FINAL REPORT

October 11, 2004

Mr. Dave Brown
Water/Irrigation Division Manager
City of Yakima
2301 Fruitvale Blvd
Yakima, WA 98902

**Subject: 2004 Domestic Water Utility Rate Study Report**

Dear Mr. Brown:

**Financial Consulting Solutions Group, Inc. (FCS Group)** is pleased to submit our rate study report for the City of Yakima's Domestic Water Utility (Utility). This letter provides a brief summary of the study objectives, finding and conclusions.

## A. STUDY OBJECTIVES:

1. Update, as appropriate, operating and capital reserve targets, debt service coverage targets, and other appropriate fiscal policies to ensure sound financial operations of the Utility.
2. Develop financing strategies for funding the Utility's capital improvements projects and replacement needs over the six-year study period.
3. Forecast revenue requirements for the study period, incorporating fiscal policies, capital-related costs, ongoing operating & maintenance expenses, the Utility billing system upgrade, and other cash obligations of the Utility. Determine annual revenue adjustments necessary to fund revenue requirements.
4. Identify Utility costs and allocate to the various components of the system and allocate those costs of service to customer classes based on each customer class's relative usage of and demand for the system. Detailed cost allocations to customer classes were not required as part of this rate update since a single rate structure applies to all customers.
5. Update the rate structure to recover total Utility costs and take into consideration cost of service shifts between the fixed and variable rate components.
6. Review interim study findings with City staff and present final study results to the City Council.

7. Document study results in a project report, including technical appendices containing the detailed analyses.
8. Deliver the updated spreadsheet rate model to City staff for future in-house rate updates.

The study process involved data analyses and the development of scenarios for updates of capital project costs and scheduling, capital funding plans, and revenue requirement projections. Working closely with FCS Group, City staff collected data, provided policy direction, and validated all input parameters. These interim results were reviewed with City staff and management prior to presentation of final study results to the City Council.

This rate study incorporated actual 2003 Utility financial information, 2004 operating budgets, and the six-year capital improvement program as provided by City staff. The cost of service results and rate structure assumptions were validated with current information and the rate recommendations were developed, as summarized herein. Further, the following recommended fiscal policies were incorporated into the analyses:

- *Self-Sufficient Enterprise Fund:* The Utility should remain and operate as a self-supported enterprise fund. For this study, utility rates were established such that the Utility recovers the full cost of capital expenditures, operating & maintenance expense, debt service and coverage requirements, and adequate levels of reserves.
- *System Replacement Funding:* The purpose of system replacement funding is to provide for the replacement of aging system facilities to ensure sustainability of the system for ongoing operations. This study incorporates direct rate funding for capital projects in the amount of $750,000 per year. This level of funding approximates annual depreciation expense less debt principal payment; therefore no additional funding is recommended for system replacement at this time.
- *Capital Funding:* To provide for the continuing, and significant capital needs of the City, adequate sources of capital funding must be available to the Utility. The following capital funding strategy was assumed for the capital improvement program included in this study:
  - ✓ Cash funding from rates
  - ✓ Available capital reserves
  - ✓ Low-interest loans (SRF, PWTF)
- *Reserve Levels:* Financial reserves are a necessary and appropriate part of prudent utility management and on-going operations. This study incorporates a minimum operating fund balance target of $1 million, which falls within the industry standard of 60 days (16.5%) of annual O&M expenses. A capital contingency reserve equal to $750,000 (different than the aforementioned system replacement funding) is maintained, falling within the industry standard of 1% to 2% of utility fixed assets.
- *Revenue Bond Coverage Ratio:* The City's current minimum coverage requirement on outstanding revenue bonds is 1.25 times annual revenue bond debt service, using the net revenues of the Utility. This study incorporates the City's internal policy to set rates such that the Utility will meet a coverage goal of at least 2.0 times annual

revenue bond debt service. Failure to comply with minimum annual coverage requirements can lower the City's bond rating and jeopardize its ability to sell bonds in the future. Higher coverage levels can result in more favorable bond terms. The rates proposed herein generate coverage levels well in excess of these requirements.

Utility rates should be set at a level sufficient to meet annual utility financial obligations and to maintain adequate reserves. For this study, rates were set as low as possible, yet sufficient to provide for the on-going operations, maintenance, repair, replacement, capital improvements and general business of the Utility. Further, rate analyses should allocate costs fairly between different customer classes. For this study, rates were designed in accordance with the City's policy to apply the same rate structure to all customer classes and to transition from a declining block rate structure to a uniform block rate structure.

It is noteworthy that rate adjustments presented herein assume the current planning projections for operating and maintenance costs (O&M) and capital projects for the study period 2004 through 2009. The study's particular focus and recommendations for rate implementation are for 2005; however, future rates are also provided.

## B. MAJOR STUDY FINDINGS AND CONCLUSIONS

- The Utility customer base is projected to increase from 18,930 connections to 19,505 by the end of the study period, assuming customer growth of 0.5 percent per year.
- The City has identified $12.2 million (current dollars) in projects over the next six years consisting of replacement/rehabilitation projects, as well as supply and treatment projects necessary to comply with state/federal regulations and ensure the public health and safety of the community. Further, the capital program is expected to include funding of the Utility billing system upgrade over the next two years. In addition to the use of rate-funding and capital reserves, a Drinking Water State Revolving Fund loan application of $1.1 million has been submitted and approval is expected in February 2005. Additional loans in years 2006 and 2007 for $3 million and $2 million, respectively, will be needed to help fund identified capital projects.
- Operating and maintenance expenses are projected to continue to increase, with inflation being a large component of the increasing cost of materials used in the construction and maintenance of the water system. Significant increases in the cost of steel and plastic materials have a direct impact on the price of pipes, fire hydrants, valves, and other necessary appurtenances. Further, the cost of skilled labor and employee benefits will likely continue to increase well above general inflation levels.
- The preliminary analysis (Base Case) assumes an upfront increase of 20 percent in year 2005, sufficient to fund current O&M expenditure levels and fund the capital improvement program. Subsequent years' increases are set at 3.5 percent a year to reflect annual inflation. Following presentation of Base Case results to the City Council, FCS Group was directed to provide two additional scenarios to phase-in the rate increase. A summary of the results is presented below. Scenario A assumes a two-year phase-in to the initial increase with inflationary increases thereafter. This plan assumes full funding of the proposed reserves in all years of the planning period. Scenario B provides equal annual adjustments over the study period such that reserve levels are met by the end of the study period. Under this scenario, reserves fall well

below target levels in some years. Detailed rate schedules have been developed for both Scenario A and the Base Case. Due to the shortfall in meeting reserve levels, Scenario B is not recommended.

| Year | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|
| Scenario A | | | | | |
| Annual % Increase | 12.0 | 12.0 | 3.5 | 3.5 | 3.5 |
| Cumulative % Increase | 12.0 | 25.4 | 29.8 | 34.4 | 39.1 |
| Base Case | | | | | |
| Annual % Increase | 20.0 | 3.5 | 3.5 | 3.5 | 3.5 |
| Cumulative % Increase | 20.0 | 24.2 | 28.5 | 33.0 | 37.7 |
| Scenario B | | | | | |
| Annual % Increase | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 |
| Cumulative % Increase | 8.5 | 17.7 | 27.7 | 38.6 | 50.4 |

- The City's existing rate structure does not differentiate among customer classes. Cost of service allocations were made to determine the appropriate recovery of costs from the fixed and variables components of the rate structure. This study maintains the existing rate structure and updates the fixed charge and volume charge consistent with cost of service. The fixed charge recovers customer related costs, meters & services costs, and fire protection costs. The volume charge recovers base demand and peak demand related costs. Shifts in the fixed and variable rate components are based on a strategy to phase-in to full cost of service by the end of the study period. Transitioning from the declining block volume rate to a uniform volume rate is also completed by the end of the study period.
- The proposed schedule of rates for Scenario A is presented in the table below. Based on the City's billing system information, the average residential customer (3/4-inch meter) using 2,500 cubic feet of water per bi-monthly billing period will experience an average of a $3.25 increase in their bi-monthly bill over the course of a year in 2005.

