Transmission & Distr.	576,928
Dist Pipeline Operations	Transmission & Distr.	7,024,460
Distribution Service (House) Connection	Transmission & Distr.	416,882
Pipeline Rehabilitation & Construction	Transmission & Distr.	2,014,331
Metering Services		
Meter Shop	Transmission & Distr.	1,595,336
ARV/PRV Maintenance	Transmission & Distr.	268,701
Valve & Hydrant		
Valves	Transmission & Distr.	1,063,454
Valve Exercising	Transmission & Distr.	535,543
Hydrants	Transmission & Distr.	1,796,883
DISTRIBUTION SYSTEM SUPPORT		
Asset Mgt - Distribution	Transmission & Distr.	198,174
Dispatch	Transmission & Distr.	405,932
Water Facility Engineering - Distribution	Transmission & Distr.	823,017
Water Pipeline Engineering	Transmission & Distr.	660,046
Infrastructure Records	Transmission & Distr.	581,195
Distribution Engineering	Transmission & Distr.	645,784
Distribution Engineering & Tech Support	Transmission & Distr.	503,056
GIS Services	Transmission & Distr.	490,203
Line Locators - Distribution	Transmission & Distr.	425,298
Water Protection / Inspection	Transmission & Distr.	609,864
Small Calls	Transmission & Distr.	1,223,986
System Planning	Transmission & Distr.	1,242,542
Utility Development Services	Transmission & Distr.	335,865
ONE STOP SHOP		
Building Plan Review	Services	37,904

Table B-4
Austin Water Utility
Water Cost of Service Model
Actual O&M Costs

Item	Class Code Description	Computed
Research & Consult Water Cons	Services	3,204
Land Use Review	Services	39,126
Site Inspections	Services	279,848
Permit and License Center	Services	97,086
SUPPORT SERVICES		
Administration & Management		
Internal Audit	Administative	213,725
Business Support	Administative	389,621
Strategic Resources Services (Wholesale)	Administative	127,044
Business Improvement Services	Administative	193,494
Financial Mngt / Budget & Accounting		
CIP Budgeting / Acct & Fin Reporting	Administative	311,503
Rates, Analysis & Asset Mngt (RAAM)	Administative	270,245
Utility Central Stores	Administative	165,057
Budget & Accounting	Administative	499,203
Information Technology	Administative	1,620,627
Facility Management - Service Centers	Administative	588,020
Facility Management - WCC, NSC	Administative	422,759
Purchasing	Administative	177,724
Accounts Payable	Administative	247,239
Public Involvement	Administative	340,723
Human Resources Services		
Organizational Development	Administative	114,969
Employment - Compensation	Administative	152,902
Employee Relations & Workers Comp	Administative	157,146
Safety & Training	Administative	418,229
Equipment Repairs	Administative	255,033
CONSERVATION & REUSE		
Facility Engineering - Conservation	Administative	14,502
Environmental Affairs & Conservation		
Reicher Ranch	Administative	82,125
Land Management	Administative	1,322,895
Balcones Canyonland Preserve	Administative	1,189,498
Water Reuse	Administative	976
BILLING CUSTOMER SERVICES		
Tap Sales	Services	227,976
Taps Investigation & Admin	Services	89,340
Retail Customer Service	Customer Service	414,266
Utility Customer Services Office - AE	Customer Service	8,713,434
Bad Debt	Administative	990,000
TRANSFERS & OTHER REQUIREMENTS		
Commission on Debt	Administative	30,250
Special Support	Administative	9,813,888
WATER CONSERVATION		
Water Conservation	Administative	6,920,904
Other Operating Transfers		
Operating Transfers	Administative	1,290,811
Other Transfers	Administative	214,209
Funding of low-income subsidy		0
Total O&M Costs		$94,670,254

Table B-5
Austin Water Utility
Water Cost of Service Model
Cash Basis Capital Costs

Item		Computed
Debt Service Requirements		$78,634,102
Transfer to City General Fund		13,255,005
Transfer to Sustainability Fund		1,980,285
Transfer to Water Construction Fund/Capital Outlay		12,311,291
Operating Transfers		0
Other Transfers		214,209
		_____
Total		$106,394,891

Table B-6
Austin Water Utility
Water Cost of Service Model
Non-Rate Revenue

Item		Computed
Industrial Waste Permits		$0
Backflow Prevention Compliance Fee		355,928
Reconnection Fee		14,302
Restitution Criminal Acts		1
Xerox Copies - Utilities		3,555
Late Payment Penalties		786,547
Building Rental Income		165,712
Damage Charges		169,320
Process Assessment		0
Sales of Promotional Items		0
Compost/ Sludge Sales		0
Agricultural Bi-products		1
Water Special Billings		5,090
Wastewater Special Billings		0
Vendor Registration Fees		0
Property Sales- Motorized Vehicles		17,843
After Hours Turn-On		237,271
Meters on Fire Hydrants		21,971
Septic Tank Haulers Fee		0
Commission Agenda Packets		1
Maple Run MUD Surcharge		0
A/R Adjustment - UCSO Admin.		0
A/R Adjustment - WWW Admin.		0
A/R Adjustment - Leak Adjustment		(622,547)
A/R Adjustment - Conservation Rebate		1
Off Systems - General Services		0
Outside City UT/Service Appl Fee		0
Lab Testing Fee		1
Reuse Water Service		348,092
Tanglewood Forest Surcharge		0
Southland Oaks Surcharge		60,349
Wholesale Penalties & Fees		1
NWA Mud 1 Surcharge Credit		(252,930)
Service Installation		448,668
Special Bill - Wtr Fin Mngt		244,871
A/R Adjustment		1
Miscellaneous Revenues		96,829
Returned Check Fee		12,081
Junk/ Metal Sales		14,670
Cash Over/Short		1
Transfer in from CRFs		5,000,000
Sales Tax Penalty		1
New Service Connections		424,012
Transfer in from Public Works		150,291
Transfer in from CIP		1,000,000
Transfer in from Watershed Protection		0
Recls Recpt		2,000
Interest Income (Capital Portion)		618,625
Decrease (Increase) in Operating Reserves		(1,638,845)
Full Year Revenue Increase Adjustment (a)		0
Interest Income (O&M Portion)		556,717
Decrease (Increase) in Operating Reserves		(1,474,841)
Total		$6,765,590

Table B-7
Austin Water Utility
Water Cost of Service Model
Summary of User Charge Revenue Requirements by Customer Class

