

State of Florida



Public Service Commission

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RECORDS AND REPORTING

DATE: MAY 20, 1999

TO: DIRECTOR, DIVISION OF RECORDS AND REPORTING (BAYO)

FROM: DIVISION OF AUDITING AND FINANCIAL ANALYSIS (LESTER, DRAPER) *DD*
DIVISION OF WATER AND WASTEWATER (BETHEA) *HP*
DIVISION OF LEGAL SERVICES (VACCARO) *AK* *ALM*

RE: DOCKET NO. 990006-WS - WATER AND WASTEWATER INDUSTRY - ANNUAL REESTABLISHMENT OF AUTHORIZED RANGE OF RETURNS ON COMMON EQUITY OF WATER AND WASTEWATER UTILITIES; PURSUANT TO SECTION 367.081(4)(f), FLORIDA STATUTES.

AGENDA: 06/01/99 - REGULAR AGENDA - PROPOSED AGENCY ACTION - INTERESTED PERSONS MAY PARTICIPATE

CRITICAL DATES: FINAL DECISION BY THE END OF 1999

SPECIAL INSTRUCTIONS: NONE

FILE NAME AND LOCATION: S:\PSC\AFA\WP\990006.RCM

CASE BACKGROUND

At the June 16, 1998, Agenda Conference, the Commission approved the current leverage formula and encouraged staff to hold a workshop to review the leverage formula methodology. The Commission staff held two water and wastewater (WAW) leverage formula workshops on November 16, 1998, and March 12, 1999. Both workshops were held to solicit ideas from the industry, the Office of Public Counsel (OPC), and other interested parties to assist staff and the Commission in reviewing the existing leverage formula methodology and to determine if changes to the methodology are warranted.

Staff has reviewed and considered all the suggested changes recommended by the parties at the two workshops and in the written comments. Staff believes that several suggestions by OPC and the WAW industry are reasonable and has recommended changes to the

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leverage formula. For comparative purposes, staff has also produced a leverage formula that relies on the same methodologies used in prior years updated only for changes in the underlying market conditions.

ISSUE 1: What is the appropriate range of returns on common equity for water and wastewater utilities pursuant to Section 367.081(4)(f), Florida Statutes?

RECOMMENDATION: Staff recommends the following leverage formula:

Return on Common Equity = 8.14% + 0.789/Equity Ratio

where the Equity Ratio = Common Equity / (Common Equity
+ Preferred Equity + Long-Term
and Short-Term Debt)

Range: 8.93% @ 100% equity to 10.12% @ 40% equity

This formula is based on modifications to the existing leverage formula methodology. Staff has discussed the modifications in the body of the recommendation.

Staff further recommends that the Commission limit the authorized return on common equity to a maximum of 10.12% for all equity ratios of less than 40% to discourage imprudent financial risk.
(LESTER, DRAPER)

STAFF ANALYSIS: Section 367.081(4)(f), Florida Statutes, requires the Commission to establish a leverage formula to calculate a reasonable range of return on equity (ROE) for WAW utilities. The Commission must establish this formula not less than once each year.

The Commission established the current leverage formula by Order No. PSC-98-1434-FOF-WS, issued October 23, 1998. Order No. PSC-98-0903-FOF-WS was issued as a proposed agency action on July 6, 1998. Florida Water Services Corporation (FWSC) protested the order on July 23, 1998. FWSC subsequently withdrew the protest on September 9, 1998. Order No. PSC-98-1434-FOF-WS made Order No. PSC-98-0903-FOF-WS, which presented the current leverage formula, final and effective on October 6, 1998.

Staff is recommending changes proposed by participants at the workshops be incorporated in the updated leverage formula.

Attachment No. 1, page 2, presents a comparison of the recommended leverage formula to the status quo leverage formula.

Review of Existing Methodology

Staff notes that the leverage formula depends on the four basic assumptions listed below.

