BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In Re: Annual reestablishment ) DOCKET NO. 950006-WS
of authorized range of returns ) ORDER NO. PSC-95-0982-FOF-WS
on common equity for water and ) ISSUED: August 10, 1995
wastewater utilities, pursuant )
to Section 367.081(4)(f), F.S. )
_____ )

The following Commissioners participated in the disposition of
this matter:

SUSAN F. CLARK, Chairman
J. TERRY DEASON
JOE GARCIA
JULIA L. JOHNSON
DIANE K. KIESLING

NOTICE OF PROPOSED AGENCY ACTION

ORDER ESTABLISHING AUTHORIZED RANGE OF
RETURNS ON EQUITY

BY THE COMMISSION:

NOTICE IS HEREBY GIVEN by the Florida Public Service
Commission that the action discussed herein is preliminary in
nature and will become final unless a person whose interests are
substantially affected files a petition for a formal proceeding,
pursuant to Rule 25-22.029, Florida Administrative Code.

BACKGROUND

At the August 16, 1994 Agenda Conference, this Commission
directed its staff to review the methodology for determining the
water and wastewater (WAW) leverage formula used to determine the
range of returns on equity (ROE) for WAW utilities. Commission
staff held a preliminary workshop on December 1, 1994 in Orlando
with representatives from the WAW industry and the Office of Public
Counsel (OPC). We then held a formal Commission workshop on
February 23, 1995 in Tallahassee. Both workshops were held to
solicit input from the industry and other interested parties to
assist us in reviewing the existing leverage formula methodology
and to determine if changes to the methodology are warranted.

We have reviewed and considered all of the suggested changes
recommended by the parties at the two workshops and in the written
comments. We believe that several of the WAW industry's

suggestions are reasonable and we find it appropriate to amend the leverage formula to reflect these changes.   For comparative purposes, we have also produced a leverage formula that relies on the same methodologies used in prior years updated only for changes in the underlying market conditions.

## RANGE OF RETURN ON COMMON EQUITY

Pursuant to Section 367.081 (4) (f), Florida Statutes, this Commission is authorized to establish, not less than once each year, a leverage formula to calculate a reasonable range of returns on equity for WAW utilities.   We last established this range of returns in Order No. PSC-94-1051-FOF-WS, issued August 29, 1994, in Docket No. 940006-WS.

In calculating the updated leverage formula, we have utilized the same general framework used in prior leverage formula dockets. However, as outlined in the case background, we find it appropriate to incorporate in the updated leverage formula a number of changes proposed by representatives of the WAW industry.   As in the past, part of the difference between the existing leverage formula and the formula approved herein is the result of changes in underlying market conditions; that is, changes in bond yields and required rates of return.   The additional difference between the formulas is the result of implementing many of the suggestions made during our WAW Return on Equity (ROE) workshop held February 23, 1995.

Based on the formula of 9.05 percent + 1.131/Equity Ratio, the updated leverage formula produces a range of returns on equity from 10.18 percent to 11.88 percent.   The midpoint of the 10.18 percent to 11.88 percent range represents an increase of 55 basis points over the midpoint of the range indicated by the existing formula.

For comparative purposes, had we updated the leverage formula only for changes in underlying market conditions, the resulting leverage formula would have been 8.67 percent + 1.108/Equity Ratio. This formula would have produced a range of returns on equity from 9.78 percent to 11.44 percent.   The midpoint of this range would have represented a 13 basis point increase over the midpoint of the existing range.

The workshop process began with a staff workshop held on December 1, 1994 in Orlando.   Although many representatives still agree with the leverage formula approach, other representatives were more in favor of replacing the current methodology with other means of determining rates of return.   Alternatives suggested by some of the representatives included:

1)    surveying the small WAW utility owners to find out what rate of return they believe investors require to invest in their systems,
2)    surveying underwriters to determine what they would require to float an equity issue for a small WAW utility,
3)    implementing a risk premium approach that is tied to the utility's actual cost of debt, and
4)    implementing a risk premium approach based on the yield on a readily available market rate, such as the yield on 30 year Treasury bonds, adjusted for a constant risk variable add-on.

We have concerns with applying any of these alternatives for determining investors' required return for WAW utility investments. Our primary concern with the first two alternatives focuses on the reliability or objectivity of these approaches. In addition, there is no theoretical support for either of these alternatives. Although the risk premium approach tied to the utility's actual cost of debt has intuitive appeal, we are concerned that such an approach would penalize the utilities that actively pursue industrial revenue financing (IRBs) or other low-cost financing arrangements. In addition, such an approach could prove to be a disincentive to refinancing high cost debt with lower cost debt in a declining capital cost environment.

Although we do not find it appropriate to implement the risk premium approach based on the yield on 30 year Treasury bonds with a constant risk variable add-on at this time, we do believe this approach may be useful in the future. This approach is intuitively reasonable and does not suffer the same drawbacks as the approach tied to the utility's cost of debt. This approach is also very similar to the approach the industry's consultant, Dr. Roger Morin, stated was being considered by the National Energy Board (NEB) of Canada for determining the ROE for natural gas pipelines operating in that country. However, a specific risk premium was not provided by the industry representative. In addition, the representative proposed a constant add-on. At the February workshop, Dr. Morin stated that risk premiums vary over time based on the level of interest rates. We have recently received a copy of the final order issued by the NEB for determining returns on equity for natural gas pipelines. We will study this approach and the model that was adopted by the NEB for consideration in future leverage formula dockets.

For the February 23 workshop held in Tallahassee, the Florida Waterworks Association (FWA) retained Dr. Roger Morin of Georgia State University to make a presentation to this Commission. In his

presentation, Dr. Morin offered eight specific suggestions for amending the leverage formula. He suggested that we:

1) incorporate a Capital Asset Pricing Model (CAPM) analysis to complement the existing Discounted Cash Flow (DCF) and Risk Premium analyses,

2) correct for an averaging error with the historic DCF analysis,

3) add a risk premium of 30 to 35 basis points to the results indicated by the Risk Premium analysis,

4) recalculate the bond yield differential to measure the difference in returns between Baa3 and A1 bond ratings,

5) add a private placement premium of 50 basis points to the average return indicated by the ROE models,

6) amend the leverage formula so as to produce the same result as the average from among all the various conceptual frameworks explored in the financial literature,

7) allow the cost of debt to vary by plus or minus 50 basis points over the range of equity ratios, and

8) relax the constraint of a minimum equity ratio of 40 percent to 30 percent.

After reviewing the information presented at the workshop and through follow up discussions with Dr. Morin, we conclude that many of his suggestions are reasonable and certain changes shall be incorporated in the next leverage formula.

Dr. Morin's first suggestion is to supplement the determination of the cost of equity by adding a CAPM analysis to the array of models currently relied on for determining the leverage formula. He does not recommend the DCF analysis no longer be used, but rather he suggests that we rely on three models instead of the two models that have been used in the past. Because realized returns can be substantially different from prospective returns anticipated by investors, we do not find it appropriate to utilize a CAPM based on historic, earned returns over the past 68 years. However, we are persuaded by Dr. Morin's argument for supplementing our determination of the cost of equity by using a prospective CAPM. Based on the framework suggested by Dr. Morin, we have performed a prospective CAPM and find it appropriate to incorporate the results in the determination of the cost of equity.

Dr. Morin's second suggestion deals with a mathematical error associated with averaging stock prices, yields, and growth rates in the computation of the DCF model. We have reviewed the model and have corrected this minor error. We note that this criticism applies only to the DCF model using historic growth rates and does

not apply to the DCF model used for the other industries that rely on projected growth rates.  While the underlying theory for the DCF model is the same, there are different versions of the model.  In the past, we had to use the simple DCF formula with historic growth rates for the WAW industry because projected information was not available.  In the other industries where projected information is readily available, we use a more exact equation that takes into account the timing of future cashflows and is not subject to this averaging error.  In addition to correcting this averaging error, we find it appropriate to add a prospective DCF analysis to the group of models used to determine the cost of equity now that projected growth rates are available for publicly traded WAW utilities.

The third suggestion by Dr. Morin concerns the use of an index of natural gas utilities in the Risk Premium analysis.  Although he does not recommend the removal of this analysis, he does suggest that the index of WAW utilities is more risky than the index of natural gas utilities and therefore an adjustment must be made to compensate for this difference in risk.  He cites the comparison of a number of financial and operating statistics for the two indices which he concludes indicates that the WAW industry is more risky than the natural gas industry.  To compensate for this difference in risk, he recommends adding a premium of 30 to 35 basis points to the natural gas Risk Premium estimate of the cost of equity.  He arrived at the 30 to 35 basis point premium by multiplying the difference between the average betas for the two indices by the market risk premium used in his CAPM analysis.

In the past, the averages of the financial and operating statistics for the two indices have been mixed.  For that reason, we had assumed that the risk for these two indices was similar and that no risk adjustment was necessary.  And in certain head-to-head comparisons, we still find that there are WAW utilities that are less risky than natural gas utilities.  However, as demonstrated in Dr. Morin's presentation, the financial statistics for the natural gas and WAW utility indices are diverging.  We find it appropriate to use the beta and the market premium as a reasonable method for quantifying a risk differential.  Using the difference between the average beta of the WAW and natural gas indices (.64-.61=.03) and the prospective market risk premium of 5.9% determined in our CAPM analysis, we calculated a natural gas premium of 18 basis points. The difference between our calculation and Dr. Morin's recommendation is he used a beta differential of .05 and a market risk premium of 6.0 percent to 7.0 percent.  We note that this adjustment could be negative in the future if the average beta for the natural gas index rises above the average beta for the WAW index.  By adopting this change, we are instructing staff to make

this adjustment regardless of whether the risk differential adjustment is positive or negative.