Customer Class	O&M	Special Costs	Revenue-Based Allocations	Depreciation	Return	Total
Residential	$43,734,733	$3,357,822	$6,027,631	$9,888,301	$23,603,038	$86,611,526
Multi-Family	15,446,684	1,641,198	2,732,974	4,085,353	9,915,628	33,821,837
Commercial	23,894,254	2,430,996	4,747,023	6,568,482	16,035,330	53,676,086
Creedmore-Maha	84,232	4,709	13,676	22,369	54,870	179,856
High Valley	9,059	518	1,523	2,251	5,513	18,863
Lost Creek	405,214	22,369	78,235	111,326	273,484	890,629
Manor, City of	332	9	49	103	150	642
Manville WSC	123,915	6,531	21,588	37,188	91,256	280,478
Marsha Water	13,473	765	2,273	3,433	8,425	28,369
Nighthawk	14,188	810	2,362	3,551	8,661	29,572
North Austin MUD	530,028	28,311	101,607	154,109	375,351	1,189,406
Northtown MUD	291,792	16,064	50,318	79,290	191,730	629,194
Rivercrest	143,472	7,700	19,500	41,140	99,823	311,635
Rollingwood	190,195	9,882	34,510	58,201	142,012	434,800
Shady Hollow	345,849	18,468	69,764	101,312	248,507	783,900
Sunset Valley MUD	136,393	7,104	26,114	40,629	97,134	307,374
Water District 10	1,182,507	64,145	236,907	336,974	828,488	2,649,021
Wells Branch MUD	725,138	41,292	122,535	185,635	455,373	1,529,973
Windermere	32,582	1,076	10,665	16,200	39,193	99,715
Hospira	166,839	15,489	25,953	56,321	141,399	406,002
Spansion	783,099	92,964	173,269	203,728	516,530	1,769,589
Applied Materials	152,584	16,249	30,618	41,691	101,511	342,654
Freescale	1,200,879	136,203	255,950	331,172	836,908	2,761,112
Samsung	1,498,976	172,956	267,733	411,581	1,048,187	3,399,434
Sematech	153,612	17,591	30,408	40,869	102,389	344,870
University of Texas	789,008	85,512	152,105	222,450	553,943	1,803,018
Total	$92,049,037	$8,196,736	$15,235,290	$23,043,659	$55,774,833	$194,299,555

Table B-8
Austin Water Utility
Water Cost of Service Model
Distribution of O&M Costs to Cost Pools

Item	Joint	Retail Only	Wholesale	Watershed Land Purchase	LCRA	Indirect Fire	Total
Raw Water	$0	$0	$0	$0	$0	$0	$0
Treatment Average Day	36,711,289	0	0	0	0	0	36,711,289
Treatment Facilities	5,898,483	0	0	0	0	0	5,898,483
Pump Stations & Booster Stations	3,166,039	0	0	0	0	0	3,166,039
Pump Stations Power	3,827,196	0	0	0	0	0	3,827,196
Tanks/ Reservoirs	351,782	0	0	0	0	0	351,782
Transmission Mains	11,815,621	0	0	0	0	0	11,815,621
Distribution Mains	0	11,662,285	0	0	0	0	11,662,285
Direct Fire	0	1,695,082	0	0	0	0	1,695,082
Retail Meters & Services	0	1,396,591	0	0	0	0	1,396,591
Meters & Services	2,344,576	0	0	0	0	0	2,344,576
Watershed Land Purchases	0	0	0	0	0	0	0
LCRA Water Rights	0	0	0	0	0	0	0
Customer Service	11,480,772	0	0	0	0	0	11,480,772
Small Calls	1,539,523	0	0	0	0	0	1,539,523
Wholesale Services	0	31,959	127,836	0	0	0	159,795
Revenue-Based Volume Charge	0	0	0	0	0	0	0
Indirect	0	0	0	0	0	0	0
Totals	$77,135,282	$14,785,918	$127,836	$0	$0	$0	$92,049,037

Table B-9
Austin Water Utility
Water Cost of Service Model
Distribution of Specially Allocated Items to Cost Pools

Item	Joint	Retail Only	Wholesale	Watershed Land Purchase	LCRA	Indirect Fire	Total
Raw Water	$0	$0	$0	$0	$0	$0	$0
Treatment Average Day	0	0	0	0	0	0	0
Treatment Facilities	0	0	0	0	0	0	0
Pump Stations & Booster Stations	0	0	0	0	0	0	0
Pump Stations Power	0	0	0	0	0	0	0
Tanks/ Reservoirs	0	0	0	0	0	0	0
Transmission Mains	0	0	0	0	0	0	0
Distribution Mains	0	0	0	0	0	0	0
Direct Fire	0	0	0	0	0	0	0
Retail Meters & Services	0	0	0	0	0	0	0
Meters & Services	0	0	0	0	0	0	0
Watershed Land Purchases	0	0	0	4,487,823	0	0	4,487,823
LCRA Water Rights	0	0	0	0	3,708,913	0	3,708,913
Customer Service	0	0	0	0	0	0	0
Small Calls	0	0	0	0	0	0	0
Wholesale Services	0	0	0	0	0	0	0
Revenue-Based Volume Charge	0	0	0	0	0	0	0
Indirect	0	0	0	0	0	0	0
Totals	$0	$0	$0	$4,487,823	$3,708,913	$0	$8,196,736

Table B-10
Austin Water Utility
Water Cost of Service Model
Distribution of Revenue-Based Allocated Items to Cost Pools

Item	Joint	Retail Only	Wholesale	Watershed Land Purchase	LCRA	Indirect Fire	Total
Raw Water	$0	$0	$0	$0	$0	$0	$0
Treatment Average Day	0	0	0	0	0	0	0
Treatment Facilities	0	0	0	0	0	0	0
Pump Stations & Booster Stations	0	0	0	0	0	0	0
Pump Stations Power	0	0	0	0	0	0	0
Tanks/ Reservoirs	0	0	0	0	0	0	0
Transmission Mains	0	0	0	0	0	0	0
Distribution Mains	0	0	0	0	0	0	0
Direct Fire	0	0	0	0	0	0	0
Retail Meters & Services	0	0	0	0	0	0	0
Meters & Services	0	0	0	0	0	0	0
Watershed Land Purchases	0	0	0	0	0	0	0
LCRA Water Rights	0	0	0	0	0	0	0
Customer Service	0	0	0	0	0	0	0
Small Calls	0	0	0	0	0	0	0
Wholesale Services	0	0	0	0	0	0	0
Revenue-Based Volume Charge	15,235,290	0	0	0	0	0	15,235,290
Indirect	0	0	0	0	0	0	0
Totals	$15,235,290	$0	$0	$0	$0	$0	$15,235,290

