May 29, 2003

VIA FEDERAL EXPRESS

Ms. Sara Kyle, Chairman
Tennessee Regulatory Authority
460 James Robertson Parkway
Nashville, TN 37243

RE: Petition of Tennessee American Water Company to Change and Increase Certain Rates and Charges so as to Permit it to Earn a Fair and Adequate Rate of Return on its Property used and Useful in Furnishing Water Service to its Customers, Docket No. 03-00118.

Dear Chairman Kyle:

Enclosed for filing is the original and 13 copies of the City of Chattanooga's Direct Testimony of the following:

Mr. Marlin L. Mosby, Jr., Financial Consultant, Public Financial Management, Direct Testimony.

Should you have any questions, please contact me.

Sincerely,

Michael A. McMahan
Special Counsel

MAM/wkt
Enclosures

RE: TENNESSEE-AMERICAN WATER COMPANY
CASE NO. 03-00118
CITY OF CHATTANOOGA'S
DIRECT TESTIMONY
MARLIN L. MOSBY, JR.

Q. Please state your name, address, and occupation.

A. Marlin L. Mosby, Jr., Managing Director, Public Financial Management, 530 Oak Court Drive, Suite 145, Memphis, TN 38117, and my occupation is Financial Consultant for state and local governments and other public agencies.

Q. Would you outline your education and your work experience in the financial industry?

A. I have an Undergraduate Degree in Economics and Accounting from the University of Memphis. I have a Master's Degree in Economics and Finance from the University of Missouri, and I completed all my work except for a dissertation in Economics and Finance also at the University of Missouri. My concentrations were in macro economics, public finance and general corporate finance. After leaving the University of Missouri, I served as the Chief Economist and Manager of the Management Sciences Department for First Tennessee Bank and then as the Chief Financial Officer for the City of Memphis for 8 years and have been in public finance first as an investment banker and then as a consultant since 1984. Since 1986 I have managed PFM's Memphis office. As the manager and sole Managing Director in the Memphis office I have managed over 314 bond financings for our public clients with a par value of over $14.109 billion.

Q. Briefly outline the qualifications of PFM.

A. PFM is one of the few and, in fact, the largest financial advisory firm in the public finance industry with 22 offices nationwide. In 2002, PFM was the financial advisor on 611 transactions having a par value of $31.2 billion.

Q. What is the purpose of your testimony in this proceeding concerning the request by Tennessee-American Water Company ("TAWC") for an increase in its tariff?

A. We have been engaged by the City of Chattanooga to research and provide direct testimony regarding the appropriate cost of capital and return on equity for the Tennessee-American Water Company ("TAWC") as it relates to the water rate setting process.

Q. Have you prepared a report?

A. Yes, it is to be attached as Appendix 1.

Q. How have you organized your testimony?

A. Capital Structure
Cost of Long-Term Debt
Cost of Short-Term Debt
Return on Equity
Pennsylvania Example
Recommendation

Q. What is the capital structure of TAWC?

A. The Tennessee-American Water Company has stated their capital structure to be the following:

Type of Capital	Ratio
Short-Term Debt	6.15%
Long-Term Debt	50.02%
Preferred Stock	1.64%
Common Equity	42.19%
Total	100.00%

Source: Direct Testimony, Paul R. Moul for TAWC.

Q. How does the capital structure of Tennessee-American Water Company compare to its parent company, American Water Works?

A. We have looked at the capital structure of Tennessee-American Water Company ("TAWC") as provided by Paul R. Moul and compared that to the capital structure of the

American Water Works Company ("AWW") as reported in its 2002 audited financial report. At first glance, TAWC's capital structure appears to be similar to the capital structure of AWW; however, upon closer examination the TAWC structure has a slightly larger proportion of the structure in equity, 42.19% in the case of Tennessee-American Water Company as opposed to an average over the past seven years of 35.4% for American Water Works itself. Given the credit quality of the Chattanooga system relative to other AWW subsidiaries and other privately managed public water systems, we expected the capital allocation to TAWC to be no greater than and arguably less than that of the parent company. Given TAWC is a wholly owned subsidiary of AWW, the internal allocation of debt and equity is based upon methodology determined solely by AWW. We can find no logic for allocating more equity to the Chattanooga system than its proportional share of the parent's total equity. For purposes of this analysis we have calculated the weighted average cost of capital for TAWC based first upon the information provided by Mr. Moul and second based upon the actual capital structure of AWW.

Q. What is the relevance of the difference between what TAWC carries as equity to American Water Works Company?

A. The relevance is equity is a firm's highest cost capital. Therefore the higher the allocation of equity to the total capital structure, the higher the weighted average cost of capital. The weighted average cost of capital is then used as an important component of the rate setting methodology. The higher the cost of capital, the higher the rate request. We believe the cost of capital proposed is based upon a capital structure too heavily weighted with equity.

Q. Did you also look at the debt-equity ratio of RWE AG, the parent company of both American Water Works and Tennessee-American Water Company?

A. What we've done is look at the financials for RWE. But, because RWE is a large international company with many different businesses, their debt to equity ratio as a whole is really not appropriate for the water division, for American Water Works or for TAWC. Furthermore we do not have information on how they are allocating equity to

their water divisions. All we have is a statement RWE AG has made that those core businesses should have debt to equity ratio of 60/40.

Q. What is your overall conclusion or recommendation with respect to an appropriate capital structure for Tennessee-American Water Company?

A. Based upon PFM's research we believe that the debt to equity ratio should be no greater than 40% equity and over 60% debt. Given AWW equity has averaged 35.4% of it total capital for the past seven years, we believe an equity ratio of between 35% and 40% is appropriate.

Q. Have you analyzed the long-term debt of TAWC and what is your conclusion as to what an appropriate interest rate on that would be?

A. We've looked at the cost of long term debt from a number of different perspectives. The first perspective is to look again at American Water Works directly. We have looked at them historically for the last 3 years. You can see that in 2000 the average cost of long-term debt for American Water Works is 6.9%. In 2001, it was 5.92%, and this past year it was 5.09%. As interest rates have fallen, this is what you would expect to have happened. Their cost of long-term debt has also fallen. The other thing that we have done is that we have looked at the maturity of that debt and what is the appropriate maturity range that we should be looking at for their debt. It's one thing to issue long-term 30-year debt, but no one issues that debt and then not manage the maturity to some shorter average duration. Either they issue serial maturities, as a city utility would do, or they issue long-term debt and then manage the average life of the debt using derivative products back to a shorter average life. We have looked at a number of different utilities and have come to the conclusion that the average life of long-term debt for a standard utility, a water utility in particular, is normally in the range of six to ten years.

Q. Why do you use AWW as a comparative item?

A. It is 1) the owner of Tennessee-American Water Company, 2) it is a large company with $1.5 billion in revenue per year, and 3) the majority of its business is in regulated water. Regulated water has varied from year to year between 87% to 97% of their total

business. So, we believe that AWW is an appropriate measure of the cost of long-term debt for TAWC. We also believe that the reason a community hires a company like Tennessee-American Water Company to manage their water utility is that it is a part of a company like AWW with economies of scale not only in the operation of the facility but also in its ability to raise capital at a competitive rate. Those economies of scale affect their their credit quality, thus their borrowing and equity cost and therefore their ability to provide service to the customers at competitive rates.

Q. Did you look at what it would cost an entity like the City of Chattanooga that might own a water utility to issue debt?

A. We did because we thought this was relevant. The credit profile of a free standing municipal utility should be equal to or worse than that of TAWC. By looking at the cost of long-term taxable debt for the free standing municipal utility one should be able to establish the maximum interest rate TAWC would have to pay on its own debt. The City of Chattanooga as a freestanding water agency we believe would be a single A rated municipal utiltity at a minimum. We have looked at what other similar municipally-owned credits could sell debt for on a taxable basis. We do that by comparing an individual entity's debt cost to a market index called "Municipal Market Data" or the MMD Index. We determined, on the average, the City of Chattanooga, if it were selling taxable debt with an average life of around 6 to 11 years, would be somewhere about 200 to 215 basis points over the Triple-A MMD interest rates. For example, as of May 19 of this year, the cost of debt for a freestanding municipal water system in Chattanooga in the 6-year range would be 4.5% and in the 11-year range would be 5.28%.

Q. Based upon this analysis, what would you believe a freestanding Tennessee American Water Company could issue debt for at this time?

A. The point is that we believe that American Water Works should be able to borrow money less expensively as a corporation than Tennessee-American Water Company or the City of Chatanooga can borrow as stand-alone. And, that is, in fact, substantiated by the information that we have reviewed. AWW is currently borrowing at about 5.1% and that is a good 15 to 20 basis points less than they could borrow if TAWC were borrowing alone.

Q. Could you issue a recommendation concerning the low cost of the long-term debt for TAWC?

A. We believe that the average interest rate that we should use in calculating their return on capital should be between 5.25% and 5.75%.

Q. What is your recommendation relative to the cost of short-term debt?

A. While, currently, commercial paper programs are issuing short-term debt in the 1% to 1.25% range, we believe for purposes of this analysis that the short-term debt cost should be 1.5% to 1.75%.

Q. How does that compare to what TAWC is advocating in this proceeding?

A. They propose 3.5%

Q. Have you considered the issue of return on equity for Tennessee-American Water Company?

A. We have. We believe that the appropriate measure of return on equity is the actual return that has existed in the market historically. We have looked at that from two different perspectives: (1) from American Water Works and (2) from a review of the ROE for other publicly traded private water utility companies. We have a history going back to 1996 of American Water Works.

Q. With regard to the American Water Works, what does your review analysis show regarding return on equity?

A. What we find is that since 1998 the return on equity has ranged from a low of 8.1% in 2002, to a high of 9.84% in 2000.

Q. Have you considered how this would compare to other water utilities?

A: Yes, we did look at other water utilities. We thought it was important that you focus on similar industries, because the return on in the telecom or electric utilities are significantly different than they are in basic water and sewers utilities. The reason they are different is that the risk profile of those industries are significantly different. Water and sewer credits are stable infrastructure utilities with stable rate bases. Fitch has done research on the default rates of water and sewer utilities relative to other utilities and even relative to general obligation debt. The default rates in the waters and sewers is the lowest of all of the utility industries. The implication being that the risk profile of the water and sewer utilities is significantly lower than other public and private utilities.

Q: Are water and sewer utilities more credit worthy?

A: Yes, as I said above they are very stable industries. They are utilities whose rates are not very price elastic in a sense that people have to have water and sewer facilities, so those two utilities tend to depend higher on debt and lower on equity than other utilities do and they tend to have a lower cost of debt and equity than other utilities.

Q: Did you study other water utilities with regard to return on equity?

A: Yes, we looked at several different groups of water utilities. First, we looked at a group of smaller utilities. The average capitalization of approximately $300,000,000 as opposed to the capitalization of American Water Works over $5.3 billion. What we would expect is that as we look at smaller companies, they would have higher returns on equity and larger companies would have lower returns on equity, because of less risk involved in the larger companies. In fact, that is exactly what we found. We looked at 14 smaller companies, and their five-year return on equity averaged 10.8%. We then looked at a group of 11 companies that are all rated "A" or better, that are larger in size, some larger than Chattanooga, some approximately the size of Chattanooga. The 7 year average rate of return on equity for these utilities was 9.64%.

Q: Well, what is your conclusion based on that analysis?

