

Exhibit No.:
Issues: Rate of Return on Equity

Witness: Pauline M. Ahern
Exhibit Type: Direct
Sponsoring Party: Missouri-American Water Company
Case Nos.: WR-2010-XXXX
SR-2010-XXXX
Date: October 30, 2009

**PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI**

**CASE NOS. WR-2010-XXXX
SR-2010-XXXX**

DIRECT TESTIMONY

OF

PAULINE M. AHERN, CRRA

ON BEHALF OF

MISSOURI-AMERICAN WATER COMPANY


JEFFERSON CITY, MISSOURI

**BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI**

IN THE MATTER OF MISSOURI-AMERICAN) WATER COMPANY FOR AUTHORITY TO) FILE TARIFFS REFLECTING INCREASED) RATES FOR WATER AND SEWER) SERVICE)	CASE NO. WR-2010-XXXX CASE NO. SR-2010-XXX
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AFFIDAVIT OF PAULINE M. AHERN

Pauline M. Ahern, being first duly sworn, deposes and says that she is the witness who sponsors the accompanying testimony entitled "Direct Testimony of Pauline M. Ahern"; that said testimony and schedules were prepared by her and/or under her direction and supervision; that if inquires were made as to the facts in said testimony and schedules, she would respond as therein set forth; and that the aforesaid testimony and schedules are true and correct to the best of her knowledge.



Pauline M. Ahern

**State of New Jersey
County of Burlington
SUBSCRIBED and sworn to
Before me this 21st day of October 2009.**



Notary Public

My commission expires:

**SHARON M. KEEFE
NOTARY PUBLIC OF NEW JERSEY
MY COMMISSION EXPIRES JULY 9, 2011**

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Appendix A – Professional Qualifications of Pauline M. Ahern

1 I. **INTRODUCTION**

2 Q. **PLEASE STATE YOUR NAME, OCCUPATION AND BUSINESS ADDRESS.**

3 A. My name is Pauline M. Ahern. I am a Principal of AUS Consultants. My
4 business address is 155 Gaither Drive, Suite A, Mt. Laurel, New Jersey 08054.

5 Q. **PLEASE SUMMARIZE YOUR EDUCATIONAL BACKGROUND AND**
6 **PROFESSIONAL EXPERIENCE.**

7 A. I am a graduate of Clark University, Worcester, MA, where I received a
8 Bachelor of Arts degree with honors in Economics in 1973. In 1991, I received
9 a Master of Business Administration with high honors from Rutgers University.

10 In June 1988, I joined AUS Consultants as a Financial Analyst and am
11 now a Principal. I am responsible for the preparation of all fair rate of return
12 and capital structure exhibits for AUS Consultants and offering expert
13 testimony on behalf of investor-owned utilities before twenty-five state
14 regulatory commissions. The details of these appearances, as well as details
15 of my educational background, are shown in Appendix A supplementing this
16 testimony.

17 I am also the Publisher of AUS Utility Reports (formerly C.A. Turner),
18 where I am responsible for the production, publication, distribution and
19 marketing of various reports. AUS Utility Reports provides financial data and
20 related ratios as well as merger and acquisition activity covering more than 100
21 public utility companies on a monthly, quarterly, and annual basis. Coverage
22 includes electric, combination gas and electric, gas distribution, gas
23 transmission, telephone, water and international utilities.

1 I also calculate and maintain the A.G.A. Index under contract with the
2 American Gas Association (A.G.A.), which serves as the benchmark against
3 which the performance of the American Gas Index Fund (AGIF) is measured
4 on a monthly basis. The A.G.A. Index and AGIF are a market capitalization
5 weighted index and fund, respectively, comprised of the common stocks of the
6 publicly traded corporate members of the A.G.A.

7 I have co-authored a working paper with Frank J. Hanley, a Principal
8 and Director of AUS Consultants and Richard A. Michelfelder, Ph.D., a
9 professor of Finance at The School of Business, Rutgers University entitled
10 "New Approach to Estimating the Cost of Common Equity for Public Utilities"
11 which was presented at the Advanced Workshop in Regulation and
12 Competition at the 28th Annual Eastern Conference of the Center for Research
13 in Regulated Industries (CRRI) at Rutgers University on May 14, 2009. I have
14 also co-authored a second article with Frank J. Hanley entitled "Comparable
15 Earnings: New Life for an Old Precept" which was published in the American
16 Gas Association's Financial Quarterly Review, Summer 1994. I also assisted
17 in the preparation of an article authored by Frank J. Hanley and A. Gerald
18 Harris entitled "Does Diversification Increase the Cost of Equity Capital?"
19 published in the July 15, 1991 issue of Public Utilities Fortnightly.

20 I am a member of the Society of Utility and Regulatory Financial
21 Analysts (SURFA, formerly the National Society of Rate of Return Analysts)
22 serving as President since 2006, being reelected in 2008 with a term ending in
23 2010. Previously, I held the position of Secretary/Treasurer for 2004-2006. In

1 1992, I was awarded the professional designation "Certified Rate of Return
2 Analyst" (CRRA) by SURFA, which is based upon education, experience and
3 the successful completion of a comprehensive written examination.

4 I am an associate member of the National Association of Water
5 Companies, serving on its Finance/Accounting/Taxation Committee, a member
6 of the Energy Association of Pennsylvania, formerly the Pennsylvania Gas
7 Association, and a member of the American Finance and Financial
8 Management Associations.

9 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

10 A. The purpose is to provide testimony on behalf of Missouri-American Water
11 Company (MAWC or the Company) relative to the appropriate common equity
12 cost rate which it should be afforded the opportunity to earn on the common
13 equity financed portion of its jurisdictional rate base.

14 **Q. WHAT IS YOUR RECOMMENDED COMMON EQUITY COST?**

15 A. I recommend that the Missouri Public Service Commission (MO PSC or the
16 Commission) authorize the Company the opportunity to earn a common equity
17 cost rate of 11.60% on the common equity financed portion of its jurisdictional
18 rate base. A common equity cost rate of 11.60% results in an overall rate of
19 return of 8.83% when applied to a common equity ratio of 48.94% pro forma at
20 April 30, 2010 developed by Company Witness Michi Chao as summarized in
21 Table 1 below:
22

1 Table 1

2	<u>Type of Capital</u>	<u>Ratios</u>	<u>Cost Rate</u>	<u>Weighted Cost Rate</u>
3				
4	Long-Term Debt	50.06%	6.36%	3.18%
5	Short-Term Debt	<u>0.68</u>	3.62	<u>0.02</u>
6	Total Debt	50.74		3.20
7				
8	Preferred Stock	0.32	9.23	0.03
9				
10	Common Equity	<u>48.94</u>	11.60	<u>5.68</u>
11				
12	Total	<u>100.00%</u>		<u>8.91%</u>
13				

14 **Q. HAVE YOU PREPARED SCHEDULES WHICH SUPPORT YOUR**
15 **RECOMMENDED OVERALL FAIR RATE OF RETURN?**

16 A. Yes, I have. They have been marked for identification as Schedules PMA-1 to
17 PMA-14.

18 **II. SUMMARY**

19 **Q. PLEASE SUMMARIZE YOUR RECOMMENDED COMMON EQUITY COST**
20 **RATE.**

21 A. My recommended common equity cost rate of 11.60% is summarized on page
22 2 of Schedule PMA-1. As a wholly-owned subsidiary of American Water Works
23 Company, Inc. (American Water or the Parent), MAWC's common stock is not
24 publicly traded. Therefore, a market-based common equity cost rate cannot be
25 determined directly for MAWC. Consequently, in arriving at my recommended
26 common equity cost rate of 11.60%, I assessed the market-based cost rates of
27 companies of relatively similar risk, i.e., proxy group(s), for insight into a
28 recommended common equity cost rate applicable to MAWC and suitable for
29 cost of capital purposes. Using other utilities of relatively comparable risk as

1 proxies is consistent with the principles of fair rate of return established in the
2 Hope¹ and Bluefield² cases and adds reliability to the informed expert judgment
3 necessary to arrive at a recommended common equity cost rate. However, no
4 proxy group(s) can be selected to be identical in risk to MAWC. Therefore, the
5 proxy group(s)' results must be adjusted if necessary, to reflect the greater
6 relative business and/or financial risk of MAWC, will be subsequently
7 discussed in detail.

8 Consistent with the Efficient Market Hypothesis (EMH) which will be
9 discussed in more detail below, my recommendation results from the
10 application of four well-tested market-based cost of common equity models, the
11 Discounted Cash Flow ("DCF") approach, the Risk Premium Model ("RPM"),
12 the Capital Asset Pricing Model ("CAPM"), and the Comparable Earnings
13 Model ("CEM").

¹ Federal Power Commission v. Hope Natural Gas Co., 320 U.S. 591 (1944).

² Bluefield Water Works Improvement Co. v. Public Serv. Comm'n, 262 U.S. 679 (1922).

1 The results derived from each are as follows:

2 Table 2

	Proxy Group of Six AUS Utility Reports Water Companies	Proxy Group of Eight AUS Utility Rpts. Gas Distribution Companies	
3			
4			
5			
6			
7			
8			
9			
10	Discounted Cash Flow Model	11.73%	8.68%
11	Risk Premium Model	11.12	10.85
12	Capital Asset Pricing Model	11.58	10.49
13	Comparable Earnings Model	13.50	NMF
14			
15	Indicated Common Equity Cost		
16	Rate Before Adjustment for		
17	Business Risk	12.15%	10.35%
18			
19	Business Risk Adjustment	<u>0.05</u>	<u>0.15</u>
20			
21	Indicated Common Equity		
22	Cost Rate After Adjustment		
23	for Business Risk	12.20%	10.50%
24			
25	Financial/Credit Risk Adjustment	<u>0.32</u>	<u>0.21</u>
26			
27	Range of Indicated Common Equity		
28	Cost Rate After Adjustment for		
29	Business and Financial/Credit Risk	<u>12.52%</u>	<u>10.71%</u>
30			
31	Recommended Common Equity		
32	Cost Rate		<u>11.60%</u>
33			

34 After reviewing the cost rates based upon the four models, I conclude that
35 common equity cost rates of 12.15% and 10.35% are indicated based upon the
36 application of all four models to the market data of the proxy groups of six AUS
37 Utility Reports water companies and eight AUS Utility Reports natural gas
38 distribution companies, (LDCs), respectively before any adjustments for
39 business and/or financial/credit risk. These indicated common equity cost
40 rates were then adjusted upward by 5 basis points (0.05%) and 15 basis points
41 (0.15%), respectively, to reflect MAWC's increased business risk, due to its

1 smaller size relative to both proxy groups and by 32 basis points (0.32%) and
2 21 basis points (0.21%), respectively, to reflect MAWC's increased
3 financial/credit risk. Both adjustments will be discussed in detail subsequently.
4 After these adjustments, the risk-adjusted common equity cost rates are
5 12.52% for the water company proxy group and 10.71% for the LDCs. The
6 midpoint of the risk-adjusted common equity cost rates for both proxy groups is
7 11.62% $((12.52\% + 10.71\%)/2)$ which, when rounded to 11.60%, is my
8 recommended common equity cost rate.

9 **III. GENERAL PRINCIPLES**

10 **Q. WHAT GENERAL PRINCIPLES HAVE YOU CONSIDERED IN ARRIVING AT**
11 **YOUR RECOMMENDED COMMON EQUITY COST RATE OF 11.45%?**

12 A. In unregulated industries, the competition of the marketplace is the principal
13 determinant of the price of a product or service. In the case of regulated public
14 utilities, regulation must act as a substitute for marketplace competition.
15 Therefore, marketplace data must be relied upon in assessing a common
16 equity cost rate appropriate for ratemaking purposes in order to assure that the
17 utility can fulfill its obligations to the public and provide safe and adequate
18 service at all times. This requires a level of earnings sufficient to maintain the
19 integrity of presently invested capital and to permit the attraction of needed
20 new capital at a reasonable cost in competition with other firms of comparable
21 risk, consistent with the fair rate of return standards established by the U.S.
22 Supreme Court in the Hope and Bluefield cases cited previously.
23 Consequently, in my determination of common equity cost rate, I have

1 evaluated data gathered from the marketplace for utilities as similar in risk as
2 possible to MAWC.

3 **IV. BUSINESS RISK**

4 **Q. PLEASE DEFINE BUSINESS RISK AND EXPLAIN WHY IT IS IMPORTANT**
5 **TO THE DETERMINATION OF A FAIR RATE OF RETURN.**

6 A. Business risk is the riskiness of a company's common stock without the use of
7 debt. Examples of business risk include the quality of management, the
8 regulatory environment, customer mix and concentration of customers, service
9 territory growth and the like, which have a direct bearing on earnings.

10 Business risk is important to the determination of a fair rate of return
11 because the greater the level of risk, the greater the rate of return investors
12 demand, consistent with the basic financial precept of risk and return.

13 **Q. PLEASE DISCUSS THE BUSINESS RISKS FACING THE WATER**
14 **INDUSTRY IN GENERAL.**

15 A. One of the major risks facing the water and wastewater utility industry is related
16 to replacing aging transmission and distribution systems. Although Value Line
17 Investment Survey³ (Value Line) observes the following about the water utility
18 industry, it applies equally to the wastewater utility industry as many of the
19 water companies followed by Value Line also have wastewater operations:

20 These stocks, although up, have lost some of their luster since our
21 April report. Indeed, the group, as a whole, has fallen from the
22 upper echelon of the *Value Line Investment* universe for
23 Timeliness, as the broader market showed some glimpses of
24 rallying, and now sports an average rank.
25

³ Value Line Investment Survey, July 24, 2009.

1 Financing issues raise some concerns, longer-term, however, and
2 limit the group's 3- to 5-year appeal. In fact, not a single stock in
3 this industry stands out for 3- to 5-year appreciation potential, as
4 rising infrastructure costs threaten to erase the bulk of future profit
5 advances.
6

7 The water utilities is [sic] an increasingly capital intensive industry.
8 Many infrastructures are outdated and will require heavy
9 investment in order to make the necessary repairs. Greater EPA
10 requirements only make things more difficult, as infrastructure costs
11 are estimated at hundreds of millions of dollars over the next
12 decade.
13

14 Cash is at a premium in this space, however, with most companies
15 sporting highly leveraged balance sheets and nominal cash
16 reserves. That said, debt and stock issuances have become, and
17 are likely to remain, commonplace as providers struggle to foot the
18 bill. Unfortunately, the increased costs associated with such
19 financial undertakings, i.e., steeper interest rates and higher share
20 counts, are likely to dilute share earnings growth as well as
21 shareholder gains.
22

23 Also in its 2009 infrastructure Fact Sheet⁴ published by the American
24 Society of Civil Engineers (ASCE) they state:

25 America's drinking water systems face an annual shortfall of at
26 least \$11 billion to replace aging facilities that are near the end of
27 their useful lives and to comply with existing and future federal
28 water regulations. This does not account for growth in the demand
29 for drinking water over the next 20 years. Leaking pipes lose an
30 estimated 7 billion gallons of clean drinking water a day.
31

32 In addition, because the water and wastewater industry is much more capital-
33 intensive than the electric, natural gas or telephone industries, the investment
34 required to produce a dollar of revenue is greater. For example, it took \$3.44
35 of net utility plant on average to produce \$1.00 in operating revenues in 2008
36 for the water utility industry as a whole. In contrast, for the electric,
37 combination electric and gas, natural gas or telephone utility industries, on

⁴ 2009 American Society of Civil Engineers, Report Card for American's Infrastructure 2009.