**Readiness-To-Service Charge - $/Bi-Monthly Billing Period [a]**

| Meter Size | Existing 2004 | Proposed 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|
| 3/4" | $3.65 | $6.00 | $ 8.25 | $ 9.00 | $ 9.35 | $ 9.70 |
| 1" | $5.65 | $10.67 | $ 12.04 | $ 12.60 | $ 13.08 | $ 13.49 |
| 1-1/2" | $12.80 | $18.23 | $ 20.57 | $ 21.58 | $ 22.35 | $ 22.96 |
| 2" | $26.00 | $27.30 | $ 30.81 | $ 32.35 | $ 33.48 | $ 34.33 |
| 3" | $67.00 | $48.46 | $ 54.69 | $ 57.49 | $ 59.46 | $ 60.86 |
| 4" | $107.00 | $78.69 | $ 88.81 | $ 93.40 | $ 96.56 | $ 98.75 |
| 6" | $190.00 | $154.27 | $ 174.10 | $ 183.17 | $ 189.32 | $ 193.48 |
| 8" | $310.00 | $305.42 | $ 344.70 | $ 362.71 | $ 374.84 | $ 382.94 |
| 10" | $475.00 | $456.57 | $ 515.29 | $ 542.25 | $ 560.36 | $ 572.41 |
| 12" | $700.00 | $668.18 | $ 754.12 | $ 793.61 | $ 820.08 | $ 837.66 |

**Volume Charge - $/ccf [a]**

| Rate Block (per ccf) | Existing 2004 | Proposed 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|
| 0 - 20 | $1.13 | $1.14 | $ 1.20 | $ 1.21 | $ 1.23 | $ 1.25 |
| 21 - 250 | $1.00 | $1.14 | $ 1.20 | $ 1.21 | $ 1.23 | $ 1.25 |
| Over 250 | $0.75 | $0.85 | $ 1.00 | $ 1.07 | $ 1.15 | $ 1.25 |

**Private Fire Services - $/Bi-Monthly Period [a]**

| Line Size | Existing 2004 | Proposed 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|
| 2 | $5.00 | $5.25 | $5.50 | $5.75 | $6.00 | $6.00 |
| 3 | $7.00 | $7.35 | $7.70 | $8.05 | $8.40 | $8.75 |
| 4 | $11.00 | $11.55 | $12.10 | $12.65 | $13.20 | $13.75 |
| 6 | $26.00 | $27.30 | $28.60 | $29.90 | $31.20 | $32.50 |
| 8 | $35.00 | $36.75 | $38.50 | $40.25 | $42.00 | $43.75 |
| 10 | $60.00 | $63.00 | $66.00 | $69.00 | $72.00 | $75.00 |
| 12 | $150.00 | $157.50 | $165.00 | $172.50 | $180.00 | $187.50 |

**Bulk Water Rate - $/ccf**

| | Existing 2004 | Proposed 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|
| | $1.00 | $1.14 | $ 1.20 | $ 1.21 | $ 1.23 | $ 1.25 |

Daily water meter rental will be $4.00 per day (existing rate is $1.00 per day)

[a] Outside City rates are 1.50 times inside City rates

- The proposed schedule of rates for the Base Case is presented in the table below. Under this option, the average residential customer will experience an average of a $5.55 increase in their bi-monthly bill over the course of a year in 2005.

**Readiness-To-Service Charge - $/Bi-Monthly Billing Period [a]**

| Meter Size | Existing 2004 | Proposed 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|
| 3/4" | $3.65 | $7.30 | $ 7.85 | $ 8.50 | $ 9.05 | $ 9.60 |
| 1" | $5.65 | $11.43 | $ 11.91 | $ 12.46 | $ 12.92 | $ 13.32 |
| 1-1/2" | $12.80 | $19.52 | $ 20.34 | $ 21.33 | $ 22.08 | $ 22.67 |
| 2" | $26.00 | $29.23 | $ 30.46 | $ 31.97 | $ 33.07 | $ 33.89 |
| 3" | $67.00 | $51.88 | $ 54.07 | $ 56.81 | $ 58.72 | $ 60.07 |
| 4" | $107.00 | $84.25 | $ 87.80 | $ 92.29 | $ 95.37 | $ 97.47 |
| 6" | $190.00 | $165.16 | $ 172.12 | $ 180.99 | $ 186.97 | $ 190.97 |
| 8" | $310.00 | $326.98 | $ 340.77 | $ 358.40 | $ 370.18 | $ 377.96 |
| 10" | $475.00 | $488.79 | $ 509.42 | $ 535.80 | $ 553.38 | $ 564.95 |
| 12" | $700.00 | $715.34 | $ 745.52 | $ 784.16 | $ 809.87 | $ 826.73 |

**Volume Charge - $/ccf [a]**

| Rate Block (per ccf) | Existing 2004 | Proposed 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|
| 0 - 20 | $1.13 | $1.18 | $ 1.20 | $ 1.22 | $ 1.23 | $ 1.24 |
| 21 - 250 | $1.00 | $1.18 | $ 1.20 | $ 1.22 | $ 1.23 | $ 1.24 |
| Over 250 | $0.75 | $0.93 | $ 0.99 | $ 1.05 | $ 1.15 | $ 1.24 |

**Private Fire Services - $/Bi-Monthly Period [a]**

| Line Size | Existing 2004 | Proposed 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|
| 2 | $5.00 | $5.25 | $5.50 | $5.75 | $6.00 | $6.00 |
| 3 | $7.00 | $7.35 | $7.70 | $8.05 | $8.40 | $8.75 |
| 4 | $11.00 | $11.55 | $12.10 | $12.65 | $13.20 | $13.75 |
| 6 | $26.00 | $27.30 | $28.60 | $29.90 | $31.20 | $32.50 |
| 8 | $35.00 | $36.75 | $38.50 | $40.25 | $42.00 | $43.75 |
| 10 | $60.00 | $63.00 | $66.00 | $69.00 | $72.00 | $75.00 |
| 12 | $150.00 | $157.50 | $165.00 | $172.50 | $180.00 | $187.50 |

**Bulk Water Rate - $/ccf**

| | Existing 2004 | Proposed 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|
| | $1.00 | $1.18 | $1.20 | $1.22 | $1.23 | $1.24 |

Daily water meter rental will be $4.00 per day (existing rate is $1.00 per day)

[a] Outside City rates are 1.50 times inside City rates

## C. IMPLEMENTATION OF RATES

Based on the analyses conducted for this study, FCS Group and City staff recommend that the City Council approve the proposed schedule of rates for Scenario A as presented herein for adoption in November 2004, with implementation of rates effective January 1, 2005.

As an alternative to adopting all six years of rate increases at this time, the City could implement the proposed 2005 and 2006 increases and rather than adopting the 3.5 percent future annual increases (2007 through 2009), the City could implement rate ordinance language providing for the automatic adjustment of rates based on the average of the ENR Construction Cost Index (CCI) and the ENR Consumer Price Index (CPI), beginning January 1, 2007, and on January 1 of each successive year thereafter. The intent of this policy is to avoid large rate increases that can occur when rates are not adjusted annually in recognition of the constant rise in the cost of delivering services.

We greatly appreciate the efforts and support of City staff throughout the study process, which was invaluable in developing and refining the study analysis and results. We have endeavored to apply the best available estimates of future conditions that affect these findings. However, regular review of actual financial performance of the Utility should be an integral part of the successful implementation of this study.

It has been a pleasure working with you on this effort and we hope to be of service to the City in the future.

Sincerely,

Karyn Johnson
Senior Project Manager

# I – INTRODUCTION

## A. Background

The City of Yakima (City) owns and operates a Domestic Water Utility System (Utility), which provides service to a population base of nearly 65,000 through 18,930 service connections. In the provision of Utility service, the City strives to maintain a viable system that can serve customers with a clean, safe and adequate supply of water and to achieve this in an efficient manner. To this end, the City has implemented the following major programs:

- Distribution system replacement/refurbishment program
- Water service replacement program
- Water meter replacement program
- Hydrant replacement program
- Valve operation & maintenance program
- Cross connection control program
- Water quality testing

In addition to the above programs, the City continually evaluates its capital needs to address federal and state regulations and environmental concerns.

As part of its bi-annual rate study process, the City has implemented periodic rate increases to meet the revenue requirements of the Utility. The last rate increase became effective July 1, 2001, and represented a 20 percent increase in total rate revenues. Since that time, the Utility has continued to operate soundly without the need of additional increases, however inflation has increased by 6.2 percent[1]. The purpose of this study (2004 Rate Study) is to evaluate the Utility's capital needs and ongoing operations and maintenance expenses over the next six-year period (2004 through 2009), and to determine the adequacy of the current level of rates.

## B. Study Objectives

In February 2004, the City retained Financial Consulting Solutions Group, Inc. (FCS Group) to perform a rate study for the Utility. The study included analyses of revenue requirements, cost allocations, and rate design. The major scope elements of the study were to:

1. Update, as appropriate, operating and capital reserve targets, debt service coverage targets, and other appropriate fiscal policies to ensure sound financial operations of the Utility.
2. Develop financing strategies for funding the Utility's capital improvements projects and replacement needs over the six-year study period.
3. Forecast revenue requirements for the study period, incorporating fiscal policies, capital-related costs, ongoing operating & maintenance expenses, and other cash obligations of the Utility. Determine annual revenue adjustments necessary to fund revenue requirements.

[1] Consumer Price Index, Urban Consumers, West Region.

4. Identify Utility costs and allocate to the various components of the system and allocate those costs of service to customer classes based on each customer class's relative usage of and demand for the system. Detailed cost allocations to customer classes were not required as part of this rate update since a single rate structure applies to all customers.
5. Update the rate structure to recover total Utility costs and take into consideration cost of service shifts between the fixed and variable rate components.
6. Review interim study findings with City staff and present final study results to the City Council.
7. Document study results in a project report, including technical appendices containing the detailed analyses.
8. Deliver the updated spreadsheet rate model to City staff for future in-house rate updates.

