Exhibit No.:
Issues: Rate of Return on Equity
Capital Structure
Witness: Pauline M. Ahern
Exhibit Type: Rebuttal
Sponsoring Party: Missouri-American Water Company
Case No.: WR-2003-0500
and WC-2004-0168
Date: November 10, 2003

MISSOURI PUBLIC SERVICE COMMISSION

CASE NO. WR-2003-0500 and WC-2004-0168

REBUTTAL TESTIMONY

OF

PAULINE M. AHERN

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 SERVICE	))))	**CASE NO. WR-2003-0500**

AFFIDAVIT OF PAULINE M. AHERN

Pauline M. Ahern, being first duly sworn, deposes and says that she is the witness who sponsors the accompanying rebuttal testimony entitled "Rebuttal Testimony of Pauline M. Ahern"; that said rebuttal testimony and schedule(s) was prepared by her and/or under her direction and supervision; that if inquiries were made as to the facts in said rebuttal testimony, she would respond as therein set forth; and that the aforesaid rebuttal testimony and schedule(s) 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 4th **day of** November **2003.**

Notary Public

My commission expires:

SHARON M. KEEFE
NOTARY PUBLIC OF NEW JERSEY
MY COMMISSION EXPIRES JULY 9, 2006

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I. INTRODUCTION

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

A. My name is Pauline M. Ahern and I am a Vice President of AUS Consultants – Utility Services. My business address is 155 Gaither Drive, P. O. Box 1050, Moorestown, New Jersey 08057.

Q. Are you the same Pauline M. Ahern who previously submitted prepared direct testimony in this proceeding?

A. Yes, I am.

Q. Have you prepared schedules which support your rebuttal testimony?

A. Yes, I have. They have been marked for identification as Schedules PMA-12 through PMA- 22 .

II. PURPOSE

Q. What is the purpose of this testimony?

A. The purpose of this testimony is to rebut certain aspects of the direct testimony of David Murray, Witness for the Missouri Public Service Commission Staff (Staff) and Mark Burdette, Witness for the Office of the Public Counsel (OPC) concerning capital structure and common equity cost rate. Specifically, I will address Mr. Murray's proposed capital structure, his application of the Discounted Cash Flow (DCF) Model, Risk Premium Model (RPM) / Capital Asset Pricing Model (CAPM), the inadequacy of his recommended overall rate of return, including common equity cost rate. I will also address Mr. Burdette's inclusion of short-term debt in his proposed capital structure as well as his application of the CAPM.

III. CAPITAL STRUCTURE RATIOS

A. Mr. Murray's Proposed Capital Structure Ratios

Q. Is Mr. Murray's recommendation that the MoPSC adopt American Water Works Company's (American Water) consolidated capital structure ratios for ratemaking purposes to establish an allowed overall rate of return for Missouri-American Water Company (MAWC or the Company) appropriate?

A. No. It is not appropriate that the MoPSC set rates for MAWC in this proceeding based upon American Water's consolidated capital structure ratios. Rather, the MoPSC should adopt the Company's proposed capital structure consisting of 26.380% long-term debt, 0.521% preferred stock, and 43.099% common equity expected at November 30, 2003.

Q. Why are the Company's capital structure ratios expected at November 30, 2003 appropriate for ratemaking purposes?

A. These capital structure ratios are appropriate for ratemaking purposes for five reasons; 1) MAWC has an independently determined capital structure, 2) MAWC's stand-alone capital structure represents the actual capital financing of MAWC's jurisdictional rate base to which rates set in this proceeding will be applied; 3) MAWC's stand-alone capital structure is consistent with the capital structure ratios maintained, on average, by other water companies; 4) MAWC's stand-alone capital structure is consistent with S&P's financial target ratios of total debt to total capital criteria; and 5) MAWC's stand-alone capital structure is consistent with the capital structures allowed by the MoPSC precedent.

Q. Please comment upon the independence of MAWC's stand-alone capital structure.

A. As indicated in the Company's response to Data Information Request No. 3819, attached as Schedule PMA-12, MAWC's capital structure, on a expected basis at November 30, 2003, is expected to consist of $290,035,000 long-term debt of which $185,000,000 or 63.7% are tax-exempt bonds issued directly by MAWC with the MoPSC's authorization and 19.3%, or $56,000,000, are borrowings from American Water Capital Corp. (AWCC). MAWC's expected November 30, 2003 is also expected to contain $2,680,000 of preferred stock which is directly issued by MAWC to the external capital markets. MAWC's common equity is expected to be $221,714,180, including $122,955,389 in retained earnings obtained directly from MAWC's ratepayers. Therefore, MAWC's expected November 30, 2003 total capital aggregates to $514,429,180 ($290,035,000 long-term debt + $2,680,000 preferred stock + $221,714,180 common equity), of which the $56,000,000 in borrowings from AWCC represent only 10.9% of total capital.