1 average it took only \$1.87, \$1.36, \$0.89 and \$0.87, respectively, to produce
2 \$1.00 in operating revenues in 2008. For MAWC specifically it took \$5.63 of
3 net utility plant to produce \$1.00 in operating revenues in 2008. And, because
4 investor-owned water and wastewater utilities typically do not receive federal
5 funds for infrastructure replacement, the challenge to investor-owned water
6 and wastewater utilities is exacerbated and their access to financing is
7 restricted, thus increasing risk.

8 The National Association of Regulatory Commissioners (NARUC) has
9 also highlighted the challenges facing the water and wastewater industry
10 stemming from its capital intensity. NARUC's Board of Directors adopted a
11 resolution in July 2006, taking the position that⁵:

12 WHEREAS, To meet the challenges of the water and wastewater
13 industry which may face a combined capital investment
14 requirement nearing one trillion dollars over a 20-year period, the
15 following policies and mechanisms were identified to help ensure
16 sustainable practices in promoting needed capital investment and
17 cost-effective rates: a) the use of prospectively relevant test years;
18 b) the distribution system improvement charge; c) construction work
19 in progress; d) pass-through adjustments; e) staff-assisted rate
20 cases; f) consolidation to achieve economies of scale; g)
21 acquisition adjustment policies to promote consolidation and
22 elimination of non-viable systems; h) a streamlined rate case
23 process; i) mediation and settlement procedures; j) defined
24 timeframes for rate cases; k) integrated water resource
25 management; l) a fair return on capital investment; *and* m)
26 improved communications with ratepayers and stakeholders; *and*

27
28 WHEREAS, Due to the massive capital investment required to
29 meet current and future water quality and infrastructure
30 requirements, adequately adjusting allowed equity returns to
31 recognize industry risk in order to provide a fair return on invested
32 capital was recognized as crucial...

⁵ "Resolution Supporting Consideration of Regulatory Policies Deemed as 'Best Practices'", Sponsored by the Committee on Water. Adopted by the NARUC Board of Directors, July 27, 2006.

1
2 RESOLVED, That the National Association of Regulatory Utility
3 Commissions (NARUC), convened in its July 2006 Summer
4 Meetings in Austin, Texas, conceptually supports review and
5 consideration of the innovative regulatory policies and practices
6 identified herein as “best practices;” *and be it further*
7

8 RESOLVED, That NARUC recommends that economic regulators
9 consider and adopt as many as appropriate of the regulatory
10 mechanisms identified herein as best practices...
11

12 MAWC itself is facing an expected “massive capital investment” as it
13 projects gross capital expenditures of \$574.455 million for the years 2009
14 through 2014, representing an increase of 41% over 2008 gross plant of
15 \$1.389 billion.

16 The water and wastewater utility industry also experiences lower relative
17 depreciation rates. Lower depreciation rates, as one of the principal sources of
18 internal cash flows for all utilities, mean that water and wastewater utility
19 depreciation as a source of internally-generated cash is far less than for
20 electric, natural gas or telephone utilities. Water and wastewater utilities’
21 assets have longer lives and, hence, longer capital recovery periods. As such,
22 water and wastewater utilities face greater risk due to inflation which results in
23 a higher replacement cost per dollar of net plant than for other types of utilities.
24 Water utilities experienced an average depreciation rate of 2.5% for 2008, with
25 MAWC experiencing a lower rate of 1.8%. In contrast, in 2008, the electric,
26 combination electric and gas, natural gas or telephone industries, experienced
27 average depreciation rates of 3.7%, 3.7%, 4.0% and 7.7%, respectively.

28 In addition, as noted by Standard & Poor’s (S&P)⁶:

⁶ Standard & Poor’s, Credit Outlook For U.S. Investor-Owned Water Utilities Should Remain Stable in 2008 (January 31,

1 Standard & Poor's expects the already capital-intensive water utility
2 industry to become even more so over the next several years. Due
3 to the aging pipeline infrastructure and more stringent quality
4 standards, the U.S. Environmental Protection Agency's (EPA)
5 foresees a need for \$277 billion to upgrade and maintain U.S. water
6 utilities through 2022, with about \$185 billion going toward
7 infrastructure improvements. In addition, about \$200 billion will be
8 needed for wastewater applications, which suggests increased
9 capital spending to be a long-term trend in this industry.

10
11 In line with these trends, many companies have announced
12 aggressive capital spending programs. Forecast capital spending
13 primarily focuses on infrastructure replacements and growth
14 initiatives. Over the past five years, capital spending has been
15 equivalent to about three times its depreciation expense. However,
16 companies are now forecasting spending to be at or above four
17 times depreciation expense over the intermediate term. For
18 companies in regulatory jurisdictions that provide timely cost
19 recovery for capital expenditures, the increased spending is likely to
20 have a minimal effect on financial metrics and ratings. However,
21 companies in areas without these mechanisms, earnings, and cash
22 flow could be negatively affected by the increased spending levels,
23 which over the longer term could harm a company's overall credit
24 profile.

25
26 Due to the high level of capital spending, U.S. investor-owned water
27 utilities do not generate positive free cash flow. This, coupled with
28 the forecast increase in capital spending over the intermediate term,
29 will require additional access to capital markets. We expect rated
30 water companies to have enough financial flexibility to gain that
31 access. Ratings actions shouldn't result from this increased market
32 activity because we expect companies to use a balanced financing
33 approach, which should maintain debt near existing levels.

34
35 Moody's⁷ also notes that:

36
37 We expect that the credit quality of the investor-owned U.S. water
38 utilities will likely deteriorate over the next several years, due to
39 ongoing large capital spending requirements in the industry.
40 Larger capital expenditures facing the water utility industry result
41 from the following factors:

- 42
43
- Continued federal and state environmental compliance

2008) 2, 4.

⁷ Moody's Investors Service, Global Credit Research, "Credit Risks and Increasing for U.S. Investor Owned Water Utilities", Special Comment (January 2004) 5.

1 requirements;

- 2 • Higher capital investments for constructing modern water
- 3 treatment and filtration facilities;
- 4 • Ongoing improvement of maturing distribution and delivery
- 5 infrastructure; and
- 6 • Heightened security measures for emergency preparedness
- 7 designed to prevent potential terrorist acts.

8
9 Given the overwhelming importance of protecting the public health,
10 the water utility industry remains regulated by the federal and state
11 regulatory agencies. As a result of this importance, the level of
12 state regulators' responsiveness is critical in enabling the water
13 utilities to maintain their financial integrity. In addition, when
14 utilities are permitted a fair rate of return and timely rate
15 adjustments to reflect the costs of providing this essential service,
16 they will be more able to implement the necessary safeguards to
17 protect the public health.

18
19 Also, both the Congressional Budgeting Office (CBO) and the
20 Environmental Protection Agency (EPA) have addressed the necessary future
21 growth in water and wastewater utility infrastructure. In November 2002, the
22 CBO published a study entitled, "Future Investment in Drinking Water and
23 Wastewater Infrastructure" in which it concluded that⁸:

24 CBO estimates that for the years 2000 to 2019, annual costs for
25 investment will average between \$11.6 billion and \$20.1 billion for
26 drinking water systems and between \$13.00 billion and \$20.9
27 billion for wastewater systems.

28
29 These estimates, over the ten years ending 2019, total from \$116.0 -
30 \$201.0 billion for drinking water systems and between \$130.0 - \$209.0 billion
31 for wastewater systems, totaling \$246.0 - \$410.0 billion for the water and
32 wastewater industry combined.

⁸ "Future Investment in Drinking Water and Wastewater Infrastructure", The Congress of the United States - Congressional Budget Office (November 2002) ix.

1 Similarly, the EPA states the following⁹:

2 The survey found that the total nationwide infrastructure need is
3 \$334.8 billions for the 20-years period from January 2007 through
4 December 2026. With \$200.8 billion in needs over the next 20
5 years, transmission and distribution projects represent the largest
6 category of need. This result is consistent with the fact that
7 transmission and distribution mains account for most of the
8 nation's water infrastructure. The other categories, in descending
9 order of need are: treatment, storage, source and a miscellaneous
10 category of needs called "other". The large magnitude of the
11 national need reflects the challenges confronting water systems as
12 they deal with an infrastructure network that has aged considerably
13 since these systems were constructed, in many cases, 50 to 100
14 years ago.

15
16 In addition, the water utility industry, as well as the electric and natural gas
17 utility industries, faces the need for increased funds to finance the increasing
18 security costs required to protect the water supply and infrastructure from
19 potential terrorist attacks in the post-September 11, 2001 world.

20 In view of the foregoing, it is clear that the water and wastewater utility
21 industry's high degree of capital intensity and low depreciation rates coupled
22 with the need for substantial infrastructure capital spending and increased anti-
23 terrorism and anti-bioterrorism security spending, requires regulatory support in
24 the form of adequate and timely rate relief, as recognized by NARUC, so water
25 and wastewater utilities will be able to successfully meet the challenges they
26 face.

27 **Q. DOES MAWC FACE ADDITIONAL EXTRAORDINARY BUSINESS RISK?**

28 **A.** Yes. MAWC faces additional extraordinary business risk due to its smaller size
29 relative to the proxy groups, because all else equal, size has a bearing on risk.

⁹ "Fact Sheet: "EPA's 2007 Drinking Water Infrastructure Needs Survey and Assessment", United States Environmental Protection Agency, Office of Water, February 2009, 1.

1 **Q. PLEASE EXPLAIN WHY SIZE HAS A BEARING ON BUSINESS RISK.**

2 A. Smaller companies are simply less able to cope with significant events which
3 affect sales, revenues and earnings. In general, the loss of revenues from a
4 few larger customers, for example, would have a greater effect on a small
5 company than on a much larger company with a larger customer base. In
6 addition, the effect of extreme weather conditions, i.e., prolonged droughts or
7 extremely wet weather will have a greater affect upon a small operating water
8 utility than upon the much larger, more geographically diverse holding
9 companies.

10 Further evidence of the risk effects of size include the fact that investors
11 demand greater returns to compensate for a lack of marketability and liquidity
12 for the securities of smaller firms. Because MAWC is the regulated utility to
13 whose rate base the Commission's ultimately allowed overall cost of capital will
14 be applied, the relevant risk reflected in the cost of capital must be that of
15 MAWC, including the impact of its small size on common equity cost rate.
16 MAWC is smaller than the average company in either proxy group based upon
17 the results of my study of the market capitalization of the six water companies
18 and eight LDCs as shown on page 4 of Schedule PMA-1 and in Table 3 below
19 as of September 30, 2009.

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Table 3

	<u>Market Capitalization(1)</u>	<u>Times Greater than the Company (\$ Millions)</u>
Proxy Group of Six AUS Utility Reports Water Companies	\$769.035	1.2x
Proxy Group of Eight AUS Utility Reports Gas Distribution Cos. MAWC	1,464.019 660.080 (2) 520.259 (3)	2.8x

(1) From page 4 of Schedule PMA-1

(2) Based upon the average market-to-book ratio of the proxy group of six AUS Utility Reports water companies.

(3) Based upon the average market-to-book ratio of the proxy group of eight AUS Utility Reports natural gas distribution companies.

Because MAWC's common stock is not publicly traded, I have assumed that if it were, its the common shares would be selling at the same market-to-book ratio as the average market-to-book ratio for each proxy group, 194.5% and 153.3%, respectively, on September 30, 2009 as shown on page 3 of Schedule PMA-1. Hence, MAWC's market capitalization is estimated at \$660.080 million based upon the average market-to-book ratio of the six water companies and \$520.259 million based upon the average market-to-book ratio of the eight LDCs. In contrast, the market capitalization of the average AUS Utility Reports water company was \$769.035 million on September 30, 2009, or 1.2 times larger than MAWC's estimated market capitalization and \$1.464 billion for the average AUS Utility Reports LDC, or 2.8 times larger than MAWC's estimated market capitalization. It is conventional wisdom, supported by actual returns over time, that smaller companies tend to be more risky

1 causing investors to expect greater returns as compensation for that risk.

2 **Q. DOES THE FINANCIAL LITERATURE AFFIRM A RELATIONSHIP**
3 **BETWEEN SIZE AND COMMON EQUITY COST RATE?**

4 A. Yes. Brigham¹⁰ states:

5 A number of researchers have observed that portfolios of small-
6 firms have earned consistently higher average returns than those
7 of large-firms stocks; this is called "small-firm effect." On the
8 surface, it would seem to be advantageous to the small firms to
9 provide average returns in a stock market that are higher than
10 those of larger firms. In reality, it is bad news for the small firm;
11 what *the small-firm effect means is that the capital market*
12 *demands higher returns on stocks of small firms than on*
13 *otherwise similar stocks of the large firms.* (italics added)

14
15 **V. FINANCIAL RISK**

16 **Q. PLEASE DEFINE FINANCIAL RISK AND EXPLAIN WHY IT IS IMPORTANT**
17 **TO THE DETERMINATION OF A FAIR RATE OF RETURN.**

18 A. Financial risk is the additional risk created by the introduction of senior capital,
19 i.e., debt and preferred stock, into the capital structure. In other words, the
20 higher the proportion of senior capital in the capital structure, the higher the
21 financial risk.

22 In November 2007, S&P published its electric, gas, and water utility
23 ratings rankings in a framework consistent with the manner in which it presents
24 its rating conclusions across all other corporate sectors. As S&P stated¹¹:

25 Incorporating utility ratings into a shared framework to
26 communicate the fundamental credit analysis of a company
27 furthers the goals of transparency and comparability in the ratings
28 process.

¹⁰ Eugene F. Brigham, Fundamentals of Financial Management, Fifth Edition (The Dryden Press, 1989) 623.

¹¹ Standard & Poor's – Ratings Direct – "U.S. Utilities Ratings Analysis Now Portrayed In The S&P Corporate Ratings Matrix" (November, 30, 2007) 2.

1
2 * * *
3

4 The utilities rating methodology remains unchanged, and the use
5 of the corporate risk matrix has not resulted in any changes to
6 ratings or outlooks. The same five factors that we analyzed to
7 produce a business risk score in the familiar 10-point scale are
8 used in determining whether a utility possesses an "Excellent,"
9 "Strong," "Satisfactory," "Weak," or "Vulnerable" business risk
10 profile.

11
12 S&P expanded its Business Risk / Financial Risk Matrix in May 2009 in an
13 effort to augment its independence, strengthen the rating process and increase
14 S&P's transparency to better serve its markets (see page 11 of Schedule PMA-
15 2).

16 Pages 1 through 9 of Schedule PMA-2 describe the utility bond rating
17 process. Pages 10 through 15 describe S&P's May 2009 expansion of its
18 Business Risk / Financial Risk Matrix with the new business risk/financial risk
19 matrix shown in Table 1 on page 11 of Schedule PMA-2 and financial risk
20 indicative ratios for utilities shown in Table 2 on page 13. Notwithstanding the
21 metrics published in Table 2, S&P states:

22 The rating matrix indicative outcomes are what we typically
23 observe—but are not meant to be precise indications or
24 guarantees of future rating opinions. Positive and negative
25 nuances in our analysis may lead to a notch higher or lower than
26 the outcomes indicated in the various cells of the matrix.
27

28 As shown on Schedule PMA-11, page 2, the average S&P bond rating (issuer
29 credit rating), business risk profile and financial risk profile of the six water
30 companies are A+ (A), Excellent and Intermediate, while the average for the
31 eight LDCs are A (A), Excellent and Significant.