A: Well, we went one step further. We actually looked at a study that was performed by Cornell University which again looked at the rate of return on equity for water utilities and they broke it down as a seven year average and they broke it down by size. This study confirmed our assumption and our prior observations. The larger utilities had a lower equity ratio than smaller ones did. And they came to the same conclusion. The small utilities, with capitalization below $250 million, had average ROE's above 10.35%, and the larger utilities, those with capitalizations greater than $500 Million, averaged 9.5%.

Q: What are your ultimate conclusions on this issue?

A: The rate of return on equity that we should be using in our calculations should be somewhere between 8.15% and 9.6%.

Q: Did you also look at other subsidiaries in the American Water Works company with regard to the return on equity?

A: Yes, we did in regard to the return on equity. We studied the Pennsylvania American Water Company, which is a sub of AWW that also files public financial reports with the SEC. Their return on equity, which we thought was particularly relevant, was 8.77%.

Q: And how does that compare with what you recommend in this case?

A: It falls exactly in the middle of the range that we are recommending as a return on equity. We have suggested that the appropriate return on equity should be somewhere between 8.16% and 9.65% and that is exactly were the Pennsylvania American Water Company's ROE falls.

Q: What would the recommended range of each component of capital be for Tennessee American Water Company?

A: There are four components. The short-term debt, we came to the conclusion that the appropriate range was 1.5% to 1.75%. The long-term debt, we believe that the

appropriate range is 5.25% to 5.75%. For preferred stock, we accepted the rate that is currently being paid on the preferred stock at 5.01%, and for equity, we believe the appropriate return on equity is between 8.16% and 9.65%.

Q: How did you apply those rates of return to the TAWC capital structure?

A: What we have done is to take our recommended rates and applied those rates to the TAWC capital structure as it has been stated by Mr. Moul in his testimony. We believe that is the high end of what would be an acceptable range. And that would be, if you take 1.5% for short term debt, 5.25% for long term debt, 5.01% preferred stock and 8.16% for the common equity, you will come up with a weighted average cost of capital of 6.24%. Beyond that, if you take the high end of the range, the 1.75% for short-term debt, the 5.75% for long-term debt and the 5.10% for preferred stock and 9.65% for common equity, you come up with a weighted average cost of capital of 7.14%.

Q: OK. So that's the overall range?

A: So the range there is 6.24% to 7.14%. However, we believe that cost of capital includes a higher than appropriate allocation to equity. If we were to take the American Water Works, equity to debt ratio, which is 31.6% for equity, you will get a range of a cost of capital from 5.91% to 6.7%.

Q: OK. So what is your overall recommendation?

A: Our overall recommendation is that the average is 6.5% and that it is the appropriate cost of capital for TAWC to use in calculating rates and fees prior to the merger with RWE.

Q: Do you think that the merger with RWE should have any impact on the cost of capital for TAWC?

A: Based upon the testimony of RWE to several regulatory agencies at the time of the merger; one of the points that they made over and over again, was that they were a larger global company and that their cost of capital should be less than the cost of capital of AWW, and that the utilities like Tennessee Water should see a lower cost of capital after the merger than they did prior to the merger. Our conclusion is their 6.5% cost of capital

is the appropriate level for the old AWW company. And in fact, once you see the merger, you should see a cost of capital that is equal to or less than what it would have been under the old AWW structure.

Q: Thank you. Does that conclude your testimony?

A: Yes.

TENNESSEE REGULATORY AUTHORITY

STATE OF TENNESSEE

COUNTY OF HAMILTON

BEFORE ME, the undersigned authority, duly commissioned and qualified in and for the State and County aforesaid, personally came and appeared Marlin L. Mosby, Jr. who, being by me first duly sworn deposed and said that:

He is appearing as a witness on behalf of the City of Chattanooga before the Tennessee Regulatory Authority, and if present before the Authority and duly sworn, his testimony would set forth in the annexed transcript consisting of 10 pages.

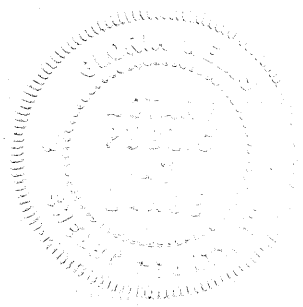
Marlin L. Mosby, Jr.

Sworn to and subscribed before me

This 29th **day of May, 2003.**

Notary Public

My commission expires MY COMMISSION EXPIRES: March 27, 2007



Tennessee-American Water Company
Direct Testimony
of
Public Financial Management
Concerning Cost of Capital

We have been engaged by the City of Chattanooga to research and provide direct testimony regarding the cost of capital and return on equity for the Tennessee-American Water Company ("TAWC"). This report details our research, findings and recommendations in the following categories:

- Capital Structure
- Cost of Long-Term Debt
- Cost of Short-Term Debt
- Return on Equity
- Pennsylvania Example
- Recommendation

Capital Structure

The Tennessee-American Water Company has stated their capital structure to be the following:

Type of Capital	Ratio
Short-Term Debt	6.15%
Long-Term Debt	50.02%
Preferred Stock	1.64%
Common Equity	42.19%
Total	100.00%

Source: Direct Testimony, Paul R. Moul for TAWC.

Such capital structure appears appropriate for a water utility company. We would expect to find a heavier debt than equity weighting given the amount of capital projects and the affordability of debt relative to equity. We felt it was necessary to compare the capital structure of Tennessee American Water Works Company to its direct parent, American Water Works Company, Inc.

American Water Works Company, Inc. ("AWW") is the direct parent of TAWC. AWW is a well-capitalized, regulated water utility. In its 2002 Operational and Financial Report, AWW states, "The bulk of the company's activities are centered in locally managed utility subsidiaries that are regulated by the state in which each operates." Indeed, we find this to be true as we look at the breakout of AWW's operating income:

American Water Works
Operating Income Components

Dollars (in millions)

Fiscal Year	Regulated	Unregulated	Other	Total
2002	1,486,576	228,597	-	1,715,173
2001	1,376,637	62,250	-	1,438,887
2000	1,310,116	40,474	-	1,350,590

Percentage

Fiscal Year	Regulated	Unregulated	Other	Total
2002	87%	13%	0%	100%
2001	96%	4%	0%	100%
2000	97%	3%	0%	100%

As such, we believe the capital structure of TAWC should closely resemble that of its direct parent AWW. We also believe that the size of AWW (approximately $1.5 billion in regulated water utility revenue) should afford TAWC easy access to low-cost capital. AWW's historical capital structure since 1996 is shown in the table below:

American Water Works
Historical Capital Structure

Dollars (in millions)	2002	2001	2000	1999	1998	1997	1996
Short-Term Debt	394.712	580.17	573.57	278.22	142.35	159.91	204.53
Long-Term Debt	3470.751	2,550.02	2,271.17	2,393.10	2,332.19	1,870.77	1,716.39
Preferred Equity	33.858	49.42	52.69	93.81	97.09	97.66	99.01
Common Equity	1801.921	1,758.02	1,669.68	1,634.80	1,481.61	1,142.42	1,057.87
Total Market Cap.	5,701.24	4,937.63	4,567.11	4,399.93	4,053.24	3,270.76	3,077.80

Percentage	2002	2001	2000	1999	1998	1997	1996
Short-Term Debt	7%	12%	13%	6%	4%	5%	7%
Long-Term Debt	61%	52%	50%	54%	58%	57%	56%
Preferred Equity	1%	1%	1%	2%	2%	3%	3%
Common Equity	32%	36%	37%	37%	37%	35%	34%
Total	100%	100%	100%	100%	100%	100%	100%

Source: 2002 data from AWW financials, all other data from Bloomberg L.P.

For the most part, TAWC's capital structure resembles that of AWW. It appears that TAWC has a higher equity allocation and a lower long-term debt allocation than that of its parent by about 5 to 10%.

We would expect that the capital structure would mirror that of AWW at a minimum. We would also expect that Chattanooga's water utility would present a very strong credit relative to other water utility holdings of AWW, which would justify a lower equity allocation. We were unable to reason why AWW has allocated a higher equity component to TAWC.

In 2003, AWW was acquired by RWE AG (see Appendix I for a diagram of the current ownership structure). RWE AG is, for the most part, a globally diversified utility holding company with core businesses in Electricity, Gas, Water and Environmental Services. While we reviewed the capital structure of RWE, we did not feel that it appropriately reflected the capital structure of a U.S.-based, regulated water utility. We did note, however, that RWE allocated capital costs to its core businesses on a 60% debt, 40% equity basis, which is in line with that of AWW.

Cost of Long-Term Debt

To analyze the cost of debt to an entity such as TAWC, we first researched the cost of long-term debt for American Water Works. As demonstrated above, AWW is a large, regulated utility company with a historically stable capital structure. AWW should be able to obtain lower cost debt than debt acquired by TAWC if it were not a wholly-owned subsidiary.

American Water Works lists the cost of long-term debt for itself and its subsidiaries in its annual report. The table below summarizes long-term debt information from American Water Works 2002 and 2001 annual reports:

American Water Works
Long-Term Debt Cost

Long-Term Debt of American Water Works Company, Inc.

			2002		2001		2000	
Description	Maturity	Coupon	Amount	Percentage	Amount	Percentage	Amount	Percentage
Series C Debentures	5/1/2003	7.41%		0%	81,000	27%	81,000	51%
Series D Debentures	7/2/2002	6.28%		0%		0%	10,000	6%
Series D Debentures	7/2/2003	6.28%		0%	45,000	15%	45,000	28%
Series D Debentures	7/2/2004	6.32%	15,000	9%	15,000	5%	15,000	9%
Senior Note	8/1/2005	7.02%	4,000	2%	6,000	2%	8,000	5%
Senior Note	11/6/2006	4.92%	150,000	89%	150,000	51%		0%
Total			169,000	100%	297,000	100%	159,000	100%
Weighted Average Coupon			5.09%		5.92%		6.90%	

Long-Term Debt of Subsidiaries

	2002			2001			2000		
Interest Rate	Amount	Percentage	Cumulative	Amount	Percentage	Cumulative	Amount	Percentage	Cumulative
1% to less than 2%	127,531	4%	4%	25,363	1%	1%	16,913	1%	1%
2% to less than 3%	4,627	0%	4%	63	0%	1%		0%	1%
3% to less than 4%	2,453	0%	4%	314	0%	1%	353	0%	1%
4% to less than 5%	1,078,187	33%	37%	155,295	7%	8%	3,552	0%	1%
5% to less than 6%	690,954	21%	58%	487,563	22%	30%	487,922	23%	24%
6% to less than 7%	566,271	17%	75%	649,658	29%	59%	513,182	24%	48%
7% to less than 8%	546,798	17%	91%	588,571	26%	85%	706,580	33%	82%
8% to less than 9%	91,000	3%	94%	99,103	4%	89%	113,200	5%	87%
9% to less than 10%	150,111	5%	99%	194,189	9%	98%	214,646	10%	97%
10% to less than 11%	41,000	1%	100%	50,371	2%	100%	53,352	3%	100%
Total	3,298,932	100%		2,250,490	100%		2,109,700	100%	

As shown in the table, the average cost of debt for American Water Works has decreased by 181 basis points since 2000. The average cost of all outstanding debt today for AWW is 5.09%.

Further, debt of AWW's subsidiaries appears to have a similar trend. In 2000, 24% of AWW's subsidiary debt had interest rates below 6 percent and 48% had interest rates below 7 percent. In 2001, these numbers increased with 30% having interest rates below 6 percent and 59% having interest rates below 7%. In 2002 the cost of debt for AWW's subsidiaries was reduced by approximately 100 basis points as 37% had interest rates below 5% and 58% had interest rates below 6%.