The next suggestion by Dr. Morin concerns the assumption in the leverage formula that a Moody's Baa2 bond rating and the corresponding cost rate is representative of the average marginal cost of debt for a Florida WAW utility over a 40 percent to 100 percent equity ratio range. During his presentation he stated that because of their financial profile and the general lack of liquidity of their debt issues, an assumed bond rating of Baa3 plus a private placement premium of 50 basis points would be more reflective of the marginal cost of debt for these companies.

We began using the Baa2 rating and the corresponding cost rate because it is readily available and because any rating below Baa is considered speculative with respect to the payment of interest and the repayment of principal. Although a Baa3 rate is not readily available, we can interpolate an approximate rate using our bond yield differential study. We find it appropriate to make this adjustment and we have measured the bond yield differential based on the difference in yields between A1 and Baa3 rather than Baa2 as has been our practice.

In addition to adjusting the bond yield differential, Dr. Morin believes it is also necessary to consider a private placement premium to recognize that Florida WAW utilities do not have access to the public debt and equity markets. Because of their small size, lack of institutional interest in their securities, and the lack of liquidity of their issues, Florida WAW utilities must rely on the private placement market to obtain capital. In his presentation, he recommended a premium for private placements over public issues of approximately 50 basis points based on the results of empirical studies conducted several years ago. However, he has subsequently done research that indicates a private placement premium in the current market environment of approximately 25 basis points. The results of our survey of participants in the private placement market and our review of more recent financial literature support Dr. Morin's more recent finding of a 25 basis point premium. As a result, in addition to adjusting the bond yield differential to recognize an assumed bond rating of Baa3, we find it appropriate to incorporate a private placement premium of 25 basis points in the derivation of the leverage formula.

The next suggestion deals with the specific conceptual framework used to derive the leverage formula. During his presentation, Dr. Morin stated that there are a number of frameworks in financial theory to document the relationship between the cost of equity and leverage. He noted that the framework used

by us produced results below the average of all the various
frameworks available.  At that time, he recommended the leverage
formula be amended so as to produce the same result as the average
from all the various frameworks.  However, since the time of the
February workshop, Dr. Morin has reconsidered his position on this
issue and he now endorses the framework which we have used to
derive the leverage formula.

Another suggestion by Dr. Morin concerns the assumption in the
leverage formula that the cost of debt remains constant over the 40
percent to 100 percent equity ratio range.  He states that this
assumption is unrealistic and he suggests that the leverage formula
should allow for the rising cost of debt as leverage rises.  He
recommends that once a cost of debt is determined, the leverage
formula should allow the cost to vary plus or minus 50 basis points
depending on the level of common equity in the capital structure.

We do not find it appropriate to incorporate this suggestion
in the determination of the leverage formula for three reasons.
First, from a practical standpoint we find that it would be
administratively burdensome to recalibrate the leverage formula
every time it is used.  Second, from a theoretical standpoint we
find that such a change is not necessary.  The theories underlying
the leverage formula, as used in Florida, are based on the works of
Modigliani and Miller (1958) and Miller (1977).  According to
Modigliani and Miller, the risk of financial leverage falls
entirely on equity and, therefore, the cost of debt remains
constant as leverage increases.  Although it is reasonable to
expect that as the amount of debt in the capital structure becomes
excessive the cost of debt and equity will rise, we find that a
debt ratio of 60 percent for a regulated WAW utility is not
excessive.  Finally, we find that if this change is adopted it
could produce a disincentive for utilities with below average
levels of common equity to increase their level of equity capital.

Dr. Morin's final suggestion concerns our practice of limiting
the allowed return to the return indicated at an equity ratio of 40
percent.  While he sympathizes with our desire to discourage the
use of high leverage, he argues that there is nothing imprudent or
unusual about higher levels of debt.  In addition, because the
small WAW utilities in Florida do not have access to equity
markets, generate limited internal capital, and must resort to the
private debt markets for capital, it is difficult for these
companies to increase their equity ratios.  To accommodate this
situation, he recommends that the 40 percent equity ratio
constraint be relaxed to 30 percent.

As Dr. Morin explained in his presentation, we have capped the allowed return at the level indicated at a 40 percent equity ratio to discourage the use of high leverage.  We still find that this approach is reasonable and should not be changed as suggested by Dr. Morin.  Given that the average equity ratio for the index of publicly traded WAW utilities is 42.0 percent and given the consensus opinion that the WAW utilities in Florida are more risky than the utilities in the index, it is only logical to assume the average Florida WAW utility should strive for an equity ratio higher than the average for the index.  This being the case, we do not find that we should reward utilities with equity ratios below 40 percent with a higher allowed ROE.  We find that the cap should remain at the return indicated at a 40 percent equity ratio.

After careful consideration of all of the suggestions made by the WAW industry, we calculated the updated leverage formula.  The basic assumptions, with one exception, remain unchanged from the previous year and are as follows:

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 40 percent to 100 percent equity ratio range.

The one basic assumption from previous years that has been modified this year concerns the assumed bond rating and average marginal cost of debt to a Florida WAW utility as discussed earlier.  At the suggestion of the WAW industry, we have derived an assumed Baa3 yield based on the bond yield differential.  Although it has been suggested that the Baa3 rating may still be too conservative, we find that any rating below Baa is considered speculative as to the issuer's ability to pay interest and repay principal.  Given adequate management and effective regulation, we do not find it appropriate to consider the average Florida WAW utility's ability to pay interest and repay principal as speculative.  Therefore, while we find it is reasonable to adopt the suggestion to use an assumed Baa3 rating and cost rate, we do not find it is appropriate to assume a bond rating below investment grade.

In addition to adjusting the bond yield differential to recognize an assumed Baa3 rating, we find it appropriate to increase the cost of debt used in the formula by 25 basis points to recognize a private placement premium.  As discussed earlier, a private placement premium is deemed necessary to recognize that none of the WAW utilities in Florida issue debt or equity through

public placements.   The industry's consultant quantified the
current difference between a public placement and a private
placement as approximately 25 basis points on average.  The results
of our survey of participants in the private placement market and
our review of the financial literature support the finding of the
industry's consultant.

In addition to the comments and suggestions from the various
WAW utility industry representatives raised during the workshops,
an issue was raised prior to the August 16, 1994 Agenda conference
regarding the assumption in the leverage formula that business risk
is similar for all Florida WAW utilities.   A concern was raised
that the publicly traded WAW companies in the index are not
representative of Florida utilities.    It was noted that many
Florida WAW utilities either report net losses on their annual
reports or fail to earn their allowed ROE.   It was also noted that
because of the wide variety of WAW utilities under our
jurisdiction, there is no "average" Florida WAW utility.

It is generally recognized that there is a considerable
difference in size between the utilities in the WAW index and
Florida utilities.   However, recognizing that all WAW utilities
must comply with federal water regulations, all face uncertainty
regarding future demand, all face uncertainty regarding future
supply, and all are exposed to regulatory risk, the argument that
the index is not reflective of the business risk inherent in the
WAW industry is misplaced.    Our updated leverage formula
appropriately compensates for the difference in risk due to
differences in size between the companies in the index and Florida
WAW utilities.

Regarding the point about certain Florida WAW utilities
perennially filing annual reports indicating net losses or rates of
return below their allowed returns on equity, we find that the
decisions on the part of utility management and possibly certain
rate structure issues are more responsible for this situation than
the level of returns indicated by the leverage formula.   We find
that the assumption of similar business risk for all Class A and B
utilities is still reasonable.   If it is believed that certain
Class C utilities can no longer be included in this group then it
may be time to explore forms of regulation other than rate of
return regulation for these utilities.   Pursuant to Section
367.0814(7), Florida Statutes, and Commission Rule 25-30.456,
Florida Administrative Code, we have the authority to employ non-
ratebase forms of regulation for Class C utilities.

In the leverage formula, the 11.88 percent return on common
equity is comprised of four segments.   First, a 10.78 percent

return on equity is derived by averaging the results of two DCF
analyses, a Risk Premium analysis, and a CAPM analysis.  We
assigned one third weight to the average of the two DCF analyses,
one third weight to the Risk Premium analysis, and one third weight
to the CAPM analysis.

The DCF models are applied to an index of publicly traded WAW
utilities.  The difference between the two applications is one
relies on historic growth rates and the other relies on projected
growth rates.  In the past, only a DCF analysis using historic
growth rates was used because of a lack of projected financial
information on publicly traded WAW utilities.

The Risk Premium model is applied to an index of publicly
traded natural gas utilities.  This is the same application used in
prior leverage formula dockets with one modification.  In response
to the suggestion by the industry consultant at the workshop, we
added an 18 basis point premium to the return indicated by the Risk
Premium analysis of natural gas companies.  This adjustment is made
to compensate for the perceived difference in risk between the
index of natural gas companies and the index of WAW utilities.

Finally, as suggested by the industry consultant during the
workshop, we have added a CAPM analysis to our group of cost of
equity models.  We have performed a prospective CAPM analysis based
on the framework suggested by the WAW consultant.

Second, we added a bond yield differential adjustment of 51
basis points to reflect the difference in risk between the indices
of companies used in the DCF and Risk Premium models and an average
WAW utility in Florida.  Third, we added the private placement
premium of 25 basis points discussed earlier to recognize that
Florida WAW utilities do not have access to the public debt and
equity markets.  Finally, we added an adjustment of 34 basis points
to reflect the required return on equity at a 40% equity ratio.
(See page 1 of Attachment 1).

The bond yield differential adjustment of 51 basis points is
comprised of the bond yield differential between the yield on A1-
rated bonds and the assumed yield on Baa3-rated bonds.  (See pages
11-12 of Attachment 1).  The A1 rating is the average bond rating
for both the natural gas index and the WAW index and the Baa3
rating is the bond rating assumed for the average WAW utility in
Florida.

We have added the private placement premium of 25 basis points
to recognize that Florida WAW utilities do not have access to the
public debt and equity markets.  The premium was based on the

results of surveys of participants in the private placement market
conducted by us and the industry's consultant and a review of the
financial literature.