The study process involved data analyses and the development of scenarios for updates of capital project costs and scheduling, capital funding plans, and revenue requirement projections. Working closely with FCS Group, City staff collected data, provided policy direction, and validated all input parameters. These interim results were reviewed with City staff and management prior to presentation of study results to the City Council.

This report provides an overview of the methodologies used in completing the study and summarizes the final study findings and results.

The remainder of this report provides separate sections for Methodology (Section II) and Utility Findings & Results (Section III). A Technical Appendix follows the report, including spreadsheet model outputs for the Utility rate analyses.

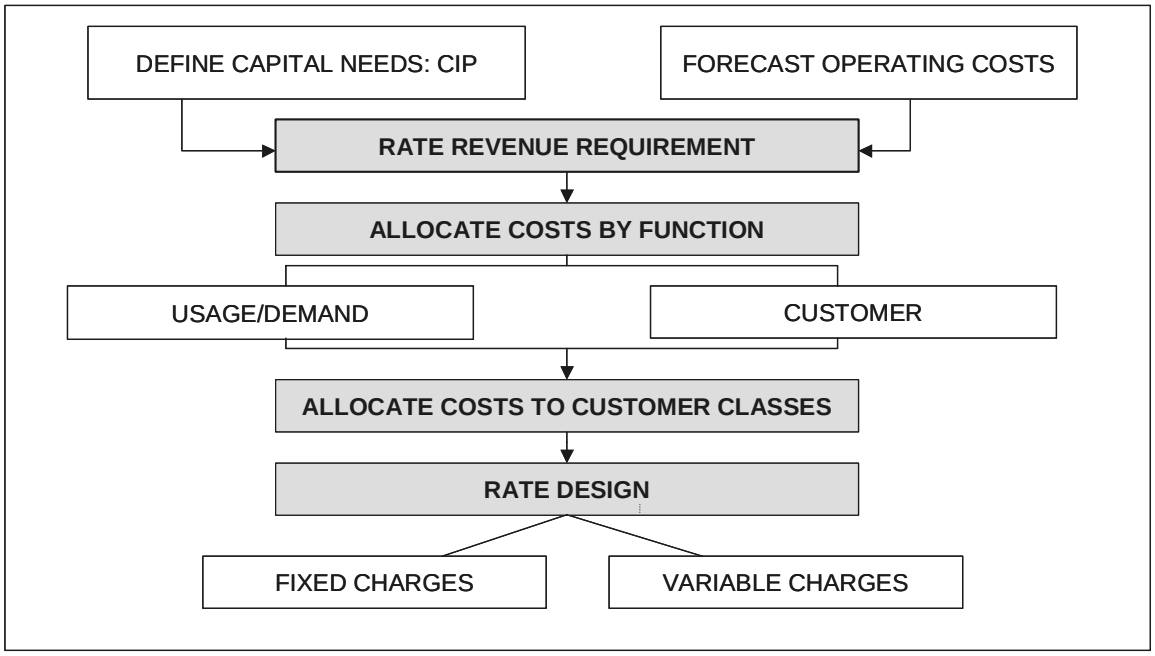
## II - METHODOLOGY

The methods used in the rate study follow general industry guidelines for developing utility rates, which are designed (1) to generate sufficient revenues to maintain a self-supporting, financially viable Utility and (2) to not unduly discriminate toward any class of customer. The procedures for this approach include:

- Determine total annual revenue requirements for the period of analysis, and identify those revenues that must be generated from domestic water rates.
- Allocate revenue requirements to the basic functional cost components of the domestic water system (Base Demand, Extra Capacity, Meters & Services, Customer, and Fire Protection).
- Distribute cost components to customers according to their respective service requirements.
- Design a rate structure that recovers, to the extent practical, the cost to serve each customer class, as well as individual customers within a customer class. As noted previously, the City applies a single rate structure to all customer classes. This is based on the premise that all Utility customers exhibit similar usage patterns, thus no distinction of customer classes is necessary to achieve rate equity.

The graphic in Exhibit II-1 summarizes the key steps in this process. In the following sections, a general introduction to the issues and approach for the analyses is provided, followed by a section addressing the results of the analyses for the Utility.

**Exhibit II-1 – Rate Study Methodology**




A. Revenue Requirements

**Approach**

The revenue requirement analysis forecasts the amount of annual revenue that needs to be generated by water rates. The analysis incorporates operating revenues, operating and maintenance (O&M) expenses, debt service payments, rate funded capital needs, and any other identified revenues or expenses related to Utility operations, and determines the sufficiency of the current level of rates. Revenue needs are also impacted by bond covenants and specific fiscal policies and financial goals of the Utility, as described herein.

The analysis determines the amount of revenue needed in a given year to meet that year's expected financial obligations. For this analysis, two revenue sufficiency criteria have been developed to reflect the financial goals and constraints of the Utility: (1) cash needs must be met, and (2) revenue bond coverage requirements must be realized. In order to operate successfully with respect to these goals, both tests of revenue sufficiency must be met.

### *1. Sufficiency Test # 1: Cash Flow*

The cash flow test identifies all known cash requirements for the Utility in each year of the study period. Capital needs are identified and a capital funding strategy is established. Typically, this may include the the use of debt, cash reserves, outside assistance, and rate funding. Cash requirements to be funded from rates are then determined. Typically, these include O&M expenses, debt service, depreciation funding or directly funded capital outlays, and any additions to specified reserve balances. The total annual cash needs of the Utility are then compared to projected cash revenues using the current rate structure. Any projected revenue shortfalls are identified and the rate increases necessary to make up the shortfall are then estimated. Rates should be set as low as possible and yet provide for the on-going operations, maintenance, repair, replacement, capital improvements and general business of the Utility.

### *2. Sufficiency Test # 2: Debt Service Coverage*

The coverage test is based on a commitment made by the City when issuing revenue bonds. As a security condition of issuance, utilities agree that revenue bonds have a high priority for payment (a senior lien) compared to most other utility expenditures. The only outlays with a higher lien are operating and maintenance expenses. Annual coverage over and above the debt service payment is a requirement of revenue bonds and some other long-term debt issuance, and acts as a form of cushion or securitization for the bondholders against poor financial performance. Debt service coverage is expressed as a multiplier. For example, a 1.0 coverage factor would imply no additional cushion is required. A 1.25 coverage factor means revenues must be sufficient to pay operating expenses, annual revenue bond debt service, plus an additional 25% of annual revenue bond debt service. The City's current minimum coverage requirement on outstanding revenue bonds is 1.25 times annual revenue bond debt service, using the net revenues of the Utility. This study incorporates the City's internal policy to set rates that will achieve a coverage goal of at least 2.0 times the Utility's annual revenue bond debt service.

In determining the revenue requirements, both the cash needs and coverage sufficiency tests must be met. The result is the total rate revenue requirement for any given year. The analysis uses this rate revenue requirement to indicate annual rate adjustments and to drive the cost-of service analysis.

## Fiscal Policies

In concert with the revenue requirement analysis, fiscal policies were updated to maintain the long-term financial health and performance of the Utility. A brief summary of the key policies incorporated into the revenue requirement analyses is provided below.

### *1. Self-Sufficient Enterprise Fund*

The Utility should remain a self-supported enterprise fund. An enterprise fund is generally self-supporting, receiving revenues for payment of services on a user fee basis as opposed to property taxes or other revenue sources. By utilizing an enterprise fund (essentially a business model) concept of accounting, reporting and management, subsidies among various City-provided services are minimized or eliminated altogether. The City's budgeting process should include a balanced and controlled annual (or bi-annual) budget for the Utility.

### *2. System Replacement Funding*

The purpose of system replacement funding is to provide for the replacement of aging system facilities to ensure sustainability of the system for ongoing operations. A common approach of municipal utilities is to incorporate a replacement funding (or equity accumulation) mechanism based on annual depreciation expense as a reasonable level of reinvestment in the system.

Annual depreciation is a non-cash expense intended to recognize the consumption of utility assets over their useful lives. Collecting the amount of annual depreciation expense through rates provides a funding source for capital expenditures, especially those related to repair and replacement of existing utility plant. Further, funding depreciation through rates helps to ensure that existing ratepayers pay for the use of the assets serving them, with the cash flow funding at least a portion of the eventual replacement of those assets. As an alternative to full depreciation funding, depreciation funding net of debt principal payments is sometimes used as a relatively moderate replacement funding strategy. Using this approach, the full funding of depreciation is seen as having two uses: first, reducing liabilities by paying debt principal as due, and second, generating a cash asset for system reinvestment. Debt reduction, cash accumulation, or both thereby offset depreciation.

The Utility's annual depreciation expense is $762,700. The City currently includes a water main replacement program in the six-year capital improvement program (CIP). Further, the City plans to transfer $750,000 per year from the operating fund to the capital fund for direct rate-funding of capital projects. Given this level of rate-funding, FCS Group does not see a need to generate additional rate revenues for reinvestment funding at this time.

