Commonwealth of Kentucky
Before the Public Service Commission

In the Matter of:

THE APPLICATION OF KENTUCKY-AMERICAN WATER COMPANY FOR A CERTIFICATE OF CONVENIENCE AND NECESSITY AUTHORIZING THE CONSTRUCTION OF KENTUCKY RIVER STATION II, ASSOCIATED FACILITIES AND TRANSMISSION MAIN	))))))	Case No. 2007-00134

ATTORNEY GENERAL'S PRE-FILED REBUTTAL TESTIMONY WITH NOTICE OF FILING OF ADDITIONAL MATERIAL

The Attorney General submits his Pre-filed Rebuttal Testimony, and he also provides, with this filing, additional material.

Respectfully submitted,

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Notice of Filing and Certificate of Service

Counsel gives notice that the original and eight photocopies were filed by hand delivery to Beth O'Donnell, Executive Director, Public Service Commission, 211 Sower Boulevard, Frankfort, Kentucky 40601 on this 13th day of November, 2007.

Counsel also certifies service of this document by mailing a true and correct photocopy of the same, first class postage prepaid, to the following (all on this 13th day of November 2007). (Counsel is also transmitting an electronic version of this document (in PDF format) to the parties of record.)

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Assistant Attorney General

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

IN THE MATTER OF:	:	
THE APPLICATION OF KENTUCKY-AMERICAN	:	
WATER COMPANY FOR A CERTIFICATE OF	:	
CONVENIENCE AND NECESSITY AUTHORIZING	:	CASE NO. 2007-00134
THE CONSTRUCTION OF KENTUCKY RIVER	:	
STATION II, ASSOCIATED FACILITIES AND	:	
TRANSMISSION MAIN	:	

Rebuttal Testimony of
Scott J. Rubin

on Behalf of
the Office of the Attorney General

November 13, 2007

Q. Please state your name.

A. My name is Scott J. Rubin. I previously filed direct testimony in this case.

Q. What is the purpose of your rebuttal testimony?

A. I have been asked by the Office of the Attorney General (AG) to review and respond to the testimony and exhibits filed by Louisville Water Company (LWC). I was also asked to determine whether that information changes the findings and conclusions presented in my direct testimony concerning whether Kentucky-American Water Company (KAWC) should receive a certificate of public convenience for the Pool 3 Project (and, if so, under what conditions).

Q. What information did you review?

A. My review focused on the report and financial models prepared for LWC by R.W. Beck. I am not an engineer and I have not attempted to review the accuracy of the underlying engineering assumptions (such as the size and cost of pipe or the operating and maintenance costs). I am, however, very familiar with financial modeling, particularly for the water industry, so I focused on the accuracy of the financial assumptions and the workings of R.W. Beck's model.

I reviewed many aspects of R.W. Beck's model, but in order to simplify my presentation, my testimony will concentrate on just five areas that either correct errors or have an important impact on the results of the model. Those areas are:

- For the Pool 3 option, KAWC's depreciation rates should be used instead of the generic assumptions made in the model.
- The R.W. Beck model assumes that 20% of the cost of the Pool 3 Project would be financed with municipal bonds. As I understand it, public

entities have not made a firm commitment to the Pool 3 Project, and there is no certainty that such public financing will be used. Therefore, I have assumed that KAWC must finance 100% of the Pool 3 Project.

- The model incorrectly calculates KAWC's pre-tax cost of capital. The model applies the gross revenue conversion factor to KAWC's entire return (debt and equity). It should be applied only to the equity component of the capital structure.

- The model makes the unrealistic assumption that the LWC option would be financed entirely with public debt and that there would not be any debt service coverage requirement on such debt.

- The model's results are very sensitive to the amount of water that is needed. Making a relatively small change to the amount of water has a dramatic effect on the results.

Q. Please discuss your change in depreciation rates.

A. The R.W. Beck model uses generic depreciation rates of 2.5% (a 40-year life) for treatment plant and 1.33% (a 75-year life) for the water mains. KAWC already has prepared a more detailed estimate of its depreciation rates for the Pool 3 Project, and those depreciation rates should be used. These result in composite depreciation rates for the treatment plant and pipeline of 3.06% and 1.18%, respectively. I make no change in the 2.5% rate used for the projected UV treatment installation.

Q. What is the impact of using KAWC's depreciation rates instead of the generic rates?

A. The effect is to increase depreciation expense for the Pool 3 Project by about $400,000 per year compared to the amount shown in the R.W. Beck model. This also flows through the model to increase the depreciation reserve which decreases the net plant balance after the first year. The overall effect, on a net present value basis, is to increase

the cost of the Pool 3 Project by a present value of approximately $200,000 (less than a 0.1% increase in the present value of the project).[1]

Q. What does the R.W. Beck model assume about the way in which the Pool 3 Project would be financed?

A. The model assumes that KAWC would finance 80% of the initial project cost, with the other 20% being funded by municipal bonds. Presumably this is meant to represent participation by publicly owned water suppliers in the project.

Q. Is that an accurate assumption?

A. I continue to hope that public water suppliers in Central Kentucky will agree to participate in a new water project. As I understand it, however, there is no certainty that this will occur. I have not seen any information to show that any public water supplier has made a commitment to finance a portion of the project, let alone the 20% assumed in the R.W. Beck model.

Q. What do you recommend as a modeling assumption?

A. I recommend that the Pool 3 Project should be modeled to assume that KAWC must finance 100% of the project cost.

Q. What effect does this have on the cost of the Pool 3 Project?

A. Assuming that KAWC will finance the entire project increases the cost of the Pool 3 Project by approximately $1.5 million per year in the first year, compared to R.W. Beck's

[1] All comparisons between models use R.W. Beck's spreadsheet model named: Base Case 5 MGD Incr 3% Annually(10-19-07).xls. This file, as provided, represents the scenario with an initial 6 million gallons per day (MGD) utilization of water, with that usage increasing by 0.5 MGD per year through 2030.

model. The impact declines over time as the plant value depreciates. On a net present value basis, this change increases the cost of the Pool 3 Project by approximately $13.9 million (an increase of approximately 4.4% in the present value).

Q. Does the R.W. Beck model correctly calculate the financial effect of capital investments made by KAWC?

A. No, it does not. The R.W. Beck model incorrectly assumes that KAWC's entire return would be taxable. In fact, only the equity portion of the return is taxable, because interest expense is deductible for tax purposes.

Specifically, the model assumed an after-tax cost of capital of 7.75% (which is approximately correct for KAWC's weighted cost of capital). But it then grossed up that entire return for taxes (multiplying by the gross revenue conversion factor of approximately 1.65).

The proper calculation would gross up only the equity portion of the return, resulting in a pre-tax cost of capital of 10.83%, as KAWC showed in its response to AG data request 1-9.

Q. What effect does correcting KAWC's cost of capital have on the results of the R.W. Beck model?

A. Making only this change in the model reduces the cost of the Pool 3 Project by approximately $2.6 million in the first year, with the effect declining in subsequent years as the value of the plant depreciates. On a net present value basis, this change decreases the cost of the Pool 3 Project by approximately $27.1 million (a decrease of approximately 8.7% in the present value).

Q. What is the combined effect of these three changes in the cost of the Pool 3 Project: correcting the depreciation rates, assuming no public financing, and correcting KAWC's cost of capital?

A. The combined effect of these three changes is to decrease the net present value of the Pool 3 Project by approximately $20.1 million to $293.1 million. This is approximately 6.4% lower than the $313.2 million present value shown in the R.W. Beck analysis.

I consider this $293.1 million present value to be the base case for the Pool 3 Project. This is a reasonable estimate of the present value of the costs that KAWC would incur between 2010 and 2030, under the assumption that KAWC needs 6 MGD in 2010 and an additional 0.5 MGD of water each year thereafter.[2]

Q. Do you have any concerns with R.W. Beck's calculation of the costs of the LWC pipeline project?

A. Yes, I do. In my opinion, R.W. Beck greatly understates the capital-related cost of the LWC pipeline project. Specifically, R.W. Beck assumes that the pipeline will be financed with 100% debt by some unknown public entity, even though most if not all of the benefit of the project will go to KAWC.

Q. LWC is a public entity, so isn't that a reasonable assumption to make?

A. No, it is not a reasonable assumption. First, LWC has said that it is not intending to finance the construction of the pipeline. Second, while I am not a tax expert, I am aware

[2] I take no position on the reasonableness of the 4.7% discount rate assumed in the R.W. Beck analysis. Selecting the proper discount rate for such an analysis is a complex matter that is frequently debated by economists and analysts. In this case, where most of the capital costs are incurred in the first few years, it is my opinion that the discount rate would not affect the decision to be made. While a different discount rate would affect the magnitude of the present value, it would have similar effects on both the Pool 3 and LWC pipeline options.

that there are limits on the use of government debt to assist a private corporation. Public financing to assist a private company is known as "private activity" financing, and each state is limited by federal law to the amount of such private activity financing it can undertake in each year. For example, Kentucky's limit for 2007 was approximately $357.5 million.[3] Moreover, while private activity bonds are generally exempt from federal income taxes, they can be subject to inclusion in income under the Alternative Minimum Tax (AMT) provisions of the federal income tax law. This reduces their attractiveness to higher-income investors and results in such bonds typically carrying a higher interest rate than traditional government bonds.

There is usually significant competition for private activity bond financing. For example, industrial development projects, pollution control projects, commercial development (or re-development), certain types of housing development, and other projects often compete for financing within a state's bond cap. It is very much unclear if the pipeline project – whose capital cost would represent approximately 30% of Kentucky's 2007 available private activity bond financing – would be selected for any government financing, let alone the 100% financing assumed in the R.W. Beck model.

Q. If the LWC pipeline project has to be financed by KAWC instead of through government bonds, what would that mean for the cost of the pipeline?

[3] Commonwealth of Kentucky, Office of Financial Management, Finance and Administration Cabinet, "Calendar Year 2007 Bond Cap Allocation," Dec. 27, 2006, accessed Nov. 6, 2007, < http://finance.ky.gov/NR/rdonlyres/5BB529AF-D9E8-428B-A416-81173D6A1000/0/CapNotification1.pdf >.

A. If KAWC has to finance the pipeline, the net present value of the pipeline option would be approximately $255.1 million. This is an increase of approximately 15% in R.W. Beck's projected present value of $221.6 million.

Q. If public financing is available, has R.W. Beck properly modeled the revenue requirement associated with that financing?