The 34 basis point adjustment represents the difference
between the required rate of return at a 40.0 percent equity ratio
and the required rate of return at the 45.4 percent equity ratio
average for the indices of WAW utilities and natural gas utilities.
(See pages 13-14 of Attachment 1).    Using the most recently
available capital structure for the index of publicly traded WAW
utilities and the index of natural gas utilities as a proxy for the
capital structure of an average WAW utility in Florida, we
calculate the marginal cost of investor capital for an average WAW
utility in Florida to be 10.18 percent.

In summary, we find it appropriate to base the authorized
range of returns on common equity for the Florida WAW utilities on
the following formula:

Return on Common Equity = 9.05 percent + 1.131/Equity Ratio

We further limit the authorized return on common equity to a
maximum of 11.88 percent for all equity ratios of less than 40
percent in order to discourage imprudent financial risk.    The
recommended leverage formula produces a range of returns on equity
from 10.18 percent to 11.88 percent.

Based on the foregoing, it is, therefore,
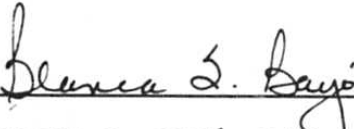
ORDERED by the Florida Public Service Commission that the
provisions of this Order are issued as proposed agency action and
will become final unless an appropriate petition if filed with the
Division of Records and Reporting, 2540 Shumard Oak Boulevard,
Tallahassee, Florida 32399-0850, by close of business on the date
indicated in the Notice of Further Proceedings or Judicial Review.
It is further

ORDERED that the appropriate formula for measuring returns on
common equity for water and wastewater utilities shall be as set
forth in the body of this Order.    It is further

ORDERED that returns on common equity are hereby capped at
11.88 percent for all water and wastewater utilities with equity
ratios of less than 40 percent in order to discourage imprudent
financial risk.

By ORDER of the Florida Public Service Commission, this 10th day of August, 1995.

_Blanca S. Bayó_

BLANCA S. BAYÓ, Director
Division of Records and Reporting

( S E A L )

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## NOTICE OF FURTHER PROCEEDINGS OR JUDICIAL REVIEW

The Florida Public Service Commission is required by Section 120.59(4), Florida Statutes, to notify parties of any administrative hearing or judicial review of Commission orders that is available under Sections 120.57 or 120.68, Florida Statutes, as well as the procedures and time limits that apply. This notice should not be construed to mean all requests for an administrative hearing or judicial review will be granted or result in the relief sought.

The action proposed herein is preliminary in nature and will not become effective or final, except as provided by Rule 25-22.029, Florida Administrative Code. Any person whose substantial interests are affected by the action proposed by this order may file a petition for a formal proceeding, as provided by Rule 25-22.029(4), Florida Administrative Code, in the form provided by Rule 25-22.036(7)(a) and (f), Florida Administrative Code. This petition must be received by the Director, Division of Records and Reporting, 2540 Shumard Oak Boulevard, Tallahassee, Florida 32399-0850, by the close of business on August 31, 1995.

In the absence of such a petition, this order shall become effective on the day subsequent to the above date as provided by Rule 25-22.029(6), Florida Administrative Code.

Any objection or protest filed in this docket before the issuance date of this order is considered abandoned unless it

satisfies the foregoing conditions and is renewed within the specified protest period.

If this order becomes final and effective on the date described above, any party substantially affected may request judicial review by the Florida Supreme Court in the case of an electric, gas or telephone utility or by the First District Court of Appeal in the case of a water or wastewater utility by filing a notice of appeal with the Director, Division of Records and Reporting and filing a copy of the notice of appeal and the filing fee with the appropriate court.  This filing must be completed within thirty (30) days of the effective date of this order, pursuant to Rule 9.110, Florida Rules of Appellate Procedure.  The notice of appeal must be in the form specified in Rule 9.900(a), Florida Rules of Appellate Procedure.

## SUMMARY OF RESULTS

### Leverage Formula Update

|  | 1994 | 1995 | 1995R |
|---|---|---|---|
| DCF ROE for Water Index (Historic) | 10.43% | 10.92% | 10.92% |
| Risk Premium ROE for Gas Index | 10.61% | 10.50% | 10.50% |
| Gas Index premium | --- | --- | .18% |
| DCF ROE for Water Index (Projected) | --- | --- | 10.37% |
| CAPM ROE for Water Index | --- | --- | 11.00% |
| AVERAGE | 10.52% | 10.71% | 10.78% |
| Bond Yield Differential | .41% | .40% | .51% |
| Private Placement Premium | --- | --- | .25% |
| Adjustment to Reflect Required Equity Return at a 40% Equity Ratio | .33% | .33% | .34% |
| Cost of Equity for Average Florida Water and Wastewater Utility at a 40% Equity Ratio | 11.26% | 11.44% | 11.88% |

### Existing Leverage Formula

Return on Common Equity $=$ 8.64% + 1.049/ER

Range of Returns on Equity $=$ 9.69% - 11.26%

### Updated Leverage Formula

Return on Common Equity $=$ 8.67% + 1.108/ER

Range of Returns on Equity $=$ 9.78% - 11.44%

### Recommended Leverage Formula

Return on Common Equity $=$ 9.05% + 1.131/ER

Range of Returns on Equity $=$ 10.18% - 11.88%

Leverage Formula = 9.05% + 1.131 / ER*

## Marginal Cost of Investor Capital
### Average Water and Wastewater Utility

| Capital Component | Ratio | Marginal Cost Rate | Weighted Marginal Cost Rate |
|---|---|---|---|
| Common Equity | 45.43% | 11.54% | 5.24% |
| Total Debt | 54.57% | 9.05% ** | 4.94% |
| | 100.00% | | 10.18% |

A 40% equity ratio is the floor for calculating the required return on common equity.
The return on equity at a 40% equity ratio = 9.05% + 1.131 / .40 = 11.88%

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

| Capital Component | Ratio | Marginal Cost Rate | Weighted Marginal Cost Rate |
|---|---|---|---|
| Common Equity | 40.00% | 11.88% | 4.75% |
| Total Debt | 60.00% | 9.05% ** | 5.43% |
| | 100.00% | | 10.18% |

* Where: Equity Ratio = Common Equity / (Common Equity + Preferred Equity
+ Long–Term Debt + Short–Term Debt)

** Assumed Baa3 rate for April 1995 plus 25 basis point private placement premium
Source: Moody's Bond Survey, 5/22/95

$$\text{Leverage Formula} = 8.67\% + 1.108 / ER^*$$

### Marginal Cost of Investor Capital
### Average Water and Wastewater Utility

| Capital Component | Ratio | Marginal Cost Rate | Weighted Marginal Cost Rate |
|---|---|---|---|
| Common Equity | 45.43% | 11.11% | 5.05% |
| Total Debt | 54.57% | 8.67% ** | 4.73% |
| | 100.00% | | 9.78% |

A 40% equity ratio is the floor for calculating the required return on common equity.
The return on equity at a 40% equity ratio = $8.67\% + 1.108 / .40 = 11.44\%$

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

| Capital Component | Ratio | Marginal Cost Rate | Weighted Marginal Cost Rate |
|---|---|---|---|
| Common Equity | 40.00% | 11.44% | 4.58% |
| Total Debt | 60.00% | 8.67% ** | 5.20% |
| | 100.00% | | 9.78% |

*  Where: Equity Ratio = Common Equity / (Common Equity + Preferred Equity + Long−Term Debt + Short−Term Debt)

** Average Baa rate for April 1995
   Source: Moody's Bond Survey, 5/22/95

## DCF Analysis of Water Index

| | Arithmetic Average Growth Rate | Current Dividend | Current Average Stock Price | Required Return On Equity % |
|---|---|---|---|---|
| American Water Works | 8.58% | 1.28 | 28.94 | 13.38 |
| Aquarion Company | 1.95% | 1.62 | 22.75 | 9.21 |
| California Water Services Co. | 4.44% | 2.04 | 31.00 | 11.32 |
| Consumers Water Company | 4.21% | 1.18 | 15.25 | 12.28 |
| Philadelphia Suburban Corp. | 2.42% | 1.12 | 18.06 | 8.77 |
| United Water Resources | 3.55% | 0.92 | 13.63 | 10.54 |
| Average | 4.19% | 1.36 | 21.60 | 10.92 |

DCF Analysis

K = D(1)/P(0) + g

K = Investors' required rate of return

D(1) = Dividend expected next period = Arithmetic growth rate x current dividend

P(0) = Current stock price = April average stock price

g = Projected long−term growth in dividends = Arithmetic growth rate

K = 10.92

Source: Standard & Poor's Stock Guide, May 1995 Edition

COST OF EQUITY FOR WATER INDEX COMPANIES
DISCOUNTED CASH FLOW MODEL

| COMPANY | DIV1 | DIV2 | DIV3 | DIV4 | EPS4 | ROE4 | Growth Yr 1-4 | Growth 4+ | HI-Price | LO-Price | April Average Price |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AMERICAN WATER WORKS | 1.28 | 1.38 | 1.49 | 1.60 | 2.90 | 11.00 | 1.0772 | 1.0493 | 29.375 | 28.500 | 28.938 |
| AQUARIAN CO. | 1.62 | 1.74 | 1.86 | 2.00 | 2.60 | 13.50 | 1.0728 | 1.0312 | 23.750 | 21.750 | 22.750 |
| CALIFORNIA WATER SVC | 2.04 | 2.10 | 2.16 | 2.22 | 3.00 | 12.00 | 1.0286 | 1.0312 | 32.250 | 29.750 | 31.000 |
| CONSUMERS WATER | 1.19 | 1.21 | 1.23 | 1.25 | 1.45 | 11.00 | 1.0165 | 1.0152 | 15.750 | 14.750 | 15.250 |
| PHILADELPHIA SUBURBAN | 1.15 | 1.18 | 1.22 | 1.25 | 1.60 | 13.00 | 1.0282 | 1.0284 | 18.375 | 17.750 | 18.063 |
| UNITED WATER RESOURCES | 0.92 | 0.96 | 1.00 | 1.05 | 1.55 | 12.50 | 1.0450 | 1.0403 | 14.125 | 13.125 | 13.625 |
| AVERAGE | 1.37 | 1.43 | 1.49 | 1.56 | 2.18 | 12.17 | 1.0447 | 1.0326 | | | 21.604 |

