

City and Borough of Juneau, AK

**WATER UTILITY AND WASTEWATER UTILITY
RATE STUDY**

Summary of Findings

October 2003



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October 2, 2003

Mr. Joe Buck
Public Works Director
City and Borough of Juneau
5433 Shaune Drive
Juneau, AK 99801

Subject: Water Utility and Wastewater Utility Rate Study Report

Dear Mr. Buck:

Financial Consulting Solutions Group, Inc. (FCS Group) is pleased to submit our water and wastewater utility rate study report for the City and Borough of Juneau (CBJ). This letter provides a brief summary of the study objectives, finding and conclusions.

A. STUDY OBJECTIVES:

1. Develop a policy framework for operating and capital reserves, system replacement, debt service coverage, and other appropriate fiscal policies.
2. Develop long-term financing strategies for funding each utility's capital improvements projects and replacement needs over the study period, fiscal years (FY) 2004 through 2012.
3. Forecast revenue requirements for the study period, incorporating fiscal policies, capital-related costs, ongoing operating & maintenance expenses and other cash obligations of the utilities.
4. Identify each utility's costs as they relate to various components of the system(s) and allocate those costs of service to customer classes based on each customer class's relative usage of and demand for the system(s).
5. Develop rate structures for each utility that recover total utility costs and take into consideration the cost of service results, as well as other practical considerations.
6. Review interim study findings with CBJ staff and the Public Works & Facilities Committee. Present final study results to the CBJ Assembly.
7. Document study results in a project report, including technical appendices containing the detailed analyses.
8. Deliver the spreadsheet water and wastewater rate models to CBJ staff, together with a user guide delineating the model update procedure.

The study process, which evolved over a period of about one year, involved several iterations of data analyses and the development of numerous scenarios for alternative fiscal policies, capital funding plans, revenue requirement projections, and alternative phase-in of rate adjustments. These interim results and options were reviewed with CBJ staff and presented to the Public Works and Facilities Committee prior to presentation of final study results to the Assembly. Working closely with FCS Group, CBJ staff collected data, provided policy direction, and validated all input parameters.

This report provides an overview of the methodologies used in completing the studies and summarizes the final study findings and recommendations, as presented to the CBJ Assembly on August 18, 2003.

This rate study incorporated actual FY 2002 and estimated FY 2003 water and wastewater utility financial information, FY 2004 operating budgets, and the capital improvement programs as provided by CBJ 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 Funds:* Each utility should remain and operate as a self-supported enterprise fund. For this study, utility rates were established such that each utility recovers the full cost of capital expenditures, operating & maintenance expense, debt service and coverage requirements, and adequate levels of reserves.
- *Capital Improvement and Replacement Program Levels:* The funding for the capital improvement and replacement program should be sustained at a level sufficient to maintain water system and wastewater system integrity.
- *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 system replacement funding equal to annual depreciation expense net of debt principal payments for each utility. As a transition to this policy, full depreciation-based system replacement funding is planned to be phased-in over a 20-year period, beginning in FY 2004.
- *Capital Funding:* To provide for the continuing, and significant capital needs of the CBJ, adequate sources of capital funding must be available to the utilities. The following capital funding strategy was assumed for the capital improvement programs included in this study:
 - ✓ Grants and low-interest loans, as approved
 - ✓ Capital reserves (including depreciation funding from rates)
 - ✓ Revenue Bonds
- *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 for each utility equal to 30 days, or about 8.2 percent, of annual operating expense.

- *Revenue Bond Coverage Ratio:* The CBJ's current minimum coverage requirement on the outstanding 2002 water/wastewater revenue and refunding bond is 1.25 times annual debt service, using the combined net revenues of the water and wastewater utilities. To ensure each utility is a self-supporting enterprise, this study assumes that each utility will independently meet this coverage requirement; meaning that the revenues of each utility should be sufficient to pay operating expenses (excluding depreciation), the annual debt service payment, plus an additional 25 percent of the annual revenue bond debt service. Failure to comply with minimum annual coverage requirements can lower the CBJ's bond rating and jeopardize its ability to sell bonds in the future.
- *Rate Levels:* Service 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 utilities.

Important Note: should the CBJ choose to implement rates at a level that does not recover the full cost of utility operations on an annual basis, substantial care must be taken to ensure that all bond covenants are met. Failure to meet bond covenants, and/or financial stability guidelines established for ADEC loan eligibility, could jeopardize the CBJ's ability to secure these significant capital funding sources in the future. Although outside sources of funds (such as general fund support) might be options to help fund certain utility expenditures in the short-term, they cannot be used in the calculation of annual bond debt service coverage.

- *Rate Equity and Rate Structures:* The water and wastewater rate analyses should allocate costs fairly between different customer classes. For this study, cost of service-based rates were designed, as well as two alternative rate structures to incorporate practical considerations for mitigating significant impacts to certain customer classes resulting from the cost of service analysis.
- *Frequency of Rate Adjustments:* Rate revenue adequacy should be evaluated regularly as part of the utilities' budgeting process to ensure that budgeted expenses and cash reserve accumulations, including the impacts of regulations, are reflected in current rates. The final study results incorporate a three-year rate adjustment cycle for the first three years, and then transitioning to a two-year cycle to align with CBJ's biennial budget cycle.

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 FY 2004 through FY 2012. The study's particular focus and recommendations for implementation are for FY 2004, with future impacts shown for ***planning purposes only***. Due to the uncertainty related to the future capital costs and potential for grants and low-cost loans, we recommend that the CBJ update the projections and resulting rates prior to implementation of subsequent rate adjustments.

B. MAJOR STUDY FINDINGS AND CONCLUSIONS

Major studying findings and conclusions are:

- The Water Utility's revenue requirements are driven by the existing and projected cash needs of the utility. The CBJ has not adjusted water rates in over 10 years, and revenues at current rate levels will not keep up with the increasing costs of operations, not to mention pay debt service, provide for system replacement, and maintain adequate reserves.
- The revenue requirements results indicate a FY 2004 rate increase of 19 percent. Based on the assumed transition to a two-year rate implementation cycle, additional increases of 18 percent and 16 percent will be necessary in FY 2007 and FY 2009, respectively. An additional adjustment of 5 percent will be required in FY 2011.
- Similar to the Water Utility, the Wastewater Utility's revenue requirements are driven by the existing and projected cash needs of the utility. Operating revenues are significantly less than cash operating and maintenance expenses. In other words, the utility has been relying on its cash reserves to pay for operations, which is a questionable practice from a utility business perspective. To fund its capital improvement program, the utility is heavily reliant on outside sources. In short, the utility's financial position is not sustainable at the current level of rates.
- The revenue requirement results indicate a FY 2004 rate increase of 39 percent. Based on the assumed transition to a two-year rate implementation cycle, two additional 13 percent increases will be necessary in FY 2007 and FY 2009. An additional 7 percent adjustment will be required in FY 2011.

C. RECOMMENDATION

- Given the high level of overall rate increases needed for each utility, and significant impacts to certain customer classes based on the cost of service analyses, we recommend the CBJ implement "across-the-board" rate increases for the current rate implementation cycle and transition to cost of service-based rates over time.

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. However, regular review of actual financial performance of the Water and Wastewater Utilities should be an integral part of the successful implementation of this study. In particular, changes in the timing, costs, and financing of capital improvements could have a material impact on the results.

A final electronic copy of the spreadsheet rate models and the user guide will be submitted to the CBJ under separate cover.

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

Sincerely,

Karyn Johnson
Project Manager

Nihat Dogan
Senior Consultant

David W. Findlay, CPA, CMC
Principal

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I – INTRODUCTION

In October 2002, the City and Borough of Juneau (CBJ) retained Financial Consulting Solutions Group, Inc. (FCS Group) to perform a comprehensive cost of service analysis and rate study for the water utility. Shortly thereafter, a similar study was authorized for the wastewater utility to be completed in concert with the water rate study. The purpose of the two studies was to evaluate respective and combined revenue requirements, cost of service, and rate designs for each utility. The major scope elements of the studies were to:

1. Develop a policy framework for operating and capital reserves, system replacement, debt service coverage, and other appropriate fiscal policies.
2. Develop long-range financing strategies for funding each utility's capital improvements projects and replacement needs over the study period, fiscal years (FY) 2004 through FY 2012.
3. Forecast revenue requirements for the study period, incorporating fiscal policies, capital-related costs, ongoing operating & maintenance expenses and other cash obligations of the utilities.
4. Identify each utility's costs as they relate to various components of the system(s) and allocate those costs of service to customer classes based on each customer class's relative usage of and demand for the system(s).
5. Develop rate structures for each utility that recover total utility costs and take into consideration the cost of service results, as well as other practical considerations.
6. Review interim study findings with CBJ staff and the Public Works & Facilities Committee. Present final study results to the CBJ Assembly.
7. Document study results in a project report, including technical appendices containing the detailed analyses.
8. Deliver the spreadsheet water and wastewater rate models to CBJ staff, together with a user guide delineating the model update procedure.

The study process, which evolved over a period of about one year, involved several iterations of data analyses and the development of numerous scenarios for alternative fiscal policies, capital funding plans, revenue requirement projections, and alternative phase-in of rate adjustments. These interim results were reviewed with CBJ staff and presented to the Public Works & Facilities Committee prior to presentation of final study results to the Assembly. Working closely with FCS Group, CBJ staff collected data, provided policy direction, and validated all input parameters.

We greatly appreciate the efforts and support of CBJ staff throughout the study process, which was invaluable in developing and refining the study analysis and results. Furthermore, we want to acknowledge the welcomed participation of the Public Works & Facilities Committee, and thank the members of the Assembly for their input on study results.