A. No, even if public financing is available for the pipeline, R.W. Beck's model does not correctly show the impact of such financing on required revenues. R.W. Beck assumes that the only revenue to be collected would be O&M expenses, debt service on the bonds, and depreciation. This ignores the nearly universal requirement for the bond issuer to receive revenues in excess of debt service and expenses, known as a debt service coverage requirement. According to a recent report from Fitch Ratings, the typical AA-rated municipal water utility would have debt service coverage of at least 1.5 times and more likely closer to 2.0 times.[4] Another recent Fitch report compiled data for more than 150 public water and sewer bond issuers and found that the median A-rated government utility had a minimum debt service coverage of 1.5 times, with higher-rated utilities having minimum coverage ratios of at least 1.9 times or 2.2 times (AA-rated and AAA-rated, respectively).[5]

In my opinion, therefore, proper modeling of the revenue requirement impact of public bond financing must include revenue sufficient to achieve a debt service coverage

[4] Fitch Ratings, "Water and Sewer Revenue Bond Rating Guidelines" (Apr. 16, 2007).

[5] Fitch Ratings, "2007 Median Ratios for Water and Sewer Revenue Bonds — Retail Systems" (Jan. 16, 2007).

of at least 1.5 times. The debt service coverage is calculated as (revenues - expenses + depreciation) divided by debt service.

Q. What is the effect of including a 1.5 times debt service coverage requirement in the public financing of the LWC pipeline option?

A. The effect of including this minimum coverage requirement is to increase the net present value of the revenue requirements to $261.9 million. This represents an increase of $40.3 million (18%) in the net present value of the LWC pipeline option.

Q. According to your calculations, KAWC financing of the pipeline has a lower net present value than public financing if there is a 1.5 times debt service coverage requirement. Why is that the case?

A. Financing through KAWC's revenue requirement results in a smaller net present value because when the project is included in a utility's rate base it is paid for over its entire useful life, rather than through a 20-year bond. In other words, if there is public financing the entire cost of a pipeline with an estimated life of 75 years or more, would be paid for by customers during just the first 20 years of the pipeline's life. In contrast, financing through a utility's rate base pays for the facility over its entire useful life.

Q. What do you consider the base case for the LWC pipeline project?

A. I consider the base case for the LWC pipeline to be the KAWC-financed option, which has a net present value of $255.1 million.

Q. According to your revisions of the R.W. Beck analysis, the Pool 3 Project is more expensive than the LWC pipeline project, is that accurate?

A. Yes, that is accurate as far as it goes. Under base case conditions – 6 MGD of water the first year, increasing by 0.5 MGD per year – the Pool 3 Project would be approximately 15% more expensive on a net present value basis than the LWC pipeline option.

Q. What happens if KAWC needs more water than the base case assumption?

A. If KAWC needs more water than the base case assumption, then the Pool 3 Project becomes the more cost effective option. If the initial demand is 6 MGD, but the demand increases by 1.0 MGD per year (with a maximum of 25 MGD), then the net present values of the two options are essentially identical: $302.9 million for Pool 3 and $302.3 million for the LWC pipeline.

If demand increases even faster, then the Pool 3 option becomes more cost-effective than the LWC pipeline. For example, if the initial demand is 6 MGD, but it increases by 1.25 MGD per year (again with a maximum demand of 25 MGD), then the Pool 3 option has a net present value of $306.5 million, compared to the LWC pipeline's present value of $319.2 million.

Q. What do these figures illustrate?

A. These figures show how sensitive the LWC option is to the amount of water purchased. Most of the costs of the Pool 3 Project are fixed – the pipeline, treatment plant, and employees do not change with the amount of water produced. In contrast, a much greater percentage of the costs of the LWC pipeline option vary with the amount of water purchased by KAWC. Thus, in the example where annual demand increases by 1 MGD instead of 0.5 MGD, Pool 3 costs increase by a present value of approximately $9.8

million. In contrast, the costs to KAWC of the LWC pipeline and water purchase increase by a present value of approximately $47.2 million under the same scenario.

Q. Does this analysis affect your initial conclusion that the Pool 3 Project is in the public interest, as long as KAWC guarantees the construction cost and agrees to certain other conditions?

A. No, this analysis does not change my initial conclusion. This analysis shows that the costs of the project proposed by KAWC are reasonably close to the only other option identified (the LWC pipeline and water purchase). Depending on the assumptions about the amount of water that KAWC's customers will need over the next 20 years, the Pool 3 Project is either slightly more expensive than, about the same cost as, or slightly less expensive than the LWC option. All of those costs appear to be within the margin of error and contingencies built into the cost estimates. For example, the construction costs include a 20% contingency, and the reasonable cost estimates for both options fall within that 20% range.

Q. In forming your opinion, did you consider R.W. Beck's analysis of what it terms "Phase II" – the construction of an additional project to serve demands from 2030 through 2050?

A. No, I did not consider the so-called Phase II analysis. I consider that analysis to be highly speculative and designed to deal with conditions that are well beyond the reasonable planning horizon for KAWC. We simply have no idea what type of changes in population, demand patterns, local climate conditions, water treatment technology, or other factors might occur between now and 2030. We also do not know the impact on the Kentucky River of improvements planned by the Kentucky River Authority. It is

possible that by 2030, pool 9 or pool 3 or both will be able to support substantially greater water withdrawals than they support today. Thus, while I reviewed the so-called Phase II analysis, I did not give it any weight in reaching my conclusions.

Q. What do you recommend?

A. I recommend that the Commission approve KAWC's application for a certificate of public convenience, with the conditions I recommended in my direct testimony. With those conditions, it is my opinion that the proposed Pool 3 Project is a reasonable project to undertake to meet the present and future water needs of KAWC's customers.

Q. Does this conclude your rebuttal testimony?

A. Yes, it does.

Commonwealth of Kentucky
Before the Public Service Commission

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THE APPLICATION OF KENTUCKY-AMERICAN	:	
WATER COMPANY FOR A CERTIFICATE OF	:	
CONVENIENCE AND NECESSITY AUTHORIZING	:	CASE NO. 2007-00134
THE CONSTRUCTION OF KENTUCKY RIVER	:	
STATION II, ASSOCIATED FACILITIES AND	:	
TRANSMISSION MAIN	:	

AFFIDAVIT OF SCOTT J. RUBIN

Commonwealth of Pennsylvania)
)
County of Columbia)

Scott J. Rubin, being first duly sworn, states the following: The prepared Pre-filed Rebuttal Testimony constitutes the rebuttal testimony of Affiant in the above-styled case. Affiant states that he would give the answers set forth in the Pre-filed Rebuttal Testimony if asked the questions propounded therein. Affiant further states that, to the best of his belief and knowledge, his statements made are true and correct. Further, Affiant saith not.

Scott J. Rubin

SUBSCRIBED AND SWORN to before me this 13th day of November, 2007.

NOTARY PUBLIC

My Commission Expires: Nov 5, 08

COMMONWEALTH OF PENNSYLVANIA
Notarial Seal
Erica L. Dellegrotto, Notary Public
Town of Bloomsburg, Columbia County
My Commission Expires Nov. 3, 2008
Member, Pennsylvania Association of Notaries

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Ernie Fletcher
Governor

John R. Farris
Secretary

F. Thomas Howard
Executive Director

Calendar Year ("CY") 2007 Bond Cap Allocation

Wednesday, December 27, 2006

Pursuant to KRS 103.286 and 200 KAR 15:010, the Kentucky Private Activity Bond Allocation Committee ("the Committee") will be accepting **LOCAL ISSUER POOL** applications for CY2007 volume cap from Monday, January 15, 2007 through Friday February 16, 2007. **STATE ISSUER POOL** applications for CY2007 volume cap will be due Wednesday, January 10, 2007. The Notice of Intent application to apply for CY2007 volume cap and the above-referenced statutes and corresponding administrative regulations may be found at:

http://finance.ky.gov/ourcabinet/caboff/OOC/ofm/debt/kpabac.htm

Any application received after 4:30 p.m. EST on the stated deadlines above will **NOT** be considered for review. Please be advised that the responsibility of meeting the deadline lies with the applicant and not with a courier service. Faxed applications will not be accepted.

The total available volume cap for CY2007 is expected to be approximately $357,516,290.00. Twenty percent (20%), or $71,503,258.00, will be available to the Local Issuer Pool. Applicants in the Local Issuer Pool are permitted a maximum of twenty-five percent (25%) of the total amount available in the Local Issuer Pool. Eighty percent (80%), or $286,013,032.00, will be available to the State Issuer Pool. These figures are based on the December 2006 U.S. Census Bureau population estimate for Kentucky (4,206,074) multiplied by the per capita ($85). If you plan to apply for the maximum amount available within the applicable pool, you can reflect this by stating "Maximum Available" in the "Allocation Requested" section of the Notice of Intent form.

All applications received by the deadline will be reviewed. Local Issuer Pool applications will be ranked based upon the criteria established in 200 KAR 15:010. These rankings will be submitted to the Committee for its use in making allocations among projects. State Issuer Pool applications will be reviewed and presented to the Committee for allocation.

Please contact Rob Ramsey, Jr. at (502) 564-2924 should you have any questions regarding the allocation process for CY2007.

Kentucky
UNBRIDLED SPIRIT

Revenue
Special Report

2007 Median Ratios for Water and Sewer Revenue Bonds — Retail Systems

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Related Research

- "Water and Sewer Revenue Bond Rating Guidelines," dated April 13, 2004

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■ Summary

The 2007 medians continue Fitch Ratings' attempt at providing market participants with a clear understanding of certain ratios utilized in its review of water and sewer revenue bond credits, building on Fitch's initial water and sewer medians published in 2004. With this latest release, Fitch made several modifications to the medians, in terms of both the presentation and ratios reflected, to identify key median ratios utilized in the rating process and to better relay certain trends observed from rating individual credits since compiling the initial medians. A brief discussion outlining these trends, both national and regional, is presented in this report based on the median results. A more detailed analysis with particular challenges facing the industry will be published in a sector outlook report, which is expected to be released in the first part of 2007.

■ Key Findings

National Perspective

For several years, regulatory agencies, trade organizations, and industry professionals have predicted massive water and sewer capital needs to rehabilitate the nation's aging infrastructure and meet the rapid growth pressures in certain parts of the country. The 2004 medians provided some indication of the impending construction to address these concerns; with the 2007 medians, this cycle appears to be in full swing.