While it is true that MAWC is receiving part of its debt financing through AWCC, it is clear from the Company's response to Data Information Request No. 3817 and the September 10, 2003 interview referenced by Mr. Murray on pages 21 and 22 of his direct testimony that MAWC will avail itself of either AWCC debt financing or tax-exempt debt financing through the State of Missouri's EIERA funding program depending upon whichever source of debt financing is lowest cost. Since MAWC is not obligated to borrow from AWCC, it is by no means a certainty that the exclusive source of MAWC's future debt financings will be AWCC.

Moreover, MAWC's long-term debt is secured by its own assets and not the assets of American Water or any of American Water's other subsidiaries, some of whom are engaged in non-regulated activities. In turn, MAWC's assets do not secure the debt of American Water or any of its subsidiaries. Although a support agreement exists between American Water and AWCC, it only assures that AWCC will be able to meet its

debt obligations and is silent upon the debt obligations of its operating water subsidiaries, including MAWC. The support agreement does not state that American Water will meet MAWC's debt service obligations to AWCC. Mr. Hartnett was clear in the September 20, 2003 interview in stating that while American Water, under the support agreement:

> "would have to provide any necessary funds to meet any shortfalls. . . it would not preclude certainly continuing to pursue Missouri American to meet its obligations. Missouri American is the primary obligor to Capital Corp. They have signed a note whenever they make a borrowing."

Moreover, Standard & Poor's (S&P) indicates the following in its August 1, 2003 Research Report on American Water Capital Corp. (attached as Schedule PMA-13):

> "There is a support agreement between American Water Works and AWCC, which links the two entities, but American Water Works does not guarantee debt issued by AWCC." (emphasis added)

Bond rating agencies, such as S&P, are investor influencing and their opinion regarding the non-existence of a guarantee of AWCC's debt by American Water are likely to affect investors' perceptions of the true nature of the support agreement between American Water and AWCC.

Thus, MAWC's capital structure is consistent with the considerations enumerated by David C. Parcell in The Cost of Capital –A Practitioner's Guide prepared for the Society of Utility and Regulatory Financial Analysts. Three of the considerations Mr. Parcell notes as helpful in determining whether a stand-alone utility or consolidated parent capital structure is appropriate for ratemaking purposes are[1]:

1. Whether subsidiary utility obtains all of its capital from its parent, or issues its own debt and preferred stock. (emphasis added)

2. Whether parent guarantees any of the securities issued by the subsidiary.

3. Whether subsidiary's capital structure is independent of its parent (i.e., existence of double leverage, absence of proper relationship between risk and leverage of utility and non-utility subsidiaries).

[1] David C. Parcell, The Cost of Capital –A Practitioner's Guide Society of Utility and Regulatory Financial Analysts, 1997, p. 4-20.

MAWC does not obtain all of its capital from American Water. S&P states that American Water does not guarantee any of the securities of its subsidiaries, including AWCC. MAWC's capital structure is independent of its parent, American Water.

In view of the foregoing, because MAWC is responsible to service its own debt, is not obligated to borrow from AWCC , and does indeed have an independently determined capital structure, the only conclusion to be drawn is that MAWC's proposed stand-alone capital structure ratios expected at November 30, 2003 are appropriate for ratemaking purposes.

Q. Why is the actual capital financing MAWC's jurisdictional rate base relevant and appropriate for ratemaking purposes?

A. The actual capital financing MAWC's jurisdictional rate base is relevant and appropriate for ratemaking purposes because it represents the actual dollars which are financing the jurisdictional rate base to which rates set in this proceeding will be applied. In contrast, the consolidated MAWC capital structure proposed by Mr. Murray contains capital which does not finance MAWC's jurisdictional rate base. It includes the long-term debt capital of operating water subsidiaries other than MAWC and which finances the jurisdictional rate bases of those subsidiaries. It also includes capital issued to finance the acquisitions of subsidiaries which operate in states other than Missouri, namely Citizens Communications and Azurix Industrial Corp.. Furthermore, it includes capital which finances American Water's non-regulated subsidiaries, American Water Services and American Water Resources.

MAWC's ratemaking capital structure expected at November 30, 2003 aggregates to but $514,429,180. In contrast, American Water's total capital, as shown on Mr. Murray's Schedule 9, aggregates to $5,657,241,734. During the six months ended June 30, 2003, American Water's total permanent capital increased by more than $3 billion, to $8,972,267,000, $8,457,837,820 greater than the capital actually financing

the Company's proposed rate base of $497,681,177. As discussed previously, American Water's capital finances its numerous subsidiaries, both regulated and non-regulated, which operate in 27 states and 4 Canadian provinces. Thus, nearly $8.5 billion of its capital is simply not available to finance MAWC's jurisdictional rate base.

In view of the foregoing, namely that the capital structure proposed by Mr. Murray, contains capital which is clearly not financing MAWC's rate base, his recommended capital structure ratios should be rejected by the MoPSC in setting rates in this proceeding.