1. Business risk is similar for all WAW utilities.
2. The cost of equity is an exponential function of the equity ratio.
3. The marginal weighted average cost of investor capital is constant over the equity ratio range of 40% to 100%.
4. The cost rate at an assumed Moody's Baa3 bond rating plus 25 basis points represents the average marginal cost of debt to a Florida WAW utility over an equity ratio range of 40% to 100%.

A further assumption is that the leverage formula is appropriate for the average Florida WAW utility.

The existing leverage formula relies on four ROE models and several adjustments for differences in risk and debt cost to conform the model results to the average Florida WAW utility. The models are as follows:

1. **Two discounted cash flow (DCF) models applied to an index of water utilities** - The water utilities index consists of six national water companies that have publicly traded stock and are followed by the Value Line Investment Survey (Value Line). One DCF model uses historical dividend growth rates and the other uses prospective growth rates. The historical model weights each company's returns by market capitalization and is an annual model. The prospective DCF is a quarterly model.
2. **A risk premium model applied to an index of publicly traded natural gas utilities** - The risk premium is the average for 120 months. The Commission has used natural gas utilities as a proxy for water companies because data has not been available for water utilities for 120 months. The

natural gas utilities have been considered an appropriate proxy for WAW utilities.

3. **A Capital Asset Pricing Model (CAPM)** - The CAPM model uses a market return for all dividend paying stocks followed by Value Line, the yield on 30-year Treasury Bonds projected by the Blue Chip Financial Forecasts, and the average beta of the index of water utilities.

The results of the above models are averaged and adjusted in the following manner:

1. **Gas Index Risk Adjustment** - This is a risk adjustment to reflect the perceived difference in risk between the index of natural gas utilities and the index of water utilities. This adjustment originated with leverage formula workshops held in 1995 and initially increased the ROE range. In 1997 and 1998, the adjustment decreased the ROE range.
2. **Bond Yield Differential** - This reflects the difference in yields between A+/A1 rated bonds, which is the average bond rating for the water company index, and BBB-/Baa3 rated bonds. A significant leverage formula assumption is that Florida WAW utilities are comparable to water companies with the lowest investment grade bond rating, which is Baa3. This adjustment compensates for the difference between credit quality of the water company index and the assumed credit quality of Florida WAW utilities. The Bond Yield Differential is presented on attachment 1, page 6.
3. **Private Placement Securities Premium** - This adds 25 basis points to reflect the difference in yields on securities publicly traded and privately placed. Investors require a premium for the lack of liquidity of privately placed capital.

After the above adjustments, the result is plugged into the average capital structure for the water utilities and gas utilities. The cost of equity is determined at a 40% equity ratio, and the leverage formula is derived. The leverage formula derived using

the existing methodology updated for changes in the underlying market conditions is presented on Attachment No. 1, page 2.

Modifications to Existing Methodology

Staff used information presented at the workshops to modify the existing methodology. Staff discusses these modifications below.

1. **Eliminate the Historical Model** - Staff recommends eliminating the DCF model that uses historical growth rates. The prospective, i.e., forecasted, growth rates consider the historical trend in dividends. At the workshop, OPC stated this model should be eliminated. Staff agrees that the prospective DCF is more theoretically correct. In addition, the historical model weighted each company result by market capitalization. By removing the historical model, the controversy over whether to recognize market capitalization is eliminated.
2. **Annual DCF Model** - Staff recommends the Commission use an annual DCF model instead of a quarterly model, which the existing methodology employs. Due to compounding, the quarterly result is higher, but it does not consider the compounding effect of monthly revenue receipts by the utility. Therefore, the annual DCF model is more appropriate for this purpose.
3. **Eliminate the Gas Risk Premium Model** - Staff has used the gas risk premium model because the water risk premium model did not have the necessary 120 months. Also, the gas industry was thought to be a reasonable proxy for the water utilities. Staff believes that, due to changes in the gas industry such as open access, the gas industry is no longer a reasonable proxy. The focus should be on models that reflect the required return on common equity for water utilities. The results of these models can then be adjusted to reflect conditions in Florida.
4. **Eliminate the Gas Index Risk Adjustment** - This adjustment originated with the 1995 workshops and was intended to compensate for the higher risk, as

measured by the beta statistic, of the water index compared with the gas index. In 1997 and 1998 the water index beta was lower than the gas index beta resulting in a negative adjustment to the leverage formula result. Eliminating this adjustment is consistent with removing the gas index risk premium model.