Typically, corporations will manage long-term debt costs to a duration target between five and ten years. Most corporate managers accept the fact that their debt yield curve is upward sloping (i.e., yields, or debt cost, increase as the maturity date is extended). As such most managers will target a long-term cost of debt within the five to ten year maturity range.

There are two basic methods to achieve this long-term debt target: (1) issue debt with five to ten year maturities, or (2) issue longer-term debt and shorten the duration synthetically with derivatives.

We did not find the use of derivatives in AWW's 2002 and 2001 annual reports to further reduce its cost of debt. AWW's average cost of long-term debt of 5.09%, however,

would suggest the company is managing to a long-term cost of debt within the five to ten year timeframe.

We also reviewed RWE's cost of debt. In its 2002 annual report, RWE states, "the average interest rate (coupon) for bonds outstanding in all currencies is 5.82% per annum. Bonds were partly secured by interest rate and currency derivatives."

We were unable to determine from the financials whether the 5.82% is before inclusion of derivatives. We were also unable to determine what additional adjustments should be made to this number, given that the water component of RWE is most likely one of the least risky components and should, therefore, have a lower than average debt cost.

As declared by FitchRatings, water and sewer credits are some of the strongest credits in the municipal market (see FitchRatings report titled, "Secure Credit on Tap, Municipal Water/Sewer Ratings Move Upward" attached as Appendix II). Fitch's report states:

> The key credit strengths of most municipal water and sewer utilities remain their enduring, regulated 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. . .
>
> While regulation continues to ratchet up requirements related to some contaminants (particularly for some small systems), the most potentially burdensome regulatory mandates for municipal enterprises, especially initial conversion to secondary wastewater treatment, appear to be in the past for most systems. Also, regulatory focus has already shifted somewhat from municipal point sources of pollution to the more amorphous nonpoint water pollution sources, which affect municipal operations less consistently.

While we acknowledge that TAWC is not a municipal water credit, we believe the key credit points made by FitchRatings in their article are relevant to TAWC's business model. Fitch's points highlight the strong credit nature of water utilities and the reduced risk of this structure relative to other utilities components such as electric and solid waste.

Additionally, we reviewed the cost of debt to the City of Chattanooga, if it issued debt on a taxable basis for water purposes. To determine the cost of debt for an entity such as the City of Chattanooga, we researched comparable, taxable water utility transactions for the period of 1999 through today.

We found 26 taxable, municipal debt transactions since 1999. For these transactions, we calculated a spread to the Municipal Market Data AAA-rated curve based on the original yield and year of maturity. The Municipal Market Data (commonly called "MMD") curve is a curve used to price municipal securities. Municipal credits typically trade at a spread-to-MMD, similar to a corporate credit trading at a spread-to-treasury.

We then computed an average spread to MMD calculated across all transactions for each year of maturity. As shown in Appendix III, municipal debt is typically issued as a series of principal maturities rather than a single, bullet maturity. To approximate a bullet maturity, we look at the average life of the transaction and utilize that maturity's cost of debt as a municipal issuer's targeted cost of funds.

Appendix III shows the majority of issuers issue 10 year debt with a significant portion issuing debt as long as 20 years. Such transactions would have average lives of approximately 6 and 11 years, respectively. Again, this methodology is similar to a corporate manager targeting a long-term cost of debt between five and ten years. The spread to MMD for debt with a 6 year average life is 215 basis points, and 200 basis points for 11 year debt.

Using the information from our analysis, we add the spread to the current MMD curve and the resulting Cost of Debt is our target cost of funds. As of May 19, 2003, the 6 year MMD was 2.37% and the 11 year MMD was 3.28%. The resulting cost of debt is calculated as:

Average Life	MMD Spread	May 19 MMD	Cost of Debt
6 Years	2.15%	2.37%	4.52%
11 Years	2.00%	3.28%	5.28%

Additionally, we checked the Bloomberg Fair Market Sector Curve for the current cost of debt for an A-rated utility. The Bloomberg Fair Market Sector Curve is a yield curve prepared by Bloomberg L.P., which shows the cost of debt for a given maturity, given market sector and given credit rating. As of May 22, 2003, the Bloomberg Fair Market Sector Curve showed the 5-year cost of debt to be 3.41% and the 10-year cost of debt to be 4.47% for a single-A rated U.S. utility.

Given the credit structure is the same if the City of Chattanooga issues the debt or TAWC issues the debt we believe these are fair estimates of TAWC's cost of debt for this water utility. The table below summarizes our findings as it relates to the cost of long-term debt for the Tennessee American Water Company:

Description	Cost of Debt
AWW 2002 Weighted Average Cost of Debt	5.09%
RWE 2002 Stated Cost of Debt	5.82%
City of Chattanooga Water Utility Taxable Debt (11 Yrs)	5.28%
Average	5.40%

Based on our analysis of American Water Works' and RWE's funding, we believe a 5.50% cost of long-term debt is both reasonable and attainable by the Tennessee American Water Company. We are recommending the cost of long-term debt for TAWC be set between 5.25% and 5.75%.

Cost of Short-Term Debt

We are currently seeing commercial paper programs with short-term debt costs of approximately 1.0%. As recently as last week, we saw issuers achieving short-term debt costs below 1.0%.

For two to three year planning purposes, we have recommended our municipal clients anticipate short-term borrowing costs between 1.50% and 1.75%. We believe AWW can achieve similar rates, given its size and credit rating and that a 1.50% to 1.75% cost of short-term debt is appropriate for TAWC.

Return on Equity

To determine the return on equity (ROE) for Tennessee-American Water Works, we looked at the return on equity generated by its direct parent, American Water Works. Again, AWW is predominantly a regulated water utility company, with operating revenues from regulated water utilities ranging from 87% to 97% of total revenues over the last three years. Additionally, TAWC should (1) have a return on equity equal to its direct parent because it does not issue its own stock, and (2) set rates based on the returns expected by AWW's investors.

The table below shows the historical return on equity for American Water Works.

American Water Works
Historical ROE
($ in millions)

	2002	2001	2000	1999	1998	1997	1996
ROE[1]		9.39%	9.52%	8.66%	11.66%	12.15%	10.41%
Net Income[1,3]	147.06	164.47	164.23	142.26	153.85	141.21	105.29
Total Common Equity[1,3]	1,801.92	1,758.02	1,669.68	1,634.80	1,481.61	1,142.42	1,057.87
Calculated ROE[2]	8.16%	9.36%	9.84%	8.70%	10.38%	12.36%	9.95%
Per AWW Financials		9.60%	9.60%	9.10%	10.90%	10.80%	11.40%
Average ROE	8.16%	9.45%	9.65%	8.82%	10.98%	11.77%	10.59%

[1]Source: Bloomberg L.P.

[2]Calculated by dividing Net Income by Total Common Equity.

[3]2002 information was obtained from American Water Works 2002 Operational. and Financial Report, Management Discussion and Analysis.

As shown in the Historical ROE table, AWW's return on equity ranged from approximately 10.59% to 11.77% in the years 1996 through 1998 with an average of 11.11%. Since 1998, AWW's return on equity has ranged from approximately 8.16% to 9.65% with an average ROE over this time period of approximately 9.02%.

We also reviewed the impact of the merger with RWE on AWW's expected return on equity. As expected, we were unable to isolate the regulated water utility component of RWE and to determine this component's potential impact on the overall ROE of RWE. We did find, however, numerous statements from RWE and AWW, which suggested the overall cost of capital for AWW and its subsidiaries would be reduced as a result of the merger.

As was demonstrated in TAWC's hearing by the Tennessee Regulatory Authority (the "TRA"), RWE's purchase of American Water is expected to result in lower capital costs for the Tennesse-American Water Company. TAWC's petition to the TRA, Docket No. 01-0116, dated December 12, 2001, states, "Tennessee-American will be able to access the vast financial, technical services and other resources available through Thames Holdings and its parent or one of its subsidiaries. Affiliation with Thames Holdings will enhance Tennessee-American's ability to obtain necessary capital."

Similarly, the Arizona-American Water Company, Inc.'s hearing, Docket No. W-01303A-01-0983, dated August 8, 2002, proposed a lower cost of capital as a result of the merger with RWE:

> Arizona-American believes that the proposed transaction is likely to generate benefits for Arizona-American and its utility customers. Arizona-American states that in addition to potential reductions in the cost of capital, Thames Water's extensive experience in managing water and wastewater operations throughout the world, when combined with the existing expertise of American Water Works' management, should enhance the quality of service provided to Arizona-American utility customers...
>
> Staff and Arizona-American agree that as a result of the proposed transaction, Arizona-American may benefit from the lower cost of capital that RWE enjoys as compared to that of Arizona-American's affiliate, American Water Capital Corp., which currently provides debt capital to Arizona-American through its parent, American Water Works. Because RWE's credit ratings are superior to those of American Water Capital Corp. at the present time, and RWE has substantially larger market capitalization than that available to Arizona-American through American Water Works and American Water Capital Corp., RWE currently has greater equity and debt financing capability than American Water Works and American Water Capital Corp.

RWE/Thames Water Company further indicated reduced capital costs during the Kentucky-American Water Company hearing (Kentucky-American Water Company, Thames Water Aqua Holdings GmbH, Case No. 2002-00018, Responses to Commission Staff's First Set of Interrogatories and Requests for Production of Documents dated February 22, 2002, Item No. 21). When asked to describe the positive rate impacts of the merger, Thames Water responded:

> The transaction will not adversely affect rates. In addition, over the long run, customers of KAWC should see a moderation in the need for rate relief from what it would have been absent the transaction, due to at least the following factors, which exceed the existing capabilities of American Water standing alone:

1) Greater economies of scale within a worldwide organization…

4) Greater access to sources of capital allowing a more flexible and cost effective approach to financing new water quality standards, infrastructure replacement, etc.

Kentucky-American customers will positively benefit from the worldwide experience of RWE and Thames Water in the areas of technology development and deployment, human resources and training, research, security, financing and other practices.

Additionally, AWW cites access to lower cost capital as a merger benefit in its 2002 Operational and Financial Report:

> As important as this change is to matters such as access to lower cost capital, a vastly increased pool of financial and technical resources, and the ability to share best practices, much of what has defined American Water will change little if at all…
>
> Where capital is required, lower-priced capital becomes a critical advantage. American Water Service's access to the financial strength of RWE provides the type of advantage needed to continue to succeed in the competitive fee-for-service business.

While it is acknowledged that the merger with RWE should reduce TAWC's capital costs, it is difficult to determine the magnitude of such adjustment. There are very few companies the size of RWE, the world's third-largest water company (Vivendi and Suez are the world's first and second largest water companies). Additionally data on the capital structure of their water divisions is extremely difficult to break out and financial information is often consolidated across business groups. Very little information is available on regulated water divisions and typically no analysis or breakout is performed on their contribution to the parent company's return on equity.

We, therefore, are forced to review the return on equity for smaller, U.S.-based water producers. While we believe these companies are not relevant comparables for TAWC, AWW or RWE, they do provide the outlying or maximum required ROE for a water utility company from which we can reasonably make adjustments for AWW and RWE. In reviewing this information, we recognize that such companies do not benefit from the economies of scale or the improved access to capital markets from which subsidiaries of AWW or RWE benefit (again, this improved capital cost and resulting lower rates is often one of the key issues in approving mergers).

Just to provide a benchmark for the relative difference among RWE and AWW and other water utilities, we look to market capitalization as a measure of the overall size and capital ability of a company. In layman's terms, market capitalization is simply the sum of a company's current debt, preferred stock and common stock. Companies with larger market capitalization generally have better access to the capital markets, more sophisticated debt management and lower capital cost structures relative to smaller companies.