Table B-11
Austin Water Utility
Water Cost of Service Model
Distribution of Net Plant in Service to Cost Pools

Description	Joint	Retail Only	Wholesale	Watershed Land Purchase	LCRA	Indirect Fire	Total
Raw Water	$0	$0	$0	$0	$0	$0	$0
Treatment Average Day	0	0	0	0	0	0	0
Treatment Facilities	132,204,526	0	0	0	0	0	132,204,526
Pump Stations & Booster Stations	50,098,948	0	0	0	0	0	50,098,948
Pump Stations Power	0	0	0	0	0	0	0
Tanks/ Reservoirs	34,760,565	0	0	0	0	0	34,760,565
Transmission Mains	202,190,528	0	0	0	0	0	202,190,528
Distribution Mains	0	124,165,067	0	0	0	0	124,165,067
Direct Fire	0	7,188,888	0	0	0	0	7,188,888
Retail Meters & Services	0	0	0	0	0	0	0
Meters & Services	7,859,826	0	0	0	0	0	7,859,826
Watershed Land Purchases	0	0	0	0	0	0	0
LCRA Water Rights	0	0	0	0	0	0	0
Customer Service	0	0	0	0	0	0	0
Small Calls	0	0	0	0	0	0	0
Wholesale Services	0	0	0	0	0	0	0
Revenue-Based Volume Charge	0	0	0	0	0	0	0
Indirect	33,399,381	10,271,583	0	0	0	0	43,670,964
Totals	$460,513,774	$141,625,538	$0	$0	$0	$0	$602,139,312

Table B-12
Austin Water Utility
Water Cost of Service Model
User Charge Revenue Requirements by Customer Service Characteristic

Customer Class	Base	Max-Day	Max-Hour	Customer	Meter	Fire	Totals
Residential	$52,691,032	$15,016,380	$3,836,168	$10,279,179	$3,594,950	$1,193,816	$86,611,526
Multi-Family	25,540,579	4,105,505	1,535,649	317,752	736,905	1,585,447	33,821,837
Commercial	38,530,395	9,037,792	2,569,999	879,466	1,336,062	1,322,372	53,676,086
Creedmore-Maha	143,839	35,342	0	166	509	0	179,856
High Valley	15,840	2,883	0	55	84	0	18,863
Lost Creek	696,560	192,652	0	55	1,361	0	890,629
Manor, City of	302	81	0	55	204	0	642
Manville WSC	202,125	77,958	0	55	340	0	280,478
Marsha Water	23,418	4,812	0	55	84	0	28,369
Nighthawk	24,754	4,559	0	55	204	0	29,572
North Austin MUD	884,169	297,421	0	332	7,483	0	1,189,406
Northtown MUD	494,373	127,346	0	332	7,143	0	629,194
Rivercrest	232,344	76,319	0	166	2,806	0	311,635
Rollingwood	307,681	124,912	0	166	2,041	0	434,800
Shady Hollow	580,253	202,175	0	111	1,361	0	783,900
Sunset Valley MUD	222,492	78,982	0	388	5,513	0	307,374
Water District 10	2,009,999	637,402	0	55	1,565	0	2,649,021
Wells Branch MUD	1,263,928	260,733	0	388	4,924	0	1,529,973
Windermere	40,409	58,570	0	55	680	0	99,715
Hospira	241,203	130,011	24,022	55	1,802	8,909	406,002
Spansion	1,465,183	200,358	82,966	111	3,153	17,818	1,769,589
Applied Materials	256,435	45,126	15,504	498	5,467	19,623	342,654
Freescale	2,148,755	434,137	133,975	332	7,319	36,595	2,761,112
Samsung	2,671,294	545,724	171,649	55	1,802	8,909	3,399,434
Sematech	274,875	42,987	16,241	55	1,802	8,909	344,870
University of Texas	1,340,455	302,123	88,811	775	14,320	56,534	1,803,018
Totals	$132,302,691	$32,042,291	$8,474,985	$11,480,772	$5,739,884	$4,258,932	$194,299,555

Table B-13
Austin Water Utility
Water Cost of Service Model
Peaking Factors by Customer Class

Customer Class	Max-Day	Max-Hour
Residential	1.66	2.42
Multi-Family	1.37	1.99
Commercial	1.55	2.25
Creedmore-Maha	1.62	2.36
High Valley	1.46	2.12
Lost Creek	1.71	2.49
Manor, City of	1.73	2.52
Manville WSC	1.99	2.89
Marsha Water	1.52	2.21
Nighthawk	1.47	2.13
North Austin MUD	1.87	2.72
Northtown MUD	1.66	2.40
Rivercrest	1.82	2.65
Rollingwood	2.05	2.97
Shady Hollow	1.91	2.76
Sunset Valley MUD	1.92	2.80
Water District 10	1.82	2.64
Wells Branch MUD	1.52	2.22
Windermere	5.52	8.09
Hospira	2.24	3.27
Spansion	1.32	1.91
Applied Materials	1.41	2.05
Freescale	1.47	2.13
Samsung	1.47	2.13
Sematech	1.36	1.98
University of Texas	1.52	2.21

Table B-14
Austin Water Utility
Water Cost of Service Model
Revenue Summary

Customer Class	Existing Rates	Computed Rates	Percent Difference
Residential	$78,810,693	$86,709,735	10.0%
Multi-Family	34,631,345	33,857,794	(2.2%)
Commercial	61,533,634	53,740,884	(12.7%)
Creedmore-Maha	178,719	179,953	0.7%
High Valley	18,859	18,865	0.0%
Lost Creek	887,545	891,647	0.5%
Manor, City of	729	642	(11.9%)
Manville WSC	280,479	280,725	0.1%
Marsha Water	28,059	28,378	1.1%
Nighthawk	29,375	29,606	0.8%
North Austin MUD	1,170,391	1,190,933	1.8%
Northtown MUD	627,063	629,259	0.4%
Rivercrest	317,685	311,953	(1.8%)
Rollingwood	434,825	434,956	0.0%
Shady Hollow	779,199	782,897	0.5%
Sunset Valley MUD	306,657	307,207	0.2%
Water District 10	2,633,503	2,650,573	0.6%
Wells Branch MUD	1,523,677	1,529,066	0.4%
Windermere	99,340	99,649	0.3%
Hospira	348,548	406,372	16.6%
Spansion	2,092,216	1,771,037	(15.4%)
Applied Materials	373,745	343,021	(8.2%)
Freescale	3,068,951	2,763,541	(10.0%)
Samsung	3,887,156	3,402,853	(12.5%)
Sematech	398,204	345,211	(13.3%)
University of Texas	1,946,422	1,804,453	(7.3%)
Totals	$196,407,020	$194,511,209	(1.0%)