5. **Increase the Private Placement Premium** - Staff recommends increasing the private placement premium from 25 to 50 basis points. With the existing methodology, the Commission assumes the average Florida WAW utility can borrow funds at the Baa3 rate plus 25 basis points for the private placement premium. The private placement premium is necessary to compensate investors for the lack of liquidity with privately placed securities. Staff believes this concept is sound but quantifying the premium is difficult due the private nature of these transactions.

At the workshops, industry representative suggested that the cost of borrowing for Florida WAW utilities might be higher than the cost rate used in the leverage formula. In researching the cost of debt for water utilities, staff found that the cost of funds can be significantly above the level in the existing methodology. One lender said the typical rate was prime plus 1% to 2.75%. The current prime rate is 7.75%, indicating a range of 8.75% to 10.50%. Another lender indicated a minimum rate of approximately 8.5%, based on the 30-year Treasury Bond rate plus 3%. These lenders also had requirements such as audited financial statements, which are not typical for the Florida WAW utilities. Staff believes a private placement premium of 50 basis points gives some additional recognition to the higher debt costs for the average Florida WAW utility.

The recommended modifications result in two ROE models: A prospective annual DCF model and a CAPM model. Staff believes the CAPM model, since it is a risk premium model, will appropriately reflect the direction of interest rates just as the gas risk premium model did. The DCF and CAPM models are presented on attachment 1, pages 4 and 5, respectively.

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Staff recommends the modified leverage formula presented below:

Modified Leverage Formula

Return on Common Equity = 8.14% + 0.789/Equity Ratio

Range: 8.93% to 10.12%

Attachment 1, page 1, presents the calculation of the recommended 1999 leverage formula.

DOCKET NO. 990006-WS
DATE: May 20, 1999

ISSUE 2: Should the Commission close this docket?

RECOMMENDATION: No, upon expiration of the protest period, this docket should remain open. (VACCARO)

STAFF ANALYSIS: Upon expiration of the protest period, if a timely protest is not received, this docket should remain open. This will allow staff to monitor the movement in capital costs and to readdress the reasonableness of the leverage formula as conditions warrant.

SUMMARY OF RESULTS

Leverage Formula Update

	<u>1997</u>	<u>1998</u>	<u>1999</u>
(A) DCF ROE for Water Index (Historical) ¹	9.28%	9.96%	--
(B) DCF ROE for Water Index (Projected) ²	8.66%	8.39%	8.77%
(C) Risk Premium ROE for Gas Index	9.52%	8.80%	--
(D) Gas Index Premium	(.24)%	(.66)%	--
(E) CAPM ROE for Water Index	<u>10.23%</u>	<u>9.46%</u>	<u>9.19%</u>
AVERAGE [(((A+B)/2)+(C+D)+E)/3]	9.49%	8.93%	8.98%
Bond Yield Differential	.49%	.45%	.42%
Private Placement Premium	.25%	.25%	.50%
Adjustment to Reflect Required Equity			
Return at a 40% Equity Ratio	<u>.23%</u>	<u>.22%</u>	<u>.22%</u>
Cost of Equity for Average Florida WAW			
Utility at a 40% Equity Ratio	<u>10.46%</u>	<u>9.85%</u>	<u>10.12%</u>

1998 Leverage Formula (Currently in effect)

Return on Common Equity = 7.72% + 0.852/ER
 Range of Returns on Equity = 8.57% - 9.85%

1999 Leverage Formula (Recommended)

Return on Common Equity = 8.14% + .789/ER
 Range of Returns on Equity = 8.93% - 10.12%

Note: 1999 calculation uses March 1999 Data

¹ 1997 & 1998 DCF ROE for Water Index calculated using historical data weighted by market capitalization amounts listed in Value Line.