This report provides an overview of the methodologies used in completing the studies and summarizes the final study findings and recommendations, as presented to the Assembly on August 18, 2003.

The remainder of this report provides separate sections for Methodology (Section II), Water Utility Findings & Results (Section III), and Wastewater Utility Findings & Results (Section IV). The spreadsheet model outputs have been provided at the end of the Report as Technical Appendices. The spreadsheet rate models and the user guide will be submitted to the CBJ following this report.

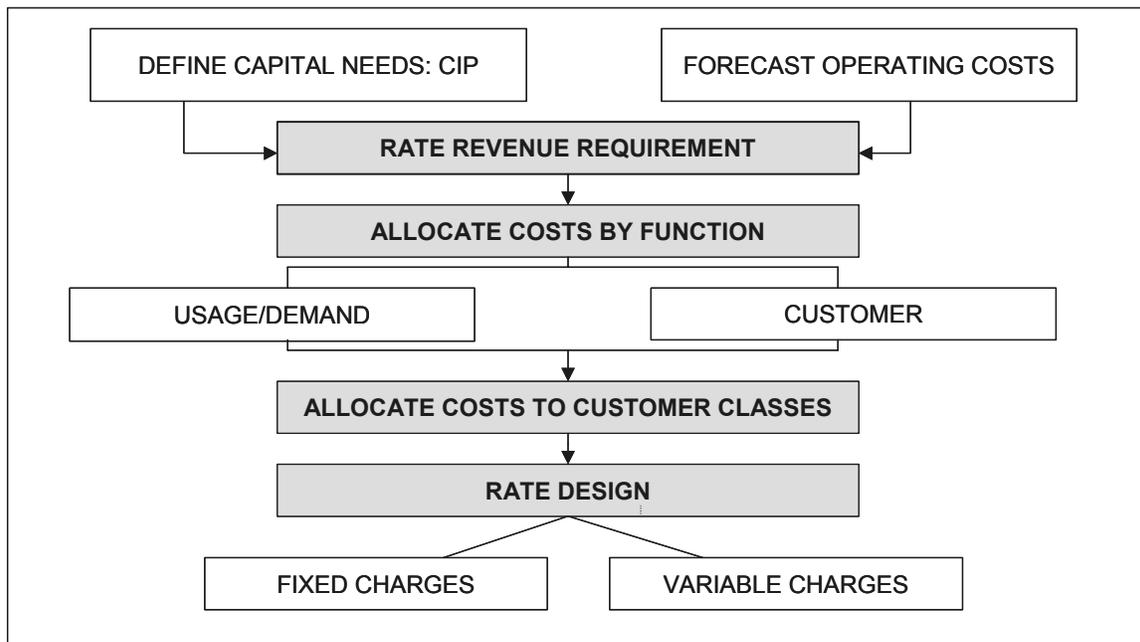
II - METHODOLOGY

The methods used in the rate studies follow general industry guidelines and best management practices for developing utility rates, which are designed to generate sufficient revenues to maintain self-supporting, and financial viable utilities and 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 rates.
- Allocate revenue requirements to basic functional cost components of the systems.
- Distribute cost components to customers according to their respective service requirements.
- Design a rate structure that recovers from each class and within each class, to the extent possible, the cost to serve that customer class.

The graphic in Exhibit 1 summarizes the key steps in this process. In each of the following sections, a general introduction to the issues and approach for the analyses is provided, followed by sections addressing the results of the separate analyses for the water utility and wastewater utility.

Exhibit 1 – Rate Study Methodology



A. Revenue Requirements

Approach

The revenue requirements analysis determines the amount of annual revenue that needs to be generated by service rates. The requirements incorporate the annual operating budget and the capital and financial policy needs as described herein.

The analysis determines the amount of revenue needed in a given year to meet that year's expected financial obligations. We require that at least two separate conditions be satisfied for rates to be sufficient: cash needs must be met, and the revenue bond coverage requirement, if any, must be realized. Each utility's revenue requirement is calculated individually.

The cash flow test identifies all the known cash requirements for the utility in each year of the study period. Cash requirements include operating and maintenance 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.

The coverage test is based on a commitment made by the CBJ 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 bond 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 (excluding depreciation), annual debt service, plus an additional 25% of debt service. The CBJ's current minimum coverage requirement on the outstanding 2002 water/wastewater revenue and refunding bond is 1.25 times annual debt service, using the combined net revenues of the water and wastewater utilities. To ensure each utility is a self-supporting enterprise, each utility should independently meet this coverage requirement. Note: the 1.25 debt service coverage factor is a minimum requirement; meaning anything less than this level would be a technical default of the bond covenants. Usually a 1.35 coverage factor or higher is desired by bond rating agencies.

In determining the revenue requirements, both the cash needs and coverage sufficiency tests must be met. If a rate revenue deficiency exists under both tests, the analysis adds the greatest deficiency to the forecasted rate revenue. 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 determining the total revenue requirements, our study assumes incorporation of the recommended fiscal policies as summarized below.

1. Self-Sufficient Enterprise Funds

Each 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 CBJ-provided services are minimized or eliminated altogether. The CBJ budgeting process should include a balanced and controlled annual budget for each utility. For this study, utility rates are established such that each utility recovers the full cost of capital expenditures, operating & maintenance expenses, debt service and coverage requirements, and adequate levels of reserves. This mitigates inequities that can occur for water or wastewater service only customers, as well as ensures that users can better control some of their costs by applicable conservation measures.

2. Capital Improvement and Replacement Program Levels

The funding for the capital improvement and replacement program should be sustained at a level sufficient to maintain system integrity. To the extent that the annual level of the capital program can be managed by the scheduling and scoping of projects, the funding should be sustained at a fairly uniform level in order to avoid any significant fluctuations impacting the operating budget and related rate increases. We refer to this as a form of “normalization”.

3. 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 payment is sometimes used as 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 CBJ has not historically set rates at a level sufficient to provide funding for system replacement. Many federal and state loan and grant programs are now requiring utilities to fund some level of system replacement as a requirement for eligibility. The recent Capacity Assessments Report prepared by Boise State University for the CBJ's requested ADEC loans recommended the CBJ begin funding system replacement. This study incorporates system replacement funding equal to annual depreciation expense net of debt principal payments for each utility. As a transition to this fiscal policy, our analysis assumes that system replacement funding will be phased-in over a 20-year period, beginning in FY 2004. It is assumed that 15 percent of the annual depreciation expense (net of debt principal payment) will be funded in the first three years of the projection period. This level of funding is increased by an additional 15 percent in every three-year period until the 100 percent funding level is reached. Since this revenue is intended to help fund capital projects, we recommend that the cash flow be tracked and reserved as part of the balance for the capital fund.

4. *Capital Funding*

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

- Grants and low-interest loans
- Revenue Bonds
- Developer contributions
- Cash-financing from rates
- Cash reserves

The CBJ's capital improvement program identified specific funding sources to fund the FY 2004 capital needs for each utility, which included non-utility resources, such as G.O. bonds not paid from utility rates, general sales tax revenue, and street tax revenue. Beyond FY 2004, this study necessarily assumes funding of all capital needs from utility resources and eliminates the reliance on outside revenue sources. This policy is consistent with the recommendation to maintain self-sufficient utility enterprises. Moreover, we do not believe that it would be prudent to rely on other scarce revenue sources needed for CBJ general and special fund programs.

The analyses used 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 assumed to be funded, first, from grants and low-interest loans (ADEC), if approved; next, from available capital reserves (i.e. depreciation funding, surplus from operations, interest earnings), and lastly from revenue bond issues.

5. *Reserve Levels*

Financial reserves are a necessary and appropriate part of prudent utility management practices. The CBJ maintains a separate reserve for each utility; however, it does not

maintain separate accounting of reserves for the operating and capital funds. All cash reserves are accounted for in the single Utility Fund. For the purposes of this rate study, FCS Group has provided separate accounting for an "Operating Fund" and "Capital Fund" within each utility in order to distinguish the different "sources" and "uses" of the operating and capital funds.

- Operating Reserve 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. An operating reserve target equal to 30 days of operating expense has been assumed in the calculation of revenue requirements for the water and wastewater utilities. Utility budgets should target an ending balance at least sufficient to meet the recommended reserve targets.
- Capital Reserve For this study, the analyses assume that as funds are generated to meet capital needs, separate accounts would be established to ensure that money generated for capital is not applied to operating costs¹. This segregation is particularly important when a utility collects excess funds in order to smooth rate impacts over a number of years in anticipation of major capital outlays. The capital fund holds grant, loan and bond proceeds; other capital-related revenues, such as depreciation funding; and surplus operating fund balances designated for capital construction and replacement projects. Cash from rates for depreciation funding and balances in excess of the minimum requirements in the operating reserve are assumed to be transferred to the capital reserve at year's end and become available (but not restricted) for capital use in subsequent years.

Based on our direct experience with hundreds of municipal utility clients, many utilities establish a minimum balance requirement in the capital reserve equal to 1 or 2 percent of utility fixed assets. This contingency provides for a source of funding for unanticipated capital repairs and/or construction cost overruns. To mitigate the rate impacts to customers, this study does not incorporate a minimum balance requirement during the study period. We recommend the CBJ review the capital balance as part of the budgeting process and build to a minimum balance over time.