Austin Water Utility
Cost of Service Rate Study 2008

APPENDIX

C

Wastewater Cost-of-Service Results

REDOAK CONSULTING
A DIVISION OF MALCOLM PIRNIE

Table C-1
Austin Water Utility
Wastewater Cost of Service Model
Number of Wastewater Connections & Estimated Flows by Customer Class

Customer Class	Connections	Flows (Kgal)		
		Customer Contributed	I&I	Total Flows
Residential	177,229	9,942,419	1,166,429	11,108,848
Multi-Family	5,202	6,943,006	814,543	7,757,548
Commercial	11,455	6,436,992	755,178	7,192,170
(Industrial Classes Below)	0	0	0	0
(Combined Residential Above)	0	0	0	0
(Combined Multi-Family Above)	0	0	0	0
(Combined Commercial Above)	0	0	0	0
Comanche Canyon (WCID#17)	1	2,400	282	2,682
Manor, City of	1	60,000	7,039	67,039
North Austin MUD #1	1	295,792	34,702	330,494
Northtown MUD	1	167,867	19,694	187,561
Rollingwood, City of	1	37,800	4,435	42,235
Shady Hollow MUD	1	88,997	10,441	99,438
Sunset Valley, City of	1	71,485	8,387	79,872
Steiner Ranch (WCID #17)	1	480	56	536
Wells Branch MUD	1	388,534	45,582	434,117
Westlake Hills, City of	1	30,000	3,520	33,520
Hospira	1	149,494	17,538	167,033
Spansion	1	467,000	54,788	521,788
Applied Materials	1	50,000	5,866	55,866
Freescale	3	450,000	52,793	502,793
Samsung	1	710,000	83,296	793,296
Sematech	1	70,000	8,212	78,212
University of Texas	14	241,913	28,381	270,294
Extra-Strength Surcharges	0	0	0	0
Totals	193,918	26,604,181	3,121,161	29,725,342

Table C-2
Austin Water Utility
Wastewater Cost of Service Model
BOD and TSS Contributions by Customer Class

Customer Class	BOD lbs/day Totals	TSS lbs/day Totals
Residential	34,291	49,980
Multi-Family	23,946	34,902
Commercial	22,201	32,359
(Industrial Classes Below)	0	0
(Combined Residential Above)	0	0
(Combined Multi-Family Above)	0	0
(Combined Commercial Above)	0	0
Comanche Canyon (WCID#17)	1	1
Manor, City of	207	302
North Austin MUD #1	1,020	1,487
Northtown MUD	579	844
Rollingwood, City of	130	190
Shady Hollow MUD	307	447
Sunset Valley, City of	247	359
Steiner Ranch (WCID #17)	0	0
Wells Branch MUD	1,340	1,953
Westlake Hills, City of	103	151
Hospira	581	366
Spansion	299	267
Applied Materials	144	268
Freescale	1,266	632
Samsung	2,041	1,041
Sematech	79	69
University of Texas	693	1,083
Extra-Strength Surcharges	16,567	3,962
Total	106,042	130,664

Table C-3
Austin Water Utility
Wastewater Cost of Service Model
Summary of Customer Service Characteristics

Customer Class	Flow	BOD	TSS	Customer	Meter
Residential	37.37%	32.34%	38.25%	91.39%	91.35%
Multi-Family	26.10%	22.58%	26.71%	2.68%	2.68%
Commercial	24.20%	20.94%	24.76%	5.91%	5.90%
(Industrial Classes Below)	0.00%	0.00%	0.00%	0.00%	0.00%
(Combined Residential Above)	0.00%	0.00%	0.00%	0.00%	0.00%
(Combined Multi-Family Above)	0.00%	0.00%	0.00%	0.00%	0.00%
(Combined Commercial Above)	0.00%	0.00%	0.00%	0.00%	0.00%
Comanche Canyon (WCID#17)	0.01%	0.00%	0.00%	0.00%	0.00%
Manor, City of	0.23%	0.20%	0.23%	0.00%	0.00%
North Austin MUD #1	1.11%	0.96%	1.14%	0.00%	0.00%
Northtown MUD	0.63%	0.55%	0.65%	0.00%	0.00%
Rollingwood, City of	0.14%	0.12%	0.15%	0.00%	0.00%
Shady Hollow MUD	0.33%	0.29%	0.34%	0.00%	0.00%
Sunset Valley, City of	0.27%	0.23%	0.28%	0.00%	0.00%
Steiner Ranch (WCID #17)	0.00%	0.00%	0.00%	0.00%	0.00%
Wells Branch MUD	1.46%	1.26%	1.49%	0.00%	0.00%
Westlake Hills, City of	0.11%	0.10%	0.12%	0.00%	0.04%
Hospira	0.56%	0.55%	0.28%	0.00%	0.00%
Spansion	1.76%	0.28%	0.20%	0.00%	0.00%
Applied Materials	0.19%	0.14%	0.21%	0.00%	0.00%
Freescale	1.69%	1.19%	0.48%	0.00%	0.00%
Samsung	2.67%	1.93%	0.80%	0.00%	0.00%
Sematech	0.26%	0.07%	0.05%	0.00%	0.00%
University of Texas	0.91%	0.65%	0.83%	0.01%	0.01%
Extra-Strength Surcharges	0.00%	15.62%	3.03%	0.00%	0.00%
Total	100.00%	100.00%	100.00%	100.00%	100.00%

Table C-4
Austin Water Utility
Wastewater Cost of Service Model
Assignment of Classes to Cost Pools