It is easy to see why there are few comparables for RWE when looking at their market capitalization. RWE's market capitalization per their 2002 Annual Report is 13.7 billion

Euros, or $13.1 billion, as of December 31, 2002. American Water's market capitalization is approximately $5.3 billion as of December 31, 2002.

There are several water companies which trade on U.S. exchanges that we can obtain capital cost and ROE information. As you can see from the market capitalization information below, these companies are much smaller than either RWE or American Water. The table below summarizes information gathered on these companies:

Company	Market Capitalization (millions)	12 Month Average ROE	5 Year Average ROE
American States Water Co.	391	9.46	10.31
Artesian Resources Corp.	85	9.05	9.28
California Water Service Group	414	8.23	10.16
Connecticut Water Service	200	12.55	12.17
Consolidated Water Co.	62	12.97	14.12
Middlesex Water Company	176	9.88	9.64
Pennichuck Corporation	56	6.13	10.85
Philadelphia Suburban	1,573	13.99	13.42
SJW Corp.	258	11.61	9.80
Southwest Water Company	124	7.81	11.44
Vivendi Environnement (ADR)	n.a.	5.91	-9.69
Western Water Company	n.a.	-76.00	-40.05
The York Water Company	118	9.91	10.96
Average[1]	314	10.55	10.80

[1]Average ROE excludes Vivendi Environnement. Additionally, Average ROE excludes highest and lowest values as outliers.
Source: multexInvestor, financial research and information, A Reuters Service.

As shown in the table above, the average market capitalization of these companies is $314 million, the twelve-month return on equity is 10.55% and the average five-year ROE is 10.80%.

It is also of interest to note that Vivendi Environnement's ROE, which was excluded from our averages due to their large market capitalization, was 5.91% over the last twelve months and –9.69% over the last five years. While Vivendi Environnement is certainly a comparable for RWE, it is obvious that other business lines within the consolidated company have had a drag on earnings. This example highlights the difficulty in analyzing the appropriate ROE for large, global holding companies.

We also obtained a research report from Standard and Poor's rating agency as of February 12, 2003 which details return on equity information for 11 water utilities rated by Standard and Poor's. The table below shows the information obtained from this report:

Water Company Return on Equity
Standard and Poor's Water Utilities Credit Stats
Report Dated: February 12, 2003

	Rating[1]	1995	1996	1997	1998	1999	2000	2001
Baton Rouge Water Works Co.	AA		13.9	13.0	12.6	11.8	14.2	
BHC Co.	A		10.3	11.5	14.4	14.9	11.8	
California Water Service Co.	AA-				21.3	10.5		
Elizabethtown Water Co.	AA-	6.3	4.6	10.1	11.0	8.9		
E'Town Corp.	AA-	5.8	4.3	9.9	10.3	8.9		
Middlesex Water Co.	A			10.4	8.2	8.6	6.6	8.8
New Jersey-American Water Co.	A		7.4	10.9	9.8	10.0	9.1	
Pennsylvania Suburban Water Co.	A+				23.7	11.9	11.4	
Southern California Water Co.	A+			9.3	9.9	10.4	10.9	11.0
United Water New Jersey	A-		10.7	11.1	13.0	9.8	11.6	
United Waterworks	A-		7.4	4.9	4.8	3.9	7.8	
Average		6.05	8.37	10.12	12.64	9.96	10.43	9.90

7-Year Average ROE:	**9.64**

[1]As of July 1, 2002

The S&P data shows that ROE's for water utilities have ranged from a low of 6.05% to a high of 12.64% over the period of 1995 to 2001. While no adjustment has been made for outliers or the number of observations, the seven-year average ROE for these companies is approximately 9.64%.

It is also important to note the E'town Corporation is a subsidiary of Thames Water plc, which is ultimately held by RWE AG (see Appendix I). E'town Corporation is also the parent company of Elizabethtown Water Company. Thames Water acquired E'town on November 27, 2000.

Prior to their acquisition by Thames Water, E'town's ROE ranged from 4.3% to 10.3%, with an average of 7.8%, and Elizabethtown's ROE ranged from 4.6% to 11.0%, with an average of 8.2%.

Further, Cornell University's Parker Center for Investment Research computed seven-year median ROE's for U.S.-based companies in various industries. In their report as of May 1999, the Water Utilities industry shows the following ROE's based on capitalization:

Industry	7 Yr Median (all)	Number of Observations	7 Yr Median (250+)	Number of Observations	7 Yr Median (500+)	Number of Observations
Water Utilities	10.35%	16	9.90%	6	9.50%	3

Source: Using Target Return on Equity and Cost of Equity, May 1999, Cornell University's Parker Center for Investment Research, http://parkercenter.johnson.cornell.edu.

The Cornell study demonstrates a declining ROE as market capitalization increases. The seven year median ROE for all water utilities is 10.35%. For water utilities with market capitalization greater than $250,000,000, the seven-year ROE median is 9.90%, and 9.50% for water utilities with market capitalization greater than $500,000,000. Also, it is important to note that the number of observations drops significantly as market capitalization increases, from 16 for all water utilities to 3 for those greater than $500 million, again demonstrating the lack of sufficient data to adequately quantify the merger benefits to TAWC from AWW or RWE.

Given the lack of comparable data, it is difficult to measure the reduction in ROE attributable to the RWE merger. We do, however, have information from which we can make a reasonable estimate of what the appropriate ROE should be. The table below summarizes the data we have gathered:

Data	ROE	Source
Median ROE for all utilities	10.35%	Cornell study
Median ROE for 250+ million mkt cap	9.90%	Cornell study
Average 5 year ROE for 314 million mkt cap	10.80%	Multex data
Median 7-Year ROE	9.64%	S&P
Median ROE for 500+ million mkt cap	9.50%	Cornell study
AWW 5.3 billion mkt cap	9.02%	Averaged from multiple sources
PAWC 1.5 billion mkt cap	8.77%	PAWC SEC filings
Vivendi 18 billion mkt cap	5.91%	Multex

As summarized in the table above, ROE appears to decline as market capitalization increases. For small companies below $500 million market capitalization, ROE ranges from 9.64% to 10.80%. For companies with market capitalization above $500 million, ROE ranges from 5.91% to 9.50%.

American Water Works, with an approximate market capitalization of $5.3 billion, showed a 9.02% average return on common equity. This return on equity is a direct pass-through to AWW's subsidiary, the Tennessee-American Water Company.

We believe the appropriate ROE assumption for TAWC should be based on the ROE that has historically been achieved through American Water Works, an extremely large, regulated water utility company. In reviewing AWW's financial information, we find that AWW's ROE has ranged from 8.16% to 9.65% since 1998, and believe that this represents an appropriate range of ROE for TAWC. We also believe that an additional downward adjustment is warranted given the reduced cost of capital promised from the merger with RWE.

Pennsylvania Example

We also researched the ROE for the Pennsylvania American Water Company ("PAWC"), a subsidiary of American Water with a market capitalization of $1.5 billion. PAWC's SEC filings show a cost of capital as of June 30, 2002, of 7.51%, of which the return on common equity is 8.77%. Their capital structure is summarized below:

Capital Type	Ratio	Rate
Debt	58.14%	6.62%
Preferred	1.01%	8.06%
Common Equity	40.85%	8.77%
Weighted Average		7.51%

Source: Pennsylvania American Water Company, SEC Filing, 12 months ended June 30, 2002.

The above table shows the Pennsylvania American Water Company's cost of debt is above our recommended range of 5.25% to 5.75%. It also shows that PAWC's cost of equity is on the low end of our recommended ROE range of 8.16% to 9.65%. In fact the mid-point of our range is 8.91%, while the actual average ROE for AWW was 9.02%. PAWC's ROE of 8.77% is below both our recommended mid-point and AWW's average.

Recommendation

To determine an overall cost of capital for the Tennessee-American Water Company, we recommended high and low ranges for cost rates of each component of TAWC's capital structure. As our discussions detailed, our recommended range for each component is as follows:

Type of Capital	Low Value	High Value
Short-Term Debt	1.50%	1.75%
Long-Term Debt	5.25%	5.75%
Preferred Stock	5.01%	5.01%
Common Equity	8.16%	9.65%

We performed no analysis of the cost rate of preferred stock for TAWC or AWW and have simply accepted TAWC's proposed rate as stated in the testimony of Paul R. Moul.

We also analyzed the overall cost of capital using the Tennessee-American Water Company stated capital structure and the American Water Works Fiscal Year 2002 capital structure. The following tables show the overall cost of capital for each scenario:

TAWC Stated Capital Structure

		Low Value		High Value	
Type of Capital	Ratio	Cost Rate	Weighted Cost Rate	Cost Rate	Weighted Cost Rate
Short-Term Debt	6.15%	1.50%	0.09%	1.75%	0.11%
Long-Term Debt	50.02%	5.25%	2.63%	5.75%	2.88%
Preferred Stock[1]	1.64%	5.01%	0.08%	5.01%	0.08%
Common Equity	42.19%	8.16%	3.44%	9.65%	4.07%
Total	100.00%		6.24%		7.14%

[1]Preferred Stock cost rate provided by Direct Testimony of Paul R. Moul for TAWC.

AWW FY 2002 Capital Structure

		Low Value		High Value	
Type of Capital	Ratio	Cost Rate	Weighted Cost Rate	Cost Rate	Weighted Cost Rate
Short-Term Debt	6.92%	1.50%	0.10%	1.75%	0.12%
Long-Term Debt	60.88%	5.25%	3.20%	5.75%	3.50%
Preferred Stock[1]	0.59%	5.01%	0.03%	5.01%	0.03%
Common Equity	31.61%	8.16%	2.58%	9.65%	3.05%
Total	100.00%		5.91%		6.70%

[1]Preferred Stock cost rate provided by Direct Testimony of Paul R. Moul for TAWC.

We believe the appropriate cost of capital for TAWC is within the values stated on the above tables. While admittedly an over-simplified approach, we believe the simple average of 6.50% (calculated by averaging all scenarios) is the best approximation for TAWC's overall cost of capital.

We also calculated the overall cost of capital using RWE's capital allocation structure of 60% debt and 40% equity. As the table below shows, this calculation produces an overall capital cost greater than that of AWW. This increased capital cost does not support RWE's statements that the cost of capital will be reduced as a result of its acquisition of AWW. We have, therefore, excluded RWE's capital allocation results from our recommendation.