6. *Revenue Bond Debt Service Coverage Ratio*

The CBJ's current minimum debt service coverage requirement on the outstanding 2002 water/wastewater revenue and refunding bond is 1.25 times annual debt service, using the

¹ Based on CBJ staff direction, deficiencies in the Operating Fund are met from the Capital Fund to avoid rate increases just to satisfy the minimum balance requirement. In other words, the models are designed to allow funds transfer in both direction: from operating fund to capital fund and from capital fund to operating fund, as necessary.

combined net revenues of the water and wastewater utilities. To ensure each utility is a self-supporting enterprise, this study assumes that each utility will independently meet this coverage requirement; meaning that the revenues of each utility should be sufficient to pay operating expenses (excluding depreciation), the annual debt service payment, plus an additional 25 percent of the annual revenue bond debt service. Failure to comply with coverage requirements can lower the CBJ's bond rating and jeopardize its ability to sell bonds in the future.

7. *Rate Levels*

Rates should be set at a level sufficient to meet annual utility obligations and maintain adequate reserves. 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 utilities.

It is important to note that should the CBJ choose to implement rates at a level that does not recover the full cost of utility operations on an annual basis, substantial care must be taken to ensure that all bond covenants are met. Failure to meet bond covenants, and/or financial stability guidelines established for ADEC loan eligibility, could jeopardize the CBJ's ability to secure these significant capital funding sources in the future. Although outside sources of funds (such as general fund support) might be options to help fund certain utility expenditures in the short-term, they cannot be used in the calculation of annual bond debt service coverage. Should revenue bonds ever go into technical default, the CBJ's ability to obtain bond insurance and/or best credit rating will be made difficult.

8. *Rate Equity and Rate Structures*

The water and wastewater rate analyses should allocate costs fairly between different customer classes. To the extent possible, rate structures should be designed by customer class based on the costs to serve each class. The objective of establishing these rates is so each customer group pays for its proportional share of the costs needed for operating and maintaining the utility.

For this study, cost of service-based rates were designed, as well as two alternative rate structures to incorporate practical considerations for mitigating significant impacts to certain customer classes resulting from the cost of service analysis.

9. *Frequency of Rate Adjustments*

Rate revenue adequacy should be evaluated regularly as part of the utilities' budgeting process to ensure that budgeted expenses and cash reserves, including the impacts of regulations, are reflected in current rates.

For this study, several scenarios were provided with varying frequency of rate adjustments. Based on CBJ staff direction, our initial rate study results were developed assuming a five-year rate adjustment cycle beginning in FY 2004. This assumption was subsequently revised to a three-year rate adjustment cycle for presentation to the Public Works & Facilities Committee. Based on the Committee's recommendations, this

assumption was again revised to a three-year cycle for the first three years, then transitioning to a two-year cycle to align with CBJ's biennial budget cycle. Following the presentation of study results to the Assembly, two additional scenarios were requested: (1) develop rates assuming phase-in to the first three-year rate increase annually over the next three years, and (2) develop rates assuming a two-year rate implementation cycle. These additional scenarios were developed assuming full recovery of each year's cost of service and provided under separate cover through a CBJ staff Memorandum.

B. Cost of Service Allocations and Rate Design

Cost of Service Allocations

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

The allocation of the capital portion of the revenue requirement was based on allocation of "plant-in-service". The allocations for the plant-in-service utilize documented engineering planning criteria from both the CBJ and industry standards.

The allocation of the operating portion of the revenue requirement was based on an allocation of expenses. In general, functional cost allocation was based on known or assumed cost "causation". For example, customer-billing costs are allocated to the "customer" category; salary costs are allocated to categories based on estimated time spent in each category (as provided by CBJ); wastewater treatment costs are allocated to strength components (BOD, TSS); administrative costs are allocated in proportion to all other costs, and so on.

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 that recognize the demands of each customer class. Using customer statistics from the CBJ's utility billing system, relevant planning criteria, and engineering data, the analysis allocates the costs to each customer class. As a result, costs will be recovered from customer classes based on their demand by functional category. If one customer class places a higher proportional average demand in one functional category, that customer class should pay a higher portion of that functional category's cost. Rate structures can be generated based on these results and can also be designed to further support policy objectives.

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, FY 2004 was selected as the test year with implementation of new rates in December 2003.

Customer Usage Statistics

A key component in the customer allocation of costs 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 FY 2002 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 limits², statistics are adjusted to account for the estimated discrepancy.

Further, customer usage statistics are evaluated to determine if current customer class designations represent an appropriate grouping of customers, or if revisions are warranted to better reflect customer groupings that exhibit similar usage patterns.

Rate Design

The rate design analysis focuses on constructing rates that meet both the revenue sufficiency and equity criteria. For this study, cost of service-based rates were designed for the recommended customer classes within each utility. In addition, two alternative rate structures were developed for each utility that incorporate practical considerations for mitigating significant impacts to certain customer classes resulting from the cost of service analysis.

² As a rule of thumb, 2% and less is an acceptable discrepancy. Total estimated water revenues were higher than the actual revenues by 0.44% for Water Utility and 2.27% for the Wastewater Utility. The FCS Group and CBJ staff expended substantial effort to reconcile utility billing statistics, and these results were reached after several iterations and corrections of raw customer data. Analysis of revenues by customer classes showed greater discrepancies, therefore, statistical adjustments were made at the customer class level.

III – WATER UTILITY FINDINGS & RESULTS

A. Revenue Requirements

1. Assumptions

In addition to the fiscal policies noted previously, water study results were based on incorporation of the following major assumptions:

- Study period is FY 2004 through FY 2012.
- Existing rate revenues reflect actual FY 2002 financial records. Based on direction from CBJ staff, the study conservatively assumes no growth in the customer base.
- FY 2003 ending water fund balance of \$2.6 million estimated by CBJ based on un-audited year end financial records. Consistent with the minimum balance requirement discussed in Section II, \$200,000 of the total fund balance was allocated to the operating fund, with the remaining allocated to the capital fund.
- Interest earnings on available fund balances assumed at CBJ's current average earnings rate of 4.0 percent.
- Operating & maintenance expense projected based on the FY 2004 budget, plus 3.0 percent annual inflation, and known additional costs and/or savings resulting from implementation of the capital improvement program.
- Existing debt service payment schedules provided by CBJ staff. Future years' debt service incorporates impacts of the proposed capital financing plan.
- Proposed ADEC loan financing terms include a 20-year repayment period and a 2.5% interest rate. Loan principal and interest payments are assumed to start in the year issued.
- Proposed revenue bond terms include a 20-year repayment period; interest rate of 5.5 percent; issuance cost of 2.0 percent, and a bond reserve requirement equal to one year's principal and interest payment.
- Annual depreciation expense based on FY 2002 actual financial records, increased for annual depreciation expense for planned capital projects over the study period.
- Annual capital improvement projects (CIP) for the study period were provided by CBJ staff. Project costs included an allowance for inflation. The CIP also included estimated additional O&M costs and/or savings as a result of the CIP.

2. *Capital Projects and Funding Sources*

The CBJ has projected approximately \$15.7 million in planned water capital improvement projects over the study period (detail project lists are included in the Technical Appendix). The highest annual spending is expected in FY 2004 at \$5.3 million. In subsequent years annual spending ranges from \$1.0 million to \$1.5 million. For FY 2004, funding sources were identified in the Capital Improvement Program, and include \$3.5 million in grants and outside sources (G.O. bonds not paid from utility rates), a \$1.0 million ADEC loan, and funding from the water enterprise fund (capital reserves). Future years assume funding from capital reserves, as available, with any projected shortfall assumed to be financed with Revenue Bonds. Given the level of planned capital projects and available capital reserves, it is anticipated that the utility will bond-finance an estimated \$1.9 million over the study period (roughly 12 percent of total the CIP). Nearly 60 percent of the CIP will be funded by capital reserves (close to \$9.3 million). These assumptions depend on the CBJ implementing the level of rate adjustments recommended in this report.

A summary of total planned capital expenditures and projected funding sources are shown in Exhibit 2.

Exhibit 2: Capital Projects and Projected Funding Sources
 (\$ in thousands)

WATER UTILITY	2004	2005	2006	2007	2008	2009	2010	2011	2012
CAPITAL PROJECTS	\$ 5,300	\$ 1,250	\$ 1,250	\$ 1,050	\$ 1,200	\$ 1,150	\$ 1,500	\$ 1,500	\$ 1,500
CAPITAL FINANCING									
Grants & Outside Sources	\$ 3,500	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
ADEC Loans	1,000	-	-	-	-	-	-	-	-
Enterprise Fund	800	1,250	1,250	726	852	751	1,229	1,149	1,252
Revenue Bonds	-	-	-	324	348	399	271	351	248
Total Funding Sources	\$ 5,300	\$ 1,250	\$ 1,250	\$ 1,050	\$ 1,200	\$ 1,150	\$ 1,500	\$ 1,500	\$ 1,500

3. *Results of the Revenue Requirements Analysis*

The water utility's revenue requirements are driven by the cash needs of the utility. The CBJ has not adjusted water rates in over 10 years, and revenues at current rate levels will not keep up with the increasing costs of operations, not to mention pay debt service, provide for system replacement, and maintain adequate reserves.

Total revenue requirements and fund balances are presented in Exhibit 3 and Exhibit 4 on the following pages. The revenue requirements results reflect the assumptions described herein, and indicate a FY 2004 rate increase of 19 percent³. Based on the assumed

³ This projection assumed rate adjustments would go into effect the beginning of FY 2004. Implementation at a later date will result in lower revenue generation. Since the projected increase is set to cover the Utility's needs for the next three years, a potential revenue shortfall is not expected to affect the Utility's FY 2004 financial performance. The Utility's financial performance should be evaluated and the model

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transition to a two-year rate implementation cycle, additional increases of 18 percent and 16 percent will be necessary in FY 2007 and FY 2009, respectively. An additional adjustment of 5 percent will be required in FY 2011.