10.37%  =  Cost of equity required to match the current stock price with the expected cash flows

20.96  =  April 1995 average stock price less 3% flotation costs, or Po(1-fc)

| | QTR1 | QTR2 | QTR3 | QTR4 |
|---|---|---|---|---|
| 20.96  =  DIV1 | 0.34 | 0.33 | 0.32 | 0.31 |
| DIV2 | 0.32 | 0.31 | 0.31 | 0.30 |
| DIV3 | 0.30 | 0.30 | 0.29 | 0.28 |
| DIV4 | 0.29 | 0.28 | 0.27 | 0.27 |
| P4= | 16.13 | | | |

D1+D2+D3+D4+P4 =          20.96

Data Sources:
1. Stock Prices — S&P Stock Guide, May 1995 Edition
2. DPS, EPS, ROE — Value Line Edition 9, February 10, 1995

### Risk Premium Cost of Equity for Moody's Natural Gas Distribution Index

| | |
|---|---|
| Estimated Monthly Risk Premium | 3.076 % |
| Blue Chip Forecast for 30-Year Treasury Bond | 7.42 % |
| | 10.496 % |

* Blue Chip Financial Forecasts, May 1, 1995

Capital Asset Pricing Model Cost of Equity for

Water and Wastewater Industry

CAPM analyis formula

$K =$ RF + Beta(MR - RF)
$K =$ Investor's required rate of return
RF = Risk-free rate (Blue Chip forecast for 30-year Treasury bond)
Beta = Measure of industry-specific risk (Average for water utilities
  followed by Value Line)
MR = Market return

11.00% = 7.42% + .6417(13.0% - 7.42%)

Blue Chip Financial Forecasts, May 1, 1995
Value Line Investment Survey, May 12, 1995
ValueScreen, June 1, 1995

ESTIMATED MONTHLY RISK PREMIUMS
MOODY'S NATURAL GAS DISTRIBUTION INDEX
JUNE 1985 — MAY 1995

| YEAR | MONTH | Quarterly Cost of Equity Gas | Risk Free Rate | Risk Premium |
|------|-------|------|------|------|
| 1985 | JUN | 14.588 | 11.08 | 3.508 |
|      | JUL | 14.886 | 10.48 | 4.406 |
|      | AUG | 15.017 | 10.62 | 4.397 |
|      | SEP | 15.604 | 10.70 | 4.904 |
|      | OCT | 15.030 | 10.78 | 4.250 |
|      | NOV | 15.122 | 10.66 | 4.462 |
|      | DEC | 14.672 | 10.19 | 4.482 |
| 1986 | JAN | 13.857 | 9.68 | 4.177 |
|      | FEB | 13.780 | 9.59 | 4.190 |
|      | MAR | 13.644 | 9.26 | 4.384 |
|      | APR | 12.944 | 8.15 | 4.794 |
|      | MAY | 12.684 | 7.58 | 5.104 |
|      | JUN | 12.726 | 8.13 | 4.596 |
|      | JUL | 11.818 | 8.27 | 3.548 |
|      | AUG | 11.683 | 7.88 | 3.803 |
|      | SEP | 11.653 | 7.74 | 3.913 |
|      | OCT | 11.408 | 8.10 | 3.308 |
|      | NOV | 11.617 | 8.06 | 3.557 |
|      | DEC | 11.336 | 7.82 | 3.516 |
| 1987 | JAN | 11.847 | 7.66 | 4.187 |
|      | FEB | 11.642 | 7.62 | 4.022 |
|      | MAR | 11.563 | 7.71 | 3.853 |
|      | APR | 11.293 | 7.64 | 3.653 |
|      | MAY | 11.759 | 8.35 | 3.409 |
|      | JUN | 11.903 | 8.85 | 3.053 |
|      | JUL | 11.738 | 8.67 | 3.068 |
|      | AUG | 11.856 | 8.77 | 3.086 |
|      | SEP | 11.858 | 9.06 | 2.798 |
|      | OCT | 12.148 | 9.67 | 2.478 |
|      | NOV | 12.926 | 9.73 | 3.196 |
|      | DEC | 13.078 | 9.10 | 3.978 |
| 1988 | JAN | 13.226 | 9.23 | 3.996 |
|      | FEB | 12.850 | 8.93 | 3.920 |
|      | MAR | 12.416 | 8.48 | 3.936 |
|      | APR | 12.396 | 8.64 | 3.756 |
|      | MAY | 12.398 | 8.97 | 3.428 |
|      | JUN | 12.378 | 9.30 | 3.078 |
|      | JUL | 12.049 | 9.11 | 2.939 |
|      | AUG | 12.027 | 9.28 | 2.747 |
|      | SEP | 12.314 | 9.42 | 2.894 |
|      | OCT | 12.070 | 9.14 | 2.930 |
|      | NOV | 12.036 | 8.96 | 3.076 |
|      | DEC | 12.088 | 9.09 | 2.998 |

ESTIMATED MONTHLY RISK PREMIUMS (continued)

| YEAR | MONTH | Quarterly Cost of Equity Gas | Risk Free Rate | Risk Premium |
|------|-------|-------|-------|-------|
| 1989 | JAN | 12.028 | 9.10 | 2.928 |
|      | FEB | 12.050 | 9.05 | 3.000 |
|      | MAR | 12.060 | 9.15 | 2.910 |
|      | APR | 12.580 | 9.31 | 3.270 |
|      | MAY | 12.480 | 9.17 | 3.310 |
|      | JUN | 12.312 | 8.93 | 3.382 |
|      | JUL | 12.071 | 8.37 | 3.701 |
|      | AUG | 11.882 | 8.13 | 3.752 |
|      | SEP | 11.788 | 8.23 | 3.558 |
|      | OCT | 11.450 | 8.29 | 3.160 |
|      | NOV | 11.462 | 8.12 | 3.342 |
|      | DEC | 11.320 | 8.00 | 3.320 |
| 1990 | JAN | 10.978 | 8.00 | 2.978 |
|      | FEB | 11.130 | 8.37 | 2.760 |
|      | MAR | 11.252 | 8.63 | 2.622 |
|      | APR | 11.416 | 8.73 | 2.686 |
|      | MAY | 11.620 | 8.92 | 2.700 |
|      | JUN | 11.710 | 8.87 | 2.840 |
|      | JUL | 11.468 | 8.60 | 2.868 |
|      | AUG | 11.550 | 8.62 | 2.930 |
|      | SEP | 11.830 | 8.93 | 2.900 |
|      | OCT | 11.160 | 9.08 | 2.080 |
|      | NOV | 11.340 | 8.89 | 2.450 |
|      | DEC | 11.070 | 8.58 | 2.490 |
| 1991 | JAN | 11.031 | 8.27 | 2.761 |
|      | FEB | 11.186 | 8.31 | 2.876 |
|      | MAR | 11.171 | 8.09 | 3.081 |
|      | APR | 10.864 | 8.36 | 2.504 |
|      | MAY | 10.810 | 8.26 | 2.550 |
|      | JUN | 10.820 | 8.31 | 2.510 |
|      | JUL | 10.797 | 8.52 | 2.277 |
|      | AUG | 10.783 | 8.47 | 2.313 |
|      | SEP | 10.680 | 8.15 | 2.530 |
|      | OCT | 10.988 | 7.95 | 3.038 |
|      | NOV | 10.742 | 7.86 | 2.882 |
|      | DEC | 10.719 | 7.80 | 2.919 |
| 1992 | JAN | 10.580 | 7.55 | 3.030 |
|      | FEB | 10.640 | 7.46 | 3.180 |
|      | MAR | 10.698 | 7.76 | 2.938 |
|      | APR | 10.684 | 7.90 | 2.784 |
|      | MAY | 10.810 | 7.85 | 2.960 |
|      | JUN | 10.740 | 7.77 | 2.970 |
|      | JUL | 10.525 | 7.70 | 2.825 |
|      | AUG | 10.351 | 7.37 | 2.981 |
|      | SEP | 10.170 | 7.15 | 3.020 |
|      | OCT | 9.812 | 7.05 | 2.762 |
|      | NOV | 10.032 | 7.24 | 2.792 |
|      | DEC | 10.113 | 7.40 | 2.713 |