Q. How do the Company's proposed capital structure ratios compare with those maintained by other water companies?

A. The Company's proposed capital structure ratios are consistent with those maintained, on average, by the seven water companies in either my proxy group or by the four water companies in Mr. Murray's comparable group. As shown on Schedule PMA-14, the common equity ratios, based upon total permanent capital, of the proxy group of seven water companies, averaged 44.80% for the year 2002 and ranged from 40.40% to 53.24%, while the common equity ratios of Mr. Murray's four water companies averaged 45.95% (see Mr. Murray's Schedule 12) in 2002. Hence, MAWC's ratemaking common equity ratio of 43.099% is consistent with, if not slightly more conservative than, that of the water companies in both my proxy group and in Mr. Murray's comparable group.

Moreover, Phillips supports the use of actual capital structure ratios, and not a hypothetical one such as the consolidated American Water capital structure, for ratemaking purposes under such conditions, i.e., when they are consistent with those of other similar utilities, when he states[2]:

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2 Phillips, Charles F., Jr., The Regulation of Public Utilities, 3rd Edition, Public Utility Reports, Arlington, VA, 1993, p. 391.

> Debt ratios began to rise during the late 1960s and early 1970s, and the financial condition of the public utility sector began to deteriorate. It became the common practice to use actual or expected capitalizations; actual where a historic test year is used, expected when a projected or future test year is used.[83] (footnote omitted) The objective, in short, shifted from minimization of the short-term cost of capital to protection of a utility's ability "to raise capital at all times. This objective requires that a public utility make every effort to keep indebtedness at a prudent and conservative level."[84] (footnote omitted) A hypothetical capital structure is used only where a utility's actual capitalization is clearly out of line with those of other utilities in its industry or where a utility is diversified.[85] (footnote omitted)

In view of the foregoing, since the expected November 30, 2003 capital structure ratios of MAWC are clearly consistent with those maintained on average by the companies in both the proxy group of seven water companies and Mr. Murray's comparable group of four water companies and the fact that the Company's proposed capital structure contains the actual capital actually financing its jurisdictional rate base, it is clear that the Company's proposed capital structure ratios and not those recommended by Mr. Murray should be adopted for ratemaking purposes in this proceeding.

Q. How do the Company's capital structure ratios compare with S&P's financial targets?

A. The Company's capital structure ratios are consistent with S&P's financial targets. Although MAWC's bonds are not rated by S&P, AWCC's bonds are rated A- by S&P and AWCC is assigned an above average business position, likely a "2" or a "3". In addition AWCC's credit rating is A based upon S&P's consideration of "the stand-alone credit profile of American Water Works" and then notched up to "reflect the material level of parental support from RWE as well as the core nature of American Water Works' regulated water operations to the RWE water division." (see Schedule PMA-13). Thus, S&P would likely assign a bond / credit rating of A to American Water Works and MAWC. S&P's financial target debt to total capital benchmark ratio for a utility whose bond / credit rating is in the A category and which is assigned a business position of "2" or "3" range from 51.0% to 56.5% and 47.5% to 53.0%, respectively. (See page 12 of Exhibit PMA-2). This implies ranges of total equity of 43.5% to 49.0% for a business position of

"2" and 47.0% to 52.5% for a business position of "3". The Company's proposed total equity ratio of 43.620% (common equity of 43.099% plus preferred stock of 0.521%) falls at the bottom of the range of total equity ratios implied for an A rated utility with a business position of "2" and below the bottom of the range implied for an A rated utility with a business position of "3". Therefore, MAWC's proposed total equity ratio is consistent with the ranges of total equity ratios implied in S&P's financial target total debt to total capital ratios for a utility with a business position of "2" or "3" in order to obtain and maintain an A bond / credit rating. In contrast, Mr. Murray's recommended total equity ratio of 32.47% (31.85% common equity + 0.62% preferred stock, see Mr. Murray's Schedule 24) based upon American Water's consolidated capital structure falls far below the ranges of implied total equity ratios required by S&P for utilities with bonds rated in the A category and assigned a business position of "2" or "3".

In view of the foregoing, since the expected November 30, 2003 capital structure ratios of MAWC are clearly consistent with S&P's financial total debt to total capital benchmark ratios the Company's proposed stand-alone capital structure ratios and not those recommended by Mr. Murray should be adopted for ratemaking purposes in this proceeding.

Q. What has been previous MoPSC precedent regarding consolidated / parent capital structures for ratemaking purposes?

A While the MoPSC has authorized consolidated / parent capital structures in the past, it has done so under very different circumstances than in the instant proceeding where MAWC does indeed have an independently determined capital structure which is consistent with the capital structures maintained by other water companies and with S&P's financial target debt to total capital benchmarks. In Case No. ER-97-394, re: Missouri Public Service (MPS), a Division of UtiliCorp United Inc., the MoPSC determined that the consolidated capital structure of UtiliCorp was appropriate for ratemaking

purposes as MPS, as a division of UtiliCorp, issued no common stock or debt of its own and its capital structure was based upon an allocation of capital. However, the MoPSC's decision in Case No. ER-97-394 stands in contrast to its decision in Case No. ER-93-37 also relating to MPS. In Case No. ER-93-37, the MoPSC determined that MPS'

> "divisional capital structure is the most appropriate. . . is testable, understandable, based on published facts and material, has been in continuous operation for more than five years, and has been subjected to substantial regulatory review. . . is reasonable due [to] its continuity."