The amount of revenue deficiency or surplus is determined on the basis of the two measures of revenue sufficiency described earlier. Should growth exceed the conservative estimate, or if expenses increase or decrease more than projected, the rate increases beyond FY 2004 will be impacted.

It is important to review the utility rates on an annual basis to validate the assumptions in the analysis before implementing the future projected rate increases. If conditions are better than anticipated, less of an increase may be required; conversely, if conditions worsen, a larger rate increase and/or increased debt financing may be required.

Exhibit 3: Revenue Requirements Analysis
 (\$ in thousands)

WATER UTILITY	2004	2005	2006	2007	2008	2009	2010	2011	2012
REVENUES									
Rate Revenues (w/ existing rates)	\$ 2,620	\$ 2,620	\$ 2,620	\$ 2,620	\$ 2,620	\$ 2,620	\$ 2,620	\$ 2,620	\$ 2,620
Operating Interest Income	8	7	8	8	8	8	9	9	9
Other Revenues	14	14	15	15	16	16	17	17	18
Total Revenues	\$ 2,642	\$ 2,641	\$ 2,642	\$ 2,643	\$ 2,643	\$ 2,644	\$ 2,645	\$ 2,646	\$ 2,646
EXPENSES									
Operations & Maintenance	\$ 2,247	\$ 2,305	\$ 2,374	\$ 2,446	\$ 2,519	\$ 2,595	\$ 2,673	\$ 2,753	\$ 2,836
Existing Debt Service	237	334	341	333	331	327	322	318	312
New Debt Service	64	64	64	94	127	164	189	222	245
Depreciation Funding	327	338	348	714	720	729	1,102	1,107	1,113
Direct Rate Funded CIP	-	-	-	-	-	-	-	-	-
Total Expenses	\$ 2,875	\$ 3,041	\$ 3,127	\$ 3,587	\$ 3,697	\$ 3,815	\$ 4,286	\$ 4,400	\$ 4,506
ANNUAL RATE ADJUSTMENT	19.0%	0.0%	0.0%	18.0%	0.0%	16.0%	0.0%	5.0%	0.0%
Rate Revenues After Rate Increase	\$ 3,117	\$ 3,117	\$ 3,117	\$ 3,679	\$ 3,679	\$ 4,267	\$ 4,267	\$ 4,480	\$ 4,480
Net Cash Flow After Rate Increase	264	98	12	115	5	476	6	106	1

updated on an annual basis to assess the impact of a shortfall in FY 2004 and resulting reduction in the expected surplus from operations.

Exhibit 4: Projected Fund Balances
 (\$ in thousands)

WATER UTILITY	2004	2005	2006	2007	2008	2009	2010	2011	2012
OPERATING FUND									
Beginning Balance	\$ 200	\$ 185	\$ 189	\$ 195	\$ 201	\$ 207	\$ 213	\$ 220	\$ 226
Net Cash Flow From Operations	264	98	12	115	5	476	6	106	1
Transfers to Capital Fund	(280)	(94)	(7)	(109)	1	(470)	0	(100)	6
Ending Balance	\$ 185	\$ 189	\$ 195	\$ 201	\$ 207	\$ 213	\$ 220	\$ 226	\$ 233
CAPITAL FUND									
Beginning Balance	\$ 2,426	\$ 2,320	\$ 1,577	\$ 726	\$ 852	\$ 751	\$ 1,229	\$ 1,149	\$ 1,252
Depreciation Funding	327	338	348	714	720	729	1,102	1,107	1,113
Grants & Outside Sources	3,500	-	-	-	-	-	-	-	-
Net Debt Proceeds	1,000	-	-	324	348	399	271	351	248
Transfers from Operating Fund	280	94	7	109	(1)	470	(0)	100	(6)
Interest Earnings	88	75	45	29	31	30	47	45	47
Capital Expenditures	(5,300)	(1,250)	(1,250)	(1,050)	(1,200)	(1,150)	(1,500)	(1,500)	(1,500)
Ending Balance	\$ 2,320	\$ 1,577	\$ 726	\$ 852	\$ 751	\$ 1,229	\$ 1,149	\$ 1,252	\$ 1,155
TOTAL UTILITY FUND BALANCE	\$ 2,505	\$ 1,766	\$ 921	\$ 1,053	\$ 958	\$ 1,442	\$ 1,368	\$ 1,478	\$ 1,388

(a) Operating fund ending balance represents the minimum target reserve of 30 days of O&M expense.

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. As noted earlier, cost of service allocations and rates are developed for FY 2004.

Water 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 use or maximum periodic demand placed on the system by customers, such as seasonal business operations.

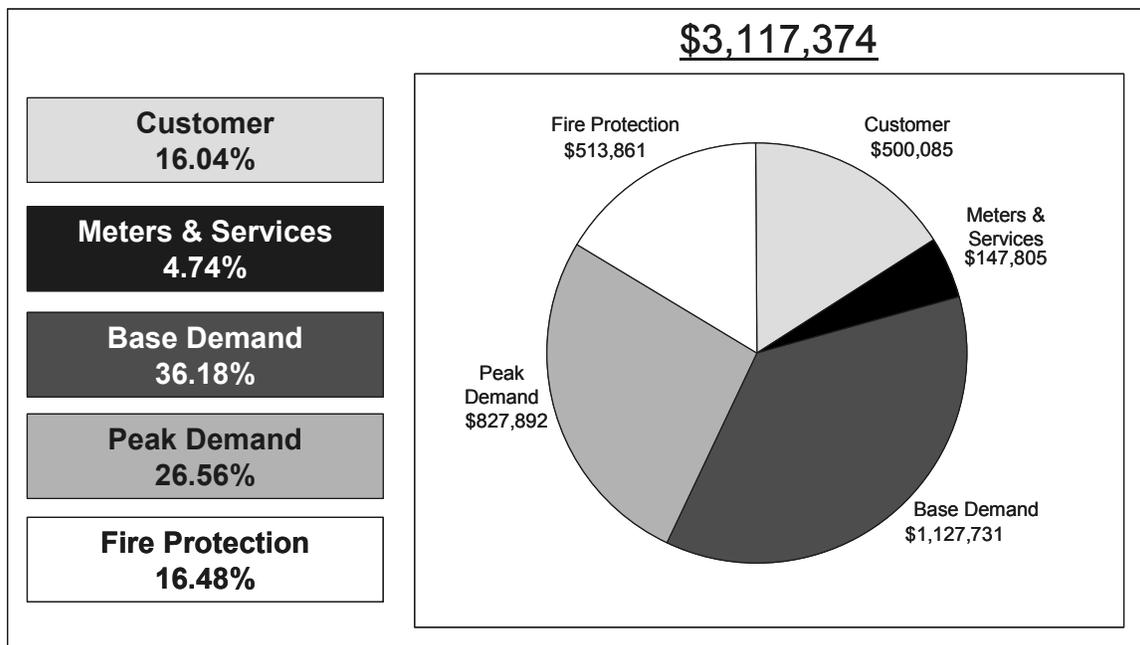
- **Fire Protection** costs are related to providing direct fire protection. This pertains to storage and pumping facilities, and mains. Fire flow requirements vary for each customer class and are established by industry standards and through the CBJ's water system planning process. Note: when the water system meets fire flow standards, all customers benefit by improved fire ratings and cost savings in lower fire insurance. This is true whether water is used for domestic purposes or not.

The following assumptions were applied in the functional allocations:

- Average day demand of 3.5 million gallons per day (mgd); maximum day demand of 7.0 mgd (as provided by CBJ staff).
- Source of supply and treatment costs allocated to base and peak demands using the ratio of peak to average day demand.
- Allocations to storage, pumping, and transmission & distribution (T&D) facilities based on FCS Group's professional judgment, with the concurrence of CBJ staff. The analyses assume that 10 percent of storage, pumping, and T&D facilities are allocated to the fire protection component. The remainder of the cost is assigned to base and peak demand using the ratio of peak to average day demand.
- Operating & maintenance costs are allocated based on a detailed review of line items, such as salaries, office and operating supplies, chemicals, etc., and assigned to functions based on assumed cost causation.

Results of the functional allocation of costs (total revenue requirements equal to \$3.1 million) are summarized in Exhibit 5.

Exhibit 5: Results of Functional Allocation of Costs



These functionally allocated costs are then allocated to the customer classes based on the relative demands placed on the water system by each class. The resulting allocation of costs to each class forms the basis for setting rates.

2. *Customer Class Designations & Customer Usage Statistics*

Water utility customer classes currently include flat rate residential (single family, duplex, trailer parks); metered residential (multiple family, bed & breakfast); flat commercial; metered commercial (bulk water sales, regular commercial); and seafood processors/exporters (Taku Smokeries, Alaskan Brewery).

The CBJ provided customer-billing data for the customer classes, including the number of customers, dwelling units, and monthly metered water usage data. A significant portion of the customer base is un-metered; mostly, residential (single family, duplex, trailer parks) and a limited number of commercial customers. Absent metered water data for all customer classes, the CBJ does not have the necessary information to accurately determine how costs should actually be recovered from each customer class so we estimated water usage data for the un-metered customers to complete the cost of service analysis and we developed rates as equitable as possible given the limited data. Estimating un-metered customer water consumption involved the following three step process:

- Monthly gross water production data was summarized.
- An estimate of water system loss, assumed at 12 percent (provided by CBJ staff), was subtracted from monthly gross water production records to estimate total customer consumption.
- Monthly metered water consumption for the metered customers (multiple family and commercial) was subtracted from the estimated total customer consumption to arrive at an estimate of water consumption for the un-metered classes. A “reasonableness” review was conducted of the resulting usage per unit for the residential class.