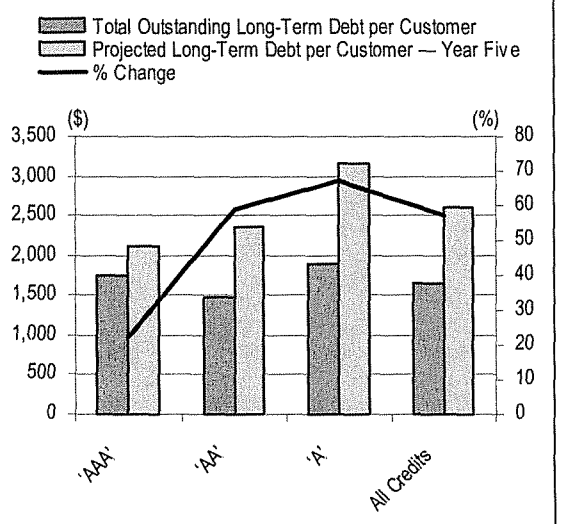
Overall, it is difficult to gauge the total amount of planned spending across the industry in the near term. However, the 2007 medians revealed two major points on the sector nationally as a result of expected capital demands:

- Debt levels are on the rise.
- Debt service coverage will decline from existing margins.

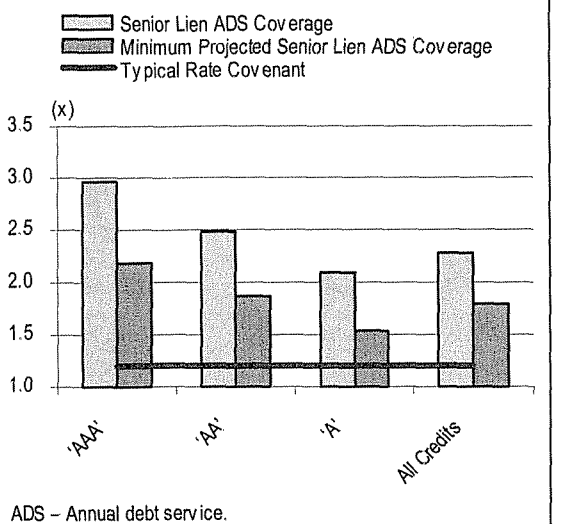
For retail systems, debt levels are currently moderate, with a median outstanding debt per customer of roughly $1,660. Illustrating the near-term borrowing demands within the sector, the median debt burden is expected to rise 57% over the five-year period from the date the credits were rated, adding nearly $1,000 in debt per customer within that time frame.

To put these individual system debt plans into perspective relative to the potential size of near-term retail capital construction nationwide, the issuers included in the 2007 medians reported anticipated outlays in excess of $39 billion over a five-year period, with these providers servicing an estimated 15%–20% of the entire U.S. population. While this correlation gives some indication of the projected expenditures for retail systems, it falls short of a true representation of industry needs,

2007 Key Debt Medians



2007 Key Coverage Medians



ADS – Annual debt service.

as wholesale capital costs, which are difficult to gauge nationwide, are excluded.

By rating category, it appears 'AAA' rated credits are ahead of the curve in terms of meeting future capital needs, having absorbed a sizable amount of construction costs in the intervening years since the 2004 medians. This has not only resulted in the lowest average annual capital improvement plan (CIP) costs per customer among the rating categories for 2007, but has also meant rising debt levels since the 2004 medians, when customer debt levels for 'AAA' category credits were the lowest overall. While 'AAA' systems will still see increases in debt levels over the next few years, the future burden to customers is expected ultimately to be lower than that of other credits, particularly the 'A' rating category issuers, which generally are experiencing either rapid growth or above-average deferred maintenance needs.

As debt levels rise nationwide, rate hikes are expected to follow. However, median annual projected rate increases are moderate across the industry (4.1% for water and 5.0% for sewer) and are not expected to make up the entire difference in debt carrying charges, especially as operating costs are likely to continue to rise as well. As a result, coverage margins are forecast to deteriorate somewhat, although the national median is still expected to comfortably exceed typical rate covenants.

Currently, financial ratios within the sector remain strong. Median annual debt service (ADS) coverage levels for the industry well exceed the typical utility rate covenant of 1.20 times (x) to 1.25x ADS. In addition, the level of senior lien debt service (18% of operating revenues overall), while not necessarily representative of aggregate system debt, is comparable to that of single-purpose local governments like school districts.

Likewise, operating margins are relatively high and liquidity remains sizable, providing ample flexibility to meet the increasing capital expenditures. While it is too soon to tell, the 'AAA' rated credits are likely to see the largest decline in reserves, as the median non-debt funded portion for the rating category equals 64% of their CIPs, the highest level among the rating categories. However, because the median cash position of these credits is well over two times that of 'AA' and 'A' rating category credits, the impact should not materially affect the 'AAA' category liquidity ratios relative to other credits.

Much of the sector's financial performance is no doubt due to the covenants and policies in place. Of the issuers included in the 2007 medians, a sizable number reported either bond covenants or internal policies to fund one or more of the following types of reserves:

- Rehabilitation and replacement funds.
- Operating funds.
- Rate stabilization funds.

In addition, many issuers reported target ADS coverage levels used in budgeting or forecasting

States Included in Medians by Region

Far West	Midwest	Northeast	Southeast	Southwest
Alaska	Illinois	Connecticut	Florida	Arizona
California	Kentucky	District of Columbia	Georgia	Colorado
Hawaii	Michigan	Delaware	Mississippi	New Mexico
Nevada	Missouri	Maryland	North Carolina	Texas
Oregon	Ohio	Massachusetts	South Carolina	
Utah		New Hampshire	Tennessee	
Washington		New Jersey	Virginia	
		New York		
		Pennsylvania		

operations that exceeded required rate covenants. These standards serve to enhance basic legal provisions (i.e. rate covenant, additional bonds test, and debt service reserve), and Fitch continues to believe that systems utilizing such practices are likely to be better positioned to handle the changing landscape of infrastructure construction.

Regional Perspective

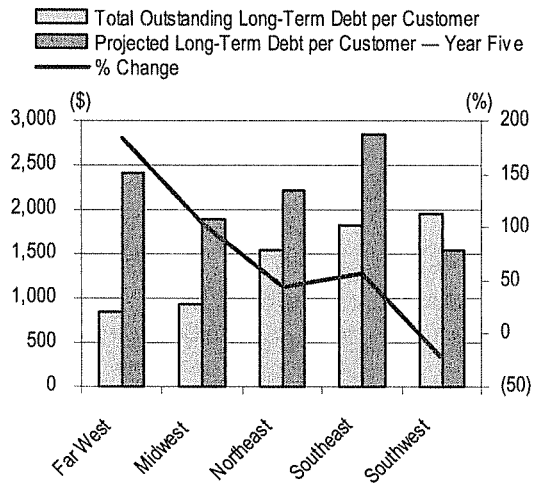
Rising overall debt levels and declining ADS coverage are also expected at the regional level, but within the regions, the medians revealed some nuances, as follows:

- Southwest region experienced the lowest debt levels at year five.
- Far West and Southeast regions experienced the highest debt levels at year five.
- Far West, Southeast, and Southwest regions had the highest expected ADS coverage.

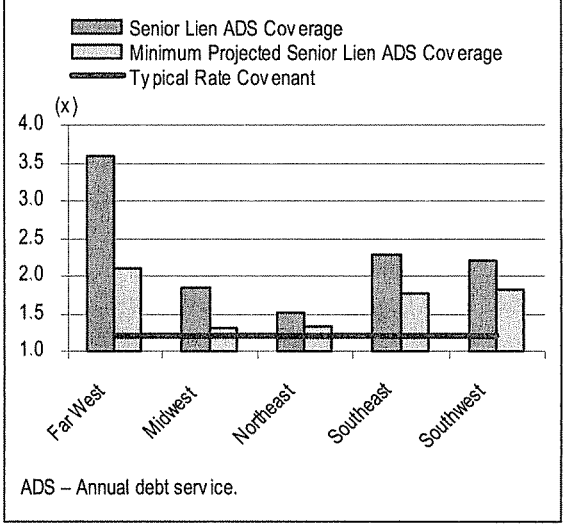
For Southwest credits, elevated customer debt levels are not unusual. Unexpectedly though, while the region currently has the highest existing median debt per customer, it is the only region projecting a net decrease in median customer debt levels by year five. Moreover, this decrease will push its median customer debt levels to the lowest in the nation.

At first glance, this seems contrary to predicted effects in the Far West and Southeast, where growth and water supplies are equally at issue and debt levels are on the rise. Indeed, the majority of southwestern issuers are projecting rising customer debt levels. Yet unlike all the other regions, the Southwest includes several issuers that are at or above the current customer debt median while projecting a decline in overall customer debt. Ultimately, these credits will be pushed to or below the five-year median, causing a reduction in future customer debt from existing levels. For the other regions, credits reporting projected declines in customer debt levels

Regional Comparisons — 2007 Key Debt Medians for All Credits



Regional Comparisons — 2007 Key Coverage Medians for All Credits



ADS – Annual debt service.

generally remained in the same position relative to the regional existing and future debt medians, either above or below them.

While this may appear to artificially lower projected southwestern customer debt levels, there are some positive underlying quantitative factors. The southwestern median 10- and 20-year debt amortization is 48% and 98%, respectively, substantially higher than all other regions except the Southeast, where medians are slightly lower. Also, a much greater percentage of southwestern credits report projected declines in customer debt levels by year five than any other region and the nation as a whole. For the Southwest, 39% of issuers report declining customer debt levels by year five, compared with the national rate of 27% and an even lower rate for the regions.

As expected, the fast-growth regions of the Southeast and Far West are forecast to have the highest and second highest customer debt burdens, respectively, by the end of the five-year projection period, even without including the debt burdens of large wholesale providers within those regions. However, these two regions, along with the Southwest, are expected to continue to have the highest debt service coverage ratios in the nation.

While the anticipated coverage levels in the Sun Belt areas will be aided by one-time connection charges resulting from growth, existing ADS coverage without such fees remains very strong, continuing to exceed coverage levels for the Midwest and Northeast, where ADS coverage levels of 1.9x and 1.5x, respectively, are below the national median and expected to be only marginally above typical rate covenants in the future at 1.3x. For the Far West, existing ADS coverage excluding connection charges currently is 2.6x, while coverage is 2.0x for the Southeast and Southwest each.

One potential reason for this fundamental difference among regions likely is that Sun Belt issuers overall have been forced to be more proactive in their approach to utility management, given historical growth pressures and/or scarcity of water supplies. While this has led to a more detailed approach to planning in general, it also has led to a more educated populace in relation to water issues overall, paving the way for passage of historical rate hikes or increases in connection fees for system development.

■ Methodology and Data

Overview

Fitch first published its water and sewer medians in 2004, with the goal of providing issuers, analysts, and investors with a quantitative framework of key ratios used in its "10Cs" water and sewer rating process. To assist in the process, the 2004 medians *(see Appendix B, page 11)* were grouped according to their respective area within the 10Cs criteria review process. The 2007 medians *(see Appendix C, page 12)* follow this practice to allow for comparisons with the 2004 medians.