Customer Class	Joint	Retail Only	Wholesale	Contract Revenue Bonds	Commercial & Industrial Monitoring	Surcharge Customers
Residential	100%	100%	0%	100%	0%	0%
Multi-Family	100%	100%	0%	100%	0%	0%
Commercial	100%	100%	0%	100%	100%	0%
(Industrial Classes Below)	100%	100%	0%	100%	57%	0%
(Combined Residential Above)	100%	100%	0%	100%	0%	0%
(Combined Multi-Family Above)	100%	100%	0%	100%	0%	0%
(Combined Commercial Above)	100%	100%	0%	100%	100%	0%
Comanche Canyon (WCID#17)	100%	0%	100%	100%	0%	0%
Manor, City of	100%	0%	100%	100%	0%	0%
North Austin MUD #1	100%	0%	100%	0%	0%	0%
Northtown MUD	100%	0%	100%	100%	0%	0%
Rollingwood, City of	100%	0%	100%	100%	0%	0%
Shady Hollow MUD	100%	0%	100%	100%	0%	0%
Sunset Valley, City of	100%	0%	100%	100%	0%	0%
Steiner Ranch (WCID #17)	100%	0%	100%	100%	0%	0%
Wells Branch MUD	100%	0%	100%	100%	0%	0%
Westlake Hills, City of	100%	0%	100%	100%	0%	0%
Hospira	100%	100%	0%	100%	57%	0%
Spansion	100%	100%	0%	100%	57%	0%
Applied Materials	100%	100%	0%	100%	57%	0%
Freescale	100%	100%	0%	100%	57%	0%
Samsung	100%	100%	0%	100%	57%	0%
Sematech	100%	100%	0%	100%	57%	0%
University of Texas	100%	100%	0%	100%	57%	0%
Extra-Strength Surcharges	100%	0%	0%	100%	0%	100%

Table C-5
Austin Water Utility
Water Cost of Service Model
Actual O&M Costs

Item	Class Code Description	Computed
WASTEWATER TREATMENT SUPPORT		
Environmental & Regulatory Support	Treatment	$527,956
WW Treatment Laboratory	Treatment	1,461,380
Process Engineering	Treatment	323,610
Facility Engineering - Plants	Treatment	701,174
WASTEWATER TREATMENT		
Hornsby Biosolids Plant		
Hornsby Operations		
Electrical	Treatment	375,250
Chemical	Treatment	852,514
Other	Treatment	1,279,401
Hornsby Maintenance	Treatment	1,824,807
Hornsby Bend Equipment Maintenance	Treatment	1,797,899
Wastewater Plant Maintenance		
South Austin Regional WWTP Maintenance	Treatment	1,672,615
Govalle WWTP Maintenance	Treatment	363,393
Walnut Creek WWTP Maintenance	Treatment	1,414,010
Electric Maintenance	Treatment	1,078,655
Instrumentation & Control Maintenance	Treatment	1,023,585
Systems Support - Wastewater--MBN	Treatment	105,869
Admin Support - Wastewater--MBN	Treatment	305,827
South Austin Regional Operations		
Electrical	Treatment	2,809,092
Chemical	Treatment	296,250
Other	Treatment	1,599,791
Govalle Operations - Govalle recently decommissioned		
Electrical	Treatment	98,750
Chemical	Treatment	0
Other	Treatment	261,600
Walnut Creek Operations		
Electrical	Treatment	2,675,389
Chemical	Treatment	335,750
Other	Treatment	1,804,198
COLLECTION SYSTEM OPERATIONS & MAINTENANCE		
Lift Stations		
Electrical	Conveyance	922,827
Other	Conveyance	3,727,146
Collection Pipeline Maintenance		
Management Services	Conveyance	553,534
Pipeline Operations	Conveyance	5,152,213
Sanitary Sewer Overflow (SSO) Prevention	Conveyance	1,359,312
Service (House) Connection	Conveyance	373,224
Construction - Invest & Rehab	Conveyance	1,717,565
COLLECTION SYSTEM SUPPORT		
Asset Management	Conveyance	196,831
Dispatch	Conveyance	404,447
Pipeline Engineering	Conveyance	660,292
Facility Engineering - Dist/Coll	Conveyance	818,504
Engineering & Tech Support	Conveyance	1,018,850
Collection System Support Laboratory		0
Collection Technical Support		0
GIS Services	Conveyance	490,104
Line Locators - Collection	Conveyance	333,521
On-Site Sewage Facilities (OSSF)	Conveyance	310,649
Industrial Waste	Conveyance	1,173,063
Infrastructure Records--MBN	Conveyance	581,545
Systems Planning	Conveyance	861,814
Utility Development Services	Conveyance	364,241
Wastewater TV Inspection, Inflow & Infiltration		
TV Inspection	Conveyance	2,764,298
Inflow and Infiltration	Conveyance	1,155,035

Table C-5
Austin Water Utility
Water Cost of Service Model
Actual O&M Costs

Item	Class Code Description	Computed
Collection Engineering	Conveyance	2,876,745
ONE STOP SHOP		
Commercial Building Plan Review		
Building Plan Review	Administrative	37,904
Building Plan Review - IW	Administrative	90,717
Land Use Review	Administrative	39,126
One-Time Inspection	Administrative	39,126
Permit Center		
Permit and License Center	Administrative	96,622
Permit and License Center OSSF	Administrative	39,126
Site Inspections	Administrative	274,517
SUPPORT SERVICES		
Administration & Management		
Internal Audit	Administrative	213,724
Business Support	Administrative	390,135
Strategic Resources Services - Wholesale	Administrative	127,043
Business Improvement Services	Administrative	193,840
CIP Budget/Acct & Fin Reporting--MBN	Administrative	311,572
Rates, Analysis & Asset Mngt	Administrative	269,455
Stores	Administrative	160,559
Budget & Accounting	Administrative	495,610
Information Technology Support	Administrative	1,620,626
Facility Expenses		
Facility Management - GBSC, Webberville	Administrative	523,440
Facility Management - WCC, NSC	Administrative	583,620
Purchasing / MBE / WBE		
Purchasing	Administrative	177,625
Accounts Payable	Administrative	245,968
Public Involvement - Community Involvement	Administrative	337,579
Personnel / Training		
Organizational Development	Administrative	114,440
Employment - Compensation	Administrative	148,589
Employee Relations & Wkrs Comp	Administrative	157,146
Safety & Training	Administrative	416,452
Equipment Repairs	Administrative	494,076
CONSERVATION & REUSE		
Facility Engineering - Conservation	Treatment	32,430
Environmental Lab - Conserv. & Reuse Support	Treatment	1,094,711
Water Reuse / WW Reuse	Treatment	177,178
BILLING CUSTOMER SERVICES		
Tap Sales	Administrative	170,797
Taps Investigation & Admin	Administrative	80,513
Retail Customer Service	Administrative	461,570
Utility Customer Services Office - AE	Administrative	4,810,774
Bad Debt	Administrative	982,500
TRANSFERS & OTHER REQUIREMENTS		
Commission on Debt	Administrative	30,347
Special Support	Administrative	8,768,654
TRANSFERS & OTHER REQUIREMENTS		
Operating Transfers	0	931,350
Other Transfers	0	214,209
Funding of low-income subsidy	0	0
Total O&M Costs		$78,158,195