Based on discussions with CBJ staff and a review of customer class usage patterns, the following potential revisions to the current customer class designations were evaluated:

- Meter Duplex Customers & Reclassify as Metered Residential. CBJ staff suggested metering all duplex customers and charging a metered rate within a 3- to 5-year period. Since the purpose of this cost of service analysis was to design rates for FY 2004, it was decided to postpone this review until the next rate study update. For this study, duplex customers remain within the flat residential class.
- Reclassify Trailer Parks as Metered Residential. Since trailer parks are currently metered, CBJ suggested the analysis reclassify trailer parks as metered residential and charge them according to the metered residential rate schedule. The utility billing system does not currently maintain metered consumption data for the

trailer parks. Partial manual records were available but did not provide adequate information to accurately assess actual monthly usage. Assuming the same water usage per unit as estimated for the un-metered customer classes, the analysis indicated a potential loss in revenues resulting from this reclassification of approximately \$65,000 per year. The current flat rate of \$19 per month is applied to the total number of trailer park units, roughly 800 units. The metered rate structure includes a \$13 base rate that applies to the number of accounts, rather than units, roughly 9 trailer park accounts. The volume charge of \$1.75 per 1,000 gallons of water used over 4,000 gallons is not projected to make up for the shortfall in the base charge revenue. For this study, we recommended maintaining the existing customer class designation for trailer parks. The CBJ could re-evaluate this option concurrent with the evaluation of metering and reclassifying the duplex class. However, we would expect that the actual monthly water usage of these customers will be relatively consistent with the data used in this analysis and result in a loss in annual revenues if reclassified.

- Establish a Separate Customer Class for Bulk Water Sales. Water sales to cruise ships (bulk water sales) are currently subject to the metered commercial rate. Based on our review of monthly water usage patterns, cruise ships have a significantly different water demand pattern than regular commercial customers. First, cruise ships use large quantities of water over a limited period of time; namely, the peak summer season, and are peak day users. This places a significant demand on the system during the summer season. Secondly, cruise ships do not benefit from fire protection services, and should not be asked to pay for the costs associated with the provision that service. Lastly, service to cruise ships could be established as interruptible service, meaning that in case of an emergency, such as a fire in the waterfront area, this service could be curtailed if system capacity was not available to fight the fire. Based on these findings, this study established a separate customer class for “bulk water” sales and designed rates to reflect their significant peaking characteristics and no fire protection allocation.
- Reclassify Taku Smokeries as Metered Commercial. Based on our review of water demand patterns, Taku Smokeries, currently grouped with the brewery in the seafood processors/exporters class, has similar water usage patterns to the regular commercial customers. Furthermore, the smokery never reaches the customer class monthly water usage allowance of 500,000 gallons. Based on these findings, this study reclassified the smokery as metered commercial and charged the calculated metered commercial rate.
- Reclassify the Brewery as Large Commercial/Industrial. The brewery uses a fairly large quantity of water at a relatively constant rate of use, in comparison to typical commercial customers who generally use less water per account and put more of a peak demand on the system. Although the billing records for the brewery indicate a larger than expected peak use in excess of average annual use, the distinct usage pattern warrants a separate classification and recognition of

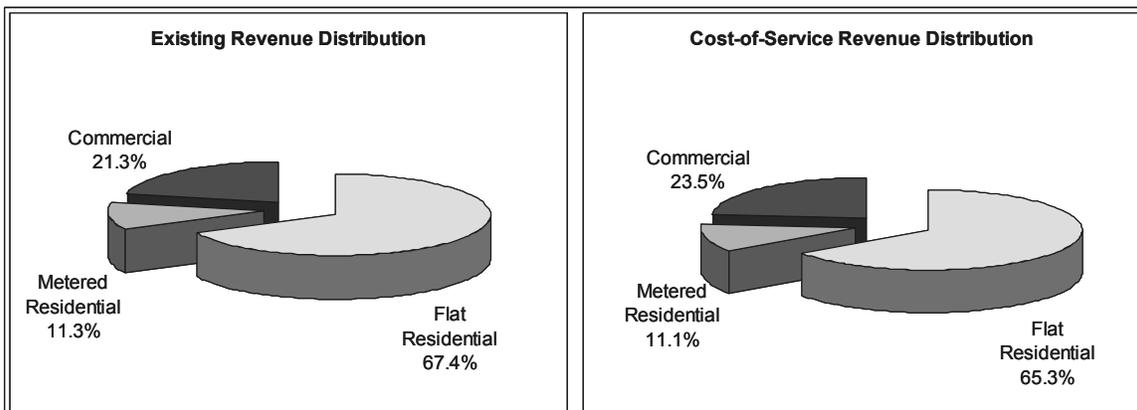
lower peaking requirements. For this study, we eliminated the seafood/export class and classified the brewery as large commercial/industrial. Although the brewery is the only customer currently in this class, future large commercial and/or industrial customers locating in Juneau would be grouped in this class.

Functional costs are allocated to the recommended customer classes as follows:

- Customer costs and meters & services costs are allocated to customer classes based on their proportional share of total system number of accounts⁴.
- Base demand costs are allocated to customer classes based on their proportional share of total system annual water usage.
- Peak demand costs are allocated to customer classes based on their proportional share of total system summer season water usage. The summer season is defined as the five months of May through September.
- Fire protection costs are allocated based on the weighted average number of accounts and fire flow requirements for each customer classes. The fire flow requirements are defined in the 1984 Juneau Area-wide Water Master Plan (Appendix B, Page 3) as follows:
 - Single family residential: 1,500 gallons per minute (gpm) for a 2 hour period.
 - All other classes: 3,500 gpm for a 3 hour period.
 - Bulk water sales (cruise ships) are not allocated any fire protection costs.

Exhibit 6 provides a comparison of the distribution of revenues under existing rates with the distribution of revenues indicated from the cost of service analysis.

Exhibit 6: Comparison of Revenue Distribution



⁴ Meters and services costs are typically associated with meter sizes and number of connections. The Utility billing system does not include information on meter sizes, therefore, the number of accounts is used for allocation purposes.

As can be seen from Exhibit 6, the cost of service revenue distribution is very similar to the existing revenue distribution. There is only a small shift from flat rate residential customers to commercial customers. Although there is no significant shift between residential and non-residential customers, there are significant shifts within the non-residential class as a whole (regular commercial, Taku Smokeries, bulk water, brewery). The resulting rates are discussed in the following section.

3. *Calculated Rates for FY 2004*

The current water rate structure includes three major rate categories: un-metered flat rate customers (residential and commercial), metered residential and commercial customers, and seafood processors/exporters. The un-metered customers pay a flat rate of \$19.00 per month per unit. Metered customers pay a base rate of \$13.00 per month per account, including a usage allowance of 4,000 gallons per month, plus a volume charge of \$1.75 per 1,000 gallons of water use over the allowance. The seafood processors/exporters class pays a monthly base charge of \$250.00, including an allowance of 500,000 gallons, plus a volume charge of \$0.50 per 1,000 gallons over the allowance.

For this study, FCS Group developed rates under three alternative rate structures: cost of service-based rates, across-the-board rates, and across the board by cost of service by class. These rate structures are briefly described below.

- Cost of Service Rates: The required rate revenue increase is recovered from each customer class in proportion to the calculated cost of service for each customer class's base rate component (customer-related costs) and volume rate component (usage/demand-related costs). For the un-metered customer classes there is only one rate component (flat rate). As noted earlier, the water utility's required overall revenue increase for FY 2004 is 19 percent. Under the cost of service rates, those customer classes currently paying less than their share of cost of service (regular commercial, cruise ship bulk water, large commercial/industrial) will experience a rate increase greater than 19 percent, while those customer classes currently paying more than their share of cost of service (residential) will experience a rate increase less than 19 percent. In total, the utility will generate the required additional 19 percent in revenues, and will eliminate the current customer class subsidies, which results in more equitable rates by customer class. Under this rate alternative, commercial customers currently paying less than cost of service will realize significant rate impacts.
- Across-the Board Rates: The required rate revenue increase is recovered equally from each customer class in proportion to the existing rate structure components (no shift between the current base rate and volume rate components). For example, the water utility increase of 19 percent is applied equally to the existing flat rate for the un-metered customer classes and to the existing fixed rate and volume rate for the metered customers (all existing rates are increased 19% across-the-board). In total, the utility will generate the required additional 19 percent in revenues, but will

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continue the current customer class subsidies. This alternative reduces the significant rate impacts to the commercial customers currently paying less than their cost of service, with relatively nominal impacts to the residential class.

- **Across-the-Board by Cost of Service by Class:** This alternative is similar to cost of service rates in that it recovers cost of service by class and eliminates the current customer class subsidies. It differs from cost of service rates in that it does not change the existing rate structure (no shift between the current base rate and volume rate components). The indicated increase for each customer class is applied to the existing base rate and volume rate components rather than the cost of service shift between rate components. This alternative only affects metered rates. Flat rates are the same under this alternative and cost of service rates. As with the other two alternatives, these rates will generate the required additional 19 percent in revenues. Under this alternative, rate impacts vary by individual customers within each class depending upon their level of usage.

A comparison of existing rates and the calculated rates under each rate structure alternative is shown in Exhibit 7, followed by a sample of water utility customer bill impacts under each rate structure in Exhibit 8.