ESTIMATED MONTHLY RISK PREMIUMS (continued)

| YEAR | MONTH | Quarterly Cost of Equity Gas | Risk Free Rate | Risk Premium |
|------|-------|------------------------------|----------------|--------------|
| 1993 | JAN | 9.653 | 7.29 | 2.363 |
|      | FEB | 9.518 | 7.16 | 2.358 |
|      | MAR | 9.306 | 6.87 | 2.436 |
|      | APR | 9.086 | 6.63 | 2.456 |
|      | MAY | 9.222 | 6.63 | 2.592 |
|      | JUN | 9.338 | 6.67 | 2.668 |
|      | JUL | 9.547 | 6.54 | 3.007 |
|      | AUG | 8.769 | 6.33 | 2.439 |
|      | SEP | 8.774 | 6.16 | 2.614 |
|      | OCT | 8.813 | 5.93 | 2.883 |
|      | NOV | 8.843 | 5.89 | 2.953 |
|      | DEC | 9.136 | 6.23 | 2.906 |
| 1994 | JAN | 9.133 | 6.26 | 2.873 |
|      | FEB | 8.805 | 6.23 | 2.575 |
|      | MAR | 8.885 | 6.44 | 2.445 |
|      | APR | 9.126 | 6.89 | 2.236 |
|      | MAY | 9.431 | 7.30 | 2.131 |
|      | JUN | 9.550 | 7.47 | 2.080 |
|      | JUL | 9.737 | 7.42 | 2.317 |
|      | AUG | 9.723 | 7.60 | 2.123 |
|      | SEP | 9.802 | 7.540 | 2.262 |
|      | OCT | 9.921 | 7.770 | 2.151 |
|      | NOV | 9.813 | 8.010 | 1.803 |
|      | DEC | 10.198 | 8.150 | 2.048 |
| 1995 | JAN | 10.342 | 7.950 | 2.392 |
|      | FEB | 10.071 | 7.920 | 2.151 |
|      | MAR | 9.891 | 7.670 | 2.221 |
|      | APR | 9.865 | 7.500 | 2.365 |
|      | MAY | 9.747 | 7.380 | 2.367 |
| | **AVERAGE** | | | 3.076 |