The MoPSC's decision was upheld in its Order on Remand in Case No. ER-93-37, where the Commission stated:

> "The Commission finds that MoPub's proposed capital structure is the most reasonable and should, therefore, be used. . . .the use of UtiliCorp consolidated capital structure may be a valid approach. However, this is not the best approach for this case because UtiliCorp is comprised of both operating utility divisions and unregulated subsidiaries, and its capital structure reflects that mix. Use of MoPub's assigned capital structure will help insulate it to some extent from UtiliCorp's unregulated subsidiaries, and the assigned structure is actually analogous to the capital structures of comparable electric utilities.. . . Finally, the Commission determines that in this case it will not impose a different capital structure on a utility where the management of the company has chosen an appropriate capital structure."

The principles expressed by the MoPSC in its orders in Case No. ER-93-37 apply equally to this proceeding, namely, that MAWC's proposed stand-alone capital structure is appropriate, testable, reasonable, based upon published facts and material, has been continually in place more than five years, has been subject to substantial regulatory review, insulates MAWC from American Water's unregulated operations, and is analogous to the capital structures of comparable water utilities.

In view of all the foregoing, as well as the inadequate opportunity for pretax interest coverage implicit in Mr. Murray's recommendation, which will be discussed subsequently, Mr. Murray's recommended consolidated capital structure ratios should be rejected by the MoPSC. Rather, the Company's proposed ratemaking capital structure ratios, expected at November 31, 2003, consisting of 56.380%% long-term debt, 0.521%

preferred stock, and 43.099% common equity are appropriate capital structure ratios for ratemaking purposes and should be adopted by the MoPSC.

Q. Why are American Water's consolidated capital structure ratios not appropriate for ratemaking purposes for MAWC?

A. American Water's consolidated capital structure ratios are not appropriate for ratemaking purposes for MAWC for four reasons; 1) American Water's consolidated capital structure ratios do not represent the actual capital which finances MAWC's jurisdictional rate base to which rates set in this proceeding will be applied; 2) American Water's consolidated capital structure ratios are not consistent with the capital structure ratios maintained, on average, by water companies; 3) American Water's consolidated capital structure ratios are not consistent with S&P's financial target ratios of total debt to total capital criteria for a water utility whose long-term debt would likely be rated in the A bond rating category and assigned a business position of "2" or "3"; and 4) American Water's consolidated capital structure ratios reflect the risk of the consolidated operations of American Water and not that of a stand-alone operating water utility.

Q. Why do American Water's consolidated capital structure ratios not represent the actual capital which finances MAWC's jurisdictional rate base?

A. As previously discussed, MAWC's proposed rate base is $497,681,177. In contrast, the total capital, represented by Mr. Murray's recommended American Water consolidated capital structure, consists of $5,657,241,734 as shown on his Schedule 9. And, as discussed above, American Water's total capital has increased to $8,972,267,000 in the six months ended June 30, 2003. Hence, there is $8,474,585,823 more in capital on American Water's balance sheet than included in MAWC's proposed rate base, i.e., ($8,972,267,000 - $497,681,177 = $8,474,585,823). This $8.5 billion is simply not

available or necessary to finance MAWC's rate base. This additional $8.5 billion finances American Water's many and varied operations, including the rate bases of its other operating water subsidiaries, as well as acquisitions of subsidiaries which do not operate in Missouri and American Water's non-regulated subsidiaries. Clearly, the risk inherent in the consolidated capital structure is not representative of MAWC's actual risk.

Q. How do American Water's consolidated capital structure ratios compare with those maintained by other water companies?

A. American Water's consolidated capital structure ratios are <u>not</u> consistent with those maintained, on average, by either the seven companies in my proxy group or by the four water companies in Mr. Murray's comparable group. As discussed previously and shown on Schedule PMA-14, the common equity ratios, based upon total permanent capital, of the proxy group of seven water companies, averaged 44.80% for the year 2002, ranging from 40.0% to 53.24%, while the common equity ratios of Mr. Murray's four water companies average 45.95% (see Mr. Murray's Schedule 12) in 2002. In contrast, Mr. Murray's proposed consolidated American Water common equity ratio is 31.85%, significantly lower than the average common equity ratios maintained by water companies comparable to MAWC. A capital structure containing a common equity ratio of 31.85% indicates significantly greater financial risk in comparison with the average capital structures maintained by water companies. Greater financial risk also means a higher common equity cost rate because it increases total investment risk, including common equity risk. Mr. Murray has not fully taken the degree of financial risk inherent in American Water's consolidated capital structure into account by increasing his common equity cost rate recommendation by <u>only</u> 33 basis points, the average spread between BBB and A rated public utility bond yields for the past eight years. (see page 33 of Mr. Murray's direct testimony) As will be discussed subsequently, a much larger increment must be added to his recommended common equity cost rate to reflect the greater

financial risk inherent in his proposed capital structure vis-à-vis the average capital structures maintained by the water companies in his comparable group upon whose market data he based his common equity cost rate.