² 1997 & 1998 used quarterly DCF models, 1999 uses the Annual DCF model.

Leverage Formula Comparison

	<u>1999 STATUS</u> <u>QUO</u>	<u>RECOMMENDATION</u>
(A) DCF ROE for Water Index (Historical)	9.41%	
(B) DCF ROE for Water Index (Projected) ¹	8.89%	8.77%
(C) Risk Premium ROE for Gas Index	8.42%	
(D) Gas Index Premium	(.40)%	
(E) CAPM ROE for Water Index	<u>9.19%</u>	<u>9.19%</u>
AVERAGE [(((A+B)/2)+(C+D)+E)/3]	8.79%	8.98%
Bond Yield Differential	.42%	.42%
Private Placement Premium	.25%	.50%
Adjustment to Reflect Required Equity		
Return at a 40% Equity Ratio	<u>.29%</u>	<u>.22%</u>
Cost of Equity for Average Florida WAW		
Utility at a 40% Equity Ratio	<u>9.74%</u>	<u>10.12%</u>

1999 Leverage Formula (STATUS QUO)

Return on Common Equity = 7.89% + 0.740/ER
 Range of Returns on Equity = 8.63% - 9.74%

RECOMMENDATION

Return on Common Equity = 8.14% + 0.789/ER
 Range of Returns on Equity = 8.93% - 10.12%

Note: March 1999 Data

¹ The Status Quo uses a quarterly DCF model and the recommendation uses an annual DCF model.

Marginal Cost of Investor Capital
Average Water and Wastewater Utility

<u>Capital Component</u>	<u>Ratio</u>	<u>Cost Rate</u>	Weighted Marginal <u>Cost Rate</u>
Common Equity	44.88%	9.90%	4.44%
Total Debt	<u>55.12%</u>	8.14% ¹	<u>4.49%</u>
	100.00%		8.93%

A 40% equity ratio is the floor for calculating the required return on common equity. The return on equity at a 40% equity ratio = 8.14% + 0.789/.40 = 10.12%

Marginal Cost of Investor Capital
Average Water & Wastewater Utility at 40% Equity Ratio

<u>Capital Component</u>	<u>Ratio</u>	<u>Cost Rate</u>	Weighted Marginal Marginal <u>Cost Rate</u>
Common Equity	40.00%	10.12%	4.05%
Total Debt	<u>60.00%</u>	8.14% ¹	<u>4.89%</u>
	100.00%		8.93%

Where: ER = Equity Ratio = Common Equity / (Common Equity + Preferred Equity + Long-Term Debt + Short-Term Debt)

* Assumed Baa3 rate for March 1999 plus a 50-basis point private placement premium.

Source: Moody's Credit Perspectives

¹ Assumed Baa3 rate for March 1999 plus a 50-basis point private placement premium.

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<u>Company</u>	<u>DIV1</u>	<u>DIV2</u>	<u>DIV3</u>	<u>DIV4</u>	<u>EPS4</u>	<u>ROE4</u>	<u>GR1-4</u>	<u>GR4+</u>	<u>HI-PR</u>	<u>LO-PR</u>	<u>AVER-PR</u>
American Water Works	\$0.86	\$0.95	\$1.04	\$1.15	\$2.50	12.50%	1.1017	1.0675	\$31.19	\$28.25	\$29.72
Aquarion Co.	\$1.12	\$1.17	\$1.22	\$1.27	\$1.70	12.00%	1.0428	1.0304	\$27.50	\$22.13	\$24.81
California Water SVC	\$1.12	\$1.18	\$1.24	\$1.30	\$2.05	12.00%	1.0509	1.0439	\$26.75	\$24.13	\$25.44
E'Town	\$2.04	\$2.11	\$2.18	\$2.25	\$3.20	10.50%	1.0332	1.0312	\$44.00	\$39.13	\$41.56
Philadelphia Suburban	\$0.70	\$0.78	\$0.86	\$0.95	\$1.45	12.50%	1.1072	1.0431	\$23.25	\$19.75	\$21.50
United Water Resources	\$0.96	\$0.97	\$0.99	\$1.00	\$1.50	12.50%	1.0137	1.0417	\$20.94	\$18.44	\$19.69
Average	\$1.13	\$1.19	\$1.25				1.0582	1.0429			\$27.12