Data Set

As with the 2004 medians, the 2007 medians strictly cover wholly retail or predominantly retail systems for which Fitch has taken rating actions on senior lien debt. The data include most water and sewer revenue bond credits rated from September 2003 to February 2006, although certain credits have been excluded for various reasons, as outlined below *(for a complete list of issuers included in the 2007 medians, see Appendix A, pages 8–10)*. The 2007 pool of credits numbers 153, compared with a total of 51 surveyed in 2004. In cases where the same issuer sold debt multiple times, only the data from the most recent rating were incorporated into the database.

In the 2007 medians, combined water and sewer utilities accounted for 92 credits (60% of the total); individual water systems, 38 (25%); and individual sewer systems, 23 (15%). In addition, of the systems surveyed, certain credits carried a variety of additional pledges, including eight with stormwater revenue, four with ad valorem taxes, three with electric revenue, three with gas revenue, and one with recycled water revenue.

Excluded from the 2007 data set are 22 wholesale and 20 retail credits, eight of which are 'BBB' rating category issuers. The 'BBB' rating category credits were disregarded, as Fitch views these issuers as outliers with extenuating circumstances, and the related data tend to produce dramatic shifts in various ratios. Other retail credits were excluded predominantly due to four main reasons, each of which had the potential to skew results:

- Debt rated was issued on a junior or subordinate lien basis.
- The majority of system revenues were derived from electric revenues.

Key Ratios Utilized in the "10Cs" Rating Process — 2007 Medians

	Rating Category			
	'AAA'	'AA'	'A'	All Credits
Capital Demands and Debt Policies				
Total Outstanding Long-Term Debt per Customer ($)	1,738	1,471	1,892	1,656
Projected Debt per Customer – Year Five ($)	2,112	2,346	3,164	2,595
Coverage and Financial Performance/Cash and Balance Sheet Considerations				
Senior Lien ADS Coverage (x)	3.0	2.5	2.1	2.3
Minimum Projected Senior Lien ADS Coverage (x)	2.2	1.9	1.5	1.8
Operating Margin (%)	40	31	37	34
Days Cash on Hand	623	266	244	266
Days of Working Capital	334	283	271	279

ADS – Annual debt service.

- Issuers were affected by the extraordinary events of Hurricanes Katrina and/or Rita.
- Debt rated was below investment grade.

The 2007 database has been expanded to include 105 data fields, compared with 71 utilized in 2004. This expansion will enable Fitch to better monitor certain trends in the industry and develop new medians for publication from historical data at a future date, if necessary.

New Information for 2007

For 2007, Fitch highlighted certain key ratios and added eight new medians. Identifying the key ratios was deemed to give the market a better understanding of the priority in weighting certain ratios in the rating process, while the new medians were added to enhance understanding of the other ratios considered during a credit review and to provide more trend information in general. Specifically, the medians added in 2007 relate to debt burden, financial performance, and treatment capacity.

Medians vs. Rating Process

While the medians serve as a useful tool in comparing overall credit quality, Fitch maintains that the data are a complement to the rating process, rather than a substitute. Therefore, when evaluating the medians in relation to the rating process, certain distinctions between the two should be reiterated:

- Medians essentially provide a point-in-time snapshot, whereas the rating process focuses more on trends.
- Not all the areas, ratios, or factors covered in Fitch's 10Cs rating process are reflected in the medians — specifically, management, policies, and legal provisions.
- Medians present a composite of the range of credits within each rating category and do not delineate offsetting strengths or weaknesses at the individual credit level that may affect a rating.

However, Fitch believes that the medians serve as a useful tool for market participants by allowing for broad assessments and comparisons of credit quality.

Water and Sewer Median Definitions

Median	Definition	Significance
Population	Estimated population of the service area	Provides an overview on the scope of operations within the service area; not material in the rating process (presented for informative purposes only)
2000 Census MHI ($)	MHI for the primary municipal entity served by the utility as reported by the U.S. Census Bureau	Indicates the overall wealth of average residential customers and their ability to pay for services
Total Water Customers	Most recent water customer account total, if applicable	Provides an overview on the scope of operations within the service area; not material in the rating process (presented for informative purposes only)
Water Customer Annual Growth Rates*	Percentage of historical average annual customer account growth rates	Indicates the pressures a utility may be facing to meet customer demands
Total Sewer Customers	Most recent sewer customer account total, if applicable	Provides an overview on the scope of operations within the service area; not material in the rating process (presented for informative purposes only)
Sewer Customer Annual Growth Rates*	Percentage of historical average annual customer account growth rates	Indicates the pressures a utility may be facing to meet customer demands
Top 10 Customers as % of Revenues	Total annual receipts from the largest 10 customers divided by total operating system revenues for the year	Indicates revenue concentration levels of the 10 largest customers
Ensured Water Supply (Year)	Estimated year in which current water supplies are sufficient to meet needs; in some cases, supplies extend to longer terms but available information extends only to the planning horizon	Indicates ability for continued growth within the service area
Age of Plant (Years)	Total accumulated depreciation divided by annual depreciation	Indicates to what level plant maintenance is being deferred
Treated But Unbilled Water (%)	Treated but unbilled water divided by total water treated (also termed "unaccounted for water," which includes water lost from line breaks, fire control, and developer usage, etc.)	Indicates to what level plant maintenance is being deferred
Water Treatment Capacity Remaining (%)**	Average percentage of permitted treatment capacity available	Indicates the pressures a utility may be facing to meet customer demands
Sewer Treatment Capacity Remaining (%)**	Average percentage of permitted treatment capacity available	Indicates the pressures a utility may be facing to meet customer demands
Average Annual CIP Costs per Customer ($)	Total projected capital needs within the CIP divided by the number of years of the CIP, divided by total number of customers (for a combined utility, the individual utility with the most customers was used, typically the water utility)	Indicates impact of the CIP on ratepayers (principal only)
Average Annual Debt Issuance in CIP per Customer ($)	Total projected debt to be issued within the CIP divided by the number of years of the CIP, divided by total number of customers (for a combined utility, the individual utility with the most customers was used, typically the water utility)	Indicates the amount of CIP debt attributable to each customer (principal only)
CIP Debt Financed (%)**	Percentage of issuer's total CIP expected to be debt financed	Indicates future debt leverage of capital assets
Total Outstanding Debt to Net Plant Assets (%)	Total amount of utility long-term debt divided by the net asset value of the plant	Indicates existing debt leverage of capital assets
Total Outstanding Long-Term Debt per Customer ($)	Total amount of utility long-term debt divided by total number of customers (for a combined utility, the individual utility with the most customers was used, typically the water utility)	Indicates the existing debt burden attributable to each customer (principal only; key ratio)
10-Year Principal Payout**	Percentage of principal amortizing within 10 years	Indicates longevity of system debt
20-Year Principal Payout**	Percentage of principal amortizing within 20 years	Indicates longevity of system debt
Projected Debt per Customer – Year Five ($)**	Total outstanding system debt divided by total outstanding projected customers five years from the date of the rating	Indicates the total debt burden to ratepayers five years from the date of the rating (key ratio)
Individual Water/Sewer Utility Average Monthly Residential Bill ($)	Average monthly residential bill for individual utilities; when billing was not calculated on a monthly basis, it was converted to a monthly amount for standardization	Indicates the monthly cost of service to residential customers
Individual Water/Sewer Utility Average Annual Bill as % of 2000 Census MHI	Average monthly residential bill for individual utilities times 12, divided by the 2000 Census MHI	Indicates the annual burden for cost of service to ratepayers
Combined Water/Sewer Utility Average Monthly Residential Bill ($)	Average monthly residential bill for combined utilities; when billing was not calculated on a monthly basis, it was converted to a monthly amount for standardization	Indicates the monthly cost of service to residential customers
Combined Water/Sewer Utility Average Annual Bill as % of 2000 Census MHI (%)	Average monthly residential bill for combined utilities times 12, divided by the 2000 Census MHI	Indicates the annual burden for cost of service to ratepayers
Average Annual Projected Water Rate Increases (%)	Sum of planned annual rate increases divided by the number of years over which increases are forecast	Indicates the future expected burden for cost of service to ratepayers
Average Annual Projected Sewer Rate Increases (%)	Sum of planned annual rate increases divided by the number of years over which increases are forecast	Indicates the future expected burden for cost of service to ratepayers
Senior Lien MADS Coverage (x)	Current-year revenues available for debt service divided by projected MADS	Indicates the financial margin to meet projected MADS with current revenues available for debt service

*Presentation changed with the 2007 medians. **New with the 2007 medians. MHI – Median household income. CIP – Capital improvement plan. MADS – Maximum annual debt service.

Water and Sewer Median Definitions (continued)

Median	Definition	Significance
Senior Lien ADS Coverage (x)	*Current-year revenues available for debt service divided by* current-year debt service	*Indicates the financial margin to meet current* ADS with current revenues available for debt service (key ratio)
Minimum Projected Senior Lien ADS Coverage (x)	Minimum debt service coverage projected, based on revenues available for debt service in any given fiscal year, divided by the respective debt service amount for that fiscal year	Indicates the financial margin during the year in which future ADS coverage is projected to be the lowest (key ratio)
Senior Lien Debt Service as % of Operating Revenues*	Current-year senior lien debt service divided by current-year operating revenues	Indicates the level of annual senior lien debt service burden on system operations
Operating Margin (%)	Operating revenues minus operating expenditures plus *depreciation, divided by operating revenues*	Indicates financial margin (key ratio)
Days of Operating Revenues in Accounts Receivable	Current unrestricted accounts receivable, divided by operating revenues divided by 365	Indicates rate at which customer revenues are received
Days Cash on Hand	Current unrestricted cash and investments, divided by operating expenditures minus depreciation, divided by 365	Indicates financial flexibility (key ratio)
Days of Working Capital*	Current unrestricted assets minus current liabilities payable from unrestricted assets, divided by operating expenditures minus depreciation, divided by 365	Indicates financial flexibility (key ratio)

*New with the 2007 medians. ADS -- Annual debt service.