Q. How do American Water's consolidated capital structure ratios compare with S&P's financial target total debt to total capital ratios?

A. American Water's consolidated capital structure ratios are not consistent with S&P's financial targets for a utility whose bonds are rated in the A bond rating category and which is assigned a business position or "2" or "3", the likely bond / credit rating and business position(s) of MAWC as discussed previously. As also discussed previously, the implied total equity range required by S&P for a utility whose bond / credit rating is in the A bond rating category and which is assigned a business position of "2" or "3" range from 42.5% to 49.0% and 47.0% to 52.5%, respectively. A total equity ratio of 32.47% (32.47% = 31.85% common equity + 0.62% preferred stock, see Mr. Murray's Schedule 24) clearly falls far below the bottom of either range.

In making an upward adjustment to his DCF recommended cost of common equity of only 33 basis points as discussed above, Mr. Murray has assumed that if American Water's, and hence, MAWC's, bonds were rated by S&P, they would be rated in the BBB bond rating category. Mr. Murray's recommended total equity ratio of 32.47% even falls below the end of the implied ranges of total equity of 36.5% to 43.5% and 39.0% to 47.0% for a utility whose bond / credit rating is in the BBB bond rating category and which is assigned a business position of "2" or "3".

Clearly, then, Mr. Murray's capital structure ratios are not consistent with S&P's financial total debt to total capital benchmark ratios for a utility with either an A or BBB bond rating and assigned a business position of "2" or "3". Therefore, they should be rejected for ratemaking purposes for MAWC.

B. Inclusion of Short-term Debt

Q. Mr. Murray's and Mr. Burdette's proposed capital structures contain short term debt. Is this appropriate?

A. No. It is not appropriate to include short-term debt in any capital structure authorized for MAWC, whether it be the inappropriate consolidated American Water capital structure or the appropriate MAWC stand-alone capital structure, expected at November 30, 2003. First, MAWC's most recent twelve-month average balance of short-term debt does not exceed its Construction Work In Progress (CWIP) balances. Second, CWIP is not included in rate base and therefore, the debt financing CWIP should not be included in a ratemaking capital structure. Third, MAWC currently has no short-term debt outstanding.

Q. What is the Company's current short-term debt balance?

A. For the twelve months ended October 2003, MAWC had an average balance of $4,280,549 in short-term debt outstanding, with no short-term debt currently outstanding as of October 31, 2003. During this same period, MAWC's CWIP balances averaged $20,021,302, or $15,740,753 less than the average short-term debt balance. Hence, there is no reason for either Mr. Murray or Mr. Burdette to include any short-term debt in their proposed capital structures, because MAWC does not currently have short-term debt which exceeds CWIP nor has short-term debt exceeded CWIP, on average, for the latest twelve months. Moreover, the Company's level of short-term debt has been quite variable especially in the twelve months ended with October 2003, ranging from a high of $13,015,699 in January 2003 to $0 in both November 2002 and October 2003. Clearly, then, MAWC does not use short-term debt consistently or as permanent financing and it should not be included in MAWC's ratemaking capital structure.

IV. TESTIMONY OF MoPSC STAFF WITNESS DAVID MURRAY

A. Cost of Common Equity

1. Discounted Cash Flow

Q. Do you have any comment on Mr. Murray's application of the DCF Model?

A. Yes. My comments surround the development of his conclusion of a growth rate to be used in his application of the DCF model. First, on Schedule 14-2, he has included a negative 7.34% historical (1997-2002) EPS growth rate for California Water Services Group in developing his average annual compound growth rates. It is illogical that investors would rely upon such a growth rate, as investors do not invest in securities expecting to lose money. Hence, this negative growth rate should have been excluded. I have corrected the development of the historical growth in DPS, EPS and BVPS to exclude California Water Services Group's negative 7.34% growth rate in column 1 on page 1 of Schedule PMA-15 which results in an average historical growth rate of 3.69% for Mr. Murray's comparable group of water companies in contrast to Mr. Murray's conclusion of 3.36% (see Schedule 14-3).

Second, Mr. Murray relied upon both I/B/E/S and S&P's projected 5-year growth in EPS. As indicated on page 3 of Schedule PMA-15, I/B/E/S is the source of S&P's growth rates. Including them in the development of a conclusion of projected growth rate results in an inappropriate double counting of these growth rates resulting in an understatement of the average projected growth rate in EPS. I have also corrected for this on page 1 of Schedule PMA-15. The result is an average projected growth rate in EPS of 6.88% in contrast to Mr. Murray's conclusion of 6.42% as shown on his Schedule 15.