### *3. Capital Funding*

To provide for the continuing, and significant capital needs of the City, adequate sources of capital funds must be available to the Utility. Long-term capital funding strategies provide feasible sources of funds for identified capital needs. Several capital funding mechanisms are available to water utilities, most commonly:

- Developer contributions
- Grants, to a limited extent
- Capital connection charges
- Cash-financing from rates

- Cash reserves
- Low-interest loans
- Revenue Bonds

This analysis uses a prioritized capital funding strategy, starting from the lowest cost-funding source to the more expensive sources, as needed. Based on this strategy, capital projects are funded, first, from available capital reserves (i.e. capital connection charge revenues, cash-funding from rates, and interest earnings), next, from low-interest loans, as approved, and lastly from revenue bond proceeds, if needed.

### *4. Reserve Levels*

Financial reserves are a necessary and appropriate part of prudent utility management practices. The City maintains separate accounting for the Utility operating fund and capital fund, and maintains a cash reserve target for each fund.

*Operating Reserves*. Operating reserves are designed to provide a liquidity cushion to ensure that adequate cash working capital will be maintained to deal with significant cash balance fluctuations, such as seasonal fluctuations in billings and receipts, unanticipated cash operating expenses, or lower than expected revenue collections. Target funding levels are generally expressed in number of days' cash operating expenses, with the minimum requirement varying with the expected risk of unanticipated needs. FCS Group recommends that the City maintain a minimum cash balance in the operating fund equal to 60 days (16.5%) of annual O&M expense. The current plan assumes a minimum target balance of $1 million, which falls well within the recommended target.

*Capital Contingency Reserves*. The capital fund holds loan and bond proceeds; other capital-related revenues, and transfers from the operating fund designated for capital construction and replacement projects.

A capital contingency reserve is an amount of cash set aside in case of an emergency, should a piece of equipment or a portion of the utility's infrastructure fail unexpectedly. Additionally, the reserve could be used for other unanticipated capital needs, including project cost overruns. These reserves are not intended to cover the costs of system-wide failures resulting from catastrophic events; a more common practice is to carry insurance for such purposes. FCS Group recommends that the City maintain a minimum cash balance in the capital fund equal to 1.0% to 2.0% of utility fixed assets. The current plan assumes a minimum target balance of $750,000, which falls well within the recommended target.

## B. Cost of Service and Rate Design

### Cost of Service Allocations

The cost of service analysis is intended to provide the analytical basis for recovering the forecasted revenue requirements from customer classes according to the demand they place on the system. These analyses involve a two-step process: First, capital and O&M costs are allocated to applicable functional categories. Then, based on customer class demand characteristics, functional costs are distributed to customer classes.

Capital costs include debt service payments, cash-financed capital improvements, and a portion of taxes and additions/uses of cash reserves. The most common methodology for assigning the capital portion of the revenue requirement to functional components is to

allocate such costs on the basis of plant investment, which represents the original cost of existing plant assets in service. The allocations for the plant-in-service utilize documented engineering planning criteria from both the City and industry standards.

Operating costs include O&M expenses and a portion of taxes and additions/uses of cash reserves. The allocation of the operating portion of the revenue requirement was based on a detailed allocation of line item expenses. In general, functional cost allocation was based on known or assumed cost "causation". For example, salaries & wages and personnel benefits are allocated to the components based on an analysis of full-time equivalent employee's time spent on each function. Operating expenses related to the operation of specific facilities are allocated to cost components in generally the same manner as capital costs. Customer-billing costs are allocated to the "customer" category while administrative and other indirect costs are generally allocated in proportion to all other costs.

The functional cost allocation process results in a pool of costs for each functional category. From these cost pools, unit costs are created that form the building blocks for designing rate structures. Using customer statistics from the City's utility billing system and relevant planning criteria, the analysis allocates the costs to each customer class.

Cost of service allocations are made for a "test" year considered representative of the period in which proposed rates are expected to be in effect. For this study, 2005 was selected as the test year with implementation of new rates effective January 1, 2005.

**Customer Usage Statistics**

A key component in the revenue requirement and rate analyses is testing the reliability and accuracy of customer statistics. This test is conducted as follows: detailed billing statistics for a given year are multiplied by the rates in effect for that year (for this study 2003 is used as the base year). The total revenue generated from these customer statistics should approximate the actual revenue receipts shown in the financial statements (with minor differences due to accounts receivable differences, delinquencies, etc.). If the revenue estimates are within reasonable limits[2], statistics are adjusted to account for the estimated discrepancy.

**Rate Design**

The principal consideration in establishing water rates is to obtain rates for customers that generate sufficient revenues for the Utility and are reasonably commensurate with the cost of providing water service. Other considerations in designing rates should include ease of implementation, impact on customer bills, and incentives for water conservation. This rate update focused on developing a phase-in strategy to more closely align the fixed and variables components of the rate structure with cost of service, and to continue the City's policy to transition from a declining block rate structure to single uniform volume rate.

[2] As a rule of thumb, +/- 3% is an acceptable discrepancy. The water utility customer statistics fell within 1% of reported revenues.

## III –UTILITY FINDINGS & RESULTS

### A. Revenue Requirements

#### 1. Assumptions

Utility results were based on incorporation of the following major assumptions:

- Existing rate revenues are based on actual 2003 financial records. Future revenues (under existing rates) incorporate annual customer growth of 0.5 percent. Development of projected revenues under existing rates provides the benchmark upon which to evaluate the need for revenue adjustments throughout the study period. Such revenue is a function of the number and size of customer meters, the quantity of metered water usage, and the current schedule of water rates.
- Miscellaneous revenues from charges for new water services, personnel services, hydrant fees, etc. are based on the 2004 budget and are conservatively assumed to remain at the current level throughout the study period.
- Capital connection charge revenues are based on the 2004 budget, and again, are conservatively assumed to remain at the current level throughout the study period. Consistent with State guidelines, such revenues are used to fund capital projects. Further, the debt service coverage test excludes connection charge revenues from the compliance calculation in order to avoid reliance on uncertain growth.
- 2004 beginning fund balances for the operating fund and capital fund are based on year-end 2003 financial statements. The capital fund balance also includes remaining proceeds from the approved Public Works Trust Fund loan.
- Interest earnings on available fund balances are estimated at 2.0 percent.
- Operating & maintenance (O&M) expenses consist of the cost of personnel and materials to supply, pump, and distribute water on a routine basis. Since these costs are an annual obligation of the Utility, they must be met from water sales revenues. O&M expense projections are based on the 2004 budget, plus 3.0 percent annual inflation and/or known cost changes.
- Taxes to be paid to the General Fund (in lieu taxes) are a function of Utility revenues and, as such, increase as the total revenues for the Utility increase. The current City tax rate is 14.0 percent of revenues, excluding annual debt service payments on existing revenue bonds.
- State taxes are based on current Excise and B&O tax rates applied to applicable revenues. Similar to General Fund taxes, state taxes are a function of Utility revenues and increase as the total revenues for the Utility increase.
- Existing debt service payment schedules were provided by City staff and include repayment on outstanding revenues bonds and Public Works Trust Fund loans, including the recent loan for the water treatment plant improvements.
- Future years' debt service incorporates impacts of the proposed capital-financing plan. A Drinking Water State Revolving Fund loan application of $1.1 million has been submitted and approval is expected in February 2005. Additional loans are proposed in years 2006 and 2007 in the amounts of $3 million and $2 million,

respectively. The approved 2005 loan carries an interest rate of 0.5 percent, issuance cost of 1.0 percent, and a 20-year repayment period. Proposed loans assume the same terms.

- Residual equity transfers are transfers from the Utility operating fund to other City funds for the Utility's allocated share of other City debt. This study assumes an allocation of approximately $71,000 per year.
- Transfers from the operating fund of $750,000 a year are planned to provide direct rate-funding of capital projects. This represents an amount approximating annual depreciation expense less debt principal payments, and serves as a funding mechanism for reinvestment in the system from existing ratepayers.
- The six-year capital improvement program (CIP) incorporates projects identified in the 2004 Water System Plan. All costs include an allowance for inflation estimated at 4.0 percent per year. Further, the City anticipates funding the Utility billing system upgrade through the capital program in 2005/2006. Routine capital outlays are funded from the Utility operating fund and are not included in the CIP.

## 2. Capital Projects and Funding Sources

The City has identified $12.2 million (current dollars) in projects over the next six years consisting of replacement and rehabilitation projects necessary to sustain viable operation of the system, as well as supply and treatment projects necessary to comply with state and federal regulations and ensure the public health and safety of the community.

Exhibit III-1 presents the projects identified in the six-year capital improvement program.