Cost of Equity

Annually	=	.087722					
Quarterly	=	.088852					
Discounted Cash Flows:	=	1.058218	1.022863	.989545	.956409	22.27917	
March 1999 Average Stock Price	=	\$26.31					
Less 3% flotation Costs [Po(1-fc)]							
Cost of equity required to match the current stock price with the expected cash flows	=	8.77%					

Source:

1. S&P Stock Guide: Apr., 1999 with March Stock Prices
2. DPS, EPS, ROE - Value Line Edition 9, February 5, 1999.

Capital Asset Pricing Model Cost of Equity for
Water and Wastewater Industry

CAPM analysis formula

$$K = RF + \text{Beta}(\text{MR} - \text{RF})$$

$$K = \text{Investor's required rate of return}$$

$$\text{RF} = \text{Risk-free rate (Blue Chip forecast for 30-year Treasury bond)}$$

$$\text{Beta} = \text{Measure of industry-specific risk (Average for water utilities followed by Value Line)}$$

$$\text{MR} = \text{Market return}$$

$$\underline{9.19\%} = 5.38\% + .57(12.07\% - 5.38\%)$$

Source: Blue Chip Financial Forecasts, April 1, 1999
Value Screen, April 1999

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BOND YIELD DIFFERENTIALS

Public Utility Long Term Bond Yield Averages
 Long-Term Corporate Bond Yield Averages -
 Avg. Public Utility