Table C-6
Austin Water Utility
Wastewater Cost of Service Model
Cash Basis Capital Costs

Item		Computed
Debt Service Requirements (Includes CRB)		$82,812,283
Transfer to City General Fund		13,107,647
Transfer to Sustainability Fund		1,964,817
Transfer to Wastewater Construction Fund/Capital Outlay		35,465,114
Operating Transfers		0
Other Transfers		214,210
Total		$133,564,071

Table C-7
Austin Water Utility
Water Cost of Service Model
Non-Rate Revenue

Item		Computed
Industrial Waste Permits		$397,595
Reconnection Fee		14,827
Permit-Liquid Waste Hauler		11,616
Restitution Criminal Acts		1
Xerox Copies - Utilities		458
Late Payment Penalties		982,759
Building Rental Income		163,813
Damage Charges		1
Process Assessment		1
Compost/ Sludge Sales		410,672
Agricultural Bi-products		31,985
Wastewater Special Billings		16,924
Commission Agenda Packets		1
Property Sales- Motorized Vehicles		68,889
After Hours Turn-On		201,116
Special Bill - Wtr Fin Mgmt		61,088
Septic Tank Haulers Fee		837,751
Wholesale Penalities & Fees		78,347
Service Installation		34,086
A/R Adjustment - Leak Adjustment		(63,278)
NWA MUD 1 Surcharge Credit		(277,656)
WW Meter Application Fee		1,957
OSSF Reviews		38,258
Lab Testing Fee		11,530
Reuse Water Service		7,364
A/R Adjustment - Conservation Rebate		1
Southland Oaks Surcharge		68,271
A/R Adjustment		1
Miscellaneous Revenues		25,000
Returned Check Fee		11,455
Junk/ Metal Sales		10,275
Cash Over/Short		1
Sales Tax Penalty		1
New Service Connections		381,940
Transfer In from CIP		1,000,000
Transfers In (from CRF's & Public Works)		3,700,292
Interest Income (O&M Portion)		577,575
Decrease (Increase) in Operating Reserves		6,599,196
Interest Income (Capital Portion)		967,133
Decrease (Increase) in Operating Reserves		3,941,058
Total		$20,312,304

Table C-8
Austin Water Utility
Wastewater Cost of Service Model
Summary of User Charge Revenue Requirements by Customer Class

Customer Class	O&M	Special Costs	Revenue-Based Allocations	Depreciation	Return	Total
Residential	$28,511,258	$202,373	$5,944,663	$10,358,780	$29,576,928	$74,594,002
Multi-Family	15,835,428	141,322	3,791,730	7,233,760	20,654,207	47,656,447
Commercial	15,529,090	131,022	3,741,686	6,706,556	19,148,906	45,257,260
(Industrial Classes Below)	0	0	0	0	0	0
(Combined Residential Above)	0	0	0	0	0	0
(Combined Multi-Family Above)	0	0	0	0	0	0
(Combined Commercial Above)	0	0	0	0	0	0
Comanche Canyon (WCID#17)	2,786	49	605	1,447	3,907	8,795
Manor, City of	104,571	1,221	21,641	46,849	122,078	296,360
North Austin MUD #1	515,387	0	117,235	230,959	601,826	1,465,407
Northtown MUD	292,507	3,417	61,452	131,074	341,547	829,997
Rollingwood, City of	65,893	769	14,855	29,515	76,909	187,941
Shady Hollow MUD	155,093	1,811	31,997	69,491	181,076	439,468
Sunset Valley, City of	124,581	1,455	24,249	55,817	145,445	351,548
Steiner Ranch (WCID #17)	585	10	161	289	781	1,826
Wells Branch MUD	676,971	7,908	161,507	303,374	790,522	1,940,283
Westlake Hills, City of	52,303	611	12,088	23,425	61,039	149,465
Hospira	336,294	3,043	76,749	150,842	433,332	1,000,260
Spansion	827,085	9,506	265,380	410,798	1,215,885	2,728,653
Applied Materials	112,745	1,018	34,109	51,539	147,491	346,902
Freescale	932,712	9,160	255,219	431,414	1,252,671	2,881,175
Samsung	1,478,835	14,452	349,618	682,771	1,981,224	4,506,899
Sematech	129,436	1,425	40,792	63,095	185,723	420,471
University of Texas	536,188	4,924	126,727	245,508	704,720	1,618,067
Extra-Strength Surcharges	2,892,762	0	0	560,343	1,275,628	4,728,734
Total	$69,112,512	$535,495	$15,072,464	$27,787,646	$78,901,845	$191,409,961

Table C-9
Austin Water Utility
Wastewater Cost of Service Model
Distribution of O&M Costs to Cost Pools

Item	Joint	Retail Only	Wholesale	Contract Revenue Bonds	Commercial & Industrial Monitoring	Surcharge Customers	Total
Collection	$0	$16,405,047	$0	$0	$0	$0	$16,405,047
Interceptors	10,014,142	0	0	0	0	0	10,014,142
Lift Stations (Conveyance)	6,221,582	0	0	0	0	0	6,221,582
Plant Raw WW Pumping	2,182,381	0	0	0	0	0	2,182,381
Preliminary Treatment	594,410	0	0	0	0	0	594,410
Industrial Waste Control	0	0	0	0	699,229	699,229	1,398,457
Bar Screens	0	0	0	0	0	0	0
Grit Removal	0	0	0	0	0	0	0
Primary Clarifiers	1,098,148	0	0	0	0	0	1,098,148
Flow Equalization Basins	1,535,476	0	0	0	0	0	1,535,476
Aeration Basins	5,107,146	0	0	0	0	0	5,107,146
Secondary Clarifiers	2,163,540	0	0	0	0	0	2,163,540
Return Sludge Pumping	151,055	0	0	0	0	0	151,055
Waste Sludge Pumping	105,719	0	0	0	0	0	105,719
Filters	3,364,960	0	0	0	0	0	3,364,960
Disinfection and Outfall	1,769,466	0	0	0	0	0	1,769,466
Revenue Allocated Costs	0	0	0	0	0	0	0
Sludge Thickening	659,075	0	0	0	0	0	659,075
Biosolids Management	9,224,396	0	0	0	0	0	9,224,396
Wholesale & Industrial Services	0	0	150,445	0	37,611	0	188,056
Customer Service	6,664,386	0	0	0	0	0	6,664,386
Indirect Treatment	265,070	0	0	0	0	0	265,070
Indirect	0	0	0	0	0	0	0
Totals	$51,120,951	$16,405,047	$150,445	$0	$736,840	$699,229	$69,112,512