SOURCES: Value Line Investment Survey
S&P Stock Guide
Moody's Bond Survey

**BOND YIELD DIFFERENTIALS**
Public Utility Bond Yield Averages
Source: Moody's Bond Survey

120 Month Average − 0.1243    0.1243    0.0748    0.0748    0.0748    0.1092    0.1092    0.1092    0.1092

| YEAR | MON | Aaa | SPREAD | Aa1 | SPREAD | Aa2 | SPREAD | Aa3 | SPREAD | A1 | SPREAD | A2 | SPREAD | A3 | SPREAD | Baa1 | SPREAD | Baa2 | SPREAD | Baa3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | APR | 8.08 | 0.05 | 8.13 | 0.05 | 8.17 | 0.03 | 8.20 | 0.03 | 8.24 | 0.03 | 8.27 | 0.13 | 8.40 | 0.13 | 8.54 | 0.13 | 8.67 | 0.13 | 8.80 |
| | MAR | 8.18 | 0.05 | 8.24 | 0.05 | 8.29 | 0.03 | 8.32 | 0.03 | 8.34 | 0.03 | 8.37 | 0.13 | 8.50 | 0.13 | 8.63 | 0.13 | 8.76 | 0.13 | 8.89 |
| | FEB | 8.33 | 0.06 | 8.39 | 0.06 | 8.45 | 0.02 | 8.47 | 0.02 | 8.50 | 0.02 | 8.52 | 0.14 | 8.66 | 0.14 | 8.79 | 0.14 | 8.93 | 0.14 | 9.07 |
| 1995 | JAN | 8.53 | 0.07 | 8.60 | 0.07 | 8.66 | 0.02 | 8.68 | 0.02 | 8.71 | 0.02 | 8.73 | 0.14 | 8.87 | 0.14 | 9.01 | 0.14 | 9.15 | 0.14 | 9.29 |
| | DEC | 8.55 | 0.07 | 8.62 | 0.07 | 8.69 | 0.02 | 8.71 | 0.02 | 8.74 | 0.02 | 8.76 | 0.13 | 8.89 | 0.13 | 9.03 | 0.13 | 9.16 | 0.13 | 9.29 |
| | NOV | 8.77 | 0.06 | 8.84 | 0.06 | 8.90 | 0.03 | 8.93 | 0.03 | 8.95 | 0.03 | 8.98 | 0.12 | 9.10 | 0.12 | 9.23 | 0.12 | 9.35 | 0.12 | 9.47 |
| | OCT | 8.65 | 0.07 | 8.72 | 0.07 | 8.78 | 0.03 | 8.81 | 0.03 | 8.83 | 0.03 | 8.86 | 0.13 | 8.99 | 0.13 | 9.11 | 0.13 | 9.24 | 0.13 | 9.37 |
| | SEP | 8.41 | 0.08 | 8.49 | 0.08 | 8.56 | 0.03 | 8.59 | 0.03 | 8.61 | 0.03 | 8.64 | 0.11 | 8.75 | 0.11 | 8.87 | 0.11 | 8.98 | 0.11 | 9.09 |
| | AUG | 8.15 | 0.09 | 8.24 | 0.09 | 8.32 | 0.03 | 8.35 | 0.03 | 8.38 | 0.03 | 8.41 | 0.11 | 8.52 | 0.11 | 8.63 | 0.11 | 8.74 | 0.11 | 8.85 |
| | JUL | 8.21 | 0.09 | 8.30 | 0.09 | 8.38 | 0.03 | 8.41 | 0.03 | 8.44 | 0.03 | 8.47 | 0.11 | 8.58 | 0.11 | 8.69 | 0.11 | 8.80 | 0.11 | 8.91 |
| | JUN | 8.07 | 0.07 | 8.14 | 0.07 | 8.21 | 0.03 | 8.24 | 0.03 | 8.28 | 0.03 | 8.31 | 0.11 | 8.42 | 0.11 | 8.53 | 0.11 | 8.64 | 0.11 | 8.75 |
| | MAY | 8.11 | 0.07 | 8.18 | 0.07 | 8.24 | 0.03 | 8.27 | 0.03 | 8.30 | 0.03 | 8.33 | 0.09 | 8.42 | 0.09 | 8.52 | 0.09 | 8.61 | 0.09 | 8.70 |
| | APR | 8.00 | 0.06 | 8.06 | 0.06 | 8.12 | 0.03 | 8.15 | 0.03 | 8.19 | 0.03 | 8.22 | 0.08 | 8.30 | 0.08 | 8.39 | 0.08 | 8.47 | 0.08 | 8.55 |
| | MAR | 7.60 | 0.07 | 7.67 | 0.07 | 7.74 | 0.04 | 7.78 | 0.04 | 7.81 | 0.04 | 7.85 | 0.09 | 7.94 | 0.09 | 8.02 | 0.09 | 8.11 | 0.09 | 8.20 |
| | FEB | 7.19 | 0.08 | 7.27 | 0.08 | 7.34 | 0.04 | 7.38 | 0.04 | 7.43 | 0.04 | 7.47 | 0.10 | 7.57 | 0.10 | 7.66 | 0.10 | 7.76 | 0.10 | 7.86 |
| 1994 | JAN | 7.05 | 0.06 | 7.12 | 0.06 | 7.18 | 0.05 | 7.23 | 0.05 | 7.28 | 0.05 | 7.33 | 0.11 | 7.44 | 0.11 | 7.55 | 0.11 | 7.66 | 0.11 | 7.77 |
| | DEC | 7.06 | 0.06 | 7.12 | 0.06 | 7.18 | 0.05 | 7.23 | 0.05 | 7.29 | 0.05 | 7.34 | 0.13 | 7.47 | 0.13 | 7.60 | 0.13 | 7.73 | 0.13 | 7.86 |
| | NOV | 7.06 | 0.06 | 7.12 | 0.06 | 7.17 | 0.04 | 7.21 | 0.04 | 7.26 | 0.04 | 7.30 | 0.13 | 7.43 | 0.13 | 7.56 | 0.13 | 7.69 | 0.13 | 7.82 |
| | OCT | 6.75 | 0.07 | 6.82 | 0.07 | 6.89 | 0.05 | 6.94 | 0.05 | 6.98 | 0.05 | 7.03 | 0.08 | 7.11 | 0.08 | 7.19 | 0.08 | 7.27 | 0.08 | 7.35 |
| | SEP | 6.76 | 0.06 | 6.83 | 0.06 | 6.89 | 0.05 | 6.94 | 0.05 | 6.99 | 0.05 | 7.04 | 0.10 | 7.14 | 0.10 | 7.25 | 0.10 | 7.35 | 0.10 | 7.45 |
| | AUG | 6.94 | 0.07 | 7.01 | 0.07 | 7.07 | 0.06 | 7.13 | 0.06 | 7.19 | 0.06 | 7.25 | 0.11 | 7.36 | 0.11 | 7.48 | 0.11 | 7.59 | 0.11 | 7.70 |
| | JUL | 7.25 | 0.07 | 7.32 | 0.07 | 7.38 | 0.05 | 7.43 | 0.05 | 7.49 | 0.05 | 7.54 | 0.13 | 7.67 | 0.13 | 7.80 | 0.13 | 7.93 | 0.13 | 8.06 |
| | JUN | 7.37 | 0.09 | 7.46 | 0.09 | 7.54 | 0.07 | 7.61 | 0.07 | 7.68 | 0.07 | 7.75 | 0.10 | 7.85 | 0.10 | 7.95 | 0.10 | 8.05 | 0.10 | 8.15 |
| | MAY | 7.44 | 0.10 | 7.54 | 0.10 | 7.64 | 0.07 | 7.71 | 0.07 | 7.79 | 0.07 | 7.86 | 0.11 | 7.97 | 0.11 | 8.07 | 0.11 | 8.18 | 0.11 | 8.29 |
| | APR | 7.50 | 0.07 | 7.57 | 0.07 | 7.64 | 0.06 | 7.70 | 0.06 | 7.75 | 0.06 | 7.81 | 0.10 | 7.91 | 0.10 | 8.01 | 0.10 | 8.11 | 0.10 | 8.21 |
| | MAR | 7.64 | 0.06 | 7.70 | 0.06 | 7.76 | 0.05 | 7.81 | 0.05 | 7.85 | 0.05 | 7.90 | 0.07 | 7.97 | 0.07 | 8.03 | 0.07 | 8.10 | 0.07 | 8.17 |
| | FEB | 7.75 | 0.09 | 7.84 | 0.09 | 7.92 | 0.04 | 7.96 | 0.04 | 8.00 | 0.04 | 8.04 | 0.09 | 8.13 | 0.09 | 8.22 | 0.09 | 8.31 | 0.09 | 8.40 |
| 1993 | JAN | 7.94 | 0.10 | 8.04 | 0.10 | 8.14 | 0.04 | 8.18 | 0.04 | 8.23 | 0.04 | 8.27 | 0.10 | 8.37 | 0.10 | 8.47 | 0.10 | 8.57 | 0.10 | 8.67 |
| | DEC | 8.01 | 0.15 | 8.17 | 0.15 | 8.32 | 0.04 | 8.36 | 0.04 | 8.39 | 0.04 | 8.43 | 0.09 | 8.52 | 0.09 | 8.60 | 0.09 | 8.69 | 0.09 | 8.78 |
| | NOV | 8.11 | 0.20 | 8.31 | 0.20 | 8.51 | 0.04 | 8.55 | 0.04 | 8.59 | 0.04 | 8.63 | 0.08 | 8.71 | 0.08 | 8.78 | 0.08 | 8.86 | 0.08 | 8.94 |
| | OCT | 8.06 | 0.18 | 8.24 | 0.18 | 8.42 | 0.04 | 8.46 | 0.04 | 8.50 | 0.04 | 8.54 | 0.07 | 8.61 | 0.07 | 8.69 | 0.07 | 8.76 | 0.07 | 8.83 |
| | SEP | 8.04 | 0.12 | 8.16 | 0.12 | 8.28 | 0.04 | 8.32 | 0.04 | 8.36 | 0.04 | 8.40 | 0.05 | 8.45 | 0.05 | 8.49 | 0.05 | 8.54 | 0.05 | 8.59 |
| | AUG | 8.04 | 0.13 | 8.17 | 0.13 | 8.30 | 0.05 | 8.35 | 0.05 | 8.39 | 0.05 | 8.44 | 0.05 | 8.49 | 0.05 | 8.53 | 0.05 | 8.58 | 0.05 | 8.63 |
| | JUL | 8.12 | 0.16 | 8.29 | 0.16 | 8.45 | 0.04 | 8.49 | 0.04 | 8.53 | 0.04 | 8.57 | 0.04 | 8.61 | 0.04 | 8.65 | 0.04 | 8.69 | 0.04 | 8.73 |
| | JUN | 8.26 | 0.18 | 8.45 | 0.18 | 8.63 | 0.05 | 8.68 | 0.05 | 8.73 | 0.05 | 8.78 | 0.04 | 8.82 | 0.04 | 8.86 | 0.04 | 8.90 | 0.04 | 8.94 |
| | MAY | 8.32 | 0.18 | 8.51 | 0.18 | 8.69 | 0.06 | 8.75 | 0.06 | 8.81 | 0.06 | 8.87 | 0.05 | 8.92 | 0.05 | 8.96 | 0.05 | 9.01 | 0.05 | 9.06 |
| | APR | 8.36 | 0.20 | 8.56 | 0.20 | 8.76 | 0.06 | 8.82 | 0.06 | 8.87 | 0.06 | 8.93 | 0.06 | 8.99 | 0.06 | 9.05 | 0.06 | 9.11 | 0.06 | 9.17 |
| | MAR | 8.39 | 0.21 | 8.61 | 0.21 | 8.82 | 0.05 | 8.87 | 0.05 | 8.92 | 0.05 | 8.97 | 0.06 | 9.03 | 0.06 | 9.10 | 0.06 | 9.16 | 0.06 | 9.22 |
| | FEB | 8.30 | 0.23 | 8.53 | 0.23 | 8.76 | 0.06 | 8.82 | 0.06 | 8.87 | 0.06 | 8.93 | 0.05 | 8.98 | 0.05 | 9.04 | 0.05 | 9.09 | 0.05 | 9.14 |
| 1992 | JAN | 8.22 | 0.20 | 8.43 | 0.20 | 8.63 | 0.07 | 8.70 | 0.07 | 8.77 | 0.07 | 8.84 | 0.05 | 8.89 | 0.05 | 8.93 | 0.05 | 8.98 | 0.05 | 9.03 |
| | DEC | 8.38 | 0.16 | 8.55 | 0.16 | 8.71 | 0.06 | 8.77 | 0.06 | 8.82 | 0.06 | 8.88 | 0.06 | 8.94 | 0.06 | 9.01 | 0.06 | 9.07 | 0.06 | 9.13 |
| | NOV | 8.52 | 0.17 | 8.70 | 0.17 | 8.87 | 0.06 | 8.93 | 0.06 | 8.99 | 0.06 | 9.05 | 0.08 | 9.13 | 0.08 | 9.20 | 0.08 | 9.28 | 0.08 | 9.36 |
| | OCT | 8.57 | 0.18 | 8.75 | 0.18 | 8.92 | 0.07 | 8.99 | 0.07 | 9.05 | 0.07 | 9.12 | 0.07 | 9.19 | 0.07 | 9.25 | 0.07 | 9.32 | 0.07 | 9.39 |
| | SEP | 8.65 | 0.15 | 8.80 | 0.15 | 8.95 | 0.07 | 9.02 | 0.07 | 9.09 | 0.07 | 9.16 | 0.06 | 9.22 | 0.06 | 9.28 | 0.06 | 9.34 | 0.06 | 9.40 |
| | AUG | 8.81 | 0.13 | 8.94 | 0.13 | 9.06 | 0.08 | 9.14 | 0.08 | 9.21 | 0.08 | 9.29 | 0.06 | 9.35 | 0.06 | 9.41 | 0.06 | 9.47 | 0.06 | 9.53 |
| | JUL | 9.10 | 0.08 | 9.18 | 0.08 | 9.26 | 0.10 | 9.36 | 0.10 | 9.45 | 0.10 | 9.55 | 0.05 | 9.60 | 0.05 | 9.64 | 0.05 | 9.69 | 0.05 | 9.74 |
| | JUN | 9.10 | 0.09 | 9.19 | 0.09 | 9.28 | 0.10 | 9.38 | 0.10 | 9.49 | 0.10 | 9.59 | 0.07 | 9.66 | 0.07 | 9.72 | 0.07 | 9.79 | 0.07 | 9.86 |
| | MAY | 8.93 | 0.11 | 9.05 | 0.11 | 9.16 | 0.09 | 9.25 | 0.09 | 9.35 | 0.09 | 9.44 | 0.07 | 9.51 | 0.07 | 9.57 | 0.07 | 9.64 | 0.07 | 9.71 |
| | APR | 8.95 | 0.10 | 9.05 | 0.10 | 9.14 | 0.11 | 9.25 | 0.11 | 9.35 | 0.11 | 9.46 | 0.06 | 9.52 | 0.06 | 9.58 | 0.06 | 9.64 | 0.06 | 9.70 |
| | MAR | 9.04 | 0.09 | 9.14 | 0.09 | 9.23 | 0.11 | 9.34 | 0.11 | 9.44 | 0.11 | 9.55 | 0.06 | 9.61 | 0.06 | 9.68 | 0.06 | 9.74 | 0.06 | 9.80 |
| | FEB | 8.92 | 0.12 | 9.04 | 0.12 | 9.16 | 0.10 | 9.26 | 0.10 | 9.37 | 0.10 | 9.47 | 0.07 | 9.54 | 0.07 | 9.61 | 0.07 | 9.68 | 0.07 | 9.75 |
| 1991 | JAN | 9.17 | 0.11 | 9.28 | 0.11 | 9.39 | 0.11 | 9.50 | 0.11 | 9.60 | 0.11 | 9.71 | 0.08 | 9.79 | 0.08 | 9.88 | 0.08 | 9.96 | 0.08 | 10.04 |
| | DEC | 9.18 | 0.12 | 9.30 | 0.12 | 9.42 | 0.10 | 9.52 | 0.10 | 9.63 | 0.10 | 9.73 | 0.08 | 9.81 | 0.08 | 9.88 | 0.08 | 9.96 | 0.08 | 10.04 |
| | NOV | 9.43 | 0.08 | 9.51 | 0.08 | 9.59 | 0.10 | 9.69 | 0.10 | 9.80 | 0.10 | 9.90 | 0.07 | 9.97 | 0.07 | 10.05 | 0.07 | 10.12 | 0.07 | 10.19 |
| | OCT | 9.66 | 0.06 | 9.72 | 0.06 | 9.77 | 0.09 | 9.86 | 0.09 | 9.96 | 0.09 | 10.05 | 0.08 | 10.13 | 0.08 | 10.20 | 0.08 | 10.28 | 0.08 | 10.36 |
| | SEP | 9.73 | 0.07 | 9.80 | 0.07 | 9.87 | 0.08 | 9.95 | 0.08 | 10.04 | 0.08 | 10.12 | 0.07 | 10.19 | 0.07 | 10.25 | 0.07 | 10.32 | 0.07 | 10.39 |
| | AUG | 9.54 | 0.12 | 9.66 | 0.12 | 9.78 | 0.05 | 9.83 | 0.05 | 9.87 | 0.05 | 9.92 | 0.07 | 9.99 | 0.07 | 10.05 | 0.07 | 10.12 | 0.07 | 10.19 |
| | JUL | 9.36 | 0.13 | 9.49 | 0.13 | 9.61 | 0.05 | 9.66 | 0.05 | 9.70 | 0.05 | 9.75 | 0.06 | 9.81 | 0.06 | 9.86 | 0.06 | 9.92 | 0.06 | 9.98 |
| | JUN | 9.38 | 0.11 | 9.49 | 0.11 | 9.60 | 0.07 | 9.67 | 0.07 | 9.73 | 0.07 | 9.80 | 0.05 | 9.85 | 0.05 | 9.91 | 0.05 | 9.96 | 0.05 | 10.01 |
| | MAY | 9.58 | 0.13 | 9.71 | 0.13 | 9.83 | 0.06 | 9.89 | 0.06 | 9.94 | 0.06 | 10.00 | 0.05 | 10.05 | 0.05 | 10.11 | 0.05 | 10.16 | 0.05 | 10.21 |