Exhibit 7: Comparison of Alternative Water Rate Structures

Customer Class	Monthly Allowance (thousand gallons)	Existing Rates		Cost-of-Service Rates		Across-the-Board Rates		Across-the-Board by Cost-of-Service by Class	
		Base Charge [a]	Volume Charge [b]	Base Charge [a]	Volume Charge [b]	Base Charge [a]	Volume Charge [b]	Base Charge [a]	Volume Charge [b]
Flat Residential [c]	-	\$ 19.00	\$ -	\$ 22.10	\$ -	\$ 22.61	\$ -	\$ 22.10	\$ -
Metered Residential	4	13.00	1.75	15.18	2.06	15.47	2.08	15.27	2.06
Flat Commercial [c]	-	19.00	-	36.13	-	22.61	-	36.13	-
Metered Commercial	4	13.00	1.75	15.50	2.18	15.47	2.08	16.04	2.16
Large Commercial	500	250.00	0.50	617.45	2.12	297.50	0.60	868.77	1.74
Bulk Water [d]	-	13.00	1.75	7.70	2.32	15.47	2.08	17.10	2.30

[a] Per month.

[b] Per 1,000 gallons.

[c] Monthly base charge is per unit.

[d] Existing base charge includes 4 thousand gallons allowance.

Exhibit 8: Comparison of Sample Customer Bills

	Existing Rates	Cost-of-Service Rates		Across-the-Board Rates		Across-the-Board by Cost-of-Service by Class	
Flat Residential [a]	\$ 19.00	\$ 22.10	16.3%	\$ 22.61	19.0%	\$ 22.10	16.3%
Metered Residential							
10 thousand gallons	\$ 23.50	\$ 27.54	17.2%	\$ 27.95	19.0%	\$ 27.63	17.6%
50 thousand gallons	93.50	109.94	17.6%	111.15	19.0%	110.03	17.7%
100 thousand gallons	181.00	212.94	17.6%	215.15	19.0%	213.03	17.7%
Flat Commercial [a]	\$ 19.00	\$ 36.13	90.2%	\$ 22.61	19.0%	\$ 36.13	90.2%
Metered Commercial							
10 thousand gallons	\$ 23.50	\$ 28.58	21.6%	\$ 27.97	19.0%	\$ 29.00	23.4%
50 thousand gallons	93.50	115.78	23.8%	111.27	19.0%	115.40	23.4%
150 thousand gallons	268.50	333.78	24.3%	319.52	19.0%	331.40	23.4%
Taku Smokeries							
75 thousand gallons	\$ 250.00	\$ 170.28	-31.9%	\$ 297.50	19.0%	\$ 169.40	-32.2%
125 thousand gallons	250.00	279.28	11.7%	297.50	19.0%	277.40	11.0%
200 thousand gallons	250.00	442.78	77.1%	297.50	19.0%	439.40	75.8%
Alaskan Brewery							
800 thousand gallons	\$ 400.00	\$ 1,253.45	213.4%	\$ 476.00	19.0%	\$ 1,390.77	247.7%
1,200 thousand gallons	600.00	2,101.45	250.2%	714.00	19.0%	2,086.77	247.8%
1,600 thousand gallons	800.00	2,949.45	268.7%	952.00	19.0%	2,782.77	247.8%
Bulk Water							
1,000 thousand gallons	\$ 1,756.00	\$ 2,327.70	32.6%	\$ 2,089.64	19.0%	\$ 2,317.10	32.0%
2,000 thousand gallons	3,506.00	4,647.70	32.6%	4,172.14	19.0%	4,617.10	31.7%
3,000 thousand gallons	5,256.00	6,967.70	32.6%	6,254.64	19.0%	6,917.10	31.6%

[a] Per unit.

C. Study Recommendations

Interim study findings were reviewed with CBJ staff in a series of meetings and presented to the Public Works & Facilities Committee for input and policy direction. Committee recommendations were incorporated into the final study results and presented to the CBJ Assembly. Based on the analyses and discussions at the above meetings, FCS Group provides the following study recommendations:

- Implement the proposed fiscal policies, as presented herein, and implement a schedule of rates sufficient to recover the indicated 19 percent water rate revenue shortfall.
- Implement the “across-the board” rate structure alternative for this rate implementation cycle. This will mitigate the significant customer bill impacts for certain customers resulting from the cost of service analysis. Under this alternative, no changes to the existing customer class designations need occur.
- Transition to cost of service rates over time, and implement customer class revisions, recommended herein, at that time.

- Maintain and regularly review billing system data to ensure that the billing system is accurately applying the rate structures to the customer classes and generating the anticipated level of revenue.
- Update the model analyses on a regular basis (annual or biennial), to ensure that the most recent financial, operational, and customer data is used.

IV –WASTEWATER UTILITY FINDINGS & RESULTS

A. Revenue Requirements

1. *Assumptions*

In addition to the fiscal policies noted previously, wastewater study results were based on incorporation of the following major assumptions:

- Study period is FY 2004 through FY 2012.
- Existing rate revenues reflect actual FY 2002 financial records. Based on direction from CBJ staff, the study conservatively assumes no growth in the customer base.
- FY 2003 ending wastewater fund balance of \$2.0 million estimated by CBJ based on un-audited year end financial records. Consistent with the minimum balance requirement discussed in Section II, \$500,000 of the total fund balance was allocated to the operating fund, with the remaining allocated to the capital fund.
- Interest earnings on available fund balances assumed at CBJ's current average earnings rate of 4.0 percent.
- Operating & maintenance expense projected based on the FY 2004 budget, plus 3.0 percent annual inflation, and known additional costs and/or savings resulting from implementation of the capital improvement program.
- Existing debt service payment schedules provided by CBJ staff. Future years' debt service incorporates impacts of the proposed capital financing plan.
- Proposed ADEC loan financing terms include a 20-year repayment period and a 2.5% interest rate. Loan principal and interest payments are assumed to start in the year issued.
- Proposed revenue bond terms include a 20-year repayment period; interest rate of 5.5 percent; issuance cost of 2.0 percent, and a bond reserve requirement equal to one year's principal and interest payment.
- Annual depreciation expense based on FY 2002 actual financial records, increased for annual depreciation expense for planned capital projects over the study period.
- Annual capital improvement projects (CIP) for the study period were provided by CBJ staff. Project costs included an allowance for inflation. The CIP also included estimated additional O&M costs and/or savings as a result of the CIP.

2. *Capital Projects and Funding Sources*

The CBJ has projected approximately \$22.3 million in planned wastewater capital improvement projects over the study period (detail project lists are included in the Technical Appendix). Average annual spending varies between \$2.0 million and \$4 million. For FY 2004, funding sources were identified in the Capital Improvement Program, and include approximately \$2.0 million in grants and outside sources (G.O. bonds not paid from utility rates, general sales tax revenue, and street tax revenues), a \$0.5 million ADEC loan, and funding from the wastewater enterprise fund (capital reserves). Future years assume funding from capital reserves, as available, with any shortfall financed with Revenue Bonds. Given the level of planned capital projects and available capital reserves, it is anticipated that the utility will bond-finance an estimated \$11.9 million over the study period (roughly 54 percent of total the CIP). Approximately 35 percent of the CIP will be funded by capital reserves (close to \$7.9 million).

A summary of total planned capital expenditures and projected funding sources are shown in Exhibit 9.

Exhibit 9: Capital Projects and Projected Funding Sources
 (\$ in thousands)

WASTEWATER UTILITY	2004	2005	2006	2007	2008	2009	2010	2011	2012
CAPITAL PROJECTS	\$ 2,585	\$ 2,400	\$ 1,910	\$ 1,925	\$ 3,840	\$ 2,885	\$ 2,365	\$ 2,005	\$ 2,370
CAPITAL FINANCING									
Grants & Outside Sources	\$ 1,985	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
ADEC Loans	525	-	-	-	-	-	-	-	-
Enterprise Fund	75	2,180	593	280	1,045	558	1,143	844	1,154
Revenue Bonds	-	220	1,317	1,645	2,795	2,327	1,222	1,161	1,216
Total Funding Sources	\$ 2,585	\$ 2,400	\$ 1,910	\$ 1,925	\$ 3,840	\$ 2,885	\$ 2,365	\$ 2,005	\$ 2,370

3. *Results of the Revenue Requirements Analysis*

The wastewater utility's revenue requirements are driven by the cash needs of the utility. Operating revenues are significantly less than cash operating and maintenance expenses. In other words, the utility has been relying on its cash reserves to pay for operations. To fund its capital improvement program, the utility is heavily reliant on outside revenue sources, such as property tax and street utility revenues. In short, the utility's financial position is not sustainable at the current level of rates.

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The revenue requirements and fund balances are presented in Exhibit 9 and Exhibit 10. The revenue requirements results reflect the assumptions described herein, and indicate a FY 2004 rate increase of 39 percent⁵. Based on the assumed transition to a two-year rate implementation cycle, two additional 13 percent increases will be necessary in FY 2007 and FY 2009. An additional 7 percent adjustment will be required in FY 2011.

Similar to water, the amount of wastewater revenue deficiency or surplus is determined on the basis of the two measures of revenue sufficiency described in Section II. Should growth exceed the conservative estimate, or if expenses increase or decrease more than projected, the rate increases beyond FY 2004 will be impacted. It is important to review the utility rates on an annual basis to validate the assumptions in the analysis before implementing the future projected rate increases. If conditions are better than anticipated, less of an increase may be required; conversely, if conditions worsen, a larger rate increase and/or increased debt financing may be required.