Table C-10
Austin Water Utility
Wastewater Cost of Service Model
Distribution of Specially Allocated Items to Cost Pools

Item	Joint	Retail Only	Wholesale	Contract Revenue Bonds	Commercial & Industrial Monitoring	Surcharge Customers	Total
Collection	$0	$0	$0	$0	$0	$0	$0
Interceptors	0	0	0	535,495	0	0	535,495
Lift Stations (Conveyance)	0	0	0	0	0	0	0
Plant Raw WW Pumping	0	0	0	0	0	0	0
Preliminary Treatment	0	0	0	0	0	0	0
Industrial Waste Control	0	0	0	0	0	0	0
Bar Screens	0	0	0	0	0	0	0
Grit Removal	0	0	0	0	0	0	0
Primary Clarifiers	0	0	0	0	0	0	0
Flow Equalization Basins	0	0	0	0	0	0	0
Aeration Basins	0	0	0	0	0	0	0
Secondary Clarifiers	0	0	0	0	0	0	0
Return Sludge Pumping	0	0	0	0	0	0	0
Waste Sludge Pumping	0	0	0	0	0	0	0
Filters	0	0	0	0	0	0	0
Disinfection and Outfall	0	0	0	0	0	0	0
Revenue Allocated Costs	0	0	0	0	0	0	0
Sludge Thickening	0	0	0	0	0	0	0
Biosolids Management	0	0	0	0	0	0	0
Wholesale & Industrial Services	0	0	0	0	0	0	0
Customer Service	0	0	0	0	0	0	0
Indirect Treatment	0	0	0	0	0	0	0
Indirect	0	0	0	0	0	0	0
Totals	$0	$0	$0	$535,495	$0	$0	$535,495

Table C-11
Austin Water Utility
Wastewater Cost of Service Model
Distribution of Revenue Allocated Costs to Cost Pools

Item	Joint	Retail Only	Wholesale	Contract Revenue Bonds	Commercial & Industrial Monitoring	Surcharge Customers	Total
Collection	$0	$0	$0	$0	$0	$0	$0
Interceptors	0	0	0	0	0	0	0
Lift Stations (Conveyance)	0	0	0	0	0	0	0
Plant Raw WW Pumping	0	0	0	0	0	0	0
Preliminary Treatment	0	0	0	0	0	0	0
Industrial Waste Control	0	0	0	0	0	0	0
Bar Screens	0	0	0	0	0	0	0
Grit Removal	0	0	0	0	0	0	0
Primary Clarifiers	0	0	0	0	0	0	0
Flow Equalization Basins	0	0	0	0	0	0	0
Aeration Basins	0	0	0	0	0	0	0
Secondary Clarifiers	0	0	0	0	0	0	0
Return Sludge Pumping	0	0	0	0	0	0	0
Waste Sludge Pumping	0	0	0	0	0	0	0
Filters	0	0	0	0	0	0	0
Disinfection and Outfall	0	0	0	0	0	0	0
Revenue Allocated Costs	15,072,464	0	0	0	0	0	15,072,464
Sludge Thickening	0	0	0	0	0	0	0
Biosolids Management	0	0	0	0	0	0	0
Wholesale & Industrial Services	0	0	0	0	0	0	0
Customer Service	0	0	0	0	0	0	0
Indirect Treatment	0	0	0	0	0	0	0
Indirect	0	0	0	0	0	0	0
Totals	$15,072,464	$0	$0	$0	$0	$0	$15,072,464

Table C-12
Austin Water Utility
Wastewater Cost of Service Model
Distribution of Net Plant in Service to Cost Pools

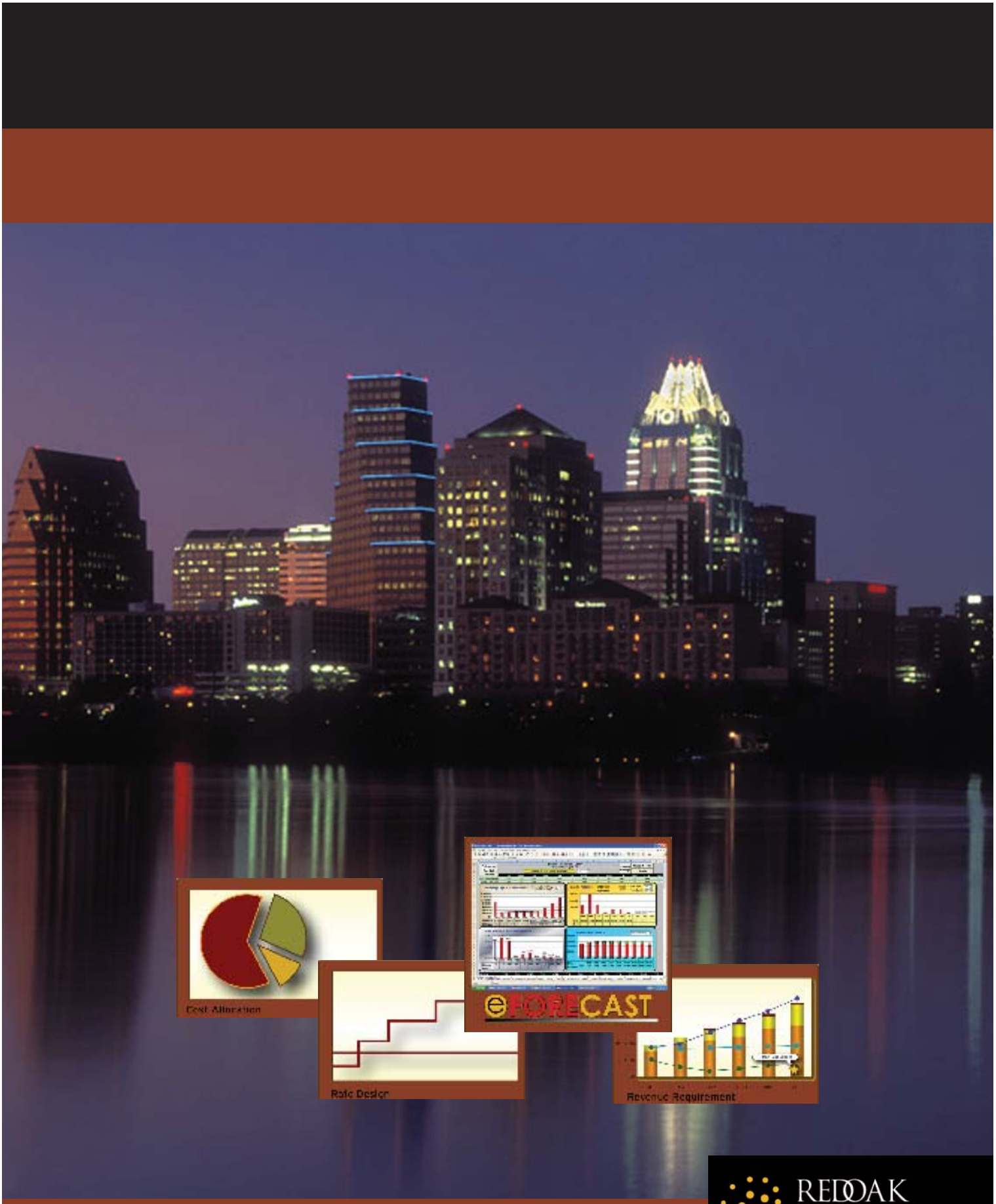
Item	Joint	Retail Only	Wholesale	Contract Revenue Bonds	Commercial & Industrial Monitoring	Surcharge Customers	Total
Collection	$0	$181,654,613	$0	$0	$0	$0	$181,654,613
Interceptors	119,081,666	0	0	0	0	0	119,081,666
Lift Stations (Conveyance)	34,280,935	0	0	0	0	0	34,280,935
Plant Raw WW Pumping	24,999,544	0	0	0	0	0	24,999,544
Preliminary Treatment	0	0	0	0	0	0	0
Industrial Waste Control	0	0	0	0	0	0	0
Bar Screens	4,304,000	0	0	0	0	0	4,304,000
Grit Removal	2,255,188	0	0	0	0	0	2,255,188
Primary Clarifiers	13,185,190	0	0	0	0	0	13,185,190
Flow Equalization Basins	8,990,410	0	0	0	0	0	8,990,410
Aeration Basins	53,892,925	0	0	0	0	0	53,892,925
Secondary Clarifiers	17,779,611	0	0	0	0	0	17,779,611
Return Sludge Pumping	10,758,442	0	0	0	0	0	10,758,442
Waste Sludge Pumping	0	0	0	0	0	0	0
Filters	0	0	0	0	0	0	0
Disinfection and Outfall	46,350,184	0	0	0	0	0	46,350,184
Revenue Allocated Costs	0	0	0	0	0	0	0
Sludge Thickening	14,180,193	0	0	0	0	0	14,180,193
Biosolids Management	67,032,966	0	0	0	0	0	67,032,966
Wholesale & Industrial Services	0	0	0	0	0	0	0
Customer Service	0	0	0	0	0	0	0
Indirect Treatment	0	0	0	0	0	0	0
Indirect	0	0	0	0	0	0	0
Totals	$417,091,255	$181,654,613	$0	$0	$0	$0	$598,745,868