Appendix A: Utilities Included in 2007 Water and Sewer Medians

	Date of Senior Lien Rating	Long-Term Rating	Rating Outlook
Alaska			
Anchorage (Sewer)	5/13/04	'AA–'	Stable
Anchorage (Water)	5/13/04	'AA–'	Stable
Arizona			
Chandler	5/25/05	'AA'	Stable
Oro Valley Municipal Property Corporation	11/7/03	'A+'	Stable
Scottsdale	3/18/04	'AA+'	Stable
Tucson	6/2/05	'AA'	Stable
California			
Belmont Joint Powers Authority	1/10/06	'A'	Positive
Diablo Water District	2/18/05	'A'	Stable
Eastern Municipal Water District	1/9/06	'AA'	Stable
Elsinore Valley Municipal Water District	1/7/05	'A+'	Stable
Helix Water District	8/19/05	'AA'	Stable
Hillsborough	2/14/06	'AA+'	Stable
Imperial Irrigation District	3/22/04	'AA–'	Stable
Indian Wells Valley Water District	11/11/03	'A+'	Stable
Lodi	5/10/04	'A–'	Evolving
Los Angeles	11/21/05	'AA–'	Stable
Los Angeles Department of Water & Power	1/26/06	'AA'	Stable
Manteca	12/2/03	'A'	Stable
Oakland	11/15/04	'A'	Stable
Orange County Sanitation District	2/23/06	'AA'	Stable
Palmdale Water District	8/18/04	'A+'	Stable
Rancho California Water District	6/3/05	'AA'	Stable
Redwood City Public Financing Authority	1/23/06	'A+'	Stable
Riverside	8/31/05	'AA'	Stable
San Jose-Santa Clara Clean Water Authority	8/24/05	'AA'	Stable
San Juan Capistrano Public Financing Authority	8/6/04	'AA–'	Stable
South Tahoe Public Utility District	4/29/04	'AA'	Stable
Stockton Public Financing Authority	10/7/05	'A'	Stable
Vallecitos Water District	5/25/05	'AA'	Stable
Yuba City	9/20/05	'A+'	Stable
Yucaipa Valley Water District	6/11/04	'A+'	Stable
Colorado			
Aurora	9/7/05	'AA–'	Stable
Denver (City and County)	5/31/05	'AA+'	Stable
Fort Collins	9/7/05	'AA–'	Stable
Connecticut			
Greater New Haven Water Pollution Control Authority	8/15/05	'A–'	Stable
New Britain	3/29/05	'A'	Stable
Delaware			
Dover	9/20/03	'A'	Stable
District of Columbia			
District of Columbia Water & Sewer Authority	7/8/04	'AA–'	Stable
Florida			
Boca Raton	12/23/05	'AAA'	Stable
Broward County	3/17/05	'AA'	Stable
Cape Coral	6/13/05	'A'	Stable
Deltona	10/1/03	'A–'	Stable
Florida Community Services Corp. of Walton County	2/2/06	'A'	Stable
Florida Governmental Utility Authority (Lehigh Utility System)	11/23/05	'A–'	Stable
Florida Keys Aqueduct Authority	2/13/06	'A+'	Stable
Fort Walton Beach	4/14/05	'AA–'	Stable
Hernando County	2/18/04	'A'	Stable
Hollywood	10/28/03	'A–'	Stable
Jupiter	10/6/03	'AA+'	Stable
Leesburg	5/24/04	'A'	Stable
Marco Island	9/30/03	'A–'	Stable
Melbourne	10/26/04	'A+'	Stable
Miami-Dade County	9/8/05	'A+'	Negative
Nassau County	9/9/03	'A–'	Stable
North Port	12/13/04	'A–'	Stable

Appendix A: Utilities Included in 2007 Water and Sewer Medians (continued)

	Date of Senior Lien Rating	Long-Term Rating	Rating Outlook
Florida (continued)			
Ocala	12/1/04	'AA–'	Stable
Orlando	10/8/03	'AA+'	Stable
Palm Beach County	4/20/04	'AAA'	Stable
Palm Coast	9/29/03	'A–'	Stable
Port Orange	1/10/06	'A+'	Stable
Port St. Lucie	6/2/05	'A'	Stable
Reedy Creek Improvement District	4/28/05	'A–'	Stable
Sanford	9/4/03	'A+'	Stable
Sarasota	8/2/05	'A+'	Stable
Seacoast Utility Authority	1/18/05	'A+'	Stable
St. Augustine	5/13/05	'A'	Stable
St. Petersburg	10/25/05	'AA–'	Stable
Tallahassee	7/12/05	'AA+'	Stable
Tampa	3/23/05	'AA'	Stable
Tohopekaliga Water Authority	10/7/03	'A+'	Stable
West Palm Beach	3/31/05	'AA–'	Stable
Winter Haven	6/21/05	'A+'	Stable
Winter Park	7/28/04	'AA–'	Stable
Georgia			
Albany Water, Gas & Light Commission	12/14/04	'A–'	Stable
Cobb County	3/16/04	'AAA'	Stable
Columbia County	10/18/04	'AA–'	Stable
Fulton County	7/20/04	'A+'	Stable
Hawaii			
Honolulu	7/7/05	'AA–'	Stable
Honolulu Board of Water Supply	12/19/03	'AA'	Stable
Illinois			
Chicago	7/29/04	'AA+'	Stable
Kentucky			
Louisville & Jefferson County Metropolitan Sewer District	6/6/05	'A+'	Stable
Massachusetts			
Boston Water & Sewer Commission	7/29/04	'AA–'	Stable
Maryland			
Baltimore (Sewer)	5/13/05	'A+'	Stable
Baltimore (Water)	5/13/05	'A+'	Stable
Michigan			
Battle Creek	9/1/05	'A+'	Stable
Kalamazoo	3/25/04	'AA–'	Stable
Muskegon Heights	11/28/05	'A–'	Stable
Missouri			
Metropolitan St. Louis Sewer District	4/1/04	'AA'	Stable
Mississippi			
Hattiesburg	12/1/04	'A+'	Stable
North Carolina			
Brunswick County	4/20/04	'A'	Stable
Cary	4/12/04	'AAA'	Stable
Charlotte	2/2/05	'AAA'	Stable
Dare County	9/8/05	'A+'	Stable
Durham	10/11/05	'AAA'	Stable
Gastonia	6/7/05	'A+'	Stable
Greensboro	8/31/05	'AA+'	Stable
Henderson	9/29/05	'A+'	Negative
High Point	10/15/04	'AA'	Stable
Orange Water & Sewer Authority	5/10/05	'AA+'	Stable
Raleigh	3/3/05	'AAA'	Stable
Salisbury	7/11/05	'A+'	Stable
Wilmington	9/20/05	'AA–'	Stable
Winston-Salem	1/11/05	'AA'	Positive
New Hampshire			
Manchester	12/9/03	'AA'	Stable

Appendix A: Utilities Included in 2007 Water and Sewer Medians (continued)

	Date of Senior Lien Rating	Long-Term Rating	Rating Outlook
New Jersey			
Passaic Valley Water Commission	1/8/04	'A'	Stable
New Mexico			
Albuquerque Bernalillo County Water Utility Authority	9/14/05	'AA'	Stable
Gallup	1/3/05	'A'	Stable
Rio Rancho	6/6/05	'A'	Stable
Nevada			
Truckee Meadows Water Authority	11/2/05	'A'	Stable
New York			
Nassau County Sewer & Storm Water Authority	9/27/04	'A'	Stable
New York City Municipal Water Finance Authority	9/27/05	'AA'	Stable
Suffolk County Water Authority	10/13/05	'AA+'	Stable
Western Nassau County Water Authority	6/24/05	'AA–'	Stable
Ohio			
Canal Winchester	11/16/04	'A–'	Stable
Toledo (Sewer)	10/14/05	'A+'	Stable
Toledo (Water)	10/14/05	'A+'	Stable
Oregon			
Eugene	7/13/05	'AA'	Stable
Pennsylvania			
Allegheny County Sanitary Authority	11/23/04	'A+'	Stable
Lehigh County Authority	10/13/03	'A+'	Stable
Philadelphia	4/11/05	'A–'	Stable
South Carolina			
Greenville	1/6/05	'AAA'	Stable
Tennessee			
Clarksville	4/30/04	'A+'	Stable
Memphis	11/22/05	'AA–'	Stable
Texas			
Arlington	3/4/05	'AA+'	Stable
Bexar Metropolitan Water District	7/11/05	'A–'	Stable
Burleson	5/18/05	'A'	Stable
Carrollton	2/4/05	'AA'	Stable
Corpus Christi	9/19/05	'AA–'	Stable
El Paso	2/9/06	'AA'	Stable
Fort Worth	3/3/05	'AA+'	Stable
Garland	3/11/05	'AA'	Negative
Granbury	3/31/05	'A'	Stable
Grand Prairie	8/30/05	'AA'	Stable
Greenville	10/6/05	'A+'	Stable
Houston	9/28/05	'A'	Stable
Killeen	9/20/05	'AA–'	Stable
Laredo	7/11/05	'A+'	Stable
Mansfield	7/6/05	'AA–'	Stable
McAllen	3/18/05	'AA–'	Stable
Mineral Wells	10/10/03	'A–'	Stable
San Angelo	11/9/05	'A+'	Stable
San Antonio	11/7/05	'AA–'	Stable
Seguin	10/20/03	'A'	Stable
Victoria	6/16/05	'A+'	Stable
Utah			
Orem	2/23/05	'AA'	Stable
St. George (Utah Water Finance Agency; Sewer)	3/15/04	'AA–'	Stable
St. George (Utah Water Finance Agency; Water)	3/15/04	'AA–'	Stable
Virginia			
Fairfax County	9/22/04	'AAA'	Stable
Fairfax County Water Authority	3/2/05	'AAA'	Stable
Loudoun County Sanitation Authority	12/14/05	'AAA'	Stable
Spotsylvania County	2/8/05	'A'	Stable
Virginia Beach	9/14/05	'AA+'	Stable
Washington			
Renton	10/28/04	'AA–'	Stable

Appendix B: 2004 Water and Sewer Medians

	Rating Category			
	'AAA'	'AA'	'A'	All Credits
Sample Size	9	22	20	51
Community Characteristics/Customer Growth and Concentration				
Population	262,300	510,333	80,194	313,619
2000 Census MHI ($)	49,185	39,565	31,962	39,217
Total Water Customers	140,400	100,606	24,338	91,661
Water Customer Growth Rates (Stable to Moderate/High Ratio)	1.3:1	8.5:1	1.3:1	2.5:1
Total Sewer Customers	105,956	89,020	20,800	86,294
Sewer Customer Growth Rates (Stable to Moderate/High Ratio)	1.7:1	6:1	1.2:1	2.3:1
Top 10 Customers as % of Revenues	9	13	14	12
Capacity				
Ensured Water Supply Through (Year)	2040	2020	2020	2022
Age of Plant (Years)	12	14	13	13
Treated But Unbilled Water (%)	10	5	12	8
Water Treatment Capacity Remaining (%)*	43	47	37	45
Sewer Treatment Capacity Remaining (%)*	40	36	47	42
Capital Demands and Debt Policies				
Average Annual CIP Costs per Customer ($)	450	371	430	417
CIP Debt Financed (%)*	73	39	23	38
Total Outstanding Debt to Net Plant Assets (%)	29	39	40	38
Total Outstanding Long-Term Debt per Customer ($)†	721	1,508	820	1,199
Charges and Rate Affordability				
Individual Water/Sewer Utility Average Monthly Residential Bill ($)	13	21	18	20
Individual Water/Sewer Utility Average Annual Bill as % of 2000 Census MHI	0.5	0.6	0.6	0.6
Combined Water/Sewer Utility Average Monthly Residential Bill ($)	34	24	49	38
Combined Water/Sewer Utility Average Annual Bill as % of 2000 Census MHI	0.9	0.7	1.7	0.9
Average Annual Projected Water Rate Increases (%)	2.0	4.5	4.0	4.0
Average Annual Projected Sewer Rate Increases (%)	—	4.4	4.3	4.0
Coverage and Financial Performance/Cash and Balance Sheet Considerations				
Senior Lien MADS Coverage (x)	2.6	1.9	1.7	2.0
Senior Lien ADS Coverage (x)†	3.0	2.0	2.3	2.3
Minimum Projected Senior Lien ADS Coverage (x)†	2.1	1.7	1.5	1.8
Operating Margin (%)†	40	34	30	35
Days of Operating Revenues in Accounts Receivable	61	48	48	49
Days Cash on Hand†	614	220	169	231
Days of Working Capital*†	658	187	203	222

*New with the 2007 medians. †Indicates key ratio. MHI – Median household income. CIP – Capital improvement plan. MADS – Maximum annual debt service. ADS – Annual debt service.