RWE Capital Allocation Structure

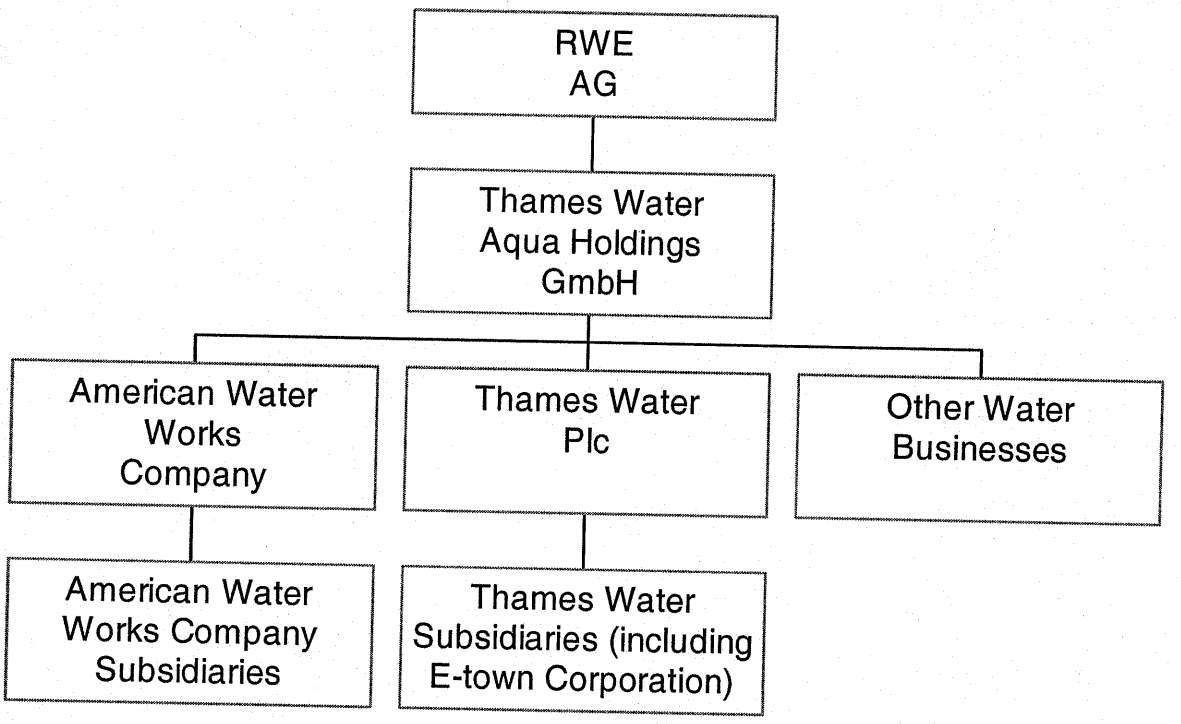
		Low Value		High Value	
Type of Capital	Ratio	Cost Rate	Weighted Cost Rate	Cost Rate	Weighted Cost Rate
Short-Term Debt	0.00%	1.50%	0.00%	1.75%	0.00%
Long-Term Debt	60.00%	5.25%	3.15%	5.75%	3.45%
Preferred Stock[1]	0.00%	5.01%	0.00%	5.01%	0.00%
Common Equity	40.00%	8.16%	3.26%	9.65%	3.86%
Total	100.00%		6.41%		7.31%

[1]Preferred Stock cost rate provided by Direct Testimony of Paul R. Moul for TAWC.

Appendix I
Current Ownership Structure of
Tennessee-American Water Company

Appendix I

RWE AG's Water Division



Source: Appendix 3, Petition of Tennessee-American Water Company for Approval of the Merger of its Parent, American Water Works, Company, Inc., with a Subsidiary of RWE Aktiengesellschaft, Docket No. 01-01116, December 12, 2001.

Appendix II
FitchRatings Report
"Secure Credit on Tap"

FITCH IBCA
The International Rating Agency

Public Finance

Revenue
Special Report

Secure Credit on Tap

Municipal Water/Sewer Ratings Move Upward

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Purpose

This report describes Fitch's revised methodology for rating municipal water and wastewater treatment revenue bonds in light of the results of Fitch's study of municipal default risk and consideration of future prospects for the sector.

Fitch's new guidelines and rating scale for the sector strive to make its credit analysis of the industry more accurate, so that issuers can incur more appropriate borrowing costs and investors receive fair returns that are commensurate with risk.

Comments are encouraged from investors, issuers, their advisers, and regulators, as Fitch continues to engage the market in an ongoing discussion that remains responsive to developments in the industry.

■ Summary

With enduring natural monopolies for provision of highly essential services, municipal water and sewer utilities in the U.S. are an extremely creditworthy debt sector with nearly no default history during the past quarter century. In the past, the usual rating range for these bonds was between 'BBB–' and 'AA'. Fitch's study of municipal default risk, as well as consideration of future prospects for the sector, suggested that this rating range was too low. Accordingly, in most instances, ratings will now be more accurately placed between 'A–' and 'AAA'. These new rating guidelines were developed as part of Fitch's nine-month review of the sector, its prospects, and all ratings within it.

On average, governments' abilities to use their monopoly power to accumulate revenues to pay water and sewer utility expenses were shown by the default study to be comparable to their abilities to collect taxes for similar general government purposes. The default study showed an aggregate sector default rate during the past two decades of 0.05% of water and sewer bonds issued. Although data collection discrepancies make exact comparisons difficult, water and sewer default experience appears to have been at least as low as that of local general obligations. Accordingly, Fitch's sector review brings the two sectors' ratings more in line with each other.

Similar to Fitch's earlier announcements for tax-supported debt, these new guidelines promise a much sharper focus on high-quality management practices — sometimes overlooked in the past — that Fitch believes have increased operating stability in the sector in the past three decades during the implementation of history's most significant environmental mandates by the U.S. government and states. For nearly every challenge still being faced by utilities in this highly varied nationwide debt sector, many of which are discussed in this report, foresighted management efforts can determine whether the challenges are met easily or in a way that undermines credit quality.

In prior weeks and with the release of this report, Fitch has upgraded 47% of its underlying water and sewer bond ratings to reflect the initial impact of the default study and these new guidelines, affecting holders of $27 billion in outstanding municipal bonds. Additional upgrades are possible as the new guidelines encourage issuers to better inform rating agencies of foresighted management practices and other factors mentioned in these guidelines.

■ Rating Consideration

Sector Has Been Underrated: Fitch's 1999 study of municipal default risk demonstrated the disparity between past performance and ratings for U.S. municipal water and sewer debt. For bonds issued during the past two decades, the aggregate default rate in the sector was about 0.05% of bonds issued. Not only was this default rate below that of 'AAA' rated corporate bonds as a class, it also was 1/15 that of 'AA' rated corporate bonds and a stunning 1/65 that of 'BBB' rated corporate debt.

Water/sewer default levels were at least comparable to those of tax-supported debt. In the past, rating agencies have generally rated water/sewer bonds below general obligation debt. In some cases, this is justified when enterprise revenue streams exhibit greater volatility due to demand or seasonal fluctuations, notably more demanding capital needs, or management practices result in a less stable operating environment for the utility. However, in other cases, a community's utility may be notably less politicized than the general government, able to function with stability more consistently than general government finances, and insulated by policy and practice from general government fluctuations. In such case, a water/sewer utility can be rated on par with or somewhat higher than a community's general obligation bonds.

Why Do Water/Sewer Bonds Perform So Well? The key credit strengths of most municipal water and sewer utilities remain their enduring, regulated 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. Operations of water and sewer utilities are often less politicized on a day-by-day basis than the wide array of general government operations affecting tax-supported bond ratings.

While state and federal environmental mandates will continue to require improvements that increase the safety of water supplies, statistics have shown that utilities have generally kept rates reasonably affordable — well under 4% of household personal income — despite the past three decades of extensive mandated improvements under the U.S. Clean Water Act (CWA) and Safe Drinking Water Act (SDWA). The sector is reasonably mature technologically, and there is no reason to assume that feasible challenges to current natural monopolies, particularly for retail water and sewer utilities, could be developed in most areas.

Some utilities are introducing competition to certain elements of operations to encourage cost savings, but they seem likely to continue doing this selectively and opportunistically, actually improving financial and operational performance. In a few areas, most notably in California, water supply scarcity and unusual characteristics of utility infrastructure, specifically an existing network of water transmission facilities, should promote significantly increased competition in the wholesale water supply sector, with potential rating impacts in the medium term.

Stability Will Be the Focus of Fitch's Rating Process: Under Fitch's new rating methodology, the most creditworthy municipal water and wastewater treatment utilities — those rated 'AA', 'AA+', and 'AAA' — will perform well in multiple areas of Fitch's 10-point rating analysis *(see box, page 9)*. However, one word summarizes the characteristics of most high achievers — stability.

Utilities issuing 'AA', 'AA+', and 'AAA' bonds typically will be supported by a service area customer base demonstrating superior economic and demographic characteristics consistent with those seen for similarly rated general obligation bonds. These highest rated utilities also will exhibit multiple management practices that maximize stability by anticipating future regulatory and growth demands, reliably implementing needed rate increases to cover operational and capital costs, and ensuring liquidity sufficient to cope with unexpected sales shortfalls or emergency needs *(see box, page 4)*.

While political officials play a needed 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 professional financial management and planning practices, low and/or affordable rates, manageable and well planned capital programs, and segregation of enterprise fund finances from those of the general government.

Future Credit Outlook is Stable: Fitch expects the sector's credit performance to continue, thus justifying long-term stability of most ratings between 'A–' and 'AAA'. Generally, regulatory and growth demands will continue to put the greatest burden on utilities, including small enterprises, and Fitch's rating process will focus on their future effects on credit quality.

During the past three decades, ratepayers in many areas have experienced substantial rate increases to pay for mandated CWA and SDWA improvements. In some respects, to borrow a common phrase from structured and project finance, the past three decades can be viewed as a severe stress test for water and sewer operations.

While regulation continues to ratchet up requirements related to some contaminants (particularly for some small systems), the most potentially burdensome regulatory mandates for municipal enterprises, especially initial conversion to secondary wastewater treatment, appear to be in the past for most systems. Also, regulatory focus has already shifted somewhat from municipal point sources of pollution to the more amorphous nonpoint water pollution sources, which affect municipal operations less consistently.

Some communities will need substantial facility upgrades to deal with new regulations limiting the effect of wet weather pollution, such as combined sewer overflows (CSOs), and safeguarding surface and ground water supplies from microbial and disinfectant byproduct contamination. Implementation of new guidelines for arsenic and other contaminants, as well as federal and state regulators' newly enhanced powers to regulate total maximum daily loads (TMDLs) of certain contaminants in biologically impaired waterways, will affect some, but not all, issuers.

More consistently affecting municipal utilities will be the combined effects of mandated facility improvements and rising operational costs from aging facilities built in the past 30 years. Some are pushing for the revival of federal and state environmental grants, which were reduced in the 1980s to make way for low-cost revolving loan funds, as a way of combating cost pressures. However, Fitch believes this is highly unlikely in the current federal budgetary environment.

The aforementioned challenges will affect some utilities much more than others, and ratings should be differentiated accordingly. Nevertheless, most water and sewer enterprises in the U.S. should remain essential and monopolistic, exhibiting significant price inelasticity. While some ratings may fluctuate, most will remain strong.

■ What Is Fitch Changing?

Adjustments to Fitch's Rating Scale for the Sector: Because the sector has been underrated, Fitch has upgraded many bonds in the U.S. municipal water/sewer sector by one to three rating notches. In the past, the typical rating range was 'BBB–' to 'AA'. The more appropriate rating range to be used in the foreseeable future will be 'A–' to 'AAA'. With these adjustments, Fitch's average rating for the sector rises to the 'A+' to 'AA–' range, similar to its rating range announced in May 2000 for general obligation bonds.

A prime analytical reason for many of Fitch's upgrades is the default study's clear historical finding that water sewer utilities' abilities to accumulate revenues have been at least comparable to general governments' abilities to tax for debt and operational needs. Fitch believes the sectors should be rated more closely with each other.

Distinct credit vulnerabilities will be shown in 'BBB' category and lower ratings, including poor financial management, unstable customer bases, and severe performance problems. Notably higher default risk is typically reflected in 'BB' category and lower ratings.

"10 Cs" of Fitch's Analysis: Fitch now differentiates bonds in this low-risk sector following a comprehensive analysis of system operations, management, capital planning, and the customer base. Fitch will continue considering 10 areas of utility operations, although some areas will now be weighed more or less than they have in the past. As described in this report, these areas can be remembered as the "10 Cs" of Fitch's analysis — community characteristics (service area), customer base, capacity, compliance with environmental laws and regulations, capital demands and debt policies, coverage (including financial position), cash (balance sheet), covenants, charges (rates), and the "crew," an informal term for management strength. These elements are interactive in that strengths in one area can offset risks in another.