As shown on page 1 of Schedule PMA-15, correcting for the inclusion of a negative growth rate and the double counting of I/B/E/S projected growth in EPS results in an average growth rate of 5.29% in contrast to Mr. Murray's conclusion of growth of 4.89%. Adding / subtracting Mr. Murray's arbitrary 50 basis points to this average results in a range of growth of 4.79% - 5.79% as also shown on Schedule PMA-15. When

combined with Mr. Murray's projected dividend yield of 3.54% a range of common equity cost rate of 8.33% to 9.33% results, with a midpoint of 8.82% as shown on Schedule PMA-16. Adding the 33 basis point yield spread between BBB and A rated public utility bonds as Mr. Murray did on page 33 of his direct testimony results in a range of common equity cost rate of 8.66% to 9.66% with a midpoint of 9.16%. A common equity cost rate of 9.16% is 40 basis points above the midpoint of his range of recommended common equity cost rate of 8.76% and still understates the common equity cost rate applicable to his recommended common equity ratio of 31.85% because it reflects the average financial risk of the comparable companies whose common equity ratio averaged 45.95% in 2002 and does not reflect the financial risk inherent in his recommended 31.85% common equity ratio which will be discussed in detail subsequently.

2. Capital Asset Pricing Model

Q. Do you have any comment regarding Mr. Murray's application of the CAPM?

A. Yes. Mr. Murray's application is flawed in three respects; 1) his choice of an historical yield on the no longer issued 30-year U.S. Treasury bond as the risk-free rate; 2) his exclusive use of an historical market equity risk premium which is incorrectly derived; and 3) his failure to also apply the empirical CAPM to account for the fact that Security Market Line (SML) as described by the traditional CAPM is not as steeply sloped as the predicted SML.

Q. Please comment upon Mr. Murray's use of the historical yield on 30-year U.S. Treasury bonds as the risk-free rate.

A. The cost of capital is prospective, as is ratemaking. Therefore, it is inappropriate to use an historical yield as the risk-free rate in a CAPM analysis. And it is inappropriate to use a yield on a bond which is no longer issued by the U. S. Treasury, such as the 30-year

bond. Rather, the prospective yield on the existing long-term U.S. Treasury bonds should be used. As shown in note 1 on page 1 of Schedule PMA-17, the current forecasted consensus yield on long-term U. S. Treasury bonds by the nearly 50 economists reported in Blue Chip Financial Forecasts dated October 1, 2003 is 5.6% for the six quarters ending with the first quarter 2005. A prospective yield of 5.6% stands in stark contrast to Mr. Murray's recommended 4.93% historical yield (July 2003) on 30-year U.S. Treasury bonds.

Q. You have stated that Mr. Murray erred in exclusively relying upon an historical market equity risk premium which was incorrectly derived. Please explain.

A. Mr. Murray's market equity risk premium of 6.4% is derived as the difference between the arithmetic mean 1926-2002 total return on large company stocks of 12.2% and the arithmetic mean 1926-2002 total return on long-term government bonds of 5.8%. (6.4% = 12.2% - 5.8%). The correct derivation of the historical market equity risk premium is the difference between the total return on large company stocks of 12.2% and the arithmetic mean 1926-2002 income return on long-term government bonds of 5.2% which results in a market equity risk premium of 7.0% (7.0% = 12.2% - 5.2%). Regarding the use of the income return and not the total return in Treasury securities in deriving an equity risk premium, Ibbotson Associates state[3]:

> Another point to keep in mind when calculating the equity risk premium is that the income return on the appropriate-horizon Treasury security, rather than the total return, is used in the calculation. The total return is comprised of three return components: the income return, the capital appreciation return, and the reinvestment return. The income return is defined as the portion of the total return that results from a periodic cash flow or, in this case, the bond coupon payment. The capital appreciation return results from the price change of a bond over a specific period. Bond prices generally change in reaction to unexpected fluctuations in yields. Reinvestment return is the return on a given month's investment income when reinvested into the same asset class in the subsequent months of the year. The income return is thus used in the estimation of the equity risk premium because it represents the truly riskless portion of the return. (emphasis added)

[3] Ibbotson Associates, Stocks, Bonds, Bills and Inflation – Valuation Edition 2003 Yearbook, pp. 69-70.

Hence, the correct historical market equity risk premium to use is 7.0% and not 6.4%. Schedule PMA-17 corrects Mr. Murray's CAPM analysis to reflect a forecasted risk-free rate of 5.6% and a properly calculated historical market equity risk premium of 7.0%. This results in a CAPM derived common equity cost rate of 9.89%, in contrast to his improperly derived CAPM result of 8.66%.