**Exhibit III-1: Capital Improvement Program**

| CAPITAL IMPROVEMENT PROJECTS | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|
| Water Main Replacement Program | $ 75,000 | $ - | $ 175,000 | $ 175,000 | $ 175,000 | $ 175,000 |
| WTP Pipe Gallery Rebuild | 520,000 | - | - | - | - | - |
| Normative River PBA | 174,000 | - | - | - | - | - |
| On-Site Chlorine | 418,500 | - | - | - | - | - |
| Chemical Feed System | 1,130,475 | - | - | - | - | - |
| Flash Mix | 1,185,600 | - | - | - | - | - |
| Well Chlorination | 10,000 | - | - | - | - | - |
| Filter Rehab Design | 136,500 | 850,000 | - | - | - | - |
| Elks Park Well | - | - | 750,000 | 750,000 | - | - |
| 40th Ave. Pump PRV | - | 25,000 | - | - | - | - |
| Viola Freeway Crossing | - | - | 180,000 | - | - | - |
| 10th St. & Mead Main Replacement | - | - | - | 160,000 | - | - |
| Long Fibre Main | - | - | 155,000 | - | - | - |
| WTP Lagoons | - | - | 1,800,000 | - | - | - |
| ASR Well #1 | - | - | - | 1,500,000 | - | - |
| 2nd Level Water Main Replacement | - | 750,000 | 750,000 | - | - | - |
| SR 24 Bridge & Nob Hill Main Extension | - | 200,000 | - | - | - | - |
| **Total** | **$ 3,650,075** | **$ 1,825,000** | **$ 3,810,000** | **$ 2,585,000** | **$ 175,000** | **$ 175,000** |

Exhibit III-2 summarizes the planned capital expenditures and associated proposed funding sources. All costs shown reflect an allowance of 4.0 percent annual inflation.

## Exhibit III-2: Capital Financing Plan

| CAPITAL FINANCING PLAN | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|
| **Beginning Fund Balance** | **$ 4,106,471** | **$ 1,264,525** | **$ 1,270,436** | **$ 946,449** | **$ 839,104** | **$ 1,452,661** |
| **Funding Sources** | | | | | | |
| Capital Reserves | $ 308,129 | $ 76,791 | $ 76,909 | $ 70,429 | $ 68,282 | $ 80,553 |
| Direct Funding from Rates | 500,000 | 750,000 | 750,000 | 750,000 | 750,000 | 750,000 |
| Grants & Contributions | - | - | - | - | - | - |
| Net Loan Proceeds | - | 1,077,120 | 2,970,000 | 1,980,000 | - | - |
| Net Bond Proceeds | - | - | - | - | - | - |
| **Total Funding Sources** | **$ 808,129** | **$ 1,903,911** | **$ 3,796,909** | **$ 2,800,429** | **$ 818,282** | **$ 830,553** |
| **Less: Capital Projects [a]** | **($3,650,075)** | **($1,898,000)** | **($4,120,896)** | **($2,907,773)** | **($204,725)** | **($212,914)** |
| **Fund Balance** | **$ 1,264,525** | **$ 1,270,436** | **$ 946,449** | **$ 839,104** | **$ 1,452,661** | **$ 2,070,300** |
| *Actual % of Assets:* | *3.3%* | *3.0%* | *2.1%* | *1.7%* | *2.8%* | *4.0%* |
| *Minimum Target Balance [1.5% of assets]:* | *$ 578,297* | *$ 633,048* | *$ 661,518* | *$ 723,332* | *$ 766,948* | *$ 770,019* |
| *City Established Target Balance:* | *$750,000* | *$750,000* | *$750,000* | *$750,000* | *$750,000* | *$750,000* |

[a] Includes an allowance for inflation of 4.0 percent per year.

## 3. Operating and Maintenance Expenses

Inflation continues to be a strong component of the increasing cost of materials used in the construction and maintenance of the water system. For instance, a significant increase in the cost of steel and plastic materials has a direct impact on the price of pipes, fire hydrants, valves, and other necessary appurtenances. Further, the cost of skilled labor and, especially employee benefits, continues to increase well above general inflation levels. Many of the service and supply industries that support Utility activities have experienced similar escalations with no slow down in these costs expected in the foreseeable future.

Exhibit III-3 summarizes the forecast of operating and maintenance expense over the study period.

## Exhibit III-3: Operating and Maintenance Expenses

| OPERATING & MAINTENANCE EXPENSE | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|
| **Functional Categories** | | | | | | |
| Source of supply | $ 381,750 | $ 403,203 | $ 414,999 | $ 427,149 | $ 439,663 | $ 452,553 |
| Pumping | 403,390 | 417,492 | 429,956 | 442,795 | 456,019 | 469,640 |
| Treatment | 837,866 | 865,002 | 890,892 | 917,559 | 945,026 | 973,316 |
| Transmission and Distribution | 1,533,892 | 1,596,909 | 1,644,306 | 1,693,125 | 1,743,409 | 1,795,201 |
| Customer Accounts | 427,821 | 440,656 | 453,875 | 467,492 | 481,516 | 495,962 |
| Administrative and General | 362,972 | 390,861 | 402,077 | 413,629 | 425,528 | 437,784 |
| **Total O&M Expenses [a]** | **$ 3,947,691** | **$ 4,114,122** | **$ 4,236,105** | **$ 4,361,749** | **$ 4,491,161** | **$ 4,624,456** |

[a] Includes an allowance for inflation of 3.0 percent per year, plus known operational changes.

## 4. Results of the Revenue Requirements Analysis

### Alternative Scenarios

Study findings concluded that annual revenue adjustments are potentially necessary in each year of the planning period. The preliminary analysis (Base Case) calculated annual increases assuming an upfront increase in year 2005 sufficient to fund current O&M expenditure levels and fund the capital improvement program. Subsequent years' increases were set to reflect annual inflation.

The Base Case results were presented to the City Council at the September 14, 2004 workshop. In response to public comment, the City directed FCS Group to provide two additional scenarios to phase-in the rate increase. Scenario A assumes a two-year phase-in to the initial increase with inflationary increases thereafter. This plan assumes full funding of the proposed reserves in all years of the planning period. Scenario B provides equal annual adjustments over the study period such that reserve levels are met by the end of the study period. Under this scenario, reserves fall well below target levels in some years.

Detailed rate schedules have been developed for both Scenario A and the Base Case. Due to the shortfall in meeting reserve levels, Scenario B is not recommended.

Exhibit III-4 presents a summary of results for the alternative revenue requirement scenarios.

**Exhibit III-4: Revenue Requirement Scenarios**

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|
| **Scenario A** | | | | | | |
| Annual Rate Adjustment | 0.0% | 12.0% | 12.0% | 3.5% | 3.5% | 3.5% |
| Cumulative Rate Adjustment | 0.0% | 12.0% | 25.4% | 29.8% | 34.4% | 39.1% |
| Additional Revenue from Rate Adjustments | $ - | $ 628,340 | $ 1,338,742 | $ 1,577,629 | $ 1,827,039 | $ 2,087,400 |
| Cumulative Fund Balance | $ 1,719,439 | $ 1,276,963 | $ 1,213,208 | $ 1,107,705 | $ 1,042,974 | $ 1,079,332 |
| *Surplus/(Deficiency) from Target [a]* | *$ 719,439* | *$ 276,963* | *$ 213,208* | *$ 107,705* | *$ 42,974* | *$ 79,332* |
| *Actual Days of O&M [b]:* | *129* | *90* | *81* | *72* | *66* | *66* |
| **Base Case Scenario** | | | | | | |
| Annual Rate Adjustment | 0.0% | 20.0% | 3.5% | 3.5% | 3.5% | 3.5% |
| Cumulative Rate Adjustment | 0.0% | 20.0% | 24.2% | 28.5% | 33.0% | 37.7% |
| Additional Revenue from Rate Adjustments | $ - | $ 1,047,234 | $ 1,273,489 | $ 1,509,755 | $ 1,756,438 | $ 2,013,962 |
| Cumulative Fund Balance | $ 1,719,439 | $ 1,616,145 | $ 1,506,338 | $ 1,351,738 | $ 1,234,722 | $ 1,215,451 |
| *Surplus/(Deficiency) from Target [a]* | *$ 719,439* | *$ 616,145* | *$ 506,338* | *$ 351,738* | *$ 234,722* | *$ 215,451* |
| *Actual Days of O&M [b]:* | *129* | *112* | *101* | *88* | *78* | *74* |
| **Scenario B** | | | | | | |
| Annual Rate Adjustment | 0.0% | 8.5% | 8.5% | 8.5% | 8.5% | 8.5% |
| Cumulative Rate Adjustment | 0.0% | 8.5% | 17.7% | 27.7% | 38.6% | 50.4% |
| Additional Revenue from Rate Adjustments | $ - | $ 445,075 | $ 932,620 | $ 1,466,489 | $ 2,050,880 | $ 2,690,374 |
| Cumulative Fund Balance | $ 1,719,439 | $ 1,128,571 | $ 733,006 | $ 527,908 | $ 632,827 | $ 1,149,217 |
| *Surplus/(Deficiency) from Target [a]* | *$ 719,439* | *$ 128,571* | *$ (266,994)* | *$ (472,092)* | *$ (367,173)* | *$ 149,217* |
| *Actual Days of O&M [b]:* | *129* | *80* | *50* | *34* | *40* | *69* |

[a] Minimum target balance of $1 million
[b] Industry benchmark is between 60 and 90 days.

### Base Case

The Base Case analysis is used in the completion of the cost of service analysis. Additional revenue requirement detail is provided in Exhibit III-5.

The proposed adjustments represent the system-wide adjustments necessary to recover total revenue requirements for the Utility. The portion of costs to be recovered from the fixed and variable components of the rate structure will vary based on the functional allocation of costs described in the next section.