Fear of Federal and State Mandates and Effects on Rate Affordability: The credit risk of mandates has constrained many utilities' ratings. Yet, the last three decades, the most intense period of regulatory pressure ever, have had little discernible effect on the sector's default history. There are multiple reasons for this, including the essentiality of the services, their price inelasticity, and increasingly strong government management practices during the period. Ratings will continue to reflect specific vulnerabilities that will likely pressure future operations due to increasing regulation. This will affect some enterprises much more than others, and, for nearly all, foresighted planning and management efforts can be beneficial.

Where mandates or potential regulation is a concern, ratings will also reflect a sharp concern for rate affordability and competitiveness, both alone and

Management Practices That May Contribute to Higher Ratings

- Long-term financial forecasting that considers future growth in demand, regulations, and infrastructure renovation and renewal needs.
- Policies to ensure appropriate financial margins, including debt service coverage levels and levels of reserves for operating, maintenance, and debt service needs. Issuers with variable-rate debt should establish financial reserves to enable them to cope with interest rate fluctuations.
- Rate affordability guidelines, considering absolute levels of rates and their affordability relative to income levels.
- Prioritized capital improvement plans that consider growth, capacity, regulatory, and replacement and renewal needs.
- Regular financial reporting and monitoring systems that allow policymakers access to timely information on fiscal performance relative to budget.
- Collection policies that regularly track the rate of timely payment receipts and enforce penalties against late payers.
- Strategies to track and anticipate future regulatory mandates, including active membership in state, regional, and national trade associations by some utility officials.
- Limiting operating exposure to growth-sensitive revenues, such as tap, connection, or impact fees.
- 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.
- Informing customers of drinking water quality and other environmental benefits made possible by their rate payments.
- 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.
- 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.
- Budget and financial reporting awards from the Government Finance Officers' Association or other similar groups.

relative to income, especially when policymakers have shown reluctance to preserve past financial margins through revenue enhancement or cost containment. Nevertheless, Fitch believes its new rating range accurately reflects overall affordability of the sector, especially relative to environmental utilities in other industrialized nations.

Strong Management Practices Emphasized: As stated in Fitch Research on "Credit Ratings in the 21st Century" *(dated March 16, 2000, available on Fitch's web site at www.fitchratings.com)*, strong management practices have not been given sufficient and consistent credit in municipal finance. Yet, experience has shown that strong management practices can dramatically improve a system's prospects for stable financial performance. Throughout this report, best management practices in the water/sewer sector — relevant to each of the 10 areas of the rating review — will be emphasized *(see box above)*. In general, strong institutionalized management practices help ensure stable performance by improving a utility'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.

Credit Risks of Rural and Poorer Communities: In the past, utilities of rural communities — particularly those with a large agricultural presence — and poorer urban communities have earned significantly lower ratings than other enterprises due to considerable focus on wealth levels, economic growth, and sectoral diversification. Often, utilities in rural and poorer areas have been unable to achieve ratings higher than the 'BBB' category. Service area characteristics will remain a rating factor. However, there is little evidence that these types of service areas translate into substantially more defaults, especially when their populations are fairly stable and customer bases are not concentrated. Accordingly, utilities of these communities should be able to earn 'A–' or higher ratings if other system characteristics warrant.

Covenants Still Matter: In recent years, a general trend in the water/sewer sector toward relaxed covenants has developed. For instance, senior lien additional bonds tests requiring 1.15 times (x) or less coverage have become more common, and some issuers are considering lower debt service reserve requirements and other changes. A utility deemed likely to experience financial and operational pressures

could receive stricter scrutiny when covenant changes are considered. The particular rating impact of more relaxed covenants will depend on the system, its characteristics, and the specific proposed changes.

The highest rated bonds of retail water and sewer utilities will still typically have senior lien additional bonds and/or rate covenant requirements to maintain 1.2x coverage of debt service by net revenues annually. Covenants requiring set-asides for operational, maintenance, and other financial reserves are also highly positive credit features, as they heighten prospects for stable financial management.

Monopolies and Privatization: As stated, the regulated monopoly power of the sector is its key credit strength, providing the environment in which operating stability is made possible for a broad range of urban, suburban, rural, retail, and wholesale water and sewer utilities. Because of this, ratings must be especially attuned in the future to situations when monopolies may be eroded, as such an occurrence changes many aspects of a utility's operating environment.

Considering this, Fitch now expects to be especially sensitive to situations when supply scarcity, available infrastructure, and/or political will make likely the loss of some or all of a water or sewer utility's monopoly power. The most important credit vulnerabilities for the foreseeable future should be those instances — still likely to be rare nationally — when wholesale providers cease being the sole supplier of a resource to a customer base, similar to what has happened in the electric power, gas, and solid waste bond sectors with some rating impact.

However, partial or complete utility privatization does not eliminate an enterprise's monopoly power. Privatization efforts must be examined on a case-by-case basis to determine the effects, if any, on monopoly provision and likely impacts on both utility revenues and expenditures. In instances where privatization produces cost savings, positive rating effects are quite possible, all other credit considerations being relatively equal.

■ "10 Cs" of Fitch's Analysis

Community Characteristics: 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 also should be determining factors for water/sewer utilities since the essentiality of the enterprises' services provides localities with a de facto ability to tax for their provision. Accordingly, the vitality and diversity of the tax, or user charge, 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 have generally come to reflect distinct local economic characteristics. The 'AAA' general obligation and water/sewer ratings will typically reflect service areas with broad, fairly wealthy economies since they are less vulnerable to sectoral downturns and economic shifts. At the other end of the typical rating spectrum, 'A' category ratings reflect reasonably stable but less wealthy or diversified economies. The 'AA' category ratings are typically associated with utilities in the middle of this range, when considering wealth and 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 are more likely to have 'BBB' or lower water and sewer bond ratings. Tourist-based communities with relatively weak prospects for consistent attraction of visitors are perhaps the most likely to fall into the 'BBB' category. 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, and the utility's direct and indirect dependence on it should be considered.

Service base volatility can have its most severe effects when the largest customers, particularly industrial entities, pull out of a community. Generally, utilities with a large customer concentration will continue to find it difficult to achieve the highest ratings. To do so, the utilities must have a strong chance of surviving a large customer withdrawal relatively unscathed due to significant financial flexibility from existing revenues and reserves or low existing rates that would allow easier absorption of moderate rate increases to cope with the loss.

Customer Base: Related to service area demographics is growth in a utility's residential, commercial, industrial, and government customer bases. Strong customer base growth or the lack of it drives many financial and capital decisions of utilities and can be a negative rating consideration. Particularly noteworthy are credit impacts of both high-growth and declining customer bases and how governments' management practices can offset credit risks related to customer base growth issues.

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

Declines in an enterprise's customer base also can necessitate higher than expected rate increases for existing customers, as they must support capital and operating expenses related to expanding regulatory requirements and previously built facilities.

These growth challenges pose credit concerns, but management can largely offset these risks through the development of capital and financial plans that minimize growth risks. In high-growth locales, higher rated utilities 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 less reliance on underused assets, when possible. 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.

Significant operating exposure to growth-sensitive revenues, such as tap, connection, or impact fees, will continue to be a credit concern for some utilities. When growth-sensitive fees represent more than 20% of annual revenues, scrutiny will be most intense during the rating process. Steps to mitigate these concerns include excluding or limiting reliance of rate covenants and additional bonds tests on these growth-sensitive fees, implementing conservative budgeting strategies for such revenues, or meticulously tracking these fees as they accumulate and strictly limiting their use to growth-related capital, rather than operating, spending.

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. For slow-growth or declining customer bases, planners can help determine the priority of certain assets to be considered for downsizing.

In the Sun Belt states, such as Florida, Texas, Arizona, and California, many municipalities have significantly enhanced efforts to manage potentially strained regional water sources and encourage various forms of customer and government conservation. Water is a finite resource, and Fitch believes the coming decades will show that this is true in more and more communities, particularly in high-growth regions. Climate change related to global warming could also increase volatility of water supply sources. The highest rated water and sewer 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.

Compliance with Laws and Environmental Regulations: Mandates have been the dominant factor in water and sewer utility credit analysis since passage of the CWA and the SDWA. They continue to threaten some enterprises, as described, but utilities can reduce credit risk by consistently attempting to predict and stay ahead of expected regulatory requirements. From the viewpoint of operating stability, anticipating and financing improvements over time are generally preferable to doing so under the threatening restrictions of orders and fines from the state, the U.S. Environmental Protection Agency (EPA), or the judiciary.

Staying ahead of regulations not only reduces the potential need for financing costly improvements through rate increases in a short period, but also can improve the products being delivered to a utility's consumers. These products are safe and tasty drinking water from the tap and clean water effluent from wastewater treatment facilities. A minor factor that may have supported the sector's credit health during the past few decades was the burgeoning

environmental movement, particularly following the 1970 Earth Day event. Utilities may continue to benefit from consistently demonstrating to consumers the tangible benefits of their user charge payments through water quality reporting and reasoned public information campaigns. Both of these have been promoted in recent legislation and facilitated by the relative ease of on-line data transmission.

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 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. Utilities playing "catch-up" on capital and asset management practices will tend to be rated lower than those consistently maintaining their infrastructure.

Water and sewer utilities are capital intensive, with annual debt burdens often surpassing those of general governments as measured by the percentage of expenditures. Higher rated utilities will generally limit debt exposure by utilizing annual "pay-as-you-go" revenues, including excess user charges and growth-related fees, to fund a significant part of their capital programs. The highest rated utilities often fund 50% or more of their capital requirements from pay-as-you-go sources.

Coverage and Cash (Finance and Balance Sheet Considerations): As evident from the aforementioned discussion of capital demands, Fitch views long-term planning as a highly desirable credit feature for a water or sewer utility. Nowhere is this more true than for operations and finances of the enterprise, where long-range planning can illustrate clear future structural deficits necessitating revenue development or 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, 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, 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 with past rainfall volatility should consider the effects of such issues on their revenues and establish financial cushions to deal with potential weather events. Also, higher rated utilities will demonstrate regular financial reporting and accountability systems that report on year-to-date financial performance to rate regulators so that midyear revenue and expenditure adjustments can be considered, when needed.

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 possible. 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 60 days of operating revenues, could be sufficient for 'AA–' or higher ratings. For utilities with substantial growth or compliance demands or significant annual volatility in revenues or expenditures, greater financial flexibility may be necessary.

Covenants: Covenants promote a certain degree of credit stability for investors. If adhered to, they can provide a high degree of protection against water and sewer bonds ever being downgraded to speculative status. Standard bond covenants consistent with 'A' and higher ratings for retail water and sewer utilities include ones limiting parity bond issuance to instances when projected revenues cover annual debt service by at least 1.2x, requiring sum sufficient or greater rate setting annually to cover both operations and debt service costs, creating debt service reserve funds at the maximum levels allowed under tax law, and establishing other reserve funds for maintenance needs of the system. 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.

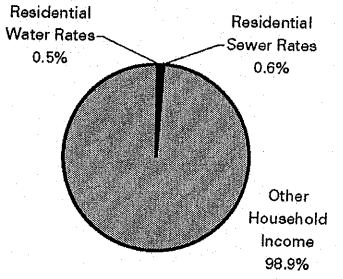
However, most retail water and sewer enterprises amply exceed their covenant coverage and liquidity requirements and should continue to do so. For them, the focus of a rating review should be actual and likely future performance, not minimum guaranteed performance in a dire scenario.