BOND YIELD DIFFERENTIALS
Public Utility Bond Yield Averages
Source: Moody's Bond Survey

120 Month Average − 0.1243    0.1243    0.0748    0.0748    0.0748    0.1092    0.1092    0.1092    0.1092

| YEAR | MON | Aaa | SPREAD | Aa1 | SPREAD | Aa2 | SPREAD | Aa3 | SPREAD | A1 | SPREAD | A2 | SPREAD | A3 | SPREAD | Baa1 | SPREAD | Baa2 | SPREAD | Baa3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | APR | 9.60 | 0.11 | 9.71 | 0.11 | 9.81 | 0.04 | 9.85 | 0.04 | 9.88 | 0.04 | 9.92 | 0.07 | 9.99 | 0.07 | 10.06 | 0.07 | 10.13 | 0.07 | 10.20 |
| | MAR | 9.48 | 0.06 | 9.54 | 0.06 | 9.60 | 0.08 | 9.68 | 0.08 | 9.77 | 0.08 | 9.85 | 0.07 | 9.92 | 0.07 | 9.99 | 0.07 | 10.06 | 0.07 | 10.13 |
| | FEB | 9.35 | 0.11 | 9.46 | 0.11 | 9.57 | 0.06 | 9.63 | 0.06 | 9.70 | 0.06 | 9.76 | 0.07 | 9.83 | 0.07 | 9.89 | 0.07 | 9.96 | 0.07 | 10.03 |
| 1990 | JAN | 9.08 | 0.16 | 9.24 | 0.16 | 9.39 | 0.06 | 9.45 | 0.06 | 9.50 | 0.06 | 9.56 | 0.06 | 9.62 | 0.06 | 9.68 | 0.06 | 9.74 | 0.06 | 9.80 |
| | DEC | 8.92 | 0.17 | 9.09 | 0.17 | 9.26 | 0.06 | 9.32 | 0.06 | 9.38 | 0.06 | 9.44 | 0.05 | 9.49 | 0.05 | 9.55 | 0.05 | 9.60 | 0.05 | 9.65 |
| | NOV | 8.92 | 0.16 | 9.09 | 0.16 | 9.25 | 0.09 | 9.34 | 0.09 | 9.42 | 0.09 | 9.51 | 0.04 | 9.55 | 0.04 | 9.60 | 0.04 | 9.64 | 0.04 | 9.68 |
| | OCT | 9.01 | 0.13 | 9.15 | 0.13 | 9.28 | 0.09 | 9.37 | 0.09 | 9.45 | 0.09 | 9.54 | 0.03 | 9.57 | 0.03 | 9.61 | 0.03 | 9.64 | 0.03 | 9.67 |
| | SEP | 9.10 | 0.13 | 9.23 | 0.13 | 9.35 | 0.08 | 9.43 | 0.08 | 9.50 | 0.08 | 9.58 | 0.04 | 9.62 | 0.04 | 9.66 | 0.04 | 9.70 | 0.04 | 9.74 |
| | AUG | 9.02 | 0.13 | 9.15 | 0.13 | 9.27 | 0.08 | 9.35 | 0.08 | 9.44 | 0.08 | 9.52 | 0.04 | 9.56 | 0.04 | 9.60 | 0.04 | 9.64 | 0.04 | 9.68 |
| | JUL | 8.98 | 0.13 | 9.11 | 0.13 | 9.23 | 0.09 | 9.32 | 0.09 | 9.41 | 0.09 | 9.50 | 0.05 | 9.55 | 0.05 | 9.59 | 0.05 | 9.64 | 0.05 | 9.69 |
| | JUN | 9.13 | 0.12 | 9.25 | 0.12 | 9.37 | 0.09 | 9.46 | 0.09 | 9.55 | 0.09 | 9.64 | 0.05 | 9.69 | 0.05 | 9.75 | 0.05 | 9.80 | 0.05 | 9.85 |
| | MAY | 9.60 | 0.09 | 9.70 | 0.09 | 9.79 | 0.07 | 9.86 | 0.07 | 9.92 | 0.07 | 9.99 | 0.10 | 10.09 | 0.10 | 10.19 | 0.10 | 10.29 | 0.10 | 10.39 |
| | APR | 9.88 | 0.07 | 9.95 | 0.07 | 10.02 | 0.05 | 10.07 | 0.05 | 10.13 | 0.05 | 10.18 | 0.10 | 10.28 | 0.10 | 10.39 | 0.10 | 10.49 | 0.10 | 10.59 |
| | MAR | 9.87 | 0.09 | 9.96 | 0.09 | 10.05 | 0.06 | 10.11 | 0.06 | 10.17 | 0.06 | 10.23 | 0.09 | 10.32 | 0.09 | 10.41 | 0.09 | 10.50 | 0.09 | 10.59 |
| | FEB | 9.71 | 0.11 | 9.82 | 0.11 | 9.93 | 0.05 | 9.98 | 0.05 | 10.02 | 0.05 | 10.07 | 0.10 | 10.17 | 0.10 | 10.28 | 0.10 | 10.38 | 0.10 | 10.48 |
| 1989 | JAN | 9.72 | 0.09 | 9.81 | 0.09 | 9.89 | 0.06 | 9.95 | 0.06 | 10.02 | 0.06 | 10.08 | 0.10 | 10.18 | 0.10 | 10.28 | 0.10 | 10.38 | 0.10 | 10.48 |
| | DEC | 9.67 | 0.11 | 9.79 | 0.11 | 9.90 | 0.05 | 9.95 | 0.05 | 10.01 | 0.05 | 10.06 | 0.13 | 10.19 | 0.13 | 10.31 | 0.13 | 10.44 | 0.13 | 10.57 |
| | NOV | 9.62 | 0.09 | 9.71 | 0.09 | 9.79 | 0.06 | 9.85 | 0.06 | 9.91 | 0.06 | 9.97 | 0.11 | 10.08 | 0.11 | 10.20 | 0.11 | 10.31 | 0.11 | 10.42 |
| | OCT | 9.52 | 0.14 | 9.66 | 0.14 | 9.80 | 0.03 | 9.83 | 0.03 | 9.87 | 0.03 | 9.90 | 0.15 | 10.05 | 0.15 | 10.20 | 0.15 | 10.35 | 0.15 | 10.50 |
| | SEP | 10.15 | 0.10 | 10.25 | 0.10 | 10.34 | 0.09 | 10.43 | 0.09 | 10.52 | 0.09 | 10.61 | 0.17 | 10.78 | 0.17 | 10.96 | 0.17 | 11.13 | 0.17 | 11.30 |
| | AUG | 10.66 | 0.10 | 10.76 | 0.10 | 10.85 | 0.11 | 10.96 | 0.11 | 11.06 | 0.11 | 11.17 | 0.17 | 11.34 | 0.17 | 11.52 | 0.17 | 11.69 | 0.17 | 11.86 |
| | JUL | 10.50 | 0.13 | 10.63 | 0.13 | 10.76 | 0.09 | 10.85 | 0.09 | 10.95 | 0.09 | 11.04 | 0.16 | 11.20 | 0.16 | 11.36 | 0.16 | 11.52 | 0.16 | 11.68 |
| | JUN | 10.27 | 0.13 | 10.40 | 0.13 | 10.52 | 0.09 | 10.61 | 0.09 | 10.70 | 0.09 | 10.79 | 0.16 | 10.95 | 0.16 | 11.11 | 0.16 | 11.27 | 0.16 | 11.43 |
| | MAY | 10.29 | 0.12 | 10.41 | 0.12 | 10.53 | 0.09 | 10.62 | 0.09 | 10.72 | 0.09 | 10.81 | 0.19 | 11.00 | 0.19 | 11.19 | 0.19 | 11.38 | 0.19 | 11.57 |
| | APR | 10.07 | 0.11 | 10.18 | 0.11 | 10.29 | 0.08 | 10.37 | 0.08 | 10.46 | 0.08 | 10.54 | 0.23 | 10.77 | 0.23 | 11.00 | 0.23 | 11.23 | 0.23 | 11.46 |
| | MAR | 9.72 | 0.10 | 9.82 | 0.10 | 9.92 | 0.06 | 9.98 | 0.06 | 10.03 | 0.06 | 10.09 | 0.20 | 10.29 | 0.20 | 10.49 | 0.20 | 10.69 | 0.20 | 10.89 |
| | FEB | 9.77 | 0.07 | 9.84 | 0.07 | 9.91 | 0.06 | 9.97 | 0.06 | 10.04 | 0.06 | 10.10 | 0.18 | 10.28 | 0.18 | 10.47 | 0.18 | 10.65 | 0.18 | 10.83 |
| 1988 | JAN | 10.39 | 0.07 | 10.46 | 0.07 | 10.52 | 0.08 | 10.60 | 0.08 | 10.68 | 0.08 | 10.76 | 0.19 | 10.95 | 0.19 | 11.15 | 0.19 | 11.34 | 0.19 | 11.53 |
| | DEC | 10.64 | 0.07 | 10.71 | 0.07 | 10.78 | 0.07 | 10.85 | 0.07 | 10.91 | 0.07 | 10.98 | 0.19 | 11.17 | 0.19 | 11.36 | 0.19 | 11.55 | 0.19 | 11.74 |
| | NOV | 10.43 | 0.09 | 10.53 | 0.09 | 10.62 | 0.07 | 10.69 | 0.07 | 10.75 | 0.07 | 10.82 | 0.19 | 11.01 | 0.19 | 11.21 | 0.19 | 11.40 | 0.19 | 11.59 |
| | OCT | 10.92 | 0.09 | 11.02 | 0.09 | 11.11 | 0.08 | 11.19 | 0.08 | 11.26 | 0.08 | 11.34 | 0.19 | 11.53 | 0.19 | 11.72 | 0.19 | 11.91 | 0.19 | 12.10 |
| | SEP | 10.53 | 0.07 | 10.60 | 0.07 | 10.66 | 0.19 | 10.85 | 0.19 | 11.03 | 0.19 | 11.22 | 0.12 | 11.34 | 0.12 | 11.46 | 0.12 | 11.58 | 0.12 | 11.70 |