UPDATED: 05/06/99

120 Month Average -		9.07%	9.07%	5.25%	5.25%	5.25%	9.30%	9.30%	9.30%	9.30%										
YR.	MONTH	Aaa SPREAD	Aa1 SPREAD	Aa2 SPREAD	Aa3 SPREAD	A1 SPREAD	A2 SPREAD	A3 SPREAD	Baa1 SPREAD	Baa2 SPREAD	Baa3									
1999	MAR	6.78	0.17	6.95	0.17	7.11	0.05	7.16	0.05	7.21	0.05	7.26	0.10	7.36	0.10	7.45	0.10	7.55	0.10	7.65
	FEB	6.56	0.19	6.75	0.19	6.94	0.05	6.99	0.05	7.04	0.05	7.09	0.11	7.20	0.11	7.30	0.11	7.41	0.11	7.52
	JAN	6.41	0.21	6.62	0.21	6.82	0.05	6.87	0.05	6.92	0.05	6.97	0.11	7.08	0.11	7.19	0.11	7.30	0.11	7.41
	DEC	6.43	0.18	6.61	0.18	6.78	0.04	6.82	0.04	6.87	0.04	6.91	0.11	7.02	0.11	7.13	0.11	7.24	0.11	7.35
	NOV	6.59	0.15	6.74	0.15	6.89	0.05	6.94	0.05	6.98	0.05	7.03	0.09	7.12	0.09	7.22	0.09	7.31	0.09	7.40
	OCT	6.64	0.08	6.72	0.08	6.80	0.05	6.85	0.05	6.91	0.05	6.96	0.06	7.02	0.06	7.07	0.06	7.13	0.06	7.19
	SEP	6.66	0.06	6.72	0.06	6.78	0.05	6.83	0.05	6.88	0.05	6.93	0.07	7.00	0.07	7.06	0.07	7.13	0.07	7.20
	AUG	6.75	0.06	6.81	0.06	6.87	0.04	6.91	0.04	6.96	0.04	7.00	0.07	7.07	0.07	7.13	0.07	7.20	0.07	7.27
	JUL	6.80	0.06	6.86	0.06	6.91	0.04	6.95	0.04	6.99	0.04	7.03	0.07	7.10	0.07	7.16	0.07	7.23	0.07	7.30
	JUN	6.80	0.06	6.86	0.06	6.91	0.04	6.95	0.04	6.99	0.04	7.03	0.06	7.09	0.06	7.15	0.06	7.21	0.06	7.27
	MAY	6.94	0.04	6.98	0.04	7.02	0.05	7.07	0.05	7.11	0.05	7.16	0.06	7.22	0.06	7.28	0.06	7.34	0.06	7.40
	APR	6.94	0.04	6.98	0.04	7.02	0.05	7.07	0.05	7.11	0.05	7.16	0.07	7.23	0.07	7.30	0.07	7.37	0.07	7.44
1998	MAR	6.96	0.04	7.00	0.04	7.04	0.04	7.08	0.04	7.12	0.04	7.16	0.07	7.23	0.07	7.30	0.07	7.37	0.07	7.44
	FEB	6.91	0.04	6.95	0.04	6.99	0.04	7.03	0.04	7.08	0.04	7.12	0.08	7.20	0.08	7.28	0.08	7.36	0.08	7.44
	JAN	6.85	0.05	6.90	0.05	6.94	0.04	6.98	0.04	7.01	0.04	7.05	0.08	7.13	0.08	7.20	0.08	7.28	0.08	7.36
	DEC	6.99	0.04	7.03	0.04	7.07	0.03	7.10	0.03	7.13	0.03	7.16	0.08	7.24	0.08	7.33	0.08	7.41	0.08	7.49
	NOV	7.09	0.03	7.12	0.03	7.15	0.03	7.18	0.03	7.22	0.03	7.25	0.08	7.33	0.08	7.41	0.08	7.49	0.08	7.57
	OCT	7.18	0.05	7.23	0.05	7.28	0.02	7.30	0.02	7.33	0.02	7.35	0.11	7.46	0.11	7.56	0.11	7.67	0.11	7.78
	SEP	7.45	0.05	7.50	0.05	7.54	0.01	7.55	0.01	7.57	0.01	7.58	0.09	7.67	0.09	7.75	0.09	7.84	0.09	7.93
AUG	7.39	0.04	7.43	0.04	7.46	0.02	7.48	0.02	7.49	0.02	7.51	0.14	7.65	0.14	7.79	0.14	7.93	0.14	8.07	
JUL	7.29	0.07	7.36	0.07	7.43	0.02	7.45	0.02	7.46	0.02	7.48	0.13	7.61	0.13	7.74	0.13	7.87	0.13	8.00	

Source: Moody's Credit Perspective

12/31/98 Equity Ratios of Water Index Companies

	Book Value Per Share	Common Shares Outstanding (millions)	Common Equity (millions)	Total Debt (millions)	Preferred Equity (millions)	Equity Ratio
American Water Works	\$15.43	80.3	\$1,239.2	\$1,247.9	\$97.1	47.95%
Aquarion Company	\$19.78	7.4	\$146.8	\$141.4	\$24.9	46.90%
California Water Service Co.	\$13.38	12.6	\$168.8	\$161.1	\$3.5	50.64%
E'Town Water Co.	\$24.62	8.5	\$208.6	\$267.2	\$12.0	42.76%
Philadelphia Suburban Corp.	\$8.45	27.4	\$231.5	\$269.6	\$3.2	45.91%
United Water Resource	\$12.32	37.0	\$456.0	\$752.2	\$89.3	35.15%
					Average	44.88%

Source: Utilities' December 31, 1998, 4th Quarter - S.E.C. 10-Qs