Covenants will receive the most scrutiny during the rating process when utilities, particularly retail utilities, show a likelihood of testing or breaching them altogether. In these cases, the covenants may dictate actual, rather than theoretical, financial performance.

Charges (Rate Affordability): Political leaders play a key role in overseeing utilities' rates. Higher rated utilities should 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 pay most user charges of retail systems.

While various rate affordability levels have been suggested in recent decades by government regulators, academics, and others, one prominent expert considers rates for water or sewer service higher than 2% of household income to be unaffordable. As regulations continue to increase and the cost of maintaining CWA and SDWA infrastructure grows, some studies, including one conducted by officials at the EPA, show that more communities may be forced to approach and surpass this target; however, today, few do.

Average Affordability of U.S. Water and Sewer Rates — 1999
(As % of Median Household Income)



Source: Raffelis Financial Consulting *2000 Water and Wastewater Rate Survey*; survey for all systems, based on 1,000 cubic feet of monthly residential water use.

Crew (Management): Management links all these credit features together. Throughout this report, Fitch has described numerous management practices related to each aspect of an enterprise's credit that should be actively considered during a rating review. They are summarized in the chart on page 4.

Issuers and their advisers are welcome to bring these practices to Fitch's attention, both during and after the rating review process. Over time, Fitch expects to expand and modify its list of best management practices as new ones become apparent.

Above all, these rating guidelines are intended to promote consistent review of such rating practices for investors, whether the managers affected are those of large, well known municipal issuers or small, rural utilities. Institutionalized management practices can often endure even trying times of economic downturn or unexpected system demand. Therefore, Fitch believes emphasizing them can result in greater rating stability and accuracy over time.

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

- Community Characteristics
  - Economic diversity.
  - Income and property wealth levels.
  - Population growth.
  - Potential for residential, commercial, or industrial sector volatility, including customer concentration.
  - Typically a key determinant for rating placement in the 'A', 'AA', or 'AAA' categories.
- Customer Base
  - Stability, growth, or decline?
  - Effect on the capital program, rates, and financial flexibility.
  - Operating reliance on growth-sensitive fees derived from customer base growth.
- Capacity
  - Water supply sources.
  - Treatment facilities.
  - Collection, transmission, and distribution infrastructure.
  - Management, technological, and personnel capacity.
  - Regional demands on water supplies.
- 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.
  - 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.
  - Impact of costs on rates.
  - Cost effects on financial flexibility.
  - Pay-as-you-go versus debt funding sources.
- Coverage and Financial Performance
  - Goals for annual financial performance.
  - Reasonableness of future budget assumptions.
  - Payment enforcement and account delinquencies.
  - Cause of past financial volatility, 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.
- Covenants
  - Annual debt service coverage of 1.2 times (x) in rate covenants and/or additional bonds tests are typical.
  - Does the system regularly exceed typical covenant requirements?
  - If so, does it show strong prospects of continuing this trend?
  - 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.
- "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?

Appendix III
MMD Analysis of Taxable Debt Issuances

ISSUER	State of Arkansas Water, Waste Disposal & Pollution G.O. Rfdg. Bonds Series 2003 A (Taxable)			Intermountain Power Agency, UT Power Supply Rev. Rfdg. Bonds Series B (Taxable)			Okanogan County Public Utility Dist. No. 1, WA Electric System Revenue Bonds 2003 B (Taxable)		
SALE DATE	3/18/2003			3/14/2003			3/14/2003		
ISSUE SIZE	$2,400,000			$15,495,000			$6,535,000		
UNDERWRITER	UBS Paine Webber			Goldman Sachs			Banc of America		
CALL FEATURES	07/01/2013 @ par			Not Callable			06/01/2013 @ par		
INSURANCE	N/A			FSA			N/A		
RATINGS	Aa2/AA			Aaa/AAA/AA			/AAA/		
YEAR	SCALE	mmd	Spread to MMD	SCALE	mmd	Spread to MMD	SCALE	mmd	Spread to MMD
1	1.85%	1.06%	0.79						
2	2.10%	1.31%	0.79						
3	2.60%	1.65%	0.95	1.85%	1.25%	0.60	2.46%	1.25%	1.21
4	3.15%	2.07%	1.08				2.90%	1.55%	1.35
5	3.30%	2.44%	0.86				3.35%	1.95%	1.40
6	3.65%	2.77%	0.88				3.64%	2.32%	1.32
7	3.90%	3.09%	0.81						
8	4.15%	3.32%	0.83						
9	4.40%	3.47%	0.93						
10	4.50%	3.59%	0.91						
11	4.75%	3.70%	1.05						
12	4.85%	3.81%	1.04						
13	4.98%	3.92%	1.06						
14	5.05%	4.03%	1.02						
15	5.18%	4.12%	1.06						
16	5.31%	4.21%	1.10						
17	5.35%	4.30%	1.05						
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ISSUER	City of Gainsville, FL Utilities System Revenue Series 2003 B (Taxable)			Stevens County Public Utility District #1, WA Water Revenue Refunding Bonds Series 2002 B (Taxable)			State of Arkansas, AR Water, Waste Disposal & Polltion Fac. G.O. Bonds Series 2002 H (Taxable)		
SALE DATE	1/30/2003			12/2/2002			8/28/2002		
ISSUE SIZE	$7,625,000			$1,355,000			$2,140,000		
UNDERWRITER	Goldman Sachs			D.A. Davidson			Crews & Assoc		
CALL FEATURES	Not Callable			Not Callable			07/01/2012 @ par		
INSURANCE	FSA			N/A			N/A		
RATINGS	Aaa/AAA						Aa2/AA		
YEAR	SCALE	mmd	Spread to MMD	SCALE	mmd	Spread to MMD	SCALE	mmd	Spread to MMD
1									
2				2.50%	1.33%	1.17			
3				3.10%	1.70%	1.40			
4				3.90%	2.05%	1.85			
5				4.40%	2.41%	1.99			
6				4.80%	2.77%	2.03			
7				5.10%	3.09%	2.01			
8				5.40%	3.34%	2.06			
9									
10	4.40%	3.85%	0.55						
11									
12							5.22%	3.83%	1.39
13							5.27%	3.95%	1.32
14							5.32%	4.07%	1.25
15							5.37%	4.19%	1.18
16							5.47%	4.29%	1.18
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ISSUER	City of Kansas City, MO Sanitary Sewer System Revenue Bonds Series 2002 D-2 (Taxable)			Mississippi Development Bank, MS Special Obligation Bonds Series 2002 A (Taxable)			New York State EFC, NY Envir. Infrastr. Revenue Bonds Series 2002 A (Taxable)		
SALE DATE	5/9/2002			5/7/2002			2/20/2002		
ISSUE SIZE	$3,000,000			$2,950,000			$31,630,000		
UNDERWRITER	Citigroup Global Markets, Inc.			Morgan Keegan			Lehman Brothers		
CALL FEATURES	Not Callablae			07/01/2008 @ par			Not Callable		
INSURANCE	N/A			FSA			N/A		
RATINGS	Aa3/AA			/AAA/			/AA-/AA-		
YEAR	SCALE	mmd	Spread to MMD	SCALE	mmd	Spread to MMD	SCALE	mmd	Spread to MMD
1	2.80%	1.80%	1.00				2.65%	1.60%	1.05
2	3.55%	2.40%	1.15	3.53%	2.38%	1.15	3.55%	2.34%	1.21
3	4.30%	2.85%	1.45				4.65%	2.84%	1.81
4	4.75%	3.13%	1.62				4.80%	3.15%	1.65
5	5.10%	3.40%	1.70				4.95%	3.48%	1.47
6	5.25%	3.66%	1.59	5.35%	3.63%	1.72	5.10%	3.68%	1.42
7	5.60%	3.85%	1.75	5.71%	3.81%	1.90	5.70%	3.88%	1.82
8	6.00%	4.03%	1.97	5.86%	3.98%	1.88	5.75%	4.01%	1.74
9	6.02%	4.14%	1.88	5.96%	4.08%	1.88	5.85%	4.11%	1.74
10	6.05%	4.24%	1.81				6.06%	4.21%	1.85
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ISSUER	Virginia Resources Authority, VA Infrastructure Revenue Bonds Series 2001 E (Taxable)			Virginia Resources Authority, Va Infrastructure Revenue Bonds Series 2001 C (Taxable)			Bandon Cranberry Water Ctl. Dist., OR Series 1999 (Taxable)		
SALE DATE	11/28/2001			6/13/2001			8/18/1999		
ISSUE SIZE	$3,400,000			$9,500,000			$1,500,000		
UNDERWRITER	Davenport			BB&T Cap Mkts			Sutro & Co., Inc.		
CALL FEATURES	05/01/2010 @ 101.0%, dtp 2011			Not Callable					
INSURANCE	N/A			N/A			N/A		
RATINGS	Aa2/AA			Aa2/AA			N/R		
YEAR	SCALE	mmd	Spread to MMD	SCALE	mmd	Spread to MMD	SCALE	mmd	Spread to MMD
1	3.40%	2.35%	1.05	4.65%	3.08%	1.57	6.50%	3.53%	2.97
2	3.95%	2.77%	1.18	5.15%	3.36%	1.79	7.00%	4.05%	2.95
3	4.90%	3.12%	1.78	5.50%	3.55%	1.95	7.25%	4.20%	3.05
4	5.00%	3.40%	1.60	5.60%	3.70%	1.90	7.40%	4.30%	3.10
5	5.35%	3.66%	1.69	5.75%	3.80%	1.95	7.50%	4.43%	3.07
6	5.60%	3.88%	1.72	6.00%	4.01%	1.99	7.60%	4.58%	3.02
7	5.70%	4.01%	1.69				7.70%	4.68%	3.02
8	5.80%	4.12%	1.68				7.80%	4.78%	3.02
9	5.90%	4.22%	1.68				7.90%	4.88%	3.02
10	6.00%	4.34%	1.66				8.00%	4.95%	3.05
11	6.10%	4.45%	1.65						
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15	6.43%	4.81%	1.62						
16							8.13%	5.35%	2.78
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21							8.38%	5.54%	2.84
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ISSUER	Belgium WI Wtrwks & Swr. Sys., WI			Canyon Lake TX Water Supply Corp., TX			City of Chelsea, MA G. O. State Qualified Bonds Urban Renewal, Series 1999 B		
SALE DATE	Series 1999 B (Taxable) 1/21/1999			Series 1999 (Taxable) 1/20/1999			1/12/1999		
ISSUE SIZE	$720,000			$3,040,000			$8,350,000		
UNDERWRITER	Bernardi Secs., Inc.			Texas Water Development Bd.			Bank of Boston		
CALL FEATURES	N/A			N/A					
INSURANCE	N/R			N/R			MBIA		
RATINGS							Aaa/AAA		
YEAR	SCALE	mmd	Spread to MMD	SCALE	mmd	Spread to MMD	SCALE	mmd	Spread to MMD
1	5.30%	3.00%	2.30	6.34%	3.00%	3.34	5.15%	3.00%	2.15
2	5.40%	3.35%	2.05	6.69%	3.35%	3.34	5.30%	3.40%	1.90
3	5.50%	3.55%	1.95	6.89%	3.55%	3.34	5.35%	3.60%	1.75
4	5.60%	3.65%	1.95	7.04%	3.65%	3.39	5.45%	3.70%	1.75
5	5.70%	3.75%	1.95	7.14%	3.75%	3.39	5.55%	3.80%	1.75
6	5.80%	3.80%	2.00	7.24%	3.80%	3.44	5.65%	3.85%	1.80
7	5.90%	3.90%	2.00	7.34%	3.90%	3.44	5.75%	3.95%	1.80
8	6.00%	4.00%	2.00	7.44%	4.00%	3.44	5.85%	4.05%	1.80
9	6.10%	4.05%	2.05	7.54%	4.05%	3.49	5.95%	4.10%	1.85
10	6.20%	4.10%	2.10	7.64%	4.13%	3.51	6.05%	4.20%	1.85
11	6.30%	4.20%	2.10	7.74%	4.23%	3.51			
12	6.40%	4.30%	2.10	7.84%	4.33%	3.51			
13	6.50%	4.40%	2.10	7.94%	4.43%	3.51			
14	6.50%	4.50%	2.00	7.99%	4.53%	3.46			
15	6.65%	4.58%	2.07	8.04%	4.60%	3.44	6.25%	4.68%	1.57
16	6.70%	4.65%	2.05	8.09%	4.68%	3.41			
17	6.75%	4.73%	2.02	8.14%	4.75%	3.39			
18	6.75%	4.78%	1.97	8.19%	4.80%	3.39			
19	6.75%	4.83%	1.92	8.24%	4.85%	3.39			
20				8.24%	4.90%	3.34	6.35%	4.93%	1.42
21				8.29%	4.92%	3.37			
22				8.29%	4.93%	3.36			
23				8.29%	4.94%	3.35			
24				8.29%	4.95%	3.34			
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ISSUER	City of Connel, WA			Copiah County, MS			Douglas County, KS		
	Water Revenue Bonds			G. O. Industrial Park Bonds			Taxable G. O. Bonds		
	Taxable			Series 2000 (Taxable)			Series A , 2001		
SALE DATE	4/5/2000			9/5/2000			2/21/2001		
ISSUE SIZE	$1,750,000			$1,550,000			$345,000		
UNDERWRITER	Richards Merrill & Peterson			TrustMark Natl. Bank			Midwest Capital Mgmt.		
CALL FEATURES				09/01/2010 @ par			08/01/2011 @ par		
INSURANCE	N/A			N/A			N/A		
RATINGS	N/A			N/R			N/R		
YEAR	SCALE	mmd	Spread to MMD	SCALE	mmd	Spread to MMD	SCALE	mmd	Spread to MMD
1	7.40%	4.20%	3.20	7.10%	4.23%	2.87	5.60%	3.30%	2.30
2	7.50%	4.57%	2.93	7.20%	4.30%	2.90	5.70%	3.55%	2.15
3	7.60%	4.67%	2.93	7.20%	4.32%	2.88	5.80%	3.62%	2.18
4	7.70%	4.73%	2.97	7.25%	4.37%	2.88	5.90%	3.72%	2.18
5	7.75%	4.78%	2.97	7.25%	4.41%	2.84	6.00%	3.83%	2.17
6	7.80%	4.82%	2.98	7.25%	4.46%	2.79	6.10%	3.93%	2.17
7	7.85%	4.86%	2.99	7.25%	4.51%	2.74	6.20%	4.03%	2.17
8	7.90%	4.90%	3.00	7.30%	4.57%	2.73	6.30%	4.13%	2.17
9	7.95%	4.94%	3.01	7.37%	4.62%	2.75	6.40%	4.22%	2.18
10	8.00%	4.98%	3.02	7.40%	4.68%	2.72	6.50%	4.31%	2.19
11	8.05%	8.04%	0.01	7.50%	4.78%	2.72			
12	8.10%	5.11%	2.99	7.60%	4.88%	2.72			
13	8.15%	5.17%	2.98	7.70%	4.98%	2.72			
14	8.20%	5.24%	2.96	7.75%	5.08%	2.67			
15	8.25%	5.31%	2.94	7.80%	5.15%	2.65			
16	8.30%	5.36%	2.94	7.88%	5.22%	2.66			
17	8.35%	5.34%	3.01	7.90%	5.26%	2.64			
18	8.40%	5.46%	2.94	8.00%	5.30%	2.70			
19	8.45%	5.51%	2.94	8.10%	5.34%	2.70			
20	8.50%	5.54%	2.96	8.13%	5.37%	2.70			
21	8.55%	5.57%	2.98						
22	8.60%	5.60%	3.00						
23	8.65%	5.61%	3.04						
24	8.70%	5.62%	3.08						
25	8.75%	5.63%	3.12						
26	8.80%	5.63%	3.17						
27	8.85%	5.64%	3.21						
28	8.90%	5.64%	3.26						
29	8.95%	5.65%	3.30						
30	9.00%	5.65%	3.35						
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ISSUER	Ennis TX Economic Dev. Corp, TX Sales Tax Revenue Bond Series 1998 (Taxable)			Ennis Texas Economic Dev. Corp., TX Sales Tax Revenue Bonds Series 1999 (Taxable)			Essex County , NJ Utility Water Sys. Rev. Bonds Series 2001 A (Federally Taxable)		
SALE DATE	10/7/1998			11/22/1999			10/4/2001		
ISSUE SIZE	$3,535,000			$3,290,430			$13,090,000		
UNDERWRITER	Southwest Securities			Southwest Securities			A. G. Edwards & Son, Inc.		
CALL FEATURES	02/01/2008 @ par			02/01/2010 @ par					
INSURANCE	FGIC			FGIC			Ambac		
RATINGS	/AAA/(-A)			/AAA/(-A)			Aaa		
YEAR	SCALE	mmd	Spread to MMD	SCALE	mmd	Spread to MMD	SCALE	mmd	Spread to MMD
1	5.15%	3.05%	2.10				3.18%	2.03%	1.15
2	5.15%	3.35%	1.80				3.60%	2.25%	1.35
3	5.15%	3.40%	1.75				4.28%	2.59%	1.69
4	5.20%	3.50%	1.70				4.73%	2.85%	1.88
5	5.25%	3.55%	1.70				4.87%	3.09%	1.78
6	5.30%	3.65%	1.65				4.92%	3.34%	1.58
7	5.35%	3.70%	1.65						
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9									
10	5.60%	3.88%	1.72	7.49%	4.95%	2.54	5.79%	3.89%	1.90
11									
12									
13									
14									
15	5.95%	4.38%	1.57						
16							6.09%	4.52%	1.57
17									
18									
19									
20	6.45%	4.62%	1.83						
21							6.87%	4.90%	1.97
22									
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25									
26				8.09%	5.79%	2.30			
27									
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35				8.45%	5.82%	2.63			