Exhibit 10: Revenue Requirement Analysis
 (\$ in thousands)

WASTEWATER UTILITY	2004	2005	2006	2007	2008	2009	2010	2011	2012
REVENUES									
Rate Revenues (w/ existing rates)	\$ 5,136	\$ 5,136	\$ 5,136	\$ 5,136	\$ 5,136	\$ 5,136	\$ 5,136	\$ 5,136	\$ 5,136
Operating Interest Income	20	19	19	20	20	21	22	23	23
Other Revenues	13	13	14	14	15	15	16	16	16
Total Revenues	\$ 5,169	\$ 5,169	\$ 5,169	\$ 5,170	\$ 5,171	\$ 5,173	\$ 5,174	\$ 5,175	\$ 5,176
EXPENSES									
Operations & Maintenance	\$ 5,797	\$ 5,790	\$ 5,940	\$ 6,140	\$ 6,388	\$ 6,660	\$ 6,876	\$ 7,101	\$ 7,314
Existing Debt Service	663	784	780	584	577	540	532	521	513
New Debt Service	34	54	177	331	592	809	923	1,031	1,145
Depreciation Funding	257	241	244	486	527	534	803	805	803
Direct Rate Funded CIP	-	-	-	-	-	-	-	-	-
Total Expenses	\$ 6,752	\$ 6,869	\$ 7,141	\$ 7,541	\$ 8,083	\$ 8,543	\$ 9,134	\$ 9,459	\$ 9,775
ANNUAL RATE ADJUSTMENT	39.0%	0.0%	0.0%	13.0%	0.0%	13.0%	0.0%	7.0%	0.0%
Rate Revenues After Rate Increase	\$ 7,140	\$ 7,140	\$ 7,140	\$ 8,068	\$ 8,068	\$ 9,117	\$ 9,117	\$ 9,755	\$ 9,755
Net Cash Flow After Rate Increase	421	303	31	561	20	610	20	335	19

⁵ This projection assumed rate adjustments would go into effect the beginning of FY 2004. Implementation at a later date will result in a lower revenue generation. Since the projected increase is set to cover the Utility's need for the next three years, a potential revenue shortfall is not expected to affect the Utility's FY 2004 financial performance. The Utility's financial performance should be evaluated and the model updated on an annual basis to assess the impact of a shortfall in FY 2004 and resulting reduction in the expected surplus from operations.

Exhibit 11: Projected Fund Balances
 (\$ in thousands)

WASTEWATER UTILITY	2004	2005	2006	2007	2008	2009	2010	2011	2012
OPERATING FUND									
Beginning Balance	\$ 500	\$ 476	\$ 476	\$ 488	\$ 505	\$ 525	\$ 547	\$ 565	\$ 584
Net Cash Flow From Operations	421	303	31	561	20	610	20	335	19
Transfers to Capital Fund	(444)	(304)	(19)	(544)	1	(588)	(3)	(316)	(2)
Ending Balance	\$ 476	\$ 476	\$ 488	\$ 505	\$ 525	\$ 547	\$ 565	\$ 584	\$ 601
CAPITAL FUND									
Beginning Balance	\$ 1,490	\$ 2,180	\$ 593	\$ 280	\$ 1,045	\$ 558	\$ 1,143	\$ 844	\$ 1,154
Depreciation Funding	257	241	244	486	527	534	803	805	803
Grants & Outside Sources	1,985	-	-	-	-	-	-	-	-
Net Debt Proceeds	525	220	1,317	1,645	2,795	2,327	1,222	1,161	1,216
Transfers from Operating Fund	444	304	19	544	(1)	588	3	316	2
Interest Earnings	63	48	17	15	31	22	39	33	39
Capital Expenditures	(2,585)	(2,400)	(1,910)	(1,925)	(3,840)	(2,885)	(2,365)	(2,005)	(2,370)
Ending Balance	\$ 2,180	\$ 593	\$ 280	\$ 1,045	\$ 558	\$ 1,143	\$ 844	\$ 1,154	\$ 844
TOTAL UTILITY FUND BALANCE	\$ 2,656	\$ 1,069	\$ 768	\$ 1,550	\$ 1,083	\$ 1,691	\$ 1,409	\$ 1,738	\$ 1,446

(a) Operating fund ending balance represents the minimum target reserve of 30 days of O&M expense.

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. As noted earlier, cost of service allocations and rates are developed for FY 2004.

Wastewater utility plant and annual expenses were allocated to the following four functional cost categories:

- **Customer** costs are associated with providing service to customers regardless of the level of usage, such as billing and office support. These costs are typically associated with the number of accounts or customers.
- **Wastewater Flow** costs are associated with conveying and treating customer contributed wastewater flow (volume).
- **Infiltration and Inflow (I&I)** costs are associated with conveying and treating I&I of groundwater and storm water runoff into the sewers.
- **Strength** costs are associated with treating effluent loading of BOD and TSS.

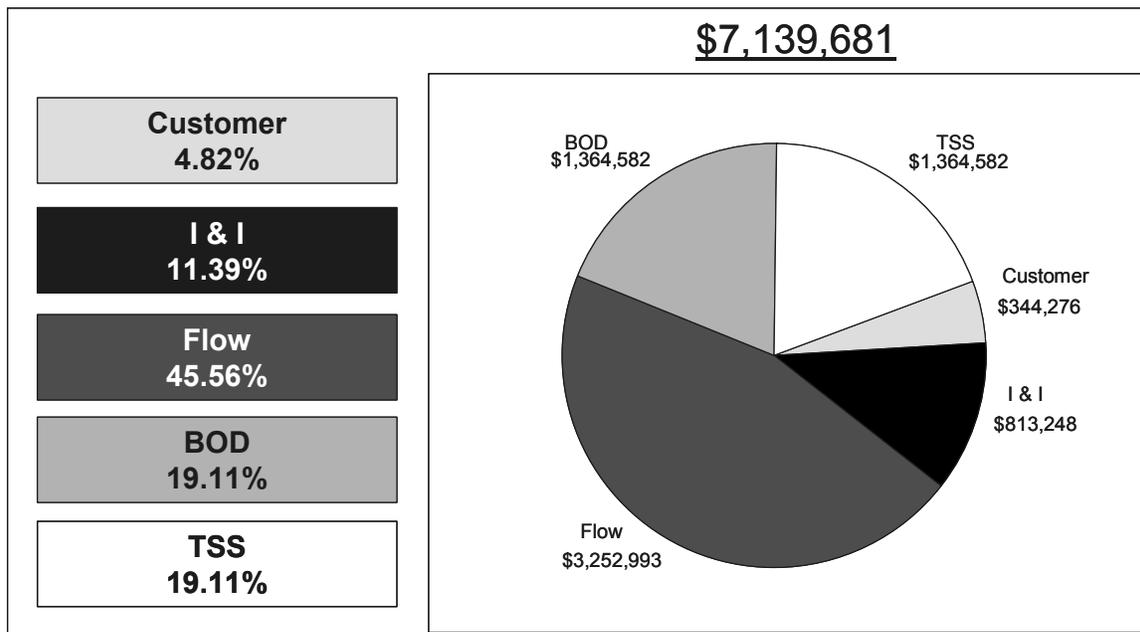
Since the Wastewater Utility does not have a Comprehensive Plan, allocations of plant facilities to functional categories were based on FCS Group's professional judgment and industry standards, with the concurrence of CBJ staff. The analyses assume that 80 percent of collection and pumping facilities are allocated to contributed wastewater flow, with the remaining 20 percent allocated to I&I. Approximately 60 percent of treatment

costs are allocated to the strength categories (30% to BOD, 30% to TSS), with the remaining 40 percent allocated to contributed flow (32%) and I&I (8%).

Operating & maintenance costs are allocated based on a detailed review of line items, such as salaries, office and operating supplies, chemicals, etc., and assigned to functions based on assumed cost causation.

Results of the functional allocation of costs (total revenue requirements equal to \$7.2 million) are summarized in Exhibit 12.

Exhibit 12: Wastewater Utility - Functional Allocation of Costs



These functionally allocated costs are then allocated to the customer classes based on the relative demands placed on the wastewater system by each class. The resulting allocation of costs to each class forms the basis for setting rates.

2. *Customer Class Designations & Customer Usage Statistics*

Wastewater utility customer classes currently include flat rate residential (single family, duplex, trailer parks); metered residential (multi-family, bed & breakfasts); flat commercial; metered commercial (all non-residential customers); and septic haulers.

The CBJ provided customer billing data for the customer classes, including the number of customers, dwelling units, and monthly metered water usage. As with water, a significant portion of the wastewater customer base is un-metered. Monthly water consumption for wastewater customers was estimated on a per unit basis using the estimations generated for the water cost of service analysis.

Contributed wastewater flow for each customer class was estimated based on total water consumption applied to an assumed return factor (percent of water usage entering the wastewater system). Based on our experience and industry standards, we assumed return factors for single family and multi-family customers at 75 percent and 85 percent, respectively. It is assumed that all water used by commercial customers enters the wastewater system; therefore, a 100 percent return factor was applied. One exception to the commercial class is the Alaskan Brewery. Based on information provided by CBJ staff, approximately 20 percent of the brewery's water use is consumed in the process of its product, with the remaining 80 percent entering the wastewater system.