Appendix C: 2007 Water and Sewer Medians

	Rating Category 'AAA'	'AA'	'A'	All Credits
Sample Size	11	67	75	153
Community Characteristics/Customer Growth and Concentration				
Population	412,679	243,571	60,558	119,037
2000 Census MHI ($)	58,289	40,132	36,924	39,535
Total Water Customers	147,563	55,012	23,447	37,299
Annual Growth (%)*	2.8	1.9	3.0	2.5
Total Sewer Customers	153,257	64,219	20,523	32,903
Annual Growth (%)*	4.0	2.6	2.8	2.8
Top 10 Customers as % of Revenues	6	9	11	9
Capacity				
Ensured Water Supply Through (Year)	2025	2029	2027	2025
Age of Plant (Years)	12	13	12	13
Treated But Unbilled Water (%)	N.A.	8	13	10
Water Treatment Capacity Remaining (%)**	48	59	49	53
Sewer Treatment Capacity Remaining (%)**	31	30	35	32
Capital Demands and Debt Policies				
Average Annual CIP Costs per Customer ($)	406	453	458	444
CIP Debt Financed (%)**	36	63	60	62
Total Outstanding Debt to Net Plant Assets (%)	35	36	53	40
Total Outstanding Long-Term Debt per Customer ($)†	1,738	1,471	1,892	1,656
10-Year Principal Payout (%)**	45	39	41	40
20-Year Principal Payout (%)**	94	86	87	87
Projected Debt per Customer – Year Five ($)**†	2,112	2,346	3,164	2,595
Charges and Rate Affordability				
Individual Water/Sewer Utility Average Monthly Residential Bill ($)	20	23	26	23
Individual Water/Sewer Utility Average Annual Bill as % of 2000 Census MHI	0.6	0.6	0.7	0.6
Combined Water/Sewer Utility Average Monthly Residential Bill ($)	31	50	50	48
Combined Water/Sewer Utility Average Annual Bill as % of 2000 Census MHI	0.7	1.4	1.6	1.5
Average Annual Projected Water Rate Increases (%)	3.5	4.2	4.2	4.1
Average Annual Projected Sewer Rate Increases (%)	4.5	4.9	5.0	5.0
Coverage and Financial Performance/Cash and Balance Sheet Considerations				
Senior Lien MADS Coverage (x)	2.5	1.9	1.9	1.9
Senior Lien ADS Coverage (x)†	3.0	2.5	2.1	2.3
Minimum Projected Senior Lien ADS Coverage (x)†	2.2	1.9	1.5	1.8
Senior Lien Debt Service as % of Operating Revenues**	21	18	19	18
Operating Margin (%)†	40	31	37	34
Days of Operating Revenues in Accounts Receivable	60	44	46	45
Days Cash on Hand†	623	266	244	266
Days of Working Capital**†	334	283	271	279

*Presentation changed with the 2007 medians. **New with the 2007 medians. †Indicates key ratio. MHI – Median household income. CIP – Capital improvement plan. N.A. – Not available. MADS – Maximum annual debt service. ADS – Annual debt service.

Revenue
Criteria Report

Water and Sewer Revenue Bond Rating Guidelines

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Inside **Page**

■ Summary

With enduring natural monopolies that provide highly essential services, municipal water and sewer utilities in the U.S. are an extremely creditworthy debt sector with virtually no default history during the past quarter century. Reflective of this strong performance, most credits tend to be rated between 'A–' and 'AAA' and should remain within this range for the foreseeable future. Fitch Ratings currently rates around 300 water, sewer, or combined utilities in 36 states, the District of Columbia, and the Territory of Guam with the average rating for these issuers between 'A+' and 'AA–'.

These rating guidelines cover all areas of Fitch's water/sewer revenue bond credit analysis, specifically the service area and economy, system demands, regulatory issues, capital needs, legal covenants, and financial performance. Underlying each of these areas is a focus on high-quality management practices, which Fitch believes has increased operating stability in the sector over the past three decades during the implementation of the most significant environmental mandates ever by the federal and state governments. For nearly every challenge still being faced by utilities in this highly varied nationwide debt sector, foresighted management efforts and sophisticated long-term planning can greatly improve a utility's chances of meeting these challenges or, conversely, the lack thereof can undermine credit quality.

■ Rating Considerations

Historically Strong Credit Quality in the Sector: While the sector has experienced its most intense period of regulatory pressure over the last three decades under the federal Clean Water Act (CWA) and Safe Drinking Water Act (SDWA), it has had little discernible effect on the sector's default history. On average, governments' abilities to accumulate revenues to pay water and sewer utility expenses were shown by Fitch's 1999 and 2003 default studies to be comparable to their abilities to collect taxes for general government purposes. The 1999 default study showed an aggregate sector default rate during the past two decades of 0.05% of issued water and sewer bonds, while the 2003 default study indicated that this rate had dropped slightly to 0.04%. Although data collection discrepancies make exact comparisons difficult, water and sewer bond default experience appears to have been at least as low as that of local general obligations.

The key credit strengths of most municipal water and sewer utilities continue to be their enduring natural monopolies. Most utilities exhibit few of the legal, market, or technological characteristics that have upset the solid waste, health care, and electric power bond sectors in recent years. Furthermore, operations of water and sewer utilities are

often less politicized on a day-to-day basis than the wide array of general government operations affecting tax-supported bond ratings.

Experience has also shown that strong management practices can dramatically improve a system's ability to cope with unexpected demands, plan for future needs, and maintain healthy, vibrant fiscal operations in a cooperative manner with elected officials and regulators. Consequently, best management practices in the water/sewer sector relevant to the rating review process that are detailed in Appendix A will be emphasized throughout this report.

Rating Methodology — The "10 Cs": Fitch differentiates revenue bonds in this low-risk sector following a comprehensive analysis of system operations, management, debt issuance and capital planning, and the customer base. As described in this report, these areas can be remembered as the "10 Cs" of Fitch's analysis — community characteristics (service area), customer growth and concentration, capacity, compliance with environmental laws and regulations, capital demands and debt policies, covenants, charges and rate affordability, coverage (including financial position), cash (balance sheet), and the "crew," an informal term for management strength *(see box, page 4)*.

Under Fitch's rating methodology, the most creditworthy municipal water and wastewater treatment facilities — those rated 'AA', 'AA+', and 'AAA' — will perform well in most, if not all, areas of Fitch's 10-point rating analysis. These elements are interactive in that strengths in one area may offset risks in another to some degree. However, one word summarizes the characteristics of most high achievers — stability.

Thes highest rated utilities also exhibit multiple management practices that maximize stability by anticipating future regulatory and growth demands, reliably implementing steady rate increases to cover operational and capital costs, and ensuring liquidity sufficient to cope with unexpected sales shortfalls or emergency needs. While elected officials play a necessary role in regulating the utilities' monopolies in their jurisdictions, the most stable utilities will generally operate relatively free from day-to-day political interference or controversies concerning rate-setting policies. This is made easier by the long-term maintenance of financial management and planning practices, low and/or affordable rates, manageable and well-planned capital programs, and the segregation of enterprise fund finances from those of the general government.

■ Fitch's "10 Cs"

Community Characteristics (Service Area): A community's economy and demographic characteristics are key drivers in determining whether most general obligation ratings are in the 'A', 'AA', or 'AAA' categories. These are also determining factors for water/sewer utilities, since the essentiality of the enterprises' services provides localities with a de facto ability to tax for their provisions. Accordingly, the vitality and diversity of the customer base is central to determining credit health.

While Fitch's rating elements are interactive, in that strengths in one can offset weaknesses in another, the three main rating categories generally have come to reflect distinct local economic characteristics. The 'AAA' general obligation and water/sewer ratings typically will reflect service areas with broad economies, since they are less vulnerable to sectoral downturns and cyclical economic shifts. At the other end of the typical rating spectrum, 'A' category ratings reflect reasonably stable but less diversified economies. The 'AA' category ratings are generally associated with utilities in the middle of this range, when considering sectoral diversification. This rating category should continue to include many urban and suburban service areas.

Service areas with prospects for significant future population, commercial, and industrial volatility or long-term decline are more likely to have 'BBB' or lower water and sewer bond ratings. The presence of agricultural activities in and of themselves does not preordain 'BBB' ratings. Rather, a detailed examination of the precise nature of the agricultural presence, its prospects for future stability, its concentration within the broader regional economy, and the utility's direct and indirect dependence on it are considered in Fitch's rating evaluation.

Customer Growth and Concentration: Related to service area demographics is growth in a utility's residential, commercial, industrial, and government customer bases as well as its customer concentration. In terms of growth, demonstrated steady increases are preferable, as these utilities typically are better able to project financial results and plan for needed improvements or expansions. Conversely, high growth and declining customer bases are more likely to affect a rating, as they can pressure the financial and capital decisions of a utility. From a quantitative standpoint, Fitch considers annual growth rates above

3% to be rapid, whereas 1% and below is viewed as stable; annual growth rates between 1%–3% are seen as moderate.