ISSUER	Fairview AL Governmental Utility, AL E. Cullman Water System Series 2000 B			City of Fortney, TX (Double Barreled) Series 2000 A (Taxable)			City of Grand Rapids, MN G. O. Wastewater Revenue Bonds Series 2001 A (Taxable)		
SALE DATE	4/27/2000			5/2/2000			10/11/2001		
ISSUE SIZE	$710,000,000			$1,670,000			$4,700,000		
UNDERWRITER	Compass Bank Birmingham			Morgan Keegan & Co.,			Cronin & Co., Inc.		
CALL FEATURES				N/A					
INSURANCE	Ambac						MBIA		
RATINGS	Aaa/AAA			Aaa			Aaa		
YEAR	SCALE	mmd	Spread to MMD	SCALE	mmd	Spread to MMD	SCALE	mmd	Spread to MMD
1							3.50%	2.08%	1.42
2							3.75%	2.28%	1.47
3							4.00%	2.62%	1.38
4							4.30%	2.88%	1.42
5							4.60%	3.12%	1.48
6							4.75%	3.36%	1.39
7							5.00%	3.58%	1.42
8							5.30%	3.71%	1.59
9							5.40%	3.81%	1.59
10	7.75%	5.15%	2.60				5.50%	3.91%	1.59
11							5.60%	4.04%	1.56
12							5.70%	4.17%	1.53
13							5.90%	4.31%	1.59
14							6.00%	4.44%	1.56
15	8.10%	5.53%	2.57				6.15%	4.55%	1.60
16							6.30%	4.65%	1.65
17							6.40%	4.74%	1.66
18									
19									
20	8.15%	5.72%	2.43	8.25%	5.72%	2.53	6.55%	4.93%	1.62
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ISSUER	Idaho St. Water Resource Board, ID Wtr. Res. Development Rev. Bonds Series 1999 (Federally Taxable)			Indiana Bond Bank, IN Water Utility Revenue Bonds Series 1999 C (Taxable)			Average Spread to MMD for Taxable Water & Sewer Related Issues		Cost of Debt Calculation as of May 19, 2003	
SALE DATE	5/18/1999			3/18/1999						
ISSUE SIZE	$5,000,000			$2,595,000						
UNDERWRITER	First Securities Co.			Robert W. Baird & Co., Inc.						
CALL FEATURES	N/A			N/A						
INSURANCE	N/R			N/R						
RATINGS										
YEAR	SCALE	mmd	Spread to MMD	SCALE	mmd	Spread to MMD	# of Issues	MMD Spread	MMD	Debt Cost
1				15.96%			16	1.90	1.030	2.93
2	6.50%	3.60%	2.90	10.16%	3.05%	7.11	20	2.14	1.140	3.28
3	6.50%	3.75%	2.75	9.06%	3.45%	5.61	20	2.15	1.390	3.54
4	6.50%	3.85%	2.65	8.91%	3.60%	5.31	19	2.23	1.790	4.02
5	6.50%	3.98%	2.52	8.33%	3.70%	4.63	19	2.17	2.090	4.26
6	6.50%	4.10%	2.40	8.17%	3.80%	4.37	19	2.15	2.370	4.52
7	6.50%	4.20%	2.30	8.05%	3.93%	4.12	17	2.22	2.670	4.89
8	6.75%	4.30%	2.45	7.96%	4.03%	3.93	15	2.28	2.900	5.18
9	6.85%	4.38%	2.47	7.90%	4.13%	3.77	15	2.29	3.020	5.31
10	6.95%	4.45%	2.50	7.85%	4.18%	3.67	19	2.20	3.140	5.34
11	7.05%	4.58%	2.47	7.81%	4.25%	3.56	10	2.00	3.280	5.28
12	7.15%	4.68%	2.47	7.78%	4.35%	3.43	9	2.35	3.400	5.75
13	7.25%	4.75%	2.50	7.76%	4.45%	3.31	9	2.34	3.510	5.85
14	7.35%	4.80%	2.55	7.73%	4.55%	3.18	9	2.29	3.610	5.90
15	7.45%	4.85%	2.60	7.71%	4.63%	3.08	15	2.15	3.710	5.86
16	7.55%	4.93%	2.62	7.70%	4.68%	3.02	8	2.43	3.810	6.24
17	7.65%	4.98%	2.67	7.68%	4.75%	2.93	8	2.42	3.910	6.33
18	7.75%	5.03%	2.72	7.67%	4.80%	2.87	6	2.76	4.000	6.76
19	7.75%	5.08%	2.67	7.66%	4.85%	2.81	6	2.74	4.080	6.82
20	7.75%	5.10%	2.65	7.65%	4.90%	2.75	12	2.42	4.150	6.57
21				5.50%	4.92%	0.58	3	2.31	4.210	6.52
22							2	3.18	4.250	7.43
23							2	3.20	4.280	7.48
24							2	3.21	4.300	7.51
25							2	2.71	4.320	7.03
26							1	3.17	4.330	7.50
27							1	3.21	4.340	7.55
28							1	3.26	4.350	7.61
29							1	3.30	4.350	7.65
30							1	3.35	4.350	7.70
31										
32										
33										
34										
35							1	2.63	4.350	6.98