In addition, Mr. Murray relied exclusively upon an historical market equity risk premium which is in direct contrast to his use of both historical and projected growth rates in his application of the DCF model. As stated previously, the cost of capital is prospective and while the arithmetic mean of long-term historical stock market returns can provide insight into investors' expectations of stock market returns because the arithmetic mean of historical returns provides investors with the valuable insight needed to estimate future risk, it is also appropriate to use an estimate of the forecasted or projected stock market return. One indication of the forecasted stock market return can be derived using Value Line's 3-5 year median total market price appreciation projections and dividend yield projections as explained in detail on pages 35 and 36 of my direct testimony and summarized in note 3 on Schedule PMA-18. Based upon current Value Line estimates a forecasted total market return of 14.4% is indicated. Subtracting the consensus forecasted yield on long-term U. S. Treasury bonds of 5.6% from the 14.4% forecasted total market return yields an 8.8% market equity risk premium.

In the top half of Schedule PMA-18, I have derived the traditional CAPM, the one applied by Mr. Murray, using the correct forecasted risk-free rate of 5.6% and a market equity risk premium based upon both the arithmetic mean historical market equity risk premium correctly calculated as described above and the forecasted market equity risk premium based upon Value Line's projections as described in note 3 on Schedule PMA-18. This results in a CAPM derived common equity cost rate of 10.44%, which is significantly greater than Mr. Murray's CAPM derived cost rate of 8.66%, based upon an historical risk-free rate and an equity risk premium for the years1926-2002. A CAPM cost

rate of 10.44% does not corroborate either Mr. Murray's range of DCF results of 7.93% to 8.93%, nor the corrected DCF results of 8.33% - 9.33% shown on Schedule PMA-16.

Q. You have stated that Mr. Murray failed to apply the empirical CAPM to account for the fact that Security Market Line (SML) as described by the traditional CAPM is not as steeply sloped as the predicted SML. Please comment.

A. As discussed in my direct testimony at lines 1-27 on page 39 of my direct testimony, while numerous tests of the CAPM have confirmed its validity, these tests have determined that "the implied intercept term exceeds the risk-free rate and the slope term is less than predicted by the CAPM."[4] These tests have also indicated that the expected return on a security is related to its risk by the following formula:

$$K = R_F + 0.25(R_M - R_F) + 0.75\beta(R_M - R_F)$$

Applying this formula using the corrected risk-free rate and market equity risk premium described previously, yields an empirical CAPM derived common equity cost rate of 11.20% for Mr. Murray's comparable water companies as shown in the bottom half of Schedule PMA-18. Averaging this 11.20% empirical CAPM result with the corrected traditional CAPM result of 10.44% results in an average CAPM result of 10.82%, which also does not corroborate either Mr. Murray's range of DCF results of 7.93% to 8.93% or the range of corrected DCF results of 8.33% - 9.33%.

3. Risk Premium Analysis

Q. Please comment upon Mr. Murray's risk premium analysis.

A. Mr. Murray's risk premium analysis adds a range of historical risk premia to a current yield on U. S. Treasury bonds as discussed on page 32 of his direct testimony. Without accepting that U.S. Treasury securities are the appropriate security to use in a risk

premium analysis, my main objection to his application of the risk premium model is his use of the current yield on U. S. Treasury bonds for reasons previously described. Mr. Murray should have, more appropriately, added his range of historical risk premia to the prospective yield on long-term Treasury bonds of 5.6% as discussed previously. Mr. Murray's historical risk premia range from 3.40% to 5.46%, which when added to a prospective yield on long-term U. S. Treasury bonds of 5.6%, yield a range of risk premium costs of common equity of 9.00% to 11.06%, with a midpoint of 10.03%. A common equity cost rate of 10.03% also does not corroborate either Mr. Murray's range of DCF results of 7.93% to 8.93% or the range of corrected DCF results of 8.33% - 9.33%.

In view of the foregoing, Mr. Murray's ultimate recommended common equity cost rate range of 8.26% - 9.26%, with a midpoint of 8.76%, is unsupported and clearly provides an inadequate return on common equity for MAWC, especially when applied to American Water's highly leveraged, and therefore, more financially risky, capital structure.

B. Recommended of Common Equity Cost Rate

Q. Please discuss Mr. Murray's recommended common equity cost rate range of 8.26% - 9.26%, with a midpoint of 8.76%, applicable to his recommended common equity ratio of 31.85%.

A. Mr. Murray's recommended common equity cost rate range of 8.26% - 9.26% is inadequate for three reasons; 1) such a cost rate range reflects the financial risk of the comparable water companies and not the greater financial risk inherent in Mr. Murray's recommended consolidated American Water capital structure; 2) such a cost rate range provides an insufficient risk premium over and above the cost of public utility debt; and 3) such a cost rate range does not provide MAWC with an adequate opportunity for pretax

[4] Roger A. Morin, Regulatory Finance – Utilities' Cost of Capital, 1994, Public Utilities Reports, Inc., Arlington,

interest coverage in order to maintain its credit quality and ability to attract capital on reasonable terms in competition with other firms of similar risk.