| | AUG | 9.92 | 0.07 | 9.99 | 0.07 | 10.05 | 0.13 | 10.18 | 0.13 | 10.32 | 0.13 | 10.45 | 0.15 | 10.60 | 0.15 | 10.75 | 0.15 | 10.90 | 0.15 | 11.05 |
| | JUL | 9.56 | 0.07 | 9.63 | 0.07 | 9.70 | 0.15 | 9.85 | 0.15 | 10.00 | 0.15 | 10.15 | 0.16 | 10.31 | 0.16 | 10.46 | 0.16 | 10.62 | 0.16 | 10.78 |
| | JUN | 9.37 | 0.12 | 9.49 | 0.12 | 9.61 | 0.14 | 9.75 | 0.14 | 9.88 | 0.14 | 10.02 | 0.15 | 10.17 | 0.15 | 10.31 | 0.15 | 10.46 | 0.15 | 10.61 |
| | MAY | 9.34 | 0.14 | 9.49 | 0.14 | 9.63 | 0.09 | 9.72 | 0.09 | 9.82 | 0.09 | 9.91 | 0.16 | 10.07 | 0.16 | 10.24 | 0.16 | 10.40 | 0.16 | 10.56 |
| | APR | 8.83 | 0.16 | 8.99 | 0.16 | 9.15 | 0.08 | 9.23 | 0.08 | 9.30 | 0.08 | 9.38 | 0.16 | 9.54 | 0.16 | 9.69 | 0.16 | 9.85 | 0.16 | 10.01 |
| | MAR | 8.21 | 0.22 | 8.43 | 0.22 | 8.64 | 0.10 | 8.74 | 0.10 | 8.83 | 0.10 | 8.93 | 0.09 | 9.02 | 0.09 | 9.10 | 0.09 | 9.19 | 0.09 | 9.28 |
| | FEB | 8.29 | 0.20 | 8.49 | 0.20 | 8.69 | 0.10 | 8.79 | 0.10 | 8.90 | 0.10 | 9.00 | 0.08 | 9.08 | 0.08 | 9.16 | 0.08 | 9.24 | 0.08 | 9.32 |
| 1987 | JAN | 8.23 | 0.20 | 8.43 | 0.20 | 8.62 | 0.11 | 8.73 | 0.11 | 8.84 | 0.11 | 8.95 | 0.11 | 9.06 | 0.11 | 9.16 | 0.11 | 9.27 | 0.11 | 9.38 |
| | DEC | 8.41 | 0.20 | 8.61 | 0.20 | 8.81 | 0.10 | 8.91 | 0.10 | 9.02 | 0.10 | 9.12 | 0.12 | 9.24 | 0.12 | 9.37 | 0.12 | 9.49 | 0.12 | 9.61 |
| | NOV | 8.59 | 0.21 | 8.80 | 0.21 | 9.01 | 0.09 | 9.10 | 0.09 | 9.19 | 0.09 | 9.28 | 0.14 | 9.42 | 0.14 | 9.55 | 0.14 | 9.69 | 0.14 | 9.83 |
| | OCT | 8.84 | 0.20 | 9.04 | 0.20 | 9.24 | 0.09 | 9.33 | 0.09 | 9.43 | 0.09 | 9.52 | 0.14 | 9.66 | 0.14 | 9.81 | 0.14 | 9.95 | 0.14 | 10.09 |
| | SEP | 8.91 | 0.18 | 9.10 | 0.18 | 9.28 | 0.08 | 9.36 | 0.08 | 9.44 | 0.08 | 9.52 | 0.15 | 9.67 | 0.15 | 9.81 | 0.15 | 9.96 | 0.15 | 10.11 |
| | AUG | 8.59 | 0.22 | 8.81 | 0.22 | 9.03 | 0.09 | 9.12 | 0.09 | 9.20 | 0.09 | 9.29 | 0.14 | 9.43 | 0.14 | 9.56 | 0.14 | 9.70 | 0.14 | 9.84 |
| | JUL | 8.66 | 0.20 | 8.86 | 0.20 | 9.05 | 0.11 | 9.16 | 0.11 | 9.26 | 0.11 | 9.37 | 0.11 | 9.48 | 0.11 | 9.58 | 0.11 | 9.69 | 0.11 | 9.80 |
| | JUN | 9.02 | 0.17 | 9.19 | 0.17 | 9.36 | 0.09 | 9.45 | 0.09 | 9.53 | 0.09 | 9.62 | 0.14 | 9.76 | 0.14 | 9.89 | 0.14 | 10.03 | 0.14 | 10.17 |
| | MAY | 9.07 | 0.16 | 9.23 | 0.16 | 9.38 | 0.07 | 9.45 | 0.07 | 9.52 | 0.07 | 9.59 | 0.14 | 9.73 | 0.14 | 9.88 | 0.14 | 10.02 | 0.14 | 10.16 |
| | APR | 8.45 | 0.21 | 8.66 | 0.21 | 8.87 | 0.09 | 8.96 | 0.09 | 9.05 | 0.09 | 9.14 | 0.16 | 9.30 | 0.16 | 9.47 | 0.16 | 9.63 | 0.16 | 9.79 |
| | MAR | 8.75 | 0.20 | 8.96 | 0.20 | 9.16 | 0.11 | 9.27 | 0.11 | 9.37 | 0.11 | 9.48 | 0.14 | 9.62 | 0.14 | 9.77 | 0.14 | 9.91 | 0.14 | 10.05 |
| | FEB | 9.65 | 0.16 | 9.82 | 0.16 | 9.98 | 0.09 | 10.07 | 0.09 | 10.17 | 0.09 | 10.26 | 0.16 | 10.42 | 0.16 | 10.58 | 0.16 | 10.74 | 0.16 | 10.90 |
| 1986 | JAN | 10.14 | 0.15 | 10.29 | 0.15 | 10.44 | 0.12 | 10.56 | 0.12 | 10.67 | 0.12 | 10.79 | 0.15 | 10.94 | 0.15 | 11.09 | 0.15 | 11.24 | 0.15 | 11.39 |
| | DEC | 10.24 | 0.16 | 10.41 | 0.16 | 10.57 | 0.13 | 10.70 | 0.13 | 10.84 | 0.13 | 10.97 | 0.17 | 11.14 | 0.17 | 11.31 | 0.17 | 11.48 | 0.17 | 11.65 |
| | NOV | 10.71 | 0.20 | 10.91 | 0.20 | 11.10 | 0.13 | 11.23 | 0.13 | 11.36 | 0.13 | 11.49 | 0.18 | 11.67 | 0.18 | 11.86 | 0.18 | 12.04 | 0.18 | 12.22 |
| | OCT | 11.23 | 0.19 | 11.42 | 0.19 | 11.61 | 0.13 | 11.74 | 0.13 | 11.88 | 0.13 | 12.01 | 0.17 | 12.18 | 0.17 | 12.35 | 0.17 | 12.52 | 0.17 | 12.69 |
| | SEP | 11.27 | 0.20 | 11.48 | 0.20 | 11.68 | 0.15 | 11.83 | 0.15 | 11.98 | 0.15 | 12.13 | 0.20 | 12.33 | 0.20 | 12.52 | 0.20 | 12.72 | 0.20 | 12.92 |
| | AUG | 11.23 | 0.21 | 11.44 | 0.21 | 11.65 | 0.16 | 11.81 | 0.16 | 11.97 | 0.16 | 12.13 | 0.20 | 12.33 | 0.20 | 12.53 | 0.20 | 12.73 | 0.20 | 12.93 |
| | JUL | 11.18 | 0.18 | 11.37 | 0.18 | 11.55 | 0.17 | 11.72 | 0.17 | 11.90 | 0.17 | 12.07 | 0.21 | 12.28 | 0.21 | 12.49 | 0.21 | 12.70 | 0.21 | 12.91 |
| | JUN | 11.17 | 0.26 | 11.43 | 0.26 | 11.68 | 0.15 | 11.83 | 0.15 | 11.98 | 0.15 | 12.13 | 0.18 | 12.31 | 0.18 | 12.48 | 0.18 | 12.66 | 0.18 | 12.84 |
| | MAY | 12.18 | 0.23 | 12.42 | 0.23 | 12.65 | 0.16 | 12.81 | 0.16 | 12.96 | 0.16 | 13.12 | 0.17 | 13.29 | 0.17 | 13.45 | 0.17 | 13.62 | 0.17 | 13.79 |

5/95 Equity Ratios of Water Index Companies

| | Book Value Per Share | Common Shares Outstanding | Common Equity | Total Debt | Preferred Equity | Equity Ratio |
|---|---|---|---|---|---|---|
| American Water Works | $22.18 | 32.66 | $724.4 | $1,464.40 | $101.7 | 31.63% |
| Aquarion Company | $17.41 | 6.69 | $116.5 | $115.60 | $0.0 | 50.19% |
| California Water Services Co. | $23.08 | 6.25 | $144.2 | $135.90 | $3.5 | 50.84% |
| Consumers Water Company | $12.42 | 8.26 | $102.6 | $159.90 | $1.1 | 38.92% |
| Philadelphia Suburban Corp. | $12.27 | 11.48 | $140.8 | $153.10 | $7.1 | 46.78% |
| United Water Resources | $11.28 | 31.39 | $354.1 | $591.50 | $107.2 | 33.63% |

Average                                                                                    42.00%

Source:    Value Line Investment Survey
           Edition 9   May 12, 1995
           C. A. Turner Utility Reports   May 1995