32 **Q. CAN ONE NEVERTHELESS MEASURE THE COMBINED BUSINESS**

1 **RISKS, I.E., INVESTMENT RISK OF AN ENTERPRISE USING BOND**
2 **RATINGS AND CREDIT RATINGS?**

3 A. Yes, similar bond ratings/issue credit ratings reflect and are representative of
4 and financial similar combined business risks, i.e., total risk. Although specific
5 business or financial risks may differ between companies, the same bond
6 rating indicates that the combined risks are similar as the bond rating process
7 reflects acknowledgment of all diversifiable business and financial risks in order
8 to assess credit quality or credit risk. Risk distinctions within a bond rating
9 category are recognized by a plus or minus. For example, within the A
10 category, an S&P rating can be at A+, A, or A-. Similarly, Moody's ratings
11 within the A category are distinguished by rating gradation of A1, A2 and A3.
12 Moreover, additional risk distinction is reflected by S&P in the assignment of
13 one of six business risk profiles, as shown in Table 1 on PMA-2, Page 11. For
14 example, S&P expressly indicates that the bond rating process encompasses a
15 qualitative analysis of business and financial risks (see pages 3 through 9 of
16 Schedule PMA-2). While not a means by which one can specifically quantify
17 the differential in common equity risk between companies, the bond (credit)
18 rating provides a useful means to compare/differentiate investment risk
19 between companies because it is the result of a thorough and comprehensive
20 analysis of all diversifiable business risks, i.e., investment risk.

1 **VI. MISSOURI-AMERICAN WATER COMPANY**

2 **Q. PLEASE DESCRIBE MAWC?**

3 A. MAWC provides water and wastewater services to approximately 455,000
4 customers, serving over 1.5 million people in and around 121 communities
5 throughout Missouri. MAWC is a wholly-owned subsidiary of American Water
6 Works Company, Inc.. Thus, the Company's common stock is not publicly
7 traded.

8 As shown on Schedule PMA-3, during the five-year period ending 2008,
9 the achieved average earnings rate on book common equity for MAWC was
10 6.68%, ranging between 3.13% in 2008 and 9.51% in 2005. The five-year
11 ending 2008 average common equity ratio based upon total capital was
12 41.79%, while the five-year average dividend payout ratio was 76.55%.

13 Total debt as a percent of earnings before interest, taxes, depreciation
14 and amortization (EBITDA) for the years 2004-2008 ranged between 5.13 and
15 6.63 times, averaging 5.74 times during the period, while funds from operations
16 relative to total debt ranged from 6.50% to 13.62%, averaging 11.98% for the
17 period.

18 Based upon these financial metrics, and recognizing that the bond rating
19 process includes a comprehensive, qualitative assessment of business and
20 financial risk, as discussed previously, it is my opinion that if MAWC had long-
21 term debt which was rated by Moody's or S&P, it would likely be rated in the
22 middle of the Baa/BBB category, with a likely S&P business position of
23 Excellent and a financial risk profile of Aggressive to Highly Leveraged.

1 **VII. PROXY GROUPS**

2 **Q. PLEASE EXPLAIN HOW YOU CHOSE THE PROXY GROUP OF SIX AUS**
3 **UTILITY REPORTS WATER COMPANIES.**

4 A. The basis of selection for the proxy group of six AUS Utility Reports water
5 companies was to select those companies which meet the following criteria: 1)
6 they are included in the Water Company Group of AUS Utility Reports
7 (September 2009); 2) they have Value Line or Reuters consensus five-year
8 EPS growth rate projections; 3) they have a positive Value Line five-year DPS
9 growth rate projection; 4) they have a Value Line adjusted beta; 5) they have
10 not cut or omitted their common dividends during the five years ending 2008 or
11 through the time of the preparation of this testimony; 6) they have 60% or
12 greater of 2008 total net operating income derived from, and 60% or greater of
13 2008 total assets devoted to, regulated water operations; and 7) which, at the
14 time of the preparation of this testimony, had not publicly announced that they
15 were involved in any major merger or acquisition activity.

16 **Q. PLEASE DESCRIBE SCHEDULE PMA-3.**

17 A. Schedule PMA-3 contains comparative capitalization and financial statistics for
18 the six AUS Utility Reports water companies for the years 2004 - 2008. Page 1
19 contains a summary of the comparative data for the years 2004-2008. Page 2
20 contains notes relevant to page 1, as well as the basis of selection and names
21 of the individual companies in the proxy group, while page 3 contains capital
22 structure ratios based upon total capital (including short-term debt) by company
23 and on average for the years 2004-2008.

1 During the five-year period ending 2008, the historically achieved average
2 earnings rate on book common equity for the group averaged 9.91%. The
3 average common equity ratio based upon total capital was 48.85%, and the
4 average dividend payout ratio was 69.21%.

5 Total debt as a percent of EBITDA for the years 2004-2008 ranged
6 between 3.52 and 3.97 times, averaging 3.71 times, while funds from
7 operations relative to total debt ranged from 16.80% to 21.00%, averaging
8 19.21%.

9 **Q. PLEASE EXPLAIN HOW YOU CHOSE THE PROXY GROUP OF EIGHT AUS**
10 **UTILITY REPORTS NATURAL GAS DISTRIBUTION COMPANIES.**

11 A. Because of the small number of publicly traded water companies available for
12 use as proxies for MAWC as well as the limited availability of comprehensive
13 investment analyst coverage for those companies, I have also utilized a proxy
14 group of gas distribution companies. Like water companies, these gas
15 distribution companies deliver a commodity, i.e., natural gas to customers
16 through a similar distribution system whose service rates of return are set by
17 the regulatory ratemaking process. The basis of selection for the proxy group
18 of eight AUS Utility Reports natural gas distribution companies was to include
19 those companies which meet the following criteria: 1) they are included in the
20 Natural Gas Distribution and Integrated Gas Company Group of AUS Utility
21 Reports (September 2009); 2) they have Value Line or Reuters consensus five-
22 year EPS growth rate projections; 3) they have positive Value Line five-year
23 DPS growth rate projections; 4) they have a Value Line adjusted beta; 5) they

1 have not cut or omitted their common dividends during the five years ending
2 2008 or to the time of the preparation of this testimony; 6) they have 60% or
3 greater of 2008 total net operating income derived from and 60% or greater of
4 2008 total assets devoted to regulated gas distribution operations and 7)
5 which, at the time of the preparation of this testimony, had not publicly
6 announced that they were involved in any major merger or acquisition activity.

7 **Q. PLEASE DESCRIBE SCHEDULE PMA-4.**

8 A. Schedule PMA-4 contains comparative capitalization and financial statistics for
9 the eight AUS Utility Reports natural gas distribution companies for the years
10 2004 - 2008. Page 1 contains a summary of the comparative data for the
11 years 2004-2008. Page 2 contains notes relevant to page 1, as well as the
12 basis of selection and names of the individual companies in the proxy group,
13 while Page 3 contains capital structure ratios based upon total capital
14 (including short-term debt) by company and on average for the years 2004-
15 2008.

16 During the five-year period ending 2008, the historically achieved average
17 earnings rate on book common equity for this group averaged 10.90%. The
18 average common equity ratio based upon total capital was 45.11%, and the
19 average dividend payout ratio was 64.07%.

20 Total debt as a percent of EBITDA for the years 2004-2008 ranged
21 between 3.41 and 3.67 times, averaging 3.59 times during the five-year period,
22 while funds from operations relative to total debt ranged from 16.41% to
23 21.24%, and averaging 19.13% during the five-year period.

1 **VIII. COMMON EQUITY COST RATE MODELS**

2 **A. The Efficient Market Hypothesis (EMH)**

3 **Q. ARE THE COST OF COMMON EQUITY MODELS YOU USE MARKET-**
4 **BASED MODELS, AND HENCE BASED UPON THE EMH?**

5 A. Yes. The DCF model is market-based in that market prices are utilized in
6 developing the dividend yield component of the model. The RPM is market-
7 based in that the bond ratings and expected bond yields used in the application
8 of the RPM reflect the market's assessment of bond/credit risk. In addition, the
9 use of betas to determine the equity risk premium also reflects the market's
10 assessment of market/systematic risk as betas are derived from regression
11 analyses of market prices. The CAPM is market-based for many of the same
12 reasons that the RPM is market-based i.e., the use of expected bond (Treasury
13 bond) yields and betas. The CEM is market-based in that the process of
14 selecting the comparable risk non-utility companies is based upon statistics
15 which result from regression analyses of market prices and reflect the market's
16 assessment of total risk. Therefore, all the cost of common equity models I
17 utilize are market-based models, and hence based upon the EMH.

18 **Q. PLEASE DESCRIBE THE CONCEPTUAL BASIS OF THE EMH.**

19 A. The EMH, which is the foundation of modern investment theory, was pioneered
20 by Eugene F. Fama¹² in 1970. An efficient market is one in which security
21 prices reflect all relevant information all the time, with the implication that prices
22 adjust instantaneously to new information, thus reflecting the intrinsic

¹² Eugene F. Fama, "Efficient Capital Markets: A Review of Theory and Empirical Work" (Journal of Finance, May 1970) 383-417.

1 fundamental economic value of a security.¹³

2 As noted by Brealey and Myers¹⁴, the generally accepted “semistrong”
3 form of the EMH, which asserts that all publicly available information is fully
4 reflected in securities prices, i.e., that fundamental analysis cannot enable an
5 investor to “out-perform the market,” is generally held to be true because the
6 use of insider information often enables investors to earn excessive returns by
7 “outperforming the market”. This means that all perceived risks are taken into
8 account by investors in the prices they pay for securities. Investors are aware
9 of all publicly-available information, including bond ratings, discussions about
10 companies by bond rating agencies and investment analysts as well as the
11 discussions of the various common equity cost rate methodologies (models) in
12 the financial literature. In an attempt to emulate investor behavior, no single
13 common equity cost rate model should be relied upon exclusively in
14 determining a cost rate of common equity and the results of multiple costs of
15 common equity models should be taken into account.

16 Furthermore, there is substantial support in the academic literature for the
17 need to rely upon more than one cost of common equity model in arriving at a
18 recommended common equity cost rate.

19 **Q. PLEASE DESCRIBE THE ACADEMIC LITERATURE SUPPORTING THE**
20 **USE OF MORE THAN ONE COST OF COMMON EQUITY MODEL.**

¹³ Roger A. Morin, New Regulatory Finance (Public Utility Reports, Inc., 2006) 279-281.

¹⁴ Brealey, Richard A. and Myers, Stewart C., Principles of Corporate Finance 1st Ed., (McGraw-Hill, 1996) 329.

1 Also, Morin¹⁵ states:
2

3 Each methodology requires the exercise of considerable
4 judgment on the reasonableness of the assumptions underlying
5 the methodology and on the reasonableness of the proxies used
6 to validate a theory. *The inability of the DCF model to account*
7 *for changes in relative market valuation, discussed below, is a*
8 *vivid example of the potential shortcomings of the DCF model*
9 *when applied to a given company.* Similarly, the inability of the
10 CAPM to account for variables that affect security returns other
11 than beta tarnishes its use. (italics added)
12

13 No one individual method provides the necessary level of
14 precision for determining a fair return, but each method provides
15 useful evidence to facilitate the exercise of an informed judgment.
16 Reliance on any single method or preset formula is inappropriate
17 when dealing with investor expectations because of possible
18 measurement difficulties and vagaries in individual companies'
19 market data. (Morin, p. 428)
20

21 * * *

22
23 The financial literature supports the use of multiple methods.
24 Professor Eugene Brigham, a widely respected scholar and
25 finance academician, asserts:^{1(footnote omitted)}
26

27 Three methods typically are used: (1) the Capital Asset
28 Pricing Model (CAPM), (2) the discounted cash flow (DCF)
29 method, and (3) the bond-yield-plus-risk-premium approach.
30 These methods are not mutually exclusive – no method
31 dominates the others, and all are subject to error when used in
32 practice. Therefore, when faced with the task of estimating a
33 company's cost of equity, we generally use all three methods
34 and then choose among them on the basis of our confidence
35 in the data used for each in the specific case at hand.
36

37 Another prominent finance scholar, Professor Stewart Myers, in
38 an early pioneering article on regulatory finance, stated:^{2(footnote}
39 omitted)

40
41 Use more than one model when you can. Because estimating
42 the opportunity cost of capital is difficult, only a fool throws
43 away useful information. That means you should not use any
44 one model or measure mechanically and exclusively. Beta is

¹⁵ Morin 428, 430 - 431.

1 helpful as one tool in a kit, to be used in parallel with DCF
2 models or other techniques for interpreting capital market
3 data.
4

5 Reliance on multiple tests recognizes that no single methodology
6 produces a precise definitive estimate of the cost of equity. As
7 stated in Bonbright, Danielsen, and Kamerschen (1988), '*no*
8 *single or group test or technique is conclusive.*' Only a fool
9 discards relevant evidence. (italics in original) (Morin, p. 430)
10

11 * * *

12
13 While it is certainly appropriate to use the DCF methodology to
14 estimate the cost of equity, there is no proof that the DCF
15 produces a more accurate estimate of the cost of equity than
16 other methodologies. Sole reliance on the DCF model ignores
17 the capital market evidence and financial theory formalized in the
18 CAPM and other risk premium methods. The DCF model is one
19 of many tools to be employed in conjunction with other methods
20 to estimate the cost of equity. *It is not a superior methodology*
21 *that supplants other financial theory and market evidence. The*
22 *broad usage of the DCF methodology in regulatory proceedings*
23 *in contrast to its virtual disappearance in academic textbooks*
24 *does not make it superior to other methods. The same is true of*
25 *the Risk Premium and CAPM methodologies.* (italics added)
26 (Morin, p. 431)
27

28 In view of all of the foregoing, it is clear that investors are or should be
29 aware of all of the models available for use in determining a common equity
30 cost rate. Thus EMH requires the assumption that, collectively, investors
31 consider them all.

32 **B. Discounted Cash Flow Model (DCF)**

33 **Q. WHAT IS THE THEORETICAL BASIS OF THE DCF MODEL?**

34 A. The theory underlying the DCF model is that the present value of an expected
35 future stream of net cash flows during the investment holding period can be
36 determined by discounting the cash flows at the cost of capital, or the investors'
37 capitalization rate. DCF theory indicates that an investor buys a stock for an

1 expected total return rate which is derived from cash flows received in the form
2 of dividends plus appreciation in market price (the expected growth rate).
3 Thus, the dividend yield on market price plus a growth rate equals the
4 capitalization rate, i.e., the total common equity return rate expected by
5 investors.

6 **Q. PLEASE COMMENT UPON THE APPLICABILITY OF THE DCF MODEL IN**
7 **ESTABLISHING A COST OF COMMON EQUITY FOR MAWC.**

8 A. The DCF model has a tendency to mis-specify investors' required common
9 equity return rate when the market value of common stock differs significantly
10 from its book value. Mathematically, because the "simplified" DCF model
11 traditionally used in rate regulation assumes a market-to-book ratio of one, it
12 understates/overstates investors' required return rate when market value
13 exceeds, or is less than, book value. It does so because, in many instances,
14 market prices reflect investors' assessments of long-range market price growth
15 potentials (consistent with the infinite investment horizon implicit in the
16 standard regulatory version of the DCF model) not fully reflected in analysts'
17 shorter range forecasts of future growth in earnings per share (EPS) and
18 dividends per share (DPS), both accounting proxies. Thus, the market-based
19 DCF model will result in a total annual dollar return on book common equity
20 equal to the total annual dollar return expected by investors only when market
21 and book values are equal, a rare and unlikely situation. In recent years, the
22 market values of utilities' common stocks have been well in excess of their
23 book values as shown on page 1 of Schedules PMA-3 and PMA-4 ranging

1 between 205.16% and 276.96% for the six AUS Utility Reports water
2 companies and 159.78% and 173.69% for of eight LDCs.

3 Under DCF theory, the rate of return investors require is related to the
4 market price paid for a security. Thus, market prices form the basis of
5 investment decisions and investors' expected rates of return. In contrast, a
6 regulated utility is generally limited to earning on its net book value
7 (depreciated original cost) rate base. Market values can diverge from book
8 values for a myriad of macroeconomic reasons including, but not limited to,
9 EPS and DPS expectations, merger or acquisition expectations, interest rates,
10 investor sentiment, unemployment levels, monetary policy etc.