A high-growth environment poses special challenges for utilities, particularly in terms of the timing and funding of capital improvements. As a community expands, water and sewer infrastructure must often be built in advance of growth and/or additional water supplies must be developed. Potential vulnerabilities include instances when growth does not occur as fast as anticipated. In such cases, user charges will likely be raised for existing customers to cover debt and operating costs. Not only can this provoke political difficulty for the utility, potentially resulting in strained financial margins, but it also can reduce the community's attractiveness to new residents and businesses, compounding the growth challenge.

While these growth challenges pose credit concerns, management can largely offset potential risks through well-developed capital and financial plans and policies that identify the nature and timing of future capital and operational needs. In high-growth locales, higher rated utilities are likely to require developer funding of many components of capital expansions upfront, including procurement of additional water rights to serve a proposed development. In addition, high-grade credits will tend to favor modular capital expansion plans, which can be accelerated or slowed based on actual demand trends.

Similarly, a utility with a declining customer base is well advised to use long-term planning to find savings through cost or personnel reduction and rely less on underused assets, when possible. The credit benefits of these management practices will be more pronounced when they are institutionally implemented on an ongoing basis, preparing for future challenges instead of merely responding to such demands in an ad hoc way.

While planning may limit certain exposures of a declining service base, customer concentration, which may ultimately lead to the loss of ratepayers, is more likely to be viewed negatively in the rating process. To this end, Fitch evaluates concentration levels in light of a service area's economic focus and sector concentration among the users. Volatility in the service base can be most severe when the largest customers, particularly industrial entities, pull out of a community or substantially downsize operations. In such a case, a utility would face pressures not only from the loss of revenues of such large users, but also may be constrained to increases rates because of elevated unemployment among its residential customers.

Generally, utilities with a large customer concentration will continue to find it difficult to achieve the highest ratings. To do so, the utilities must be able to survive a large customer withdrawal and maintain significant financial flexibility from existing revenues and reserves; low existing rates also would allow easier absorption of moderate rate increases to cope with the loss.

Overall, the top 10 largest customers among Fitch's 'AAA' rated utility credits generally account for less than 10% of revenues in any one system. A minimal amount of credits in the 'AA' and 'A' category approach or exceed 30%, but in these cases, the composition of individual users is diminished or concentration exists among users considered stable, i.e. governmental entities. Conversely, 'BBB' rated credits with similar concentration rates exhibit little diversity among the largest customers or have users that are more susceptible to economic volatility.

Capacity: Capital development and asset management strategies should consider capacity at every stage of the water/sewer utility's service delivery process — supply sources, treatment facilities, collection, transmission, and distribution, as well as management, technological, and personnel capacity to deal with anticipated service demands. Fitch believes that cooperative service management efforts with local land use and growth planners can be especially helpful in this regard. Such interactions can produce more accurate estimates of expected aggregate service area expansion and determine where and when such growth may occur. With these facts, managers can make better informed decisions on where, when, how, and in what priority service capacity should be expanded, maintained, or reduced.

To ensure the quality of service provided, comprehensive plans to maintain existing facilities and replace assets that are aging or obsolete should be adopted. Consequently, Fitch views trends of deferred maintenance as a credit risk. In this regard, Fitch evaluates a utility's annual depreciation in relation to overall assets historically depreciated to determine the age of plant and also compares a utility's annual capital expenditures in relation to depreciation for the year to gauge the amount of ongoing maintenance being performed. Utilities whose infrastructure age trends upward or whose annual capital spending regularly falls below the amount of annual depreciated assets may require

Fitch's "10 Cs" of Water/Sewer Revenue Bond Analysis

Community Characteristics

- Economic diversity.
- Income and property wealth levels.
- Population growth.
- Potential for residential, commercial, or industrial sector volatility.

Customer Growth and Concentration

- Stability, growth, or decline?
- Effect on the capital program, rates, and financial flexibility.
- Customer base concentration and sector concentration of largest users.

Capacity

- Water supply sources, regional demands on these sources, and adequacy for existing and future needs.
- Treatment facilities.
- Collection, transmission, and distribution infrastructure.
- Management, technological, and personnel capacity.
- Age of facilities and extent of deferred maintenance.

Compliance with Environmental Laws and Regulations

- Is the utility staying ahead, keeping up, or falling behind regulatory mandates?
- Status of consent decrees or compliance litigation, milestones to meet, and current stage within corrective plan.
- What developing regulations could affect the utility?
- How much will meeting the regulations costs in the five- to 10-year timeframe?

Capital Demands and Debt Policies

- Costs of growth, regulations, and maintenance.
- Debt burden to customers.
- Cost effects on financial flexibility.
- Pay-as-you-go versus debt funding sources.

Covenants

- Annual debt service coverage of 1.2 times (x) in rate covenants and additional bonds tests are typical.
- Does the system regularly exceed typical covenant requirements?
- If so, does it show strong prospects of continuing this trend?
- Other legal enhancements.
- Level of minimum credit protection provided if utility is likely to test or breach covenants.

Charges and Rate Affordability

- Do political leaders and utility officials regularly raise rates when needed? Is review by an outside entity required?
- Affordability of rates for residential, commercial, and industrial classes.
- Comparison of rates to those in nearby communities, and whether they affect the ability to raise rates when needed.
- Level of near-term increases expected.

Coverage and Financial Performance

- Goals and policies for annual financial performance.
- Reasonableness of future budget assumptions.
- Payment enforcement and account delinquencies.
- Cause of past financial volatility, if any.
- Operating reliance on growth-sensitive fees derived from customer base growth, if any.
- Policies to limit transfers to general fund are preferable.

Cash and Balance Sheet Considerations

- The less stable the operating environment, the larger the needed financial cushion.
- Operating reserve levels.
- Repair and replacement reserve levels.
- Rate stabilization reserve levels.
- Debt service reserve levels.
- Unrestricted cash and investments.
- Reserves for variable-rate fluctuations if the utility incurs variable-rate debt.
- Leverage ratio of outstanding debt to undepreciated plant assets.

"Crew" (Management)

- Important for linking these credit features together.
- Are management and administrative practices institutionalized, recognized by political leaders and management officials, and able to withstand personnel changes?
- Have management and administrative practices withstood prior periods of operating volatility, if any?

substantial upgrades in the near term to maintain regulatory compliance. Another indicator of potential needs, as far as water utilities are concerned, is the amount of treated but unbilled water distributed. Water utilities regularly replacing aging pipelines should experience water loss rates at or below the 10%–12% typically seen within the industry.

The availability of adequate water supplies is critical for a utility to meet its customer demands. As such, the highest rated water utilities will carefully consider their water supply source capacity on an ongoing basis as part of their capital and financial planning processes, considering not only their demands on such sources, but also those of neighboring jurisdictions. Credits that demonstrate a sustainable long-term supply to meet current, as well as expected future growth, needs are viewed more favorably by Fitch than those whose resources may be insufficient to allow for continued economic development. In instances where supply is an issue, Fitch considers a positive rating factor the regulatory management of potentially strained regional water resources, as well as the encouragement of and investment in customer conservation, as is the case in many Sun Belt states.

Compliance with Environmental Laws and Regulations: Mandates have been the dominant factor in water and sewer utility credit analysis since passage of the CWA in 1972 (amended in 1977, 1981, and 1987) and the SDWA in 1974 (amended in 1986 and 1996). Although they continue to pressure some enterprises, utilities can reduce credit risk by consistently attempting to predict and stay ahead of expected regulatory requirements at both the state and federal level. From the viewpoint of operating stability, anticipating and financing improvements over time are generally preferable to doing so under the threat of orders and fines from regulatory bodies or the courts.

In approaching issuers where a regulatory action has been imposed, Fitch incorporates into the rating process the events leading to enforcement, the scope of the corrective plan, and the current stage of the corrective plan. Fitch also focuses on the expected effects on ratepayers and management's commitment to meeting the set milestones and returning to compliance.

Regulatory enforcement neither precludes a utility from a high credit rating nor does it necessarily dictate immediate rating action. However, enforcement actions may reflect underlying credit weaknesses that extends beyond actual violations (i.e. management issues), in which case the rating could be directly affected. Perhaps this is most likely to occur in instances of political unwillingness to raise rates to address needed capital improvements or a lack of planning to identify and address shortcomings within the system. In such cases, enforcement action likely would put increased downward pressure on a rating as opposed to being the explicit cause for such action.

Capital Demands and Debt Policies: Regulations, customer growth, and capacity constraints, as discussed, are each major determinants of a utility's capital improvement burden. In Fitch's view, higher rated utilities will integrate all these diverse considerations into a comprehensive multiyear capital improvement and asset management strategy. The plan should attempt to prioritize expansion, improvement, and operating and maintenance needs and determine their financial impacts for rate-setting officials. This can facilitate informed long-term discussion of funding and construction alternatives, minimizing political and consumer rate shock in some cases if additional revenues are required.

Water and sewer utilities are capital intensive, with annual debt burdens often surpassing those of general governments as measured by the percentage of expenditures. Utilities limiting debt exposure by utilizing annual pay-as-you-go revenues, including excess user charges and growth-related fees, to fund a significant portion of their capital programs are generally viewed more favorably than those relying predominantly on debt-funded means. Elevated debt issuance over the near term may not adversely affect credit quality, although Fitch considers anticipated debt issuance in light of outstanding obligations, affordability levels, and historical financial performance, as well as the need for financing such projects.

With regard to debt funding for capital requirements, long-term fixed-rate debt historically has been the norm for utilities, with terms ranging from 20–30 years. However, in recent years, borrowers have increasingly utilized variable-rate instruments to reduce borrowing costs. In many instances, borrowers have also entered into swap agreements as a hedge to variable-rate obligations or to take advantage of spreads between fixed-rate debt and a swap index.

Fitch recognizes the benefits of both variable-rate obligations and swap agreements to borrowers and believes that both types of instruments can be an important tool in an issuer's overall debt strategy.

Fitch has resisted proposing rigid limits to which all borrowers should adhere; however, Fitch believes that it is imperative that management understand the implications of variable-rate and swap strategies prior to engaging in them, thoroughly evaluating the potential risks and benefits of such instruments within the issuer's asset/liability plans. Nevertheless, borrowers with a perceived high degree of exposure and/or a perceived lack of understanding and ability to manage such exposure will face tighter scrutiny than those with little or no variable-rate obligations or swap agreements outstanding *(for further information, see Fitch Research on "Guidelines for Interest Rate Swaps and Variable-Rate Debt," dated May 10, 2005; "Guidelines for Rating Variable-Rate Demand Obligations and Commercial Paper Issued with Internal Liquidity," dated March 7, 2006; and "Rating Guidelines for Debt Issued with Liquidity Support," dated April 12, 2006. All reports are available on Fitch's web site at www.fitchratings.com).*

Covenants: Covenants promote a certain level of credit stability for investors. If adhered to, they can provide a high degree of protection against water and sewer bonds being downgraded to speculative status. Standard bond covenants consistent with the two highest rating categories for senior lien water and sewer utility bonds include those limiting parity bond issuance to instances when historical and/or projected revenues cover annual debt service at least 1.2 times (x), requiring 1.2x rate setting annually to cover both operations and debt service costs, and creating debt service reserve funds at the maximum levels allowed under tax law. Additional covenants requiring set-asides for operational, maintenance, and other financial reserves are positive credit features, as they heighten prospects for stable financial management.