**Exhibit III-4: Revenue Requirements Analysis**

| REVENUE REQUIREMENTS SUMMARY | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|
| **Revenues** | | | | | | |
| Water Sales (w/ existing rates) | $5,210,120 | $ 5,236,171 | $ 5,262,352 | $ 5,288,663 | $ 5,315,107 | $ 5,341,682 |
| Other Revenues | 163,200 | 163,200 | 163,200 | 163,200 | 163,200 | 163,200 |
| Interest Earnings | 45,114 | 34,389 | 32,323 | 30,127 | 27,035 | 24,694 |
| **Total Revenues** | **$ 5,418,435** | **$ 5,433,760** | **$ 5,457,874** | **$ 5,481,990** | **$ 5,505,341** | **$ 5,529,577** |
| **Expenses** | | | | | | |
| Operating & Maintenance Expenses | $3,947,691 | $ 4,114,122 | $ 4,236,105 | $ 4,361,749 | $ 4,491,161 | $ 4,624,456 |
| Existing Debt Service | 509,434 | 458,963 | 462,813 | 460,626 | 459,023 | 455,461 |
| New Debt Service | - | 52,526 | 136,301 | 267,967 | 320,633 | 320,633 |
| Residual Equity Transfers | 71,058 | 71,058 | 71,058 | 71,058 | 71,058 | 71,058 |
| Transfers to the Capital Fund | 500,000 | 750,000 | 750,000 | 750,000 | 750,000 | 750,000 |
| In Lieu Taxes | 682,469 | 839,680 | 874,368 | 911,320 | 949,668 | 989,769 |
| State Taxes | 244,068 | 297,938 | 310,526 | 323,624 | 337,253 | 351,432 |
| **Total Expenses** | **$ 5,954,720** | **$ 6,584,287** | **$ 6,841,171** | **$ 7,146,344** | **$ 7,378,796** | **$ 7,562,809** |
| **Annual Surplus/(Deficiency)** | **$ (536,285)** | **$ (1,150,527)** | **$ (1,383,297)** | **$ (1,664,354)** | **$ (1,873,455)** | **$ (2,033,232)** |
| **Annual Rate Adjustment** | **0.00%** | **20.00%** | **3.50%** | **3.50%** | **3.50%** | **3.50%** |
| **Additional Revenue from Rate Adjustments** | **$ -** | **$ 1,047,234** | **$ 1,273,489** | **$ 1,509,755** | **$ 1,756,438** | **$ 2,013,962** |
| **Net Surplus/(Deficiency)** | **$ (536,285)** | **$ (103,293)** | **$ (109,808)** | **$ (154,599)** | **$ (117,017)** | **$ (19,271)** |
| **Beginning Fund Balance** | **$ 2,255,724** | **$ 1,719,439** | **$ 1,616,145** | **$ 1,506,338** | **$ 1,351,738** | **$ 1,234,722** |
| **Cumulative Fund Balance** | **$ 1,719,439** | **$ 1,616,145** | **$ 1,506,338** | **$ 1,351,738** | **$ 1,234,722** | **$ 1,215,451** |
| *Actual Days of O&M:* | *129* | *112* | *101* | *88* | *78* | *74* |
| *Minimum Target Balance [60 days]:* | *$801,243* | *$863,300* | *$891,123* | *$920,004* | *$949,822* | *$980,656* |
| *City Established Target Balance:* | *$1,000,000* | *$1,000,000* | *$1,000,000* | *$1,000,000* | *$1,000,000* | *$1,000,000* |

## B. Cost of Service and Rates

### 1. Cost of Service Allocations

In conducting the cost of service analysis, FCS Group followed the general methodology described in Section II. The cost of service to be allocated to the functional components consists of the total net revenue requirements for the test year 2005. Total revenue requirements to be recovered from rates equal $6,283,405. As shown in Exhibit III-6, net operating expenses of $4,706,013 and net capital costs of $1,577,392 comprise the total cost of service.

## Exhibit III-6: Total Cost of Service

| TOTAL COST OF SERVICE | Test Year 2005 Operating Expense | Capital Costs | Total |
|---|---|---|---|
| **Total Revenue Requirements** | | | |
| Operating & Maintenance Expenses | $ 4,114,122 | $ - | $ 4,114,122 |
| Debt Service Payments | - | 511,489 | 511,489 |
| Transfer to Capital Fund | - | 750,000 | 750,000 |
| Residual Equity Transfers | - | 71,058 | 71,058 |
| In Lieu Taxes | 634,250 | 205,431 | 839,680 |
| State Taxes | 225,046 | 72,892 | 297,938 |
| Operating Reserve - Gain/(Loss) | (78,022) | (25,271) | (103,293) |
| **Total** | **$ 4,895,395** | **$ 1,585,598** | **$ 6,480,994** |
| **Revenue Requirements Met From Other Sources** | | | |
| Other Operating Revenue | $ 163,200 | $ - | $ 163,200 |
| Interest Income | 26,182 | 8,207 | 34,389 |
| **Total** | **$ 189,382** | **$ 8,207** | **$ 197,589** |
| **Cost of Service to be Met from Rates** | **$ 4,706,013** | **$ 1,577,392** | **$ 6,283,405** |
| Adjustment for Full Year Rate Increase [a] | - | - | - |
| **Total Cost of Service** | **$ 4,706,013** | **$ 1,577,392** | **$ 6,283,405** |

[a] Adjustment necessary if revenue increase will not be implemented for a full year.

Utility plant and annual expenses were allocated to the following five functional cost categories:

- **Customer** costs are associated with providing services to customers regardless of the level of water used, such as billing, meter reading, and office support. These costs are typically associated with the number of accounts or customers.
- **Meters & Services** costs are associated with installation, maintenance, and repairs of meters and services. These costs are typically associated with the number of connections and meter sizes.
- **Base Demand** costs are those costs that tend to vary with the amount of water produced, such as source of supply, chemical, power, etc., and are associated with meeting a constant, or average, annual rate of use.
- **Peak Demand** costs are associated with providing facilities to meet the peak rates of demand, such as storage, transmission and distribution and are associated with meeting demands for water in excess of average day usage (peak day and peak hour).
- **Fire Protection** costs are related to providing direct fire protection. Fire flow requirements for the water system are based on industry standards and established by the Insurance Services Office and incorporated into the City's water system planning process. Note: when the water system meets fire flow standards, all customers benefit by improved fire ratings and cost savings in lower fire insurance.

The following assumptions were applied in the functional allocations:

- Based on engineering design criteria as provided by the City, a system peak day demand to average day demand ratio of 1.50 was used, which indicates that 67

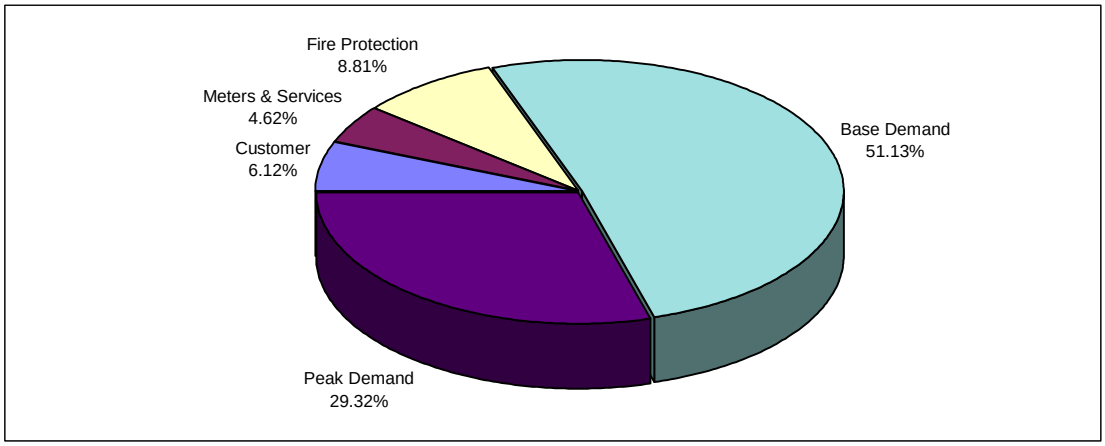
percent of the capacity of facilities designed and operated to meet maximum day demand is needed to meet average or base use. The remaining 33 percent is required to meet maximum day extra capacity requirements.

- A maximum hour to average day demand ratio of 2.14 was used, which indicates that 47 percent of the capacity of facilities designed and operated for maximum hour demand is needed for average or base use, 23 percent is required to meet maximum day extra capacity demand, and the remaining 30 percent is for maximum hour extra capacity demand.
- System fire flow requirements are 4,000 gallons per minutes for a duration four hours.
- Source of supply plant is allocated 100 percent to the Base cost component.
- Pumping, treatment, and transmission plant is allocated to Base (67%) and Peak Day (33%) cost components using the ratio of maximum day to average day demand.
- Storage and distribution plant is allocated to Base (47%), Peak Day (23%) and Peak Hour (30%) cost components using the ratio of maximum hour to average day demand.
- Hydrants are directly allocated to Fire Protection. Service connections, taps and meters are directly allocated to Meters & Services. Intangible plant and general plant are allocated in proportion to all other plant.
- Operating costs are allocated to functions based on a detailed review of line item categories. General operations & maintenance expenses are allocated as plant-in-service. Customer service expenses are allocated to the Customer component, and administration and miscellaneous expenses are allocated in proportion to all other expenses.