11 Traditional rate base/rate of return regulation, where a market-based
12 common equity cost rate is applied to a book value rate base, presumes that
13 market-to-book ratios are at unity or 1.00. However, there is ample empirical
14 evidence over sustained periods which demonstrate that this is an incorrect
15 presumption. Since market-to-book ratios of unity or 1.00 are rarely the case
16 as discussed above, regulatory allowed ROEs, i.e., earnings, have a limited
17 effect on utilities' market/book ratios as the market prices of utility common
18 stocks are also influenced by factors beyond the direct influence of the
19 regulatory process.

20 As noted by Phillips:¹⁶

21 Many question the assumption that market price should equal book
22 value, believing that 'the earnings of utilities should be sufficiently
23 high to achieve market-to-book ratios which are consistent with
24 those prevailing for stocks of unregulated companies.'

¹⁶ Phillips 395.

1
2 In addition, Bonbright¹⁷ states:
3

4 In the first place, commissions cannot forecast, except within wide
5 limits, the effect their rate orders will have on the market prices of
6 the stocks of the companies they regulate. In the second place,
7 *whatever the initial market prices may be, they are sure to change*
8 *not only with the changing prospects for earnings, but with the*
9 *changing outlook of an inherently volatile stock market.* In short,
10 market prices are beyond the control, though not beyond the
11 influence of rate regulation. Moreover, even if a commission did
12 possess the power of control, any attempt to exercise it ... would
13 result in harmful, uneconomic shifts in public utility rate levels.
14 (italics added)
15

16 **Q. IS IT REASONABLE TO EXPECT THE MARKET VALUES OF UTILITIES'**
17 **COMMON STOCKS TO CONTINUE TO SELL WELL ABOVE THEIR BOOK**
18 **VALUES?**

19 A. Yes. Although the market-to-book ratios of regulated utilities have been
20 vacillating recently due to the current and continuing economic and capital
21 market turmoil, I believe that the common stocks of utilities will continue to sell
22 substantially above their book values, on average, because many investors,
23 especially individuals who traditionally committed less capital to the equity
24 markets, will likely continue to commit a greater percentage of their available
25 capital to common stocks in view of lower interest rate alternative investment
26 opportunities and to provide for retirement. The recent past and current capital
27 market environment is in stark contrast to the late 1970's and early 1980's
28 when very high (by historical standards) yields on secured debt instruments in
29 public utilities were available. Despite the fact that the market declined

¹⁷

James C. Bonbright, Albert L. Danielsen and David R. Kamerschen, Principles of Public Utility Rates (Public Utilities Reports, Inc., 1988) 334.

1 significantly during late 2001 through 2003, following the September 11, 2001
2 tragedy and despite recent and continuing market volatility due to energy
3 prices, the stressed housing market, the credit crunch in the currently fragile
4 U.S. economy, the current crisis in the capital markets, and agreement among
5 economists that the U.S. has endured an economic recession of an as yet-to-
6 be determined length, the majority of utility stocks, on average, have continued
7 to sell at market prices well above their book value. In addition, as previously
8 discussed, the sustained high market-to-book ratios have been influenced by
9 factors other than fundamentals such as actual and reported growth in EPS
10 and DPS.

11 **Q. HAVE ANY REGULATORY COMMISSIONS RECOGNIZED THIS**
12 **TENDENCY OF THE DCF MODEL TO UNDERSTATE/OVERSTATE**
13 **INVESTORS' REQUIRED RETURN RATE WHEN MARKET-TO-BOOK**
14 **RATIOS ARE GREATER/LESS THAN UNITY?**

15 A. Yes. The Pennsylvania Public Utilities Commission (PA PUC) recognized this
16 tendency in its order of August 26, 2005 in Docket No. R-00049862, et al re:
17 The City of Lancaster – Sewer Fund when it adopted the Administrative Law
18 Judge's market-to-book adjustment of 65 basis points (0.65%) because such
19 an adjustment was "consistent with our recent orders in *PAWC*, *Aqua*, and
20 *PPL*" and "as in *PPL*, we find that adjustment is necessary because the DCF
21 method produces the investor required return based on the current market
22 price, not the return on the book value capitalization." With the MTB
23 adjustment, the equity return allowance is 10.75 percent. (emphasis added)

1 Similarly, in 1994, the Indiana Utility Regulatory Commission (IURC)
2 recognized the tendency of the DCF model to understate the cost of equity
3 when market value exceeds book value noting that¹⁸:

4 [u]nder the traditional DCF model . . . the appropriate earnings
5 level of the utility would not be derived by applying the DCF result
6 to the market price of the Company's stock . . . it would be applied
7 to the utility's net original cost rate base. *If the market price of the*
8 *stock exceeds its book value, . . . the investor will not achieve the*
9 *return which the model finds is necessary.* (italics added)

10
11 More recently, the PA PUC affirmed the tendency of the DCF model to mis-
12 specify investors' required return in its Order of February 8, 2007 in Docket No.
13 R-00061398, et al re: PPL Gas Utilities Corporation when it stated:

14 The ALJ stated that the OTS and the OCA are correct that the
15 Commission favors the DCF method to determine the cost of
16 equity. However, the ALJ concluded, based on recent precedent,
17 that the Commission consistently has adopted a leverage
18 adjustment to compensate for the difference between market
19 prices and book value (used in ratemaking). (See, *Aqua*
20 *Pennsylvania*, 204, 234 (2004); *Pa. PUC v. PPL Electric Utilities*
21 *Corp.*, Docket No. R-00049255, at 70-71 (2004); *Pa. PUC v.*
22 *Pennsylvania American Water Co.*, 2002 Pa. PUC LEXIS 1; *Pa.*
23 *PUC v. Phila. Suburban Water Co.*, 219 PUR4TH 272 (2002); *Pa.*
24 *PUC v. Pennsylvania American Water Co.*, 231 PUR4TH 277
25 (2004)). According to the ALJ, these cases are persuasive that a
26 leverage adjustment should be employed with the DCF analysis.
27 (R.D. at 62-63).
28

29 **Q. CAN THE UNDER OR OVER STATEMENT OF THE INVESTORS'**
30 **REQUIRED RATE OF RETURN ON THE MARKET BY THE DCF MODEL BE**
31 **DEMONSTRATED MATHEMATICALLY?**

32 **A.** Yes. Schedule PMA-6 demonstrates how a market-based DCF cost rate
33 applied to a book value which is either below or above market value will either

¹⁸ Re: Indiana-American Water Company, Inc. 150 PUR4th 141, 167-168 (IN URC 1994).

1 understate or overstate the investors' required return on market value. As
2 shown, there is no realistic opportunity to earn the expected market-based rate
3 of return on book value. In Column 1, investors expect a 10.00% return on a
4 market price of \$24.00. Column 2 shows that when the 10.00% return rate on
5 market value is applied to book value which is approximately 55.5% of market
6 value, the total annual return opportunity is just \$1.333 on book value. With an
7 annual dividend of \$0.840, there is an opportunity for growth of \$0.493 which is
8 just 2.05% in contrast to the 6.50% growth in market price expected by
9 investors.

10 Conversely, in Column 3, where the market-to-book ratio is 80%, when
11 the 10.00% return rate on market value is applied to a book value which is
12 approximately 25.0% greater than market value, the total annual return
13 opportunity is \$3.000 on book value with an annual dividend of \$0.840, there is
14 an opportunity for growth of \$2.160 which is 9.00% in contrast to the 6.50%
15 growth in market price expected by investors.

16 Hence, it is clear that the DCF model either understates/overstates
17 investors' required cost of common equity capital when market values
18 exceed/are less than their underlying book values and thus multiple cost of
19 common equity models should be relied upon, rather than exclusive reliance
20 upon the DCF model, when estimating investors' expectations.

21 **Q. HAVE ANY COMMISSIONS EXPLICITLY STATED THAT THE DCF MODEL**
22 **SHOULD NOT BE RELIED UPON EXCLUSIVELY?**

23 A. Yes. In my experience the majority of regulatory commissions rely upon a

1 combination of the various cost of common equity models available.

2 Specifically, the Iowa Utilities Board (IUB) has recognized the tendency of
3 the DCF model to understate investors' expected cost of common equity capital
4 when market values are significantly above their book values. In its June 17,
5 1994 Final Decision and Order in Re U.S. West Communications, Docket No.
6 RPU-93-9 the IUB stated:¹⁹

7 While the Board has relied in the past on the DCF model, in *Iowa*
8 *Electric Light and Power Company*, Docket No. RPU-89-9, "Final
9 Decision and Order" (October 15, 1990), the Board stated: "[T]he
10 DCF model may understate the return on equity in some
11 circumstances. This is particularly true when the market is
12 relatively volatile and the company in question has a market-to-
13 book ratio in excess of one." Those conditions exist in this case
14 and the Board will not rely on the DCF return. (Consumer
15 Advocate Ex. 367, See Tr. 2208, 2250, 2277, 2283-2284). *The*
16 *DCF approach underestimates the cost of equity needed to assure*
17 *capital attraction during this time of market uncertainty and*
18 *volatility. The board will, therefore, give preference to the risk*
19 *premium approach.* (italics added)

20
21 Also, the Hawaii Public Utilities Commission (HPUC) recognized this
22 phenomenon in a decision dated June 30, 1992²⁰ in a case regarding Hawaiian
23 Electric Company, Inc., when it stated:

24 In this docket, as in other rate proceedings, experts disagree on
25 the relative merits of the various methods of determining the cost
26 of common equity. In this docket, HECO is particularly critical of
27 the use of the constant growth DCF methodology. It asserts that
28 method is imbued with downward bias and, thus, its use will
29 understate common equity cost. *We are cognizant of the*
30 *shortcomings of the DCF method.* There are, however,
31 shortcomings to be found with the use of CAPM and the RP
32 methods as well. We reiterate that, despite the problems with the

¹⁹ Re: U.S. West Communications, Inc. 152 PUR4th 446, 459 (IA UB 1994).

²⁰ Re: Hawaiian Electric Company, Inc., 134 PUR4th 418, 479 (HI PUC 1992).

1 use of any methodology, *all methods should be considered and*
2 *that the DCF method and the combined CAPM and RP methods*
3 *should be given equal weight.* (italics added)
4
5

6 **Q. DO OTHER COST OF COMMON EQUITY MODELS CONTAIN**
7 **UNREALISTIC ASSUMPTIONS AND HAVE SHORTCOMINGS?**

8 A. Yes. That is why I am not recommending that any of the models be relied
9 upon exclusively, but I have focused on the shortcomings of the DCF model
10 because some regulatory commissions still place excessive or exclusive
11 reliance upon it. Although the DCF model is useful, as noted previously, it is
12 not a superior methodology that supplants financial theory and market
13 evidence based upon other valid cost of common equity models. For these
14 reasons, no model, including the DCF, should be relied upon exclusively.

15 **Q. WHICH VERSION OF THE DCF MODEL DO YOU USE?**

16 A. I utilize the single-stage constant growth DCF model because, in my
17 experience, it is the most widely utilized version of the DCF used in public utility
18 rate regulation. In my opinion, it is widely utilized because utilities are
19 generally in the mature stage of their lifecycles and not transitioning from one
20 growth stage to another. This is especially true for water utilities.

21 All companies, including utilities, go through life cycles in their
22 development, initially progressing through a growth stage, moving onto a
23 transition stage and finally assuming a steady-state or constant growth state.
24 However, the U.S. public utility industry is a long-standing industry in the U.S.,
25 dating back to approximately 1882²¹. The standards of rate of return regulation

²¹ James C. Bonbright, Albert L. Danielsen and David R. Kamerschen, Principles of Public Utility Rates, 1988, Public Utilities

1 of public utilities date back to the previously discussed principles of fair rate of
2 return established in the Hope and Bluefield decisions of 1944 and 1923,
3 respectively. Hence, the public utility industry in the U.S. is a stable and mature
4 industry characterized by the steady-state or constant-growth stage of a multi-
5 stage DCF model. The economics of the utility industry, including the water
6 utility industry; reflect the features of relative stability and demand maturity. As
7 regulated businesses, their returns on capital investment, i.e., rate base, are
8 set through a ratemaking process and not determined in the competitive
9 markets. This characteristic, taken together with the longevity of the public
10 utility industry contribute to the stability and maturity of the water utility industry.

11 Since there is no basis for applying multi-stage growth versions of the
12 DCF model to determine the common equity cost rates of mature public utility
13 companies, the constant growth model is most appropriate.

14 **Q. PLEASE DESCRIBE THE DIVIDEND YIELD YOU USED IN YOUR**
15 **APPLICATION OF THE DCF MODEL.**

16 A. The unadjusted dividend yields are based upon an average of a recent spot
17 date (September 30, 2009) as well as an average of the three months ended
18 September 30, 2009, respectively, which are derived on Schedule PMA-8. The
19 average unadjusted dividend yield is 3.33% and the median is 3.07% for the
20 six water companies and 4.69% and 4.62%, respectively, for the eight LDCs.

21 **Q. PLEASE EXPLAIN THE DIVIDEND GROWTH COMPONENT SHOWN ON**
22 **SCHEDULE PMA-7, COLUMN 2.**

1 A. Because dividends are paid quarterly, or periodically, as opposed to
2 continuously (daily), an adjustment to the dividend yield must be made. This is
3 often referred to as the discrete, or the Gordon Periodic, version of the DCF
4 model.

5 Since the various companies in the proxy groups increase their quarterly
6 dividend at various times during the year, a reasonable assumption is to reflect
7 one-half the annual dividend growth rate in the dividend yield component, or
8 $D_{1/2}$. This is a conservative approach which does not overstate the dividend
9 yield which should be representative of the next twelve-month period.
10 Therefore, the actual average dividend yields in Column 1 on Schedule PMA-7
11 have been adjusted upward to reflect one-half the growth rates shown in
12 Column 4.

13 **Q. PLEASE EXPLAIN THE BASIS OF THE GROWTH RATES OF THE PROXY**
14 **GROUPS WHICH YOU USE IN YOUR APPLICATION OF THE DCF MODEL.**

15 A. Schedule PMA-9 shows that approximately 58% of the common shares of the
16 six water companies and 47% of the common shares of the eight LDCs are
17 held by individuals as opposed to institutional investors. Individual investors
18 are particularly likely to place great significance on the opinions expressed by
19 financial information services, such as Value Line and Reuters, which are
20 easily accessible and/or available on the Internet and through public libraries.
21 Investors realize that analysts have significant insight into the dynamics of the
22 industries and they analyze individual companies as well as companies'
23 abilities to effectively manage the effects of changing laws and regulations and

1 ever changing economic and market conditions.

2 Over the long run, there can be no growth in DPS without growth in
3 EPS. Earnings expectations have a more significant, but not sole, influence on
4 market prices than dividend expectations. Thus, the use of earnings growth
5 rates in a DCF analysis provides a better matching between investors' market
6 appreciation expectations implicit in market prices and the growth rate
7 component of the DCF. Earnings expectations have a significant influence on
8 market prices and therefore, appreciation or the "growth" experienced by
9 investors. This should be evident even to relatively unsophisticated investors
10 just by listening to financial new reports on radio, TV or reading the
11 newspapers. In fact, Dr. Morin in his book, New Regulatory Finance, (2006)
12 states on page 298²²:

13 Because of the dominance of institutional investors and their
14 influence on individual investors, analysts' forecasts of long-run
15 growth rates provide a sound basis for estimating required
16 returns. Financial analysts exert a strong influence on the
17 expectations of many investors who do not possess the
18 resources to make their own forecasts, that is, they are a cause
19 of g. The accuracy of these forecasts in the sense of whether
20 they turn out to be correct is not at issue here, as long as they
21 reflect widely held expectations. As long as the forecasts are
22 typical and/or influential in that they are consistent with current
23 stock price levels, they are relevant. The use of analysts'
24 forecasts in the DCF model is sometimes denounced on the
25 grounds that it is difficult to forecast earnings and dividends for
26 only one year, let alone for longer time periods. This objection is
27 unfounded, however, because it is present investor expectations
28 that are being priced; it is the consensus forecast that is
29 embedded in price and therefore in required return, and not the
30 future as it will turn out to be.