In nearly all cases, Fitch will consider financial performance on a net revenue basis, even if a gross revenue debt security pledge is present, as creditworthy systems must reliably cover operating expenditures from the same revenue streams used to pay debt service. However, most retail water and sewer enterprises comfortably exceed their covenant coverage and liquidity requirements and should continue to do so. For them, the focus of a rating review should be actual and likely future performance, not minimum guaranteed performance in a stress scenario.

In recent years, a general trend in the water/sewer sector toward relaxed covenants has developed. Changes proposed typically focus on reducing coverage requirements or reserve fund levels. The particular rating impact of relaxed covenants will depend on the system, its characteristics, and the specific proposed changes. In cases where a change in covenants has not adversely affected a rating, such utilities have demonstrated strong and consistent performance well above existing requirements and such change is not expected to weaken the credit quality of the borrower over the foreseeable future.

Covenants will receive the most scrutiny during the rating process when utilities show a likelihood of testing or breaching them altogether or where other credit factors deemed weak are of concern. In these cases, the covenants may dictate actual, rather than theoretical, financial performance. Consequently, any loosening or "modernization" of such covenants may be expected to have a negative impact on the rating, particularly for those credits exhibiting weaker than average credit fundamentals.

Charges and Rate Affordability: Political leaders play a key role in overseeing utilities' rates. Higher rated utilities consistently consider the impact of operational and capital programs on rate affordability. While Fitch believes credit is due to those systems that consistently raise rates to preserve financial strength, these activities will be more sustainable when rate affordability is a focus of policymakers and cost containment is regularly employed. Fitch believes that not only should the level of rates for particular customers be considered in these reviews, but also the affordability of rates relative to income, particularly for residences, which tend to generate most user charge revenues of retail systems.

Fitch generally considers rates for combined water or sewer service higher than 2% of median household income (or 1% for an individual water or wastewater utility) to be financially burdensome, although various rate affordability levels have been suggested in recent decades by government regulators, academics, and others. As regulations continue to proliferate and the cost of CWA and SDWA compliance grows, some communities may be forced to approach and surpass this target; however, currently, few do, and utility bills on average should remain within this affordability range for the foreseeable future, based on some national studies.

Another measure Fitch considers when evaluating utility rates is the cost of service from other comparable utilities in the region. The comparison is utilized to determine whether future growth may be hampered due to the lack of competitiveness, particularly in neighboring suburban communities that have similar

economic and residential bases. The comparison is also useful in that anticipated rate increases may be projected forward to determine continued competitiveness. Finally, a regional comparison acts as a counterbalance to the 2% threshold where rates overall are above average but well within local affordability levels or, conversely, low-to-moderate overall but at or near 2% of median household income.

Coverage and Cash (Finance and Balance Sheet Considerations): Fitch, in general, views long-term planning as a highly desirable credit feature, and this is perhaps more true for enterprise operations, where long-range planning can clearly illustrate future structural deficits necessitating revenue development, expenditure containment, or both. Fitch believes that utilities are more likely to be stable when such decisions are considered in advance, as a result of financial forecasting, rather than when they are made haphazardly under pressure and with acute political controversy.

Higher rated utilities will set goals for appropriate financial margins, including debt service coverage levels, debt affordability, and reserve funding (rate stabilization reserves, repair and rehabilitation reserves, operating reserves, etc.), and will consistently establish rates and budgets that comply with their goals. Coverage itself as a rating factor has been overemphasized somewhat in the past. Fitch believes that, in many instances, 1.5x–2.0x coverage can support 'AA' category ratings if other system characteristics demonstrate a suitably stable credit profile. However, more comfortable financial margins are clearly a very important positive credit consideration and can be one way managers overcome risks related to other credit factors to achieve a very high bond rating.

Numerous factors can cause financial volatility during one fiscal year or over time, including variations in rainfall. Coverage and liquidity goals should be developed with historical climate volatility in mind. In short, enterprises operating in areas especially prone to rainfall volatility should consider the effect of such issues on their revenues and establish financial cushions to deal with potential weather events. Along a similar line, systems should consider financial goals relative to fixed annual system cash flow requirements. As part of monitoring financial performance relative to agency goals and policies, higher rated utilities demonstrate regular financial reporting and accountability systems that report year-to-date financial performance to rate setters so that midyear revenue and expenditure adjustments can be considered, when needed.

Because the financial health of a utility depends on the receipt of revenues for services rendered, Fitch considers the development and maintenance of adequate billing and collection measures an imperative. Credit concerns will be raised for utilities that fail to meter customers or ones that do not replace aging meters in a timely fashion. Likewise, Fitch expects utilities to develop comprehensive policies regarding the termination of service for unpaid bills, acting upon those policies when necessary. In cases where accounts receivable (expressed as days of operating revenues) are significantly high in relation to a utility's billing cycle, credit concerns may be raised.

In evaluating coverage levels, Fitch considers the stability of revenue streams available for the payment of operations and debt service. Significant exposure to growth-sensitive revenues, such as tap, connection, or impact fees, will continue to be a credit concern for some utilities, especially when growth-sensitive fees represent more than 20% of annual revenues. Steps to mitigate these concerns include prohibiting or limiting reliance on these growth-sensitive fees for rate covenants and additional bonds tests, implementing conservative budgeting strategies for such revenues, and meticulously tracking these fees as they accumulate and strictly limiting their use to growth-related capital, rather than operational spending. To gauge the ongoing ability of a utility to meet operating and debt service expenditures, Fitch calculates coverage both with and without growth-related fee revenues in its rating evaluation, if fees are pledged to bondholders. However, in presenting information publicly, while Fitch will calculate coverage based on all legally available revenues, particular mention may be made in cases where growth-sensitive fees constitute a material amount of pledged revenues or coverage may also be presented without these fees.

Because of the huge variation in operating profiles of utilities across the nation, specific recommended formulae for coverage and liquidity margins leading to higher ratings are not feasible. For utilities in the most stable operating environments with a suitably diverse and healthy service area economy, 1.5x annual coverage, with consistently maintained unrestricted financial liquidity of at least 90 days of operating revenues, could be sufficient for 'AA–' or higher ratings. For utilities with substantial growth, compliance demands, or significant annual volatility in revenues or expenditures, greater financial flexibility may be necessary.

Crew (Management): Sound management practices are key to a highly rated utility credit, affecting all aspects of Fitch's review process. Throughout this report, numerous management practices have been discussed that issuers should consider and that may impact credit quality. These practices are summarized in Appendix A; Fitch expects that this list will be expanded or modified over time with changes in the industry. Issuers and their advisers are encouraged to bring these practices to Fitch's attention, both during and after the rating review process.

One particular area that Fitch encourages issuers to highlight during the rating process is their implementation of an environmental management system (EMS). While an EMS does not automatically result in a credit enhancement because the focus and extent of each EMS program varies dramatically, they serve as a useful guide of management of various aspects of a utility, which may help to offset particular credit concerns of an entity.

Fitch has prepared these guidelines to provide issuers, consultants, and investors with a clear understanding of Fitch's water/sewer rating process and the importance of institutionalized management policies. Fitch has consistently incorporated management practices and policies within the review process, and management's importance has become even more pronounced with Fitch's 1999 and 2003 reviews of municipal debt default. Based on Fitch's findings, sound and institutionalized management practices can often endure the most extreme stresses from economic downturns or unexpected system demand, or conversely, the lack thereof can exacerbate weakening conditions. Therefore, Fitch believes emphasizing them can result in greater rating stability over time.

Appendix A: Water and Sewer Best Management Practices

System Related

- Strategies to track and anticipate future regulatory mandates, including active membership in state, regional, and national trade associations by some utility officials.
- Use of professional engineers, either within the utility or outside of it, to prepare objective reviews of system performance and needs on a regular basis and provide periodic revision of construction cost estimates.
- Regular consultation with regional and local growth planners, community development officials, and demographers to predict and, if possible, limit infrastructure needs related to population and business growth.

Debt and Capital Related

- Prioritized five-year capital improvement plans that consider growth, capacity, regulatory, and replacement and renewal needs.
- Debt issuance policies, including types, terms, and suitability under specific conditions, as well as the total amount of variable-rate debt deemed appropriate.
- Comprehensive policies regarding the use of swap agreements and their disclosure should be developed prior to entering into any such agreements.

Financial Related

- Long-term financial forecasting that considers future growth in demand, expected rate increases, regulations, and infrastructure renovation and renewal needs.
- Policies to ensure appropriate financial margins, including debt service coverage and operating liquidity levels. Issuers with variable-rate debt and swap agreements are expected to understand the implications and potential risks of such capital management strategies. In addition, issuers should establish financial reserves to enable them to cope with interest rate fluctuations and possible termination payments.
- Regular financial reporting and monitoring systems that allow policymakers access to timely information on fiscal performance relative to budget.
- Limiting operating exposure to growth-sensitive revenues, such as tap, connection, or impact fees.
- Collection policies that regularly track the rate of timely payment receipts and enforce penalties against late payers or terminate service for non-payment.
- Rate affordability guidelines, considering absolute levels of rates and their affordability relative to income levels.
- Limited exposure to financial operations of the general government, so that system revenues can be relied on for use to operate and improve the utility. Where transfers to the general fund are used, policies should specifically limit their scope and growth.
- Compliance with industry accounting practices and establishment of appropriate internal controls.

KAW → Model Results (Rubin vs. R.W. Beck)

Pool 3 - all #s are NPV @ 4.7%

RW Beck: $313.2 million

(1) KAW Depreciation: $313.4 million

(2) KAW 100% finance: $327.1 million

(3) Correct pretax cost of capital: $286.1 million

(4) Combination of (1), (2), (3): $293.1 million

LWC Pipeline

(5) RW Beck: $221.6 million

(6) KAW financed @ correct pretax Cost of Cap.: $255.1 million

(7) Public financed @ 1.5x coverage: $261.9 million

Change Consumption (25 MGD max.)
(note: error in electricity costs if after 6 MGD start)

(A) 6 MGD in 2010 + 1.0 MGD/yr.
(4) = $302.9 million (6) = $302.3 million

(B) 6 MGD in 2010 + 1.25 MGD/yr.
(4) = $306.5 million (6) = $319.2 million