Based on discussions with CBJ staff and a review of customer class usage patterns, the following potential revisions to the current customer class designations were evaluated:

- Meter Duplex Customers & Reclassify as Metered Residential. CBJ staff suggested metering all duplex customers and charging a metered rate within a 3- to 5-year period. Since the purpose of this cost of service analysis was to design rates for FY 2004, it was decided to postpone this review until the next rate study update. For this study, duplex customers remain within the flat residential class.
- Reclassify Trailer Parks as Metered Residential. Since trailer parks are currently metered, CBJ suggested the analysis reclassify trailer parks as metered residential and charge them according to the metered residential rate schedule. The utility billing system does not currently maintain metered consumption data for the trailer parks. Partial manual records were available but did not provide adequate information to accurately assess actual monthly usage. Assuming the same water usage per unit as estimated for the un-metered customer classes, and applying the assumed wastewater return factor, the analysis indicated a potential loss in revenues resulting from this reclassification of approximately \$19,000 per year. The current flat rate of \$39.50 per month is applied to the total number of trailer park units, roughly 768 units. The metered rate structure includes a \$39.50 base rate that applies to the number of accounts, rather than units, roughly 7 trailer park accounts. The volume charge of \$5.25 per 1,000 gallons of water used over 4,000 gallons is not projected to make up for the shortfall in the base charge revenue. For this study, we recommend maintaining the existing customer class designation for trailer parks. The CBJ could re-evaluate this option concurrent with the evaluation of metering and reclassifying the duplex class.
- Split Metered Commercial Class into Separate Strength Classes. Due to the higher cost imposed on the utility for treating high strength customer loading, CBJ staff requested evaluation of a rate structure that recognized these higher costs and allocates them to those customers creating the additional costs. Our initial analysis included separation of the commercial class into three strength categories: domestic, medium, and high. Examples of commercial customers assigned to domestic strength include professional office buildings, retail establishment, schools, churches, etc. Medium strength customers included hotels/motels without restaurants, smaller scale restaurants, and hospitals. High strength customers

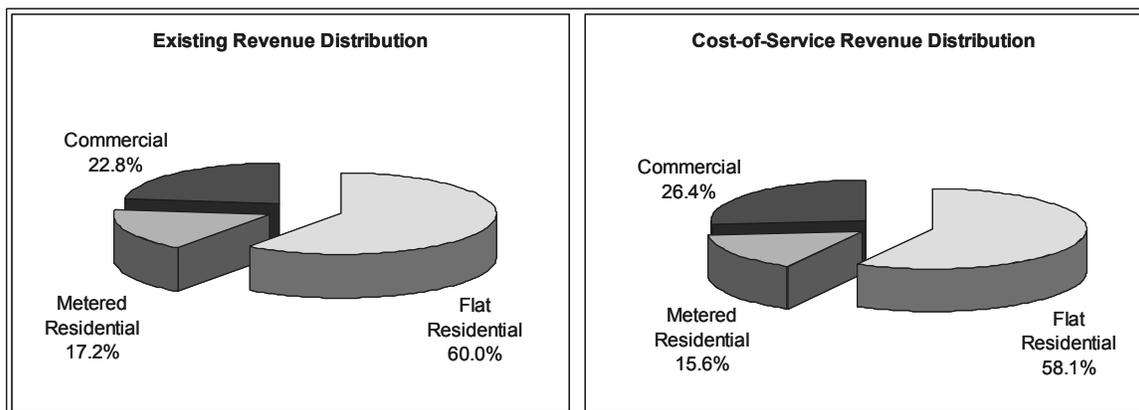
included grocery stores, mortuaries, commercial laundries, and the Alaskan Brewery. Results of this analysis indicated rate increases nearing 200 percent for the high strength class. To mitigate these impacts, we revised our analysis to include two strength categories: domestic and high. Under this analysis, the customers previously classified as medium strength were included in with the high strength customers. Based on these findings, modified cost of service rates were developed for the study.

Functional costs are allocated to the recommended customer classes as follows:

- Customer costs are allocated to the customer classes based on their proportional share of total system number of accounts.
- Wastewater Flow and I&I costs are allocated to the customer classes based on their proportional share of total system contributed wastewater flow. No I&I costs are allocated to the septic haulers class.
- Strength costs are allocated based on the assumed strength factors for each class. Strength assignments are based on FCS Group professional judgment and industry standards, with the concurrence of CBJ staff. The analyses assume residential customers and commercial domestic strength customers contribute 250 milligrams per liter (mg/l) of BOD and TSS. High strength commercial customers contribute 450 mg/l. This equates to a factor of 1.8 times the domestic strength. For the septic haulers class, a relative strength factor of 10 times the domestic strength is used.

Exhibit 13 provides a comparison of the distribution of revenues under existing rates with the distribution of revenues indicated from the cost of service analysis.

Exhibit 13: Wastewater Utility – Comparison of Revenue Distributions



As can be seen from the Exhibit 13, the cost of service revenue distribution is very similar to the existing revenue distribution. There is a small shift from residential customers to commercial commercials. Although there is no significant shift between

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residential and non-residential customers, there are significant shifts within the commercial class, taking into consideration the strength designations.

3. *Calculated Rates for FY2004*

The current wastewater rate structure is comprised of three major categories: un-metered flat rate customers (residential and commercial), metered residential and commercial customers, and septic haulers. The un-metered customers pay a flat rate of \$39.50 per month per unit. Metered customers pay a base rate of \$39.50 per account per month, including a water usage allowance of 4,000 gallons per month, plus a volume charge of \$5.25 per 1,000 gallons of water use over the allowance. The septic hauler class pays \$15.00 per 1,000 gallons.

Similar to the water utility, FCS Group developed wastewater rates under three alternative rate structures: cost of service-based rates, across-the-board rates, and across the board by cost of service by class⁶.

A comparison of existing rates and the calculated rates under each rate structure alternative is shown in Exhibit 14, followed by a sample of wastewater utility customer bill impacts under each rate structure in Exhibit 15.

Exhibit 14: Comparison of Alternative Wastewater Rate Structures

Customer Class	Monthly Allowance (thousand gallons)	Existing Rates		Cost-of-Service Rates [d]		Across-the-Board Rates		Across-the-Board by Cost-of-Service by Class [d]	
		Base Charge [a]	Volume Charge [b]	Base Charge [a]	Volume Charge [b]	Base Charge [a]	Volume Charge [b]	Base Charge [a]	Volume Charge [b]
Flat Residential [c]	-	\$ 39.50	\$ -	\$ 53.07	\$ -	\$ 54.91	\$ -	\$ 53.07	\$ -
Metered Residential	4	39.50	5.25	33.10	7.08	54.91	7.30	49.62	6.59
Flat Commercial [c]	-	39.50	-	68.55	-	54.91	-	68.55	-
Metered Commercial - Domestic	4	39.50	5.25	36.66	7.97	54.91	7.30	53.22	7.07
Metered Commercial - High	4	39.50	5.25	48.35	10.89	54.91	7.30	79.94	10.62
Septic Haulers	-	-	15.00	-	36.13	-	20.85	-	36.13

[a] Per month.

[b] Per 1,000 gallons.

[c] Monthly base charge is per unit.

[d] Based on alternative of splitting commercial into two classes; domestic and high.

⁶ For a description of these rate structures, refer to the Section III, Calculated Rates for FY 2004.

Exhibit 15: Comparison of Sample Customer Bills

	Existing Rates	Cost-of-Service Rates [c]		Across-the-Board Rates		Across-the-Board by Cost-of-Service by Class [c]	
Flat Residential [a]	\$ 39.50	\$ 53.07	34.4%	\$ 54.91	39.0%	\$ 53.07	34.4%
Metered Residential							
10 thousand gallons	\$ 71.00	\$ 75.58	6.5%	\$ 98.71	39.0%	\$ 89.16	25.6%
50 thousand gallons	281.00	358.78	27.7%	390.71	39.0%	352.76	25.5%
100 thousand gallons	543.50	712.78	31.1%	755.71	39.0%	682.26	25.5%
Flat Commercial [a]	\$ 39.50	\$ 68.55	73.5%	\$ 54.91	39.0%	\$ 68.55	73.5%
Metered Commercial - Domestic							
10 thousand gallons	\$ 71.00	\$ 84.48	19.0%	\$ 98.71	39.0%	\$ 95.64	34.7%
50 thousand gallons	281.00	403.28	43.5%	390.71	39.0%	378.44	34.7%
150 thousand gallons	806.00	1,200.28	48.9%	1,120.71	39.0%	1,085.44	34.7%
Metered Commercial - High							
10 thousand gallons	\$ 71.00	\$ 113.69	60.1%	\$ 98.71	39.0%	\$ 143.66	102.3%
50 thousand gallons	281.00	549.29	95.5%	390.71	39.0%	568.46	102.3%
150 thousand gallons	806.00	1,638.29	103.3%	1,120.71	39.0%	1,630.46	102.3%
Alaskan Brewery [b]							
800 thousand gallons	\$ 3,378.50	\$ 6,974.39	106.4%	\$ 4,697.71	39.0%	\$ 6,834.26	102.3%
1,200 thousand gallons	5,058.50	10,459.19	106.8%	7,033.71	39.0%	10,232.66	102.3%
1,600 thousand gallons	6,738.50	13,943.99	106.9%	9,369.71	39.0%	13,631.06	102.3%

[a] Per unit.

[b] Bills reflect 20% flow adjustment.

[c] Based on alternative of splitting commercial into two classes; domestic and high.

C. Study Recommendations

Interim study findings were reviewed with CBJ staff in a series of meetings and presented to the Public Works & Facilities Committee for input and policy direction. Committee recommendations were incorporated into the final study results and presented to the CBJ Assembly. Based on the analyses and discussions at the above meetings, FCS Group provides the following study recommendations:

- Implement the proposed fiscal policies, as presented herein, and implement a schedule of rates sufficient to recover the indicated 39 percent wastewater rate revenue shortfall.
- Implement the “across-the board” rate structure alternative for this rate implementation cycle. This will mitigate the significant customer bill impacts for certain customers resulting from the cost of service analysis. Under this alternative, no changes to the existing customer class designations need occur.
- Transition to cost of service rates over time, and consider implementing strength-based commercial classifications at that time. If strength-based classifications are adopted, we recommend implementing an appeal process for customers disagreeing with their strength assignment.

- Maintain and regularly review billing system data to ensure that the billing system is accurately applying the rate structures to the customer classes and generating the anticipated level of revenue.
- Update the model analyses on a regular basis (annual or biennial), to ensure that the most recent financial, operational, and customer data is used.