31
32

* * *

²² Morin 298.

1 Published studies in the academic literature demonstrate that
2 growth forecasts made by security analysts represent an
3 appropriate source of DCF growth rates, are reasonable
4 indicators of investor expectations and are more accurate than
5 forecasts based on historical growth. These studies show that
6 investors rely on analysts' forecasts to a greater extent than on
7 historic data only.
8

9 In addition, Myron Gordon, the "father" of the standard regulatory
10 version of the DCF model widely utilized throughout the United States in rate
11 base/rate of return regulation has recognized the significance of analysts'
12 forecasts of growth in EPS in a speech he gave in March 1990 before the
13 Institute for Quantitative Research and Finance. He said:

14 We have seen that earnings and growth estimates by security
15 analysts were found by Malkiel and Cragg to be superior to data
16 obtained from financial statements for the explanation of
17 variation in price among common stocks. . . estimates by
18 security analysts available from sources such as IBES are far
19 superior to the data available to Malkiel and Cragg. Eq (7) is not
20 as elegant as Eq (4), but it has a good deal more intuitive
21 appeal. It says that investors buy earnings, but what they will
22 pay for a dollar of earnings increases with the extent to which the
23 earnings are reflected in the dividend or in appreciation through
24 growth.
25

26 Professor Gordon recognized that total return is largely affected by the
27 terminal price which is mostly affected by earnings (hence price / earnings
28 multiples). However, while EPS is the most significant factor influencing
29 market prices, it is by no means the only factor that affects market prices, a
30 fact recognized by Bonbright with regard to public utilities as discussed
31 previously.

32 Studies performed by Cragg and Malkiel²³ demonstrate that analysts'

²³ John G. Cragg and Burton G. Malkiel, Expectations and the Structure of Share Prices (University of Chicago Press, 1982) Chapter 4.

1 forecasts are superior to historical growth rate extrapolations. Some question
2 the accuracy of analysts' forecast of EPS growth, however, it does not really
3 matter what the level of accuracy of those analysts' forecasts is well after the
4 fact. What is important is that they influence investors and hence the market
5 prices they pay. Moreover, there is no empirical evidence that investors,
6 consistent with the EMH, would discount or disregard analysts' estimates of
7 growth in earnings per share. The "semistrong" form of the EMH which is
8 generally held to be true indicates that all perceived risks are taken into
9 account by investors in the prices they pay for securities and investors are
10 aware of all publicly-available information, including bond ratings, discussions
11 about companies by bond rating agencies and investment analysts, as well as
12 the many analysts earnings growth forecasts available. Investors are also
13 aware of the accuracy of past forecasts, whether for EPS or DPS growth or for
14 interest rates levels. Investors have no prior knowledge of the accuracy of any
15 forecasts available at the time they make their investment decisions, as that
16 accuracy only becomes known after some future period of time has elapsed.
17 Therefore, consistent with the EMH upon which the cost of common equity
18 models I utilize are based, since investors have such analysts' earnings growth
19 rate projections available to them and investors are aware of the accuracy of
20 such projections, analysts earnings projections should be relied upon in a cost
21 of common equity analysis.

22 In addition to the empirical and academic support discussed previously
23 regarding the superiority of analysts' EPS growth forecasts in response to

1 concern about the use of analysts' forecasts, Dr. Burton G. Malkiel, the
2 Chemical Bank Chairman's Professor of Economics at Princeton University
3 and author of the widely read national bestseller book on investing entitled, "A
4 Random Walk Down Wall Street," affirmed his belief in the superiority of
5 analysts' earnings forecasts when he testified before the Public Service
6 Commission of South Carolina in November 2002:

7 With all the publicity given to tainted analysts' forecasts and
8 investigations instituted by the New York Attorney General, the
9 National Association of Securities Dealers, and the Securities &
10 Exchange Commission, I believe the upward bias that existed in
11 the late 1990s has indeed diminished. In summary, I believe that
12 current analysts' forecasts are more reliable than they were
13 during the late 1990s. Therefore, analysts' forecasts remain the
14 proper tool to use in performing a Gordon Model DCF analysis.
15 (Rebuttal testimony, South Carolina Electric and Gas Co., pp. 16-
16 17, Docket No. 2002-223-E)

17
18 Consequently, I have reviewed analysts' projected growth in EPS, as well
19 as Value Line's projected five-year compound growth rates in EPS for each
20 company in the proxy groups which are summarized on page 1, Schedule
21 PMA-10.

22 **Q. PLEASE SUMMARIZE THE DCF MODEL RESULTS.**

23 A. As shown on Schedule PMA-7, the results of the application of the single-stage
24 DCF model are 11.59% using the average and 11.73% when using the median
25 value of the six water company's results. As also shown on Schedule PMA-7,
26 the results of the application of the single-stage DCF model are 8.98% using
27 the average and 8.68% when using the median value of the eight LDCs' result.
28 In arriving at conclusions of indicated common equity cost rate for the proxy

1 groups, I have relied upon the median of the results of the DCF, due to the
2 wide range of DCF results as well as the currently extremely volatile capital
3 market conditions. In my opinion, the median is a more accurate and reliable
4 measure of central tendency, and provides recognition to all the DCF results.

5 In view of the foregoing, as shown on Schedule PMA-7 the indicated
6 common equity cost rate based upon the application of the DCF model is
7 11.73% for the six water companies and 8.68% for the eight LDCs.

8 **C. The Risk Premium Model (RPM)**

9 **Q. PLEASE DESCRIBE THE THEORETICAL BASIS OF THE RPM.**

10 A. The RPM is based upon the basic financial principle of risk and return, namely,
11 that investors require a greater return for bearing greater risk. The RPM
12 recognizes that common equity capital has greater investment risk, than debt
13 capital, as common equity shareholders are last in line in any claim on a
14 company's earnings and assets, with debt holders being first in line. Therefore,
15 investors require higher returns from common stocks than from investment in
16 bonds to compensate them for bearing the additional risk.

17 While the investors' required common equity return cannot be directly
18 determined or observed, bond returns and yields can. According to RPM
19 theory one can assess a common equity risk premium over bonds, either
20 historically or prospectively, one can use that premium to derive a cost rate of
21 common equity.

22 In summary with RPM theory, the cost of common equity equals the
23 expected cost rate for long-term debt capital plus a risk premium to

1 compensate common shareholders for the added risk of being unsecured and
2 last-in-line for any claim on the corporation's assets and earnings.

3 **Q. SOME ANALYSTS STATE THAT THE RPM IS ANOTHER FORM OF THE**
4 **CAPM. DO YOU AGREE?**

5 A. While there are some similarities, there is a very significant distinction between
6 the two models. The RPM and CAPM both add a "risk premium" to an interest
7 rate. However, the beta approach to the determination of an equity risk
8 premium in the RPM should not be confused with the CAPM. Beta is a
9 measure of systematic, or market, risk, a relatively small percentage of total
10 risk (the sum of both non-diversifiable systematic and diversifiable
11 unsystematic risk). Unsystematic risk is fully captured in the RPM through the
12 use of the long-term public utility bond yield as can be shown by reference to
13 pages 3 through 9 of Schedule PMA-2 which confirm that the bond rating
14 process involves an assessment of business risks. In contrast, the use of a
15 risk-free rate of return in the CAPM does not, and by definition cannot, reflect a
16 company's specific i.e., unsystematic risk. Consequently, a much larger
17 portion of the total common equity cost rate is reflected in the company- or
18 proxy group-specific bond yield (a product of the bond rating) than is reflected
19 in the risk-free rate in the CAPM, or indeed even by the dividend yield
20 employed in the DCF model. Moreover, the financial literature recognizes the
21 RPM and CAPM as two separate and distinct cost of common equity models.

22 **Q. HAVE YOU PERFORMED RPM ANALYSES OF COMMON EQUITY COST**
23 **RATE FOR THE PROXY GROUPS?**

1 A. Yes. The results of my application of the RPM are summarized on page 1 of
2 Schedule PMA-11 and detailed on pages 2 through 9. The first step is to
3 determine the expected bond yield.

4 **Q. PLEASE EXPLAIN THE BASIS OF THE EXPECTED BOND YIELDS OF**
5 **6.06% AND 6.35% APPLICABLE TO THE PROXY GROUPS OF WATER**
6 **AND GAS COMPANIES, RESPECTIVELY.**

7 A. Because both ratemaking and the cost of common equity are prospective, a
8 prospective yield on similarly-rated long-term debt is essential. As shown on
9 Schedule PMA-11, page 2, although based upon only one water company, the
10 average Moody's bond rating is A2 for the six water companies while the
11 average Moody's bond rating is A3 for the eight LDCs. I relied upon a
12 consensus forecast of about 50 economists of the expected yield on Aaa rated
13 corporate bonds for the six calendar quarters ending with the first calendar
14 quarter of 2011 as derived from the October 1, 2009 Blue Chip Financial
15 Forecasts (shown on page 7 of Schedule PMA-11). As shown on Line No. 1 of
16 page 1 of Schedule PMA-11, the average expected yield on Moody's Aaa rated
17 corporate bonds is 5.53%. It is necessary to adjust that average yield to be
18 equivalent to a Moody's A2 rated public utility bond. Requiring the adjustment
19 of 0.53%, shown on Line No. 2 and explained in Note 2. After adjustment, the
20 expected bond yield applicable to a Moody's A rated public utility bond is
21 6.06% as shown on Line No. 3.

22 The six water companies average Moody's bond rating is A2, therefore,
23 no adjustment is necessary to make the prospective bond yield applicable to

1 an A2 public utility bond. However, because the average Moody's bond rating
2 of the eight LDCs is A3, an adjustment of 29 basis points (0.29%) is necessary
3 to make the prospective bond yield applicable to an A3 public utility bond as
4 shown on line No. 5. Therefore, the expected specific bond yields are 6.06%
5 for the six water companies and 6.35% for the eight LDCs as shown on line
6 No. 6.

7 **Q. PLEASE EXPLAIN THE METHOD UTILIZED TO ESTIMATE THE EQUITY**
8 **RISK PREMIUM.**

9 A. I evaluated the results of two different historical equity risk premium studies, as
10 well as Value Line's forecasted total annual market return in excess of the
11 prospective yield on high grade corporate bonds, as detailed on pages 5, 6 and
12 8 of Schedule PMA-11. As shown on Line No.3, page 5, the mean equity risk
13 premium is 5.06% applicable to the of six water companies and 4.50%
14 applicable to the of eight LDCs. These estimates are the result of an average
15 of a beta-derived historical equity risk premium as well as the mean historical
16 equity risk premium applicable to public utilities with bonds rated A,
17 respectively, based upon holding period returns.

18 The basis of the beta-derived equity risk premiums applicable to the proxy
19 groups is shown on page 6 of Schedule PMA-11. The beta-determined equity
20 risk premium should receive substantial weight because betas are derived from
21 the market prices of common stocks over a recent five-year period. Beta is a
22 meaningful measure of prospective relative risk to the market as a whole and is
23 a logical means by which to allocate a relative share of the market's total equity

1 risk premium.

2 The total market equity risk premium utilized is 7.46% and is based upon
3 an average of the long-term historical market risk premium and forecasted
4 market risk premium as well as an equity risk premium based upon a study of
5 the holding period returns of the S&P Public Utility Index relative to A rated
6 public utility bond yields. To derive the historical market equity risk premium, I
7 used the most recent Morningstar²⁴ data on holding period returns for the S&P
8 500 Composite Index and the average historical yield on Moody's Aaa and A
9 rated corporate bonds for the period 1926-2008. The use of holding period
10 returns over a very long period of time is useful in the beta approach because it
11 is consistent with the long-term investment horizon presumed by the DCF
12 model. As the Ibbotson SBBI – 2009 Valuation Yearbook – Market Result for
13 Stocks, Bonds, Bills and Inflation – 2006-2008, (Ibbotson SBBI) states²⁵:

14 The estimate of the equity risk premium depends on the length of
15 the data series studied. A proper estimate of the equity risk
16 premium requires a data series long enough to give a reliable
17 average without being unduly influenced by very good and very
18 poor short-term returns. When calculated using a long data
19 series, the historical equity risk premium is relatively stable.⁵
20 Furthermore, because an average of the realized equity risk
21 premium is quite volatile when calculated using a short history,
22 using a long series makes it less likely that the analyst can justify
23 any number he or she wants. The magnitude of how shorter
24 periods can affect the result will be explored later in this chapter.

25
26 Some analysts estimate the expected equity risk premium using a
27 shorter, more recent time period on the basis that recent events
28 are more likely to be repeated in the near future; furthermore, they
29 believe that the 1920s, 1930s and 1940s contain too many
30 unusual events. This view is suspect because all periods contain

²⁴ Morningstar, Inc. acquired Ibbotson Associates in 2006.

²⁵ Ibbotson SBBI – 2009 Valuation Yearbook – Market Results for Stocks, Bonds, Bills and Inflation – 1926 – 2008 (Morningstar, Inc., 2009) 61.

1 "unusual" events. Some of the most unusual events this century
2 took place quite recently, including the inflation of the late 1970s
3 and early 1980s, the October 1987 stock market crash, the
4 collapse of the high-yield bond market, the major contraction and
5 consolidation of the thrift industry, the collapse of the Soviet
6 Union, the development of the European Economic Community,
7 and the attacks of September 11, 2001.

8
9 It is even difficult for economists to predict the economic
10 environment of the future. For example, if one were analyzing the
11 stock market in 1987 before the crash, it would be statistically
12 improbable to predict the impending short-term volatility without
13 considering the stock market crash and market volatility of the
14 1929-1931 period.

15
16 Without an appreciation of the 1920s and 1930s, no one would
17 believe that such events could happen. The 83-year period
18 starting with 1926 is representative of what can happen: it
19 includes high and low returns, volatile and quiet markets, war and
20 peace, inflation and deflation, and prosperity and depression.
21 Restricting attention to a shorter historical period underestimates
22 the amount of change that could occur in a long future period.
23 Finally, because historical event-types (not specific events) tend to
24 repeat themselves, long-run capital market return studies can
25 reveal a great deal about the future. Investors probably expect
26 "unusual" events to occur from time to time, and their return
27 expectations reflect this. (footnote omitted)
28

29 **Q. HOW DID YOU INCORPORATE VALUE LINE'S FORECASTED TOTAL**
30 **ANNUAL MARKET RETURN IN EXCESS OF THE PROSPECTIVE YIELD**
31 **ON HIGH RATED CORPORATE BONDS IN YOUR DEVELOPMENT OF AN**
32 **EQUITY RISK PREMIUM FOR YOUR RPM ANALYSIS?**

33 A. The basis of the forecasted market equity risk premium can be found on Line
34 Nos. 4 through 6 on page 6 of Schedule PMA-11. It is derived from an average
35 of the most recent 3-month (using the months of July 2009 through September
36 2009) and a recent spot (September 30, 2009) 3-5 year median market price
37 appreciation potentials by Value Line plus an average of the median estimated

1 dividend yield for the common stocks of the 1,700 firms covered in Value Line's
2 Standard Edition as explained in detail in Note 1 on page 3 of Schedule PMA-
3 12.