Table C-13
Austin Water Utility
Wastewater Cost of Service Model
User Charge Revenue Requirements by Customer Service Characteristic

Customer Class	Flow	BOD	TSS	Customer	Meter	Totals
Residential	$55,866,770	$7,497,279	$5,139,116	$6,090,838	$0	$74,594,002
Multi-Family	38,653,414	5,235,512	3,588,755	178,766	0	47,656,447
Commercial	36,682,433	4,853,942	3,327,203	393,682	0	45,257,260
(Industrial Classes Below)	0	0	0	0	0	0
(Combined Residential Above)	0	0	0	0	0	0
(Combined Multi-Family Above)	0	0	0	0	0	0
(Combined Commercial Above)	0	0	0	0	0	0
Comanche Canyon (WCID#17)	8,542	137	82	34	0	8,795
Manor, City of	220,068	45,244	31,013	34	0	296,360
North Austin MUD #1	1,089,434	223,048	152,891	34	0	1,465,407
Northtown MUD	616,611	126,584	86,769	34	0	829,997
Rollingwood, City of	139,864	28,504	19,538	34	0	187,941
Shady Hollow MUD	326,322	67,110	46,002	34	0	439,468
Sunset Valley, City of	260,659	53,905	36,950	34	0	351,548
Steiner Ranch (WCID #17)	1,748	27	16	34	0	1,826
Wells Branch MUD	1,446,438	292,982	200,829	34	0	1,940,283
Westlake Hills, City of	111,302	22,622	15,507	34	0	149,465
Hospira	835,559	126,985	37,681	34	0	1,000,260
Spansion	2,635,800	65,340	27,478	34	0	2,728,653
Applied Materials	287,902	31,386	27,579	34	0	346,902
Freescale	2,539,350	276,737	64,985	103	0	2,881,175
Samsung	3,953,468	446,333	107,063	34	0	4,506,899
Sematech	396,101	17,286	7,050	34	0	420,471
University of Texas	1,354,643	151,603	111,341	481	0	1,618,067
Extra-Strength Surcharges	0	4,186,427	542,307	0	0	4,728,734
Totals	$147,426,429	$23,748,993	$13,570,154	$6,664,386	$0	$191,409,961

Table C-14
Austin Water Utility
Wastewater Cost of Service Model
Revenue Summary

Customer Class	Existing Rates	Computed Rates	Percent Difference
Residential	$74,392,185	$74,692,011	0.4%
Multi-Family	46,253,768	47,729,253	3.2%
Commercial	47,639,158	45,285,030	(4.9%)
Comanche Canyon (WCID#17)	8,496	8,795	3.5%
Manor, City of	277,296	296,195	6.8%
North Austin MUD #1	1,473,619	1,466,614	(0.5%)
Northtown MUD	839,721	829,885	(1.2%)
Rollingwood, City of	178,512	188,051	5.3%
Shady Hollow MUD	411,264	439,208	6.8%
Sunset Valley, City of	330,645	351,229	6.2%
Steiner Ranch (WCID #17)	1,718	1,824	6.1%
Wells Branch MUD	1,919,935	1,938,903	1.0%
Westlake Hills, City of	141,900	149,433	5.3%
Hospira	992,737	1,002,277	1.0%
Spansion	3,100,976	2,733,719	(11.8%)
Applied Materials	332,097	347,172	4.5%
Freescale	2,988,288	2,885,391	(3.4%)
Samsung	4,714,496	4,513,542	(4.3%)
Sematech	464,896	421,414	(9.4%)
University of Texas	1,607,649	1,620,537	0.8%
Extra-Strength Surcharges	0	4,728,734	0.0%
Totals	$188,069,357	$191,629,215	1.9%



August 2009
2908083

Pathways to Lasting Solutions

REDOAK CONSULTING
A DIVISION OF MALCOLM PIRNIE