Results of the functional allocation of costs (total revenue requirements equal to $6.3 million) are summarized in Exhibit III-7. These functionally allocated costs are then allocated to the fixed and variable components of the rate structure to form the basis for designing rates.

**Exhibit III-7: Functional Allocation of Costs**

| TOTAL COST OF SERVICE | $ 6,283,405 |
|---|---|
| Customer | 384,439 |
| Meters & Services | 290,289 |
| Fire Protection | 553,378 |
| Base Demand | 3,212,706 |
| Peak Demand | 1,842,592 |




## 2. Rate Design

The City's existing water rate structure consists of a fixed charge increasing by meter size ("readiness-to-serve") and a three-block declining volume charge ("unit of cost"). The same schedule of rates applies to all customer classes (except private fire); meaning, there is no distinction in service demands among the customer classes. Private fire services are charged a readiness-to-serve charge; no charge is applied to actual water usage, if any.

The proposed rates have been developed in accordance with the City's policy to apply the same rate schedule to all customer classes and transition from a declining block rate structure to a single (uniform) block rate structure. This study updates the fixed and volume charges to more closely align with cost of service and transitions the existing three block declining structure to a two block declining structure, and then to a uniform volume rate by the end of the study period.

The fixed charge recovers customer related costs, meters & services costs, and fire protection costs. The volume charge recovers all base and peak demand related costs.

### Proposed Rates – Scenario A

A comparison of existing rates and the six-year schedule of proposed rates for Scenario A is shown in Exhibit III-8. Proposed rates reflect revenue increases of 12 percent in each year 2005 and 2006, followed by annual increases of 3.5 percent.

**Exhibit III-8: Scenario A - Existing & Proposed Water Rates**

**Readiness-To-Service Charge - $/Bi-Monthly Billing Period [a]**

| Meter Size | Existing 2004 | Proposed 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|
| 3/4" | $3.65 | $6.00 | $ 8.25 | $ 9.00 | $ 9.35 | $ 9.70 |
| 1" | $5.65 | $10.67 | $ 12.04 | $ 12.60 | $ 13.08 | $ 13.49 |
| 1-1/2" | $12.80 | $18.23 | $ 20.57 | $ 21.58 | $ 22.35 | $ 22.96 |
| 2" | $26.00 | $27.30 | $ 30.81 | $ 32.35 | $ 33.48 | $ 34.33 |
| 3" | $67.00 | $48.46 | $ 54.69 | $ 57.49 | $ 59.46 | $ 60.86 |
| 4" | $107.00 | $78.69 | $ 88.81 | $ 93.40 | $ 96.56 | $ 98.75 |
| 6" | $190.00 | $154.27 | $ 174.10 | $ 183.17 | $ 189.32 | $ 193.48 |
| 8" | $310.00 | $305.42 | $ 344.70 | $ 362.71 | $ 374.84 | $ 382.94 |
| 10" | $475.00 | $456.57 | $ 515.29 | $ 542.25 | $ 560.36 | $ 572.41 |
| 12" | $700.00 | $668.18 | $ 754.12 | $ 793.61 | $ 820.08 | $ 837.66 |

**Volume Charge - $/ccf [a]**

| Rate Block (per ccf) | Existing 2004 | Proposed 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|
| 0 - 20 | $1.13 | $1.14 | $ 1.20 | $ 1.21 | $ 1.23 | $ 1.25 |
| 21 - 250 | $1.00 | $1.14 | $ 1.20 | $ 1.21 | $ 1.23 | $ 1.25 |
| Over 250 | $0.75 | $0.85 | $ 1.00 | $ 1.07 | $ 1.15 | $ 1.25 |

**Private Fire Services - $/Bi-Monthly Period [a]**

| Line Size | Existing 2004 | Proposed 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|
| 2 | $5.00 | $5.25 | $5.50 | $5.75 | $6.00 | $6.00 |
| 3 | $7.00 | $7.35 | $7.70 | $8.05 | $8.40 | $8.75 |
| 4 | $11.00 | $11.55 | $12.10 | $12.65 | $13.20 | $13.75 |
| 6 | $26.00 | $27.30 | $28.60 | $29.90 | $31.20 | $32.50 |
| 8 | $35.00 | $36.75 | $38.50 | $40.25 | $42.00 | $43.75 |
| 10 | $60.00 | $63.00 | $66.00 | $69.00 | $72.00 | $75.00 |
| 12 | $150.00 | $157.50 | $165.00 | $172.50 | $180.00 | $187.50 |

**Bulk Water Rate - $/ccf**

| | Existing 2004 | Proposed 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|
| | $1.00 | $1.14 | $ 1.20 | $ 1.21 | $ 1.23 | $ 1.25 |

Daily water meter rental will be $4.00 per day (existing rate is $1.00 per day)

[a] Outside City rates are 1.50 times inside City rates

Exhibit III-9 presents a comparison of sample customer water bills under existing rates and the proposed 2005 rates for Scenario A.

**Exhibit III-9: Scenario A – Sample Customer Water Bills**

**Residential**

| Meter Size (inches) | Bi-Mthly Usage (ccf) | Existing Bi-Mthly Bill | 2005 Bi-Mthly Bill | $ Change from Existing |
|---|---|---|---|---|
| 3/4 | - | $3.65 | $6.00 | $2.35 |
| 3/4 | 6 | $10.43 | $12.84 | $2.41 |
| 3/4 | 15 | $20.60 | $23.10 | $2.50 |
| 3/4 | 25 | $31.25 | $34.50 | $3.25 |
| 3/4 | 40 | $46.25 | $51.60 | $5.35 |
| 1 | 50 | $58.25 | $67.67 | $9.42 |

**Commercial**

| Meter Size (inches) | Bi-Mthly Usage (ccf) | Existing Bi-Mthly Bill | 2005 Bi-Mthly Bill | $ Change from Existing |
|---|---|---|---|---|
| 3/4 | 75 | $81.25 | $91.50 | $10.25 |
| 1 | 115 | $123.25 | $141.77 | $18.52 |
| 2 | 150 | $178.60 | $198.30 | $19.70 |
| 2 | 250 | $278.60 | $312.30 | $33.70 |
| 4 | 400 | $472.10 | $491.19 | $19.09 |
| 4 | 800 | $772.10 | $831.19 | $59.09 |

Based on the City's billing system information, the residential class uses an average of 2,500 cubic feet (25 ccf) of water per bi-monthly billing period over the course of a year. The commercial class uses an average 11,500 (115 ccf) per billing period, and industrial customers average 51,500 (515 ccf) per billing period. Actual water usage will likely vary by customer and by billing period. For example, residential customers typically experience higher than average usage in summer months and lower than average usage in the winter months. As such, the water bill will also vary by customer and by billing period.

A comparison of existing rates and the six-year schedule of proposed rates for the Base Case is shown in Exhibit III-10. Proposed rates reflect the 2005 revenue increase of 20 percent, followed by annual increases of 3.5 percent.

## Exhibit III-10: Base Case - Existing & Proposed Water Rates

**Readiness-To-Service Charge - $/Bi-Monthly Billing Period [a]**

| Meter Size | Existing 2004 | Proposed 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|
| 3/4" | $3.65 | $7.30 | $ 7.85 | $ 8.50 | $ 9.05 | $ 9.60 |
| 1" | $5.65 | $11.43 | $ 11.91 | $ 12.46 | $ 12.92 | $ 13.32 |
| 1-1/2" | $12.80 | $19.52 | $ 20.34 | $ 21.33 | $ 22.08 | $ 22.67 |
| 2" | $26.00 | $29.23 | $ 30.46 | $ 31.97 | $ 33.07 | $ 33.89 |
| 3" | $67.00 | $51.88 | $ 54.07 | $ 56.81 | $ 58.72 | $ 60.07 |
| 4" | $107.00 | $84.25 | $ 87.80 | $ 92.29 | $ 95.37 | $ 97.47 |
| 6" | $190.00 | $165.16 | $ 172.12 | $ 180.99 | $ 186.97 | $ 190.97 |
| 8" | $310.00 | $326.98 | $ 340.77 | $ 358.40 | $ 370.18 | $ 377.96 |
| 10" | $475.00 | $488.79 | $ 509.42 | $ 535.80 | $ 553.38 | $ 564.95 |
| 12" | $700.00 | $715.34 | $ 745.52 | $ 784.16 | $ 809.87 | $ 826.73 |

**Volume Charge - $/ccf [a]**

| Rate Block (per ccf) | Existing 2004 | Proposed 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|
| 0 - 20 | $1.13 | $1.18 | $ 1.20 | $ 1.22 | $ 1.23 | $ 1.24 |
| 21 - 250 | $1.00 | $1.18 | $ 1.20 | $ 1.22 | $ 1.23 | $ 1.24 |
| Over 250 | $0.75 | $0.93 | $ 0.99 | $ 1.05 | $ 1.15 | $ 1.24 |