4 The average median expected price appreciation is 61% which translates
5 to 12.64% per annum and, when added to the average (similarly calculated)
6 median dividend yield of 2.20% equates to a forecasted annual total return rate
7 on the market as a whole of 14.84%. Thus, this methodology is consistent with
8 the use of the 3-month and spot dividend yields in my application of the DCF
9 model. To derive the forecasted total market equity risk premium of 9.31%
10 shown on Schedule PMA-11, page 6, Line No. 6, the September 1, 2009
11 forecast of about 50 economists of the expected yield on Moody's Aaa rated
12 corporate bonds for the six calendar quarters ending with the first calendar
13 quarter 2011 of 5.53% from Blue Chip Financial Forecasts was deducted from
14 the forecasted total market return of 14.84%. The calculation resulted in an
15 expected market risk premium of 9.31%.

16 **Q. WHY DO YOU GIVE EQUAL WEIGHT TO THE HISTORICAL AND**
17 **FORECASTED EQUITY RISK PREMIUM?**

18 A. Both the cost of capital and ratemaking are expectational. As such investors'
19 expectations are, in large measure, influenced by forecasts of the future
20 performance of the market as well as specific companies and industries.

21 The recent recession, which may or may not yet be over, and capital
22 market crisis resulted in a substantial decline in market values with a
23 concurrent flight to quality, i.e., greater investment in U.S. government

1 securities and better quality debt such as that rated Aaa and/or Aa in the
2 corporate and utility sectors. Schedule PMA-14 shows that the yield spreads
3 between Moody's A and Baa rated utility bonds from September 1989 through
4 August 2009 have averaged 34 basis points which is in contrast to more recent
5 spreads attributable to the recent global recession which were significantly
6 greater than 100 basis points. Currently, the cost of debt capital is stabilizing
7 somewhat to levels experienced prior to the beginning of the recession in late
8 2007. The potential for market price appreciation is still significant despite a
9 huge increase in the Dow Jones Industrial Average (DJI) between March 9,
10 2009 (the low) and October 2, 2009. Over that time, the DJI increased by
11 nearly 45% from 6,547.05 to 9,487.67. Nonetheless, there is still considerable
12 upside potential, considering that the DJI's all-time high was 14,164.53 on
13 October 9, 2007, or approximately 50% above current levels just prior to the
14 beginning of the current recession. Exclusive reliance upon historical data will
15 not properly reflect the significant increase in risk which has affected both debt
16 and common equity capital due to the recent turmoil in the capital markets.
17 Thus, it is appropriate to give equal weight to the current level of expected
18 market appreciation as well as historical market returns.

19 In an interview at the height of the crisis, Roger Ibbotson, the founder of
20 Ibbotson Associates, now a wholly-owned subsidiary of Morningstar, Inc. and
21 Professor of Finance at the Yale School of Management, stated that reliance
22 upon historical statistics including the standard deviation of returns are not
23 reflective of current and prospective risk.

1 *much more risk in the market than they had recognized.* Stocks
2 may not be done dropping, especially in light of what's happened
3 to the financial system, and I don't know when it's going to start to
4 straighten out, but ultimately, in the long run, stocks are a good
5 investment. (Emphasis added)
6

7 Thus, since we are still in the recession, or just now beginning to emerge
8 from the recession, and the market, while recovering from the lows of early
9 2009, still has not recovered to its pre-recession high, there is still greater
10 current and prospective risk for investors. This requires an equity risk premium
11 commensurate with the greater perceived risk, certainly exceeding an equity
12 risk premium based exclusively on historical indicators. Therefore, I have
13 given equal weight to the historical equity risk premium and the forecasted
14 equity risk premium.

15 Consequently, in arriving at my conclusion of equity risk premium of on
16 Line No. 7 on page 6 of Schedule PMA-10, I have given equal weight to the
17 historical equity risk premium of 5.60% and the forecasted equity risk premium
18 of 12.51% shown on Line Nos. 3 and 6, respectively ($7.46\% = (5.60\% +$
19 $9.31\%)/2$).

20 **Q. WHAT IS YOUR CONCLUSION OF AN EQUITY RISK PREMIUM FOR USE**
21 **IN YOUR RPM ANALYSIS?**

22 A. On page 9 of Schedule PMA-11, the most current Value Line betas for the
23 companies in the proxy groups are shown. Applying the median beta of the
24 proxy groups, consistent with my reliance upon the median DCF results as
25 previously discussed, to the market equity risk premium of results in a beta
26 adjusted equity risk premium of 5.96% for the proxy group of six water

1 companies and 4.85% for the proxy group of eight LDCs as shown on page 6,
2 Line No. 9.

3 A mean equity risk premium of 4.15% applicable to utilities with A
4 rated public utility bonds such as the proxy group of six water companies and
5 the proxy group of eight LDCs was calculated based upon holding period
6 returns from a study using public utilities, as shown on Line No. 2, page 5 of
7 Schedule PMA-12 and is detailed on page 8.

8 The equity risk premiums applicable to the proxy group of six water
9 companies and eight LDCs are the averages of the beta-derived premiums and
10 those based upon the holding period returns of public utilities with A rated
11 bonds, as summarized on Schedule PMA-12, page 5, i.e., 5.06% and 4.50%,
12 respectively.

13 **Q. WHAT ARE THE INDICATED RPM COMMON EQUITY COST RATES?**

14 A. They are 11.12% for the six water companies and 10.85% for the eight LDCs
15 as shown on Schedule PMA-10, page 1.

16 **Q. SOME CRITICS OF THE RPM MODEL CLAIM THAT ITS WEAKNESS IS**
17 **THAT IT PRESUMES A CONSTANT EQUITY RISK PREMIUM. IS SUCH A**
18 **CLAIM VALID?**

19 A. No. The equity risk premium varies inversely with interest rate changes,
20 although not in tandem with those changes. The presumption of a constant
21 equity risk premium is no different than the presumption of a constant "g", or
22 growth component, in the DCF model. If one calculates a DCF cost rate today,
23 the absolute result "k", as well as the growth component "g", would invariably

1 differ from a calculation made just one or several months earlier or later. This
2 implies that "g" does change, although in the application of the standard DCF
3 model, "g" is presumed to be constant. Hence, there is no difference between
4 the RPM and DCF models in that both models assume a constant component,
5 but in reality, these components, "g" and the equity risk premium both change.

6 As Morin²⁷ states with respect to the DCF model:

7 It is not necessary that *g* be constant year after year to make
8 the model valid. *The growth rate may vary randomly around*
9 *some average expected value. Random variations around*
10 *trend are perfectly acceptable, as long as the mean expected*
11 *growth is constant.* The growth rate must be 'expectationally
12 constant' to use formal statistical jargon. (italics added)
13

14 The foregoing confirms that the RPM is similar to the DCF model.
15 Both assume an "expectationally constant" risk premium and growth rate,
16 respectively, but in reality both vary (change) randomly around an arithmetic
17 mean. Consequently, the use of the arithmetic mean, and not the geometric
18 mean is confirmed as appropriate in the determination of an equity risk
19 premium as discussed previously.

20 **D. The Capital Asset Pricing Model (CAPM)**

21 **Q. PLEASE EXPLAIN THE THEORETICAL BASIS OF THE CAPM.**

22 A. CAPM theory defines risk as the covariability of a security's returns with the
23 market's returns. This covariability is measured by beta ("β"), an index
24 measure of an individual security's variability relative to the market. A beta less
25 than 1.0 indicates lower variability while a beta greater than 1.0 indicates
26 greater variability than the market.

²⁷ Morin 256.

1 The CAPM assumes that all other risk, i.e., all non-market or
2 unsystematic risk, can be eliminated through diversification. The risk that
3 cannot be eliminated through diversification is called market, or systematic,
4 risk. In addition the CAPM presumes that investors require compensation for
5 these systematic risks which are caused by macroeconomic and other events
6 that affect the returns on all assets. The model is applied by adding a risk-free
7 rate of return to a market risk premium, which is adjusted proportionately to
8 reflect the systematic risk of the individual security relative to the market as
9 measured by beta. The traditional CAPM model is expressed as:

$$R_s = R_f + \beta(R_m - R_f)$$

10 Where: R_s = Return rate on the common stock
11
12 R_f = Risk-free rate of return
13
14 R_m = Return rate on the market as a whole
15
16 β = Adjusted beta (volatility of the security
17 relative to the market as a whole)

18
19
20
21 Numerous tests of the CAPM have measured the extent to which
22 security returns and betas are related as predicted by the CAPM and have
23 confirmed its validity. However, Morin observes that while the results of these
24 tests support the notion that beta is related to security returns, the empirical
25 Security Market Line (SML) described by the CAPM formula is not as steeply
26 sloped as the predicted SML. Morin²⁸ states:

27 With few exceptions, the empirical studies agree that ... low-
28 beta securities earn returns somewhat higher than the CAPM
29 would predict, and high-beta securities earn less than

²⁸ Morin 175.

1 predicted.

2
3 * * *

4
5 Therefore, the empirical evidence suggests that the expected
6 return on a security is related to its risk by the following
7 approximation:

8
9
$$K = R_F + x \beta(R_M - R_F) + (1-x) \beta(R_M - R_F)$$

10
11 where x is a fraction to be determined empirically. The value
12 of x that best explains the observed relationship $\text{Return} =$
13 $0.0829 + 0.0520 \beta$ is between 0.25 and 0.30. If $x = 0.25$, the
14 equation becomes:

15
16
$$K = R_F + 0.25(R_M - R_F) + 0.75 \beta(R_M - R_F)^{29}$$

17
18 In view of theory and practical research, I have applied both the traditional
19 CAPM and the empirical CAPM/ECAPM to the companies in the proxy groups
20 and averaged the results.

21 **Q. PLEASE DESCRIBE YOUR SELECTION OF A RISK-FREE RATE OF**
22 **RETURN.**

23 A. As shown at the top of column 3 on page 2 of Schedule PMA-11, the risk-free
24 rate adopted for both applications of the CAPM is 4.72%. It is based upon the
25 average consensus forecast of the reporting economists in the September 1,
26 2009 Blue Chip Financial Forecasts as shown in Note 2, page 3, of the
27 expected yields on 30-year U.S. Treasury bonds for the six quarters ending
28 with the first calendar quarter 2011 of 4.72% as derived in Note 2 on page 3.

29 **Q. WHY IS THE PROSPECTIVE YIELD ON LONG-TERM U.S. TREASURY**
30 **BONDS APPROPRIATE FOR USE AS THE RISK-FREE RATE?**

31 A. The yield on long-term U.S. Treasury T-Bonds is almost risk-free and its term is

²⁹ Morin 190.

1 consistent with the long-term cost of capital to public utilities measured by the
2 yields on A rated public utility bonds. Hence, it is consistent with the long-term
3 investment horizon inherent in utilities' common stocks, as well as the long-
4 term investment horizon presumed in the standard DCF model employed in
5 regulatory ratemaking. Moreover, it is also consistent with the long-term life of
6 the jurisdictional rate base to which the allowed fair rate of return, i.e., cost of
7 capital will be applied. Morin³⁰ discusses several reasons why the yield on
8 long-term U.S. Treasury T-bonds is appropriate as the risk-free rate:

- 9 • Common stock is a long-term investment with the dividend cash flows to
10 investors lasting indefinitely. Hence, the yield on very long-term
11 government bonds, such as, the yield on 30-year Treasury bonds, is the
12 best measure of the risk-free rate for use in the CAPM.
- 13 • The expected common stock return is based on long-term cash flows,
14 regardless of an individual's holding time period.
- 15 • Stability and consistency, i.e., the yields on long-term Treasury bonds
16 match more closely with expected common stock returns.
- 17 • Yields on 90-day Treasury Bills typically do not match the investor's
18 planning horizons. Investors in common stocks, typically, have an
19 investment horizon greater than 90 days.
- 20 • Short-term rates are volatile, fluctuating widely, and subject to more
21 random disturbances than are long-term rates, resulting in volatile and
22 unreliable common equity return estimates.
- 23 • Short-term rates are also largely "administered" rates, and used by the
24 Federal Reserve as a policy vehicle for economic stimulation and money
25 supply control. Foreign governments, companies, and individuals also
26 use them as a temporary safe harbor for money.

27
28 In addition, as noted in the Ibbotson SBB³¹:

29 Although the equity risk premia of several horizons are
30 available, the long-horizon equity risk premium is preferable for
31 use in most business-valuation settings, even if an investor has
32 a shorter time horizon. Companies are entities that generally
33 have no defined life span; when determining a company's

³⁰ Morin 151.

³¹ Ibbotson SBB 59.

1 value, it is important to use a long-term discount rate because
2 the life of the company is assumed to be infinite. For this
3 reason, it is appropriate in most cases to use the long-horizon
4 equity risk premium for business valuation.
5

6 **Q. PLEASE EXPLAIN THE ESTIMATION OF THE EXPECTED EQUITY RISK**
7 **PREMIUM FOR THE MARKET.**

8 A. The basis of the market equity risk premium is explained in detail in Note 1 on
9 page 3 of Schedule PMA-12. It is derived from an average of the most recent
10 3-month (using the months of July 2009 through September 2009) and a recent
11 spot (October 2, 2009) 3-5 years median total market price appreciation
12 projections from Value Line, or total return of 14.84%, discussed previously,
13 and the long term historical arithmetic mean total returns for the years 1926-
14 2008 on large company stocks from Ibbotson – SBBI of 11.70%. From these
15 returns, I then subtracted the appropriate projected and historical risk-free rates
16 to arrive at a projected and historical equity risk premiums for the market.

17 For example, from the Value Line projected total market return of
18 14.84%, the forecasted average risk-free rate of 4.72% was deducted
19 indicating a forecasted market risk premium of 10.12%. From the Ibbotson-
20 SBBI long-term historical total return rate of 11.70%, the long-term historical
21 income return rate on long-term U.S. Government Securities of 5.20% was
22 deducted indicating an historical equity risk premium of 6.50%. Thus, the
23 projected and historical total market risk premiums are 10.12% and 6.50%,
24 averaging is 8.31%. As a measure of risk relative to the market as a whole, it
25 is appropriate to use beta to apportion the market risk premium to a specific
26 company or group. Therefore, I applied the proxy groups' respective betas to

1 the average 8.31% market risk premium to arrive at proxy group specific risk
2 premiums.

3 **Q. WHAT ARE THE RESULTS OF YOUR APPLICATION OF THE**
4 **TRADITIONAL AND EMPIRICAL CAPM TO THE PROXY GROUPS?**

5 A. As shown on Schedule PMA-12, Line No. 1 of page 1, the traditional CAPM
6 cost rates are 11.37% for the proxy group of six water companies and 10.12%
7 for the proxy group of eight LDCs. And, as shown on Line No. 2 of page 1, the
8 empirical CAPM cost rates are 11.78% for the six water companies and
9 10.85% for the eight LDCs. The traditional and empirical CAPM cost rates are
10 shown individually by company on page 2. As with the DCF results discussed
11 previously, and for the same reasons, namely the range of results and the
12 current extremely volatile capital markets, I rely upon the median results of the
13 traditional CAPM and ECAPM for the proxy groups. As shown on Line No. 3
14 on page 1, the CAPM cost rate applicable to the proxy group of six water
15 companies is 11.58%, and the CAPM cost rate applicable to the proxy group of
16 eight LDCs is 10.49% based upon the traditional and empirical CAPM.

17 **Q. SOME CRITICS OF THE ECAPM MODEL CLAIM THAT USING ADJUSTED**
18 **BETAS IN A TRADITIONAL CAPM AMOUNTS TO USING AN ECAPM. IS**
19 **SUCH A CLAIM VALID?**

20 A. No. Using adjusted betas in a CAPM analysis is not equivalent to the ECAPM.
21 Betas are adjusted because of the regression tendency of betas to converge
22 toward 1.0 over time, i.e., over successive calculations of beta. As discussed
23 previously, numerous studies have determined that the Security Market Line

1 (SML) described by the CAPM formula at any given moment in time is not as
2 steeply sloped as the predicted SML. Morin³² states:

3 Some have argued that the use of the ECAPM is inconsistent
4 with the use of adjusted betas, such as those supplied by
5 Value Line and Bloomberg. This is because the reason for
6 using the ECAPM is to allow for the tendency of betas to
7 regress toward the mean value of 1.00 over time, and, since
8 Value Line betas are already adjusted for such trend [sic], an
9 ECAPM analysis results in double-counting. This argument is
10 erroneous. Fundamentally, the ECAPM is not an adjustment,
11 increase or decrease, in beta. This is obvious from the fact
12 that the expected return on high beta securities is actually
13 lower than that produced by the CAPM estimate. The ECAPM
14 is a formal recognition that the observed risk-return tradeoff is
15 flatter than predicted by the CAPM based on myriad empirical
16 evidence. The ECAPM and the use of adjusted betas
17 comprised two separate features of asset pricing. Even if a
18 company's beta is estimated accurately, the CAPM still
19 understates the return for low-beta stocks. Even if the ECAPM
20 is used, the return for low-beta securities is understated if the
21 betas are understated. Referring back to Figure 6-1, the
22 ECAPM is a return (vertical axis) adjustment and not a beta
23 (horizontal axis) adjustment. Both adjustments are necessary.
24

25 Moreover, the slope of the Security Market Line (SML) should not be
26 confused with beta. As Eugene F. Brigham, finance professor emeritus and
27 the author of many financial textbooks states³³ :

28 The slope of the SML reflects the degree of risk aversion in the
29 economy – the greater the average investor's aversion to risk,
30 then (1) the steeper is the slope of the line, (2) the greater is the
31 risk premium for any risky asset, and (3) the higher is the
32 required rate of return on risky assets.¹²
33

34 ¹²Students sometimes confuse beta with the slope of the SML.
35 This is a mistake. As we saw earlier in connection with Figure
36 6-8, and as is developed further in Appendix 6A, beta does
37 represent the slope of a line, but *not* the Security Market Line.
38 This confusion arises partly because the SML equation is
39 generally written, in this book and throughout the finance

³² Morin 191.

³³ Eugene F. Brigham, Financial Management – Theory and Practice, 4th Ed. (The Dryden Press, 1985) 203.

1 literature, as $k_i = R_F + b_i(k_M - R_F)$, and in this form b_i looks like
2 the slope coefficient and $(k_M - R_F)$ the variable. It would
3 perhaps be less confusing if the second term were written $(k_M -$
4 $R_F)b_i$, but this is not generally done.
5

6 In addition, regulatory support for the ECAPM can be found in the New
7 York Public Service Commission's Generic Financing Docket, Case 91-M-
8 0509. Also, the Regulatory Commission of Alaska (RCA) in its Order No. 151
9 in Docket No. P-97-4 (Order entered 11/27/02) re: In the Matter of the Correct
10 Calculation and Use of Acceptable Input Data to Calculate the 1997, 1998,
11 1999, 2000, 2001 and 2002 Tariff Rates for the Intrastate Transportation of
12 Petroleum over the TransAlaska Pipeline System, noted:

13 Although we primarily rely upon Tesoro's recommendation, we
14 are concerned, however, about Tesoro's CAPM analysis.
15 Tesoro averaged the results it obtained from CAPM and
16 ECAPM while at the same time providing empirical testimony⁶⁰⁴
17 (footnote omitted) that the ECAPM results are more accurate
18 than [sic] traditional CAPM results. The reasonable investor
19 would be aware of these empirical results. Therefore, we adjust
20 Tesoro's recommendation to reflect only the ECAPM result.
21

22 Thus, using adjusted betas in an ECAPM analysis is not incorrect, nor
23 inconsistent with either their financial literature or regulatory precedent.
24 Notwithstanding empirical regulatory and support for the use of only the
25 ECAPM, my CAPM analysis, which includes both the traditional CAPM and the
26 ECAPM, is a conservative approach resulting in a reasonable estimate of the
27 cost of common equity.

1 **E. Comparable Earnings Model (CEM)**

2 **Q. PLEASE DESCRIBE YOUR APPLICATION OF THE COMPARABLE**
3 **EARNINGS MODEL AND HOW IT IS USED TO DETERMINE COMMON**
4 **EQUITY COST RATE.**

5 A. My application of the CEM is summarized on Schedule PMA-13 which consists
6 of five pages. Pages 1 through 3 show the CEM results for the proxy group of
7 six water companies and page 4 shows the CEM results for the proxy group of
8 eight LDCs. Page 5 contains notes related to pages 1 through 4.

9 The comparable earnings approach is derived from the "corresponding
10 risk" standard of the landmark cases of the U.S. Supreme Court. Therefore, it
11 is consistent with the Hope doctrine that the return to the equity investor should
12 be commensurate with returns on investments in other firms having
13 corresponding risks.

14 The CEM is based upon the fundamental economic concept of
15 opportunity cost which maintains that the true cost of an investment is equal to
16 the cost of the best available alternative use of the funds to be invested. The
17 opportunity cost principle is also consistent with one of the fundamental
18 principles upon which regulation rests: that regulation is intended to act as a
19 surrogate for competition and to provide a fair rate of return to investors.

20 The CEM is designed to measure the returns expected to be earned
21 on the book common equity, net worth, or partners' capital of similar risk
22 enterprises. Thus, it provides a direct measure of return, since it translates into
23 practice the competitive principle upon which regulation rests. In my opinion, it

1 is inappropriate to use the achieved returns of regulated utilities of similar risk
2 because to do so would be circular as achieved returns are a function of
3 authorized ROEs and inconsistent with the principle of equality of risk with non-
4 price regulated firms.

5 Consequently, the first step in determining a cost of common equity
6 using the comparable earnings model is to choose an appropriate proxy group
7 or groups of non-price regulated firms similar in risk to the proxy group of price
8 regulated utilities. The proxy group(s) should be broad-based in order to
9 obviate any company-specific aberrations. As stated previously, utilities need
10 to be eliminated to avoid circularity since the returns on book common equity of
11 utilities are substantially influenced by regulatory awards and are therefore not
12 representative of the returns that could be earned in a truly competitive market.

13 **Q. PLEASE DESCRIBE YOUR APPLICATION OF THE CEM.**

14 A. As stated previously, my application of the CEM is market-based in that the
15 selection criteria for the non-price regulated firms of comparable risk are based
16 upon statistics derived from the market prices paid by investors.

17 I have chosen two proxy groups of domestic, non-price regulated firms
18 to reflect both the systematic and unsystematic risks, equaling total risk, of the
19 proxy groups of six water companies and eight LDCs, respectively. The proxy
20 group of one hundred seventeen non-utility companies similar in risk to the
21 proxy group of six water companies and twenty-five non-utility companies
22 similar in total investment risk to the proxy group of eight LDCs are listed on
23 pages 1 through 4, Schedule PMA-13. The criteria used in the selection of

1 these proxy companies were that they be domestic non-utility companies and
2 have a meaningful rate of return on common equity, net worth, or partners'
3 capital reported in Value Line (Std. Ed.) projected for 2012-2014. Value Line
4 betas were used as a measure of systematic risk. The standard error of the
5 regression was used as a measure of each firm's unsystematic or specific risk
6 with the standard error of the regression reflecting the extent to which events
7 specific to a company's operations will affect its stock price. In essence,
8 companies which have similar betas and standard errors of the regressions,
9 have similar investment risk, i.e., the sum of systematic (market) risk as
10 reflected by beta and unsystematic (business and financial) risk, as reflected
11 by the standard error of the regression. Those statistics are derived from
12 regression analyses using market prices which, under the EMH, reflect all
13 relevant risks. The application of these criteria results in proxy groups of non-
14 price regulated firms similar in risk to the average company in each proxy
15 group.

16 Using a Value Line, Inc. proprietary database dated September 15,
17 2009, proxy groups of one hundred seventeen and twenty-five non-price
18 regulated companies were chosen based upon ranges of unadjusted beta and
19 standard error of the regression. The ranges were based upon the standard
20 deviations of the unadjusted beta and the average standard error of the
21 regression for the proxy group of six water companies and the proxy group of
22 eight LDCs as explained in Notes 1 and 7 on page 4 of Schedule PMA-13.

23 In my opinion this selection methodology is meaningful and effectively

1 responds to the criticisms normally associated with the selection of non-
2 regulated firms presumed to be comparable in total risk. This is because the
3 selection of non-price regulated companies comparable in total risk is based
4 upon regression analyses of market prices which reflect investors' assessment
5 of all risks, diversifiable and non-diversifiable. Thus, the empirical selection
6 process results in companies comparable in total risk, (i.e.) both systematic
7 and unsystematic risks.

8 Once proxy groups of non-price regulated companies are selected, it is
9 then necessary to derive returns on book common equity, net worth or
10 partners' capital for the companies in the group. These are measured using
11 the rate of return on common equity, net worth or partners' capital reported by
12 Value Line (std. Ed) projected for the next five years consistent with the use of
13 five-year projected EPS growth rates in the DCF model.

14 **Q. WHAT ARE YOUR CONCLUSIONS OF CEM COST RATE?**

15 A. For the proxy group of six water companies, my conclusion. based upon the
16 average of the median of all of the five-year projected returns on book common
17 equity, net worth or partners' capital is 14.50% as shown on page 3 of
18 Schedule PMA-13. And my conclusion for the proxy group of eight LDCs
19 based upon the median of all of the five-year projected returns on book
20 common equity, net worth or partners' capital is 21.25% as shown on page 4.

21 As with the DCF and CAPM results discussed previously, I have again
22 relied upon median and for the same reasons, namely, the wide range of
23 returns and the extreme volatility of the current capital markets. After I apply a

1 test of significance (Student's t-statistic) to determine whether any of the
2 projected returns are significantly different from their respective means at the
3 95% confidence level, the projected means of several companies have been
4 excluded. After excluding these outliers, my conclusion of CEM cost rate is
5 13.50% for the six water companies and 21.00% for the eight gas distribution
6 companies. In my opinion, the 21.00% CEM result for the eight LDCs is an
7 outlier when compared with the six water companies' 13.50% CEM result and
8 with the results of the other cost of common equity models for the eight LDCs.
9 Therefore, I will not rely upon it in determining a common equity cost rate
10 based upon the eight LDCs.

11 **IX. CONCLUSION OF COMMON EQUITY COST RATE**

12 **Q. WHAT IS YOUR OF RECOMMENDED COMMON EQUITY COST RATE?**

13 A. It is 11.60% based upon the common equity cost rates resulting from all four
14 cost of common equity models consistent with the EMH, which logically
15 mandates the use of multiple cost of common equity models as adjusted for
16 MAWC's greater business risk.

17 Moreover, absent empirical evidence to the contrary, it is reasonable
18 to assume that investors rely equally upon multiple cost of common equity
19 models in arriving at their required returns on common equity. Therefore, in
20 formulating my recommended common equity cost rate of 11.60%, I reviewed
21 the results of the application of four different cost of common equity models,
22 namely, the DCF, RPM, CAPM, and CEM for the two proxy groups. I employ
23 all four cost of common equity models as primary tools in arriving at my

1 recommended common equity cost rate because; 1) no single model is so
2 inherently precise that it can be relied upon solely, to the exclusion of other
3 theoretically sound models; 2) all four models have application problems
4 associated with them; 3) all four models are based upon the Efficient Market
5 Hypothesis (EMH) which as previously discussed, requires the assumption that
6 investors rely upon multiple cost of common equity models; and 4) as
7 demonstrated previously, the prudence of using multiple cost of common equity
8 models is supported in the financial literature. Therefore, none should be relied
9 upon exclusively to estimate investors' required rate of return on common
10 equity.

11 The results of the four cost of common equity models applied to
12 the proxy groups of six water companies and the proxy group of eight LDCs
13 are shown on Schedule PMA-1, page 2 and summarized below:

Table 4

	Proxy Group of Six AUS Utility Reports Water Companies	Proxy Group of Eight AUS Utility Rpts. Gas Distribution Companies
Discounted Cash Flow Model	11.73%	8.68%
Risk Premium Model	11.12	10.85
Capital Asset Pricing Model	11.58	10.49
Comparable Earnings Model	13.50	NMF
Indicated Common Equity Cost Rate Before Adjustment for Business Risk	12.15%	10.35%
Business Risk Adjustment	<u>0.05</u>	<u>0.15</u>
Indicated Common Equity Cost Rate After Adjustment for Business Risk	12.20%	10.50%
Financial/Credit Risk Adjustment	<u>0.32</u>	<u>0.21</u>
Range of Indicated Common Equity Cost Rate After Adjustment for Business and Financial/Credit Risk	<u>12.52%</u>	<u>10.71%</u>
Recommended Common Equity Cost Rate	<u>11.60%</u>	

Based upon these common equity cost rate results, I conclude that common equity cost rates of 12.15% and 10.35% are indicated for the water and gas distribution proxy groups, respectively before the business risk adjustments as shown on Line No. 5, page 2 of Schedule PMA-1. However, these indicated common equity cost rates are applicable to the larger, less business risky proxy groups and less financial/credit risk.

Q. IS THERE A WAY TO QUANTIFY A BUSINESS RISK ADJUSTMENT DUE TO MAWC'S SMALL SIZE RELATIVE TO THE PROXY GROUPS?

A. Yes. As discussed previously, MAWC has greater business risk than the

1 average proxy group company because of its smaller size relative to the proxy
2 groups, whether measured by book capitalization or the market capitalization of
3 common equity (estimated market value for MAWC, whose common stock is
4 not traded). Therefore, it is necessary to upwardly adjust the common equity
5 cost rates of 12.15% and 10.35% based upon the two proxy groups. The
6 adjustments are based upon data contained in Ibbotson - SBBI. The
7 determinations are based on the size premiums for decile portfolios of New
8 York Stock Exchange (NYSE), American Stock Exchange (AMEX) and
9 NASDAQ listed companies for the 1926-2008 period and related data shown
10 on pages 3 through 14 of Schedule PMA-1. The average size premium for the
11 decile in which each proxy group falls has been compared to the average size
12 premium for the 9th and 8th - 9th deciles in and between which MAWC would fall
13 if its stock were traded and sold at the September 30, 2009 average
14 market/book ratio of 194.5% and 153.3% experienced by each proxy group,
15 respectively. As shown on page 4, the size premium spread between MAWC
16 and the six AUS Utility Reports water companies is 0.37% (37 basis points)
17 and between MAWC and the eight AUS Utility Reports natural gas distribution
18 companies is 0.90% (90 basis points).

19 Although business risk adjustments of 0.37% and 0.90% are indicated
20 based upon the six water companies, and the eight LDCs, respectively, I will
21 make conservatively reasonable business risk adjustments of 0.05% (5 basis
22 points) relative to the six water companies and 0.15% (15 basis points) relative
23 to the eight LDCs as shown on Line No. 6 on page 2 of Schedule PMA-1 to the

1 indicated common equity cost rates for each group to reflect MAWC's greater
2 relative business risk as discussed previously.

3 Therefore, as shown on Line No. 7 page 2 and in Table 4 above, the
4 business risk-adjusted indicated common equity cost rates are 12.20% for the
5 six water companies and 10.50% for the eight LDCs.