**Private Fire Services - $/Bi-Monthly Period [a]**

| Line Size | Existing 2004 | Proposed 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|
| 2 | $5.00 | $5.25 | $5.50 | $5.75 | $6.00 | $6.00 |
| 3 | $7.00 | $7.35 | $7.70 | $8.05 | $8.40 | $8.75 |
| 4 | $11.00 | $11.55 | $12.10 | $12.65 | $13.20 | $13.75 |
| 6 | $26.00 | $27.30 | $28.60 | $29.90 | $31.20 | $32.50 |
| 8 | $35.00 | $36.75 | $38.50 | $40.25 | $42.00 | $43.75 |
| 10 | $60.00 | $63.00 | $66.00 | $69.00 | $72.00 | $75.00 |
| 12 | $150.00 | $157.50 | $165.00 | $172.50 | $180.00 | $187.50 |

**Bulk Water Rate - $/ccf**

| | Existing 2004 | Proposed 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|
| | $1.00 | $1.18 | $1.20 | $1.22 | $1.23 | $1.24 |

Daily water meter rental will be $4.00 per day (existing rate is $1.00 per day)

[a] Outside City rates are 1.50 times inside City rates

Exhibit III-11 presents a comparison of sample customer water bills under existing rates and the proposed 2005 rates for the Base Case.

**Exhibit III-11: Base Case - Sample Customer Water Bills**

**Residential**

| Meter Size (inches) | Bi-Mthly Usage (ccf) | Existing Bi-Mthly Bill | 2005 Bi-Mthly Bill | $ Change from Existing | Estimated No. of Customers |
|---|---|---|---|---|---|
| 3/4 | 6 | $10.43 | $14.38 | $3.95 | 5,200 |
| 3/4 | 15 | $20.60 | $25.00 | $4.40 | 3,900 |
| 3/4 | 25 | $31.25 | $36.80 | $5.55 | 1,550 |
| 3/4 | 40 | $46.25 | $54.50 | $8.25 | 1,400 |
| 1 | 50 | $58.25 | $70.43 | $12.18 | 250 |

**Commercial**

| Meter Size (inches) | Bi-Mthly Usage (ccf) | Existing Bi-Mthly Bill | 2005 Bi-Mthly Bill | $ Change from Existing | Estimated No. of Customers |
|---|---|---|---|---|---|
| 3/4 | 75 | $81.25 | $95.80 | $14.55 | 90 |
| 1 | 115 | $123.25 | $147.13 | $23.88 | 80 |
| 2 | 150 | $178.60 | $206.23 | $27.63 | 30 |
| 2 | 250 | $278.60 | $324.23 | $45.63 | 40 |
| 4 | 400 | $472.10 | $518.75 | $46.65 | 15 |
| 4 | 800 | $772.10 | $890.75 | $118.65 | 10 |

Exhibits III-12 and III-13 provide a comparison of sample bi-monthly water bills for residential and commercial customers, respectively, with other regional water service providers. It is important to note that many factors enter into the determination of rates and, therefore, a comparison of rates with other utilities should be viewed as informational only and not indicative of the appropriateness of rates for the City of Yakima.

## Exhibit III-12: Comparison of Sample Residential Water Bills

| Community | Water | *Rank* |
|---|---|---|
| Eastern Washington | | |
| **Yakima (Existing)** | **$31.25** | *15* |
| ***Yakima (Scenario A)*** | ***$34.50*** | *12* |
| ***Yakima (Base Case)*** | ***$36.80*** | *10* |
| Ellensburg | $36.43 | *11* |
| Kennewick | $40.43 | *9* |
| Nob Hill | $41.82 | *8* |
| Pasco | $34.50 | *12* |
| Richland | $50.30 | *4* |
| Selah | $33.31 | *14* |
| Union Gap | $44.56 | *6* |
| Yakima County | $45.65 | *5* |
| Other | | |
| Bellevue | $77.68 | *2* |
| Bend, OR | $44.21 | *7* |
| Tacoma | $55.21 | *3* |
| Woodinville | $77.85 | *1* |

Assumptions:

3/4-inch or smaller meter size

25 ccf bi-monthly water usage

Inside city rates, winter period if seasonal rate structure

**Exhibit III-13: Comparison of Sample Commercial Water Bills**

| Community | Water | *Rank* |
|---|---|---|
| Eastern Washington | | |
| **Yakima (Existing)** | **$123.25** | *11* |
| ***Yakima (Scenario A)*** | **$141.77** | *7* |
| ***Yakima (Base Case)*** | **$147.13** | *6* |
| Ellensburg | $125.46 | *10* |
| Kennewick | $157.40 | *4* |
| Nob Hill | $140.82 | *8* |
| Pasco | $104.84 | *14* |
| Richland | $108.05 | *13* |
| Selah | $94.47 | *15* |
| Union Gap | $119.66 | *12* |
| Yakima County | $162.20 | *3* |
| Other | | |
| Bellevue | $284.65 | *2* |
| Bend, OR | $136.53 | *9* |
| Tacoma | $151.38 | *5* |
| Woodinville | $313.75 | *1* |

Assumptions:
1-inch meter size
115 ccf bi-monthly water usage
Inside city rates, winter period if seasonal rate structure

## C. Conclusions and Recommendations

Projections are by nature conjectural and rely on many assumptions regarding growth, inflation, interest rates and other factors, and no guarantee as to their ultimate accuracy can be made. We have endeavored to apply the best available estimates of future conditions that affect these findings, including the 2004 Water System Plan Update adopted by the City Council in April 2004, and believe the analyses performed in this study provide a reasonable level of assurance with respect to the adequacy of the proposed rates and rate structure. However, regular review of actual financial performance of the Utility should be an integral part of the successful implementation of this study.

Based on the analyses conducted for this study, FCS Group and City staff recommends that City Council approve the proposed schedule of rates for Scenario A as presented herein for adoption in November 2004, with implementation of rates effective January 1, 2005.

As an alternative to adopting all six years of rate increases at this time, the City could implement the proposed 2005 and 2006 increases and rather than adopting the 3.5 percent future annual increases (2007 through 2009), the City could implement rate ordinance language providing for the automatic adjustment of rates based on the average of the ENR Construction Cost Index (CCI) and the ENR Consumer Price Index (CPI), beginning January 1, 2007, and on January 1 of each successive year thereafter. The intent of this policy is to

avoid large rate increases that can occur when rates are not adjusted annually in recognition of the constant rise in the cost of delivering services.

Automatic index adjustments may generate excess revenues in some years, while falling short of revenue requirements in other years. Additional revenues generated from the annual index adjustments could be used to build operating reserves or to cash-finance capital projects to help mitigate future debt issuance. Adjustments above the index increases should be reviewed as part of the rate study process.

**Cost Comparison of Common Liquids***

| Liquid | Price per gallon | Price per 8oz glass |
|---|---|---|
| Gas | $2.00 | $0.13 |
| Vicks 44D Cough Syrup | $80.00 | $5.00 |
| Coppertone sun-block | $72.00 | $4.50 |
| Pepto-Bismol | $58.00 | $3.60 |
| Evian bottled water | $21.00 | $1.30 |
| Mocha coffee | $40.00 | $2.50 |
| Corona beer | $12.00 | $0.75 |
| Snapple | $16.00 | $1.00 |
| Tide liquid detergent | $8.00 | $0.50 |
| Coca-Cola | $3.00 | $0.20 |
| | | |
| **City of Yakima tap water** | **2004 - $0.0015**<br>**2009 - $0.0017** | **$0.0001**<br>**$0.0001** |

## Various Facts About Water Consumption

- Typically, households use at least 50% of their water by lawn watering.
- Toilets can account for almost 30% of all indoor water use, an average of 27 gallons per person per day, more than any other fixture or appliance.
- Clothes washers can use as much as 30-35 gallons (114-133 liters) of water per cycle and dishwashers as much as 25 gallons (95 liters) per cycle.
- Each person uses about 120 gallons of water a day at home.
- The average five-minute shower takes between 15 to 25 gallons of water.
- An automatic dishwasher uses approximately 9 to 12 gallons of water while hand washing dishes can use up to 20 gallons.
- You can refill an 8 oz glass of water approximately 15,000 times for the same cost as a six-pack of soda.

**City of Yakima Tap Water**

## How much water do you get for $1.24?

- 1 unit
- 100 cubic feet
- 748 gallons
- 95,744 ounces

## What can you do with $1.24 worth of water?

- ✓ Wash 30 loads of laundry (40 loads with an energy efficient washer)
- ✓ Wash 75 loads of dishes
- ✓ Flush you toilet 150 times (375 with a low flow toilet)
- ✓ Take 40 - 5 minute showers (60 with a low flow shower head)
- ✓ Brush your teeth 375 times
- ✓ Water you lawn for nearly 2 hours

Drink 12,000 8-ounce glasses of water