6 **Q. IS THERE A WAY TO QUANTIFY A FINANCIAL RISK ADJUSTMENT DUE**
7 **TO MAWC'S GREATER FINANCIAL/CREDIT RISK RELATIVE TO THE TWO**
8 **PROXY GROUPS?**

9 A. Yes. As discussed previously, were MAWC to have long-term debt which was
10 rated by either S&P or Moody's, in my opinion the debt would be rated in the
11 BBB/Baa bond rating categories. Similarly, in my opinion, it's likely S&P credit
12 rating would also be in the BBB credit rating category. In contrast, the average
13 S&P and Moody's bond and / or credit ratings of the proxy groups as shown on
14 page 2 of Schedule PMA-11, are in the A bond/credit rating category.
15 Therefore, MAWC has greater financial/credit risk than the average company in
16 either proxy group. Based upon the basic financial principle of risk and return,
17 namely, that investors require a greater return for bearing greater risk, an
18 upward adjustment is required in order for the common equity cost rate based
19 upon the market data of the proxy companies to be reflective of MAWC's
20 greater financial risk. An indication of the required financial/credit risk
21 adjustment is the bond yield differential between Moody's A and Baa rated
22 public utility bonds. Because recent yield differentials between Moody's A and
23 Baa rated public utility bond yields are high by historical standards i.e., 0.88%

1 (88 basis points) on average for the three months ended August 2009 v. an
2 average/median monthly differential of 0.34%/0.29% (34/29 basis points) with a
3 midpoint of 0.32% (32 basis points) for the ten years ended August 2009, it is
4 more appropriate to rely upon the "normalized" yields differential of 0.32% (32
5 basis points) and 0.21% (21 basis points) over the most recent ten-year
6 historical period relative to the Moody's A2 and A3 bond rating of the proxy
7 groups of six water companies and eight LDCs, respectively. In addition,
8 adjustments of 32 and 21 basis points are conservative because they are
9 based upon an historical ten-year period and not upon the most recent monthly
10 yield differentials.

11 Therefore, as shown on page 2 of Schedule PMA-1 at Line No. 9 and
12 Table 4 above, the indicated common equity cost rate including the financial
13 risk adjustment of 0.32% (32 basis points) and 0.21% (0.21 basis points) as
14 well as the business risk adjustment of 0.05% (5 basis points) and 0.15% (15
15 basis points) discussed previously, are 12.52 for the proxy group of six water
16 companies and 10.71% for the proxy group of eight LDCs. Based upon these
17 common equity cost rates, a range of common equity cost rate of 10.40% -
18 12.50% is indicated, with a midpoint of 11.62%, which when rounded to
19 11.60% which is my recommendation.

20 A common equity cost rate of 11.60%, when applied to the pro forma
21 common equity ratio of 48.94% at April 10, 2010 results in an overall rate of
22 return of 8.91%, which, in my opinion, is both reasonable and conservative and
23 will provide MAWC with sufficient earnings to enable it to attract necessary new

1 capital.

2 **Q. DOES THAT CONCLUDE YOUR DIRECT TESTIMONY?**

3 **A. Yes.**

APPENDIX A

PROFESSIONAL QUALIFICATIONS

OF

PAULINE M. AHERN, CRRA
PRINCIPAL

AUS CONSULTANTS

**PROFESSIONAL QUALIFICATIONS
OF
PAULINE M. AHERN, CRRA
PRINCIPAL
AUS CONSULTANTS**

PROFESSIONAL EXPERIENCE

1994-Present

In 1996, I became a Principal of AUS Consultants, continuing to offer testimony as an expert witness on the subjects of fair rate of return and cost of capital before state public utility commissions. I provide assistance and support to clients throughout the entire ratemaking litigation process.

As the Publisher of AUS Utility Reports (formerly C. A. Turner Utility Reports), I am responsible for the production, publishing, and distribution of the reports. AUS Utility Reports provides financial data and related ratios for about 125 public utilities, i.e., electric, combination gas and electric, natural gas distribution, natural gas transmission, telephone, and water utilities, on a monthly, quarterly and annual basis. Among the subscribers of AUS Utility Reports are utilities, many state regulatory commissions, federal agencies, individuals, brokerage firms, attorneys, as well as public and academic libraries. The publication has continuously provided financial statistics on the utility industry since 1930.

As the Publisher of AUS Utility Reports, I supervise the production, publishing, and distribution of the AGA Rate Service publications under license from the American Gas Association. I am also responsible for maintaining and calculating the performance of the AGA Index, a market capitalization weighted index of the common stocks of the approximately 70 corporate members of the AGA. In addition, I supervise the production of a quarterly survey of investor-owned water company rate case activity on behalf of the National Association of Water Companies.

As an Assistant Vice President from 1994 - 1996, I prepared fair rate of return and cost of capital exhibits which are filed along with expert testimony before various state and federal public utility regulatory bodies. These supporting exhibits include the determination of an appropriate ratemaking capital structure and the development of embedded cost rates of senior capital. The exhibits also support the determination of a recommended return on common equity through the use of various market models, such as, but not limited to, Discounted Cash Flow analysis, Capital Asset Pricing Model and Risk Premium Methodology, as well as an assessment of the risk characteristics of the client utility. I also assisted in the preparation of responses to any interrogatories received regarding such testimonies filed on behalf of client utilities. Following the filing of fair rate of return testimonies, I assisted in the evaluation of opposition testimony in order to prepare interrogatory questions, areas of cross-examination, and rebuttal testimony. I also evaluated and assisted in the preparation of briefs and exceptions following the hearing process. I have submitted testimony before state public utility commissions regarding appropriate capital structure ratios and fixed capital cost rates.

1990-1994

As a Senior Financial Analyst, I supervised two analysts in the preparation of fair rate of return and cost of capital exhibits which are filed along with expert testimony before various state and federal public utility regulatory bodies. The team also assisted in the preparation of interrogatory responses.

I evaluated the final orders and decisions of various commissions to determine whether further actions are warranted and to gain insight which may assist in the preparation of future rate of return studies.

I assisted in the preparation of an article authored by Frank J. Hanley and A. Gerald Harris entitled "Does Diversification Increase the Cost of Equity Capital?" published in the July 15, 1991 issue of Public Utilities Fortnightly.

I co-authored an article with Frank J. Hanley entitled "Comparable Earnings: New Life for an Old Precept" which was published in the American Gas Association's Financial Quarterly Review, Summer 1994.

I was awarded the professional designation "Certified Rate of Return Analyst" (CRRRA) by the National Society of Rate of Return Analysts (now the Society of Utility and Regulatory Financial Analysts (SURFA)). This designation is based upon education, experience and the successful completion of a comprehensive examination.

As Administrator of Financial Analysis for AUS Utility Reports, which reports financial data for over 200 utility companies and has approximately 1,000 subscribers, I oversee the preparation of this monthly publication, as well as the annual publication, Financial Statistics - Public Utilities.

1988-1990

As a Financial Analyst, I assisted in the preparation of fair rate of return studies including capital structure determination, development of senior capital cost rates, as well as the determination of an appropriate rate of return on equity. I also assisted in the preparation of interrogatory responses, interrogatory questions of the opposition, areas of cross-examination and rebuttal testimony. I also assisted in the preparation of the annual publication C. A. Turner Utility Reports - Financial Statistics - Public Utilities.

1973-1975

As a research assistant in the Research Department of the Regional Economics Division of the Federal Reserve Bank of Boston, I was involved in the development and maintenance of econometric models to simulate regional economic conditions in New England in order to study the effects of, among other things, the energy crisis of the early 1970's and property tax revaluations on the economy of New England. I was also involved in the statistical analysis and preparation of articles for the New England Economic Review. Also, I acted as assistant editor for New England Business Indicators.

1972

As a research assistant in the Office of the Assistant Secretary for International Affairs, U.S. Treasury Department, Washington, D.C., I developed and maintained econometric models which simulated the economy of the United States in order to study the results of various alternate foreign trade policies so that national trade policy could be formulated and recommended.

I am also a member of the Society of Utility and Regulatory Financial Analysts (formerly the National Society of Rate of Return Analysts).

Clients Served

I have offered expert testimony before the following commissions:

Arkansas	Maryland
California	Michigan
Connecticut	Missouri
Delaware	Nevada
Florida	New Jersey
Hawaii	New York
Idaho	North Carolina
Illinois	Ohio
Indiana	Pennsylvania
Iowa	South Carolina
Kentucky	Virginia
Louisiana	Washington
Maine	

I have sponsored testimony on the rate of return and capital structure effects of merger and acquisition issues for:

California-American Water Company

New Jersey-American Water Company

I have sponsored testimony on fair rate of return and related issues for:

Alpena Power Company
Applied Wastewater Management, Inc.
Aqua Illinois, Inc.
Aqua New Jersey, Inc.
Aqua Virginia, Inc.
Artesian Water Company
The Atlantic City Sewerage Company
Audubon Water Company
The Borough of Hanover, PA
Carolina Pines Utilities, Inc.
Carolina Water Service, Inc. of NC
Carolina Water Service, Inc. of SC
The Columbia Water Company
Consumers Illinois Water Company
Consumers Maine Water Company
Consumers New Jersey Water Company
City of DuBois, Pennsylvania
Elizabethtown Water Company
Emporium Water Company
GTE Hawaiian Telephone Inc.
Greenridge Utilities, Inc.
Illinois American Water Company
Iowa American Water Company
Land'Or Utility Company
Long Neck Water Company
Louisiana Water Service, Inc.
Massanutten Public Service Company
Middlesex Water Company
Missouri-American Water Company
Mt. Holly Water Company
Nero Utility Services, Inc.
New Jersey-American Water Company
The Newtown Artesian Water Company
NRG Energy Center Pittsburgh LLC
NRG Energy Center Harrisburg LLC
Ohio-American Water Company
Penn Estates Utilities
Pinelands Water Company
Pinelands Waste Water Company
Pittsburgh Thermal
San Jose Water Company

Southland Utilities, Inc.
Spring Creek Utilities, Inc.
Sussex Shores Water Company
Tega Cay Water Service, Inc.
Total Environmental Services, Inc.
Treasure Lake Water & Sewer Divisions
Thames Water Americas
Tidewater Utilities, Inc.
Transylvania Utilities, Inc.
Trigen-Philadelphia Energy Corporation
Twin Lakes Utilities, Inc.
United Utility Companies
United Water Arkansas, Inc.
United Water Arlington Hills Sewerage, Inc.
United Water Connecticut, Inc.
United Water Delaware, Inc.
United Water Idaho, Inc.
United Water Indiana, Inc.
United Water New Jersey, Inc.
United Water New Rochelle, Inc.
United Water New York, Inc.
United Water Owego / Nichols, Inc.
United Water Pennsylvania, Inc.
United Water South County, Inc.
United Water Toms River, Inc.
United Water Virginia, Inc.
United Water West Lafayette, Inc.
United Water West Milford, Inc.
Utilities, Inc.
Utilities Inc. of Central Nevada
Utilities, Inc. of Florida
Utilities, Inc. of Louisiana
Utilities Inc. of Nevada
Utilities, Inc. of Pennsylvania
Utilities, Inc. - Westgate
Utilities Services of South Carolina
Utility Center, Inc.
Valley Energy, Inc.
Water Services Corp. of Kentucky
Wellsboro Electric Company
Western Utilities, Inc.

I have sponsored testimony on capital structure and senior capital cost rates for the following clients:

Alpena Power Company
Arkansas-Western Gas Company
Associated Natural Gas Company

PG Energy Inc.
United Water Delaware, Inc.
Washington Natural Gas Company

I have assisted in the preparation of rate of return studies on behalf of the following clients:

Algonquin Gas Transmission Company
Anadarko Petroleum Corporation
Arkansas-Louisiana Gas Company
Arkansas Western Gas Company
Artesian Water Company
Associated Natural Gas Company
Atlantic City Electric Company
Bridgeport-Hydraulic Company
Cambridge Electric Light Company
Carolina Power & Light Company
Citizens Gas and Coke Utility
City of Vernon, CA
Columbia Gas/Gulf Transmission Cos.
Commonwealth Electric Company
Commonwealth Telephone Company
Conestoga Telephone & Telegraph Co.
Connecticut Natural Gas Corporation
Consolidated Gas Transmission Company
Consumers Power Company
CWS Systems, Inc.
Delmarva Power & Light Company
East Honolulu Community Services, Inc.
Equitable Gas Company
Equitrans, Inc.
Florida Power & Light Company
Gary Hobart Water Company
Gasco, Inc.
GTE Arkansas, Inc.
GTE California, Inc.
GTE Florida, Inc.
GTE Hawaiian Telephone
GTE North, Inc.
GTE Northwest, Inc.
GTE Southwest, Inc.
Great Lakes Gas Transmission L.P.
Hawaiian Electric Company
Hawaiian Electric Light Company
IES Utilities Inc.
Illinois Power Company
Interstate Power Company
Interstate Power & Light Co.
Iowa Electric Light and Power Company
Iowa Southern Utilities Company
Kentucky-West Virginia Gas Company
Lockhart Power Company
Middlesex Water Company
Milwaukee Metropolitan Sewer District
Mountaineer Gas Company

National Fuel Gas Distribution Corp.
National Fuel Gas Supply Corp.
Newco Waste Systems of NJ, Inc.
New Jersey Natural Gas Company
New Jersey-American Water Company
New York-American Water Company
North Carolina Natural Gas Corp.
Northumbrian Water Company
Ohio-American Water Company
Oklahoma Natural Gas Company
Orange and Rockland Utilities
Paiute Pipeline Company
PECO Energy Company
Penn Estates Utilities, Inc
Penn-York Energy Corporation
Pennsylvania-American Water Co.
PG Energy Inc.
Philadelphia Electric Company
Providence Gas Company
South Carolina Pipeline Company
Southwest Gas Corporation
Stamford Water Company
Tesoro Alaska Petroleum Company
Tesoro Refining & Marketing Co.
United Telephone of New Jersey
United Utility Companies
United Water Arkansas, Inc.
United Water Delaware, Inc.
United Water Idaho, Inc.
United Water Indiana, Inc.
United Water New Jersey, Inc.
United Water New York, Inc.
United Water Pennsylvania, Inc.
United Water Virginia, Inc.
United Water West Lafayette, Inc.
Utilities, Inc of Pennsylvania
Utilities, Inc - Westgate
Vista-United Telecommunications Corp.
Washington Gas Light Company
Washington Natural Gas Company
Washington Water Power Corporation
Waste Management of New Jersey –
Transfer Station A
Wellsboro Electric Company
Western Reserve Telephone Company
Western Utilities, Inc.
Wisconsin Power and Light Company

EDUCATION:

1973 – Clark University – B.A. – Honors in Economics
1991 – Rutgers University – M.B.A. – High Honors

PROFESSIONAL AFFILIATIONS:

American Finance Association
Financial Management Association
Society of Utility and Regulatory Financial Analysts
 President – 2006-2008 and 2008-2010
 Secretary/Treasurer – 2004-2006
Energy Association of Pennsylvania
National Association of Water Companies – Member of the Finance Committee

SPEAKING ENGAGEMENT:

“New Approach to Estimating the Cost of Common Equity Capital for Public Utilities” (co-presenter with Richard A. Michelfelder, Ph.D. - Advanced Workshop in Regulation and Competition, 28th Annual Eastern Conference of the Center for Research in Regulated Industries (CRRI) at Rutgers University, May 14, 2009.

Moderator: Society of Utility and Regulatory Financial Analysis: 41st Financial Forum – “Estimating the Cost of Capital in Today’s Economic and Capital Market Environment” April 16-17, 2009, Washington, DC

AWWA Pre-Conference Workshop – Water Utility Ratemaking – March 25, 2008, Atlantic City, NJ
Topic: “Water Utility Financing: Where Does All That Cash Come From?”

PAPERS:

“New Approach to Estimating the Cost of Common Equity Capital for Public Utilities”, co-authored with Frank J. Hanley and Richard A. Michelfelder, forthcoming.

“Comparable Earnings: New Life for an Old Precept” co-authored with Frank J. Hanley, Financial Quarterly Review, (American Gas Association), Summer 1994.