Q. You have stated that Mr. Murray's recommended common equity cost rate range of 8.26% - 9.26% does not reflect the greater financial risk inherent in Mr. Murray's recommended consolidated American Water capital structure. Please explain.

A. The academic definition of financial risk is the level of fixed capital in a company's capital structure. Brigham and Gapenski[5] state:

> *Financial leverage* refers to the use of fixed charge securities – debt and preferred stock – and *financial risk* as the additional risk placed on the common stockholders as a result of financial leverage. . . . the use of debt concentrates the firms' business risk on its stockholders. (italics in original)

In addition, Brealey and Myers[6] note:

> The risk of a common stock reflects the business risk of the real assets held by the firm. But shareholders also bear *financial risk* to the extent that the firm issues debt to finance its real investments. The more a firm relies on debt financing, the riskier its common stock is . . . . Financial leverage does not affect the risk of the expected return on the firms' assets, but it does push up the risk of the common stock and lead the stockholders to demand a correspondingly higher return. (italics in original)

Mr. Murray analyzed the market data of his comparable group of four water companies in determining his recommended range of common equity cost rate. These market data reflect investors' perception of the level of financial risk inherent in the capital structures of these water companies, which for the year 2002 contained a common equity ratio of 45.95% (see Mr. Murray's Schedule 21). In contrast, Mr. Murray's recommended common equity ratio based upon American Water's consolidated capital structure is 31.85%, significantly lower than that of his comparable group. Therefore, his recommended capital structure

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VA. P. 321

[5] Eugene F. Brigham and Louis C. Gapenski, Financial Management: Theory and Practice, 4th Ed., The Dryden Press, 1985, p. 491.

is significantly higher in financial risk than the companies upon which he based his common equity cost rate.

As Morin notes[7]:

> As a company increases the relative amount of debt capital in its capital structure, total fixed charges increase, and the probability of failing to meet the growing fixed charge burden increases also. The residual earnings available to common stockholders become increasingly volatile and riskier as the firm increases its financial leverage, causing shareholders to require a higher return on equity.

Because higher financial risk demands a higher cost of capital, including a higher cost rate of common equity, it is not appropriate to apply his recommended common equity cost rate range of 8.26% - 9.26% to a common equity ratio of 31.85%, without an upward adjustment to reflect the greater financial risk inherent in capital structure with a 31.85% common equity ratio.

Q. Is there a way to quantify the downward bias inherent in Mr. Murray's recommended common equity cost rate range?

A. Yes. A study by Brigham, Gapenski and Aberwald[8] concluded that a 1 percentage point change in common equity cost ratio in the range of 40.0% to 50.0% results in an average 12 basis points change in common equity cost rate with the change approximately 15 basis points at the lower end, i.e., near 40.0%, and approximately 7 basis points at the higher end of the range, i.e., near 50.0%. Clearly, the lower the common equity ratio, the higher the common equity cost rate, all else equal. Assuming that the relationship between common equity cost rate and common equity ratio is linear, a 1 percentage point change in common equity ratio near 30.0% would likely result in a 23 basis points change in common equity cost rate. Thus, an adjustment to Mr. Murray's recommended common equity cost rate range based upon the 1,410 basis points (14.10%) difference between

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6 Richard A. Brealey and Stewart C. Myers, Principles of Corporate Finance, McGraw-Hill, 1996, p. 213.

7 Id., at p. 414.

8 Eugene F. Brigham, Louis C. Gapenski, and Dana A. Aberwald, "Capital Structure, Cost of Capital, and Revenue Requirements":, Public Utilities Fortnightly, January 8, 1987, pp. 15-24.

the average common equity ratio of his comparable water companies, i.e., 45.95%, and his recommended 31.85% consolidated American Water common equity ratio can be derived as follows: 2.44% = [(45.95% - 40.00%) * 0.15%] + [(40.00% - 31.85%) * { (0.15% + 0.23%) / 2 }] = [5.95% * 0.15%] + [8.15% * 0.19%] = 0.89% + 1.55% = 2.44%

Adding this 2.44% financial risk adjustment to Mr. Murray's recommended range of common equity cost rate of 8.26% - 9.26% which is based upon the lower financial risk of his comparable water companies, results in a risk-adjusted common equity cost rate range of 10.70% - 11.70%, with a midpoint of 11.20%, which would be properly applicable to a common equity ratio of 31.85%, and therefore more properly reflects the greater financial risk inherent in Mr. Murray's recommended consolidated American Water capital structure.

Correcting Mr. Murray's recommended cost rate of common equity range to reflect the greater financial risk inherent in his recommended consolidated American Water capital structure is summarized below:

Mr. Murray's recommended cost rate of common equity range:	8.26% - 9.26%
Adjustment to reflect the greater financial risk of a 31.85% common equity ratio:	2.44%
Mr. Murray's recommended cost rate of common equity range corrected to reflect the greater financial risk of a 31.85% common equity ratio:	10.70% - 11.70%

Q. How does a common equity cost rate range of 8.26% - 9.26% compare with utility debt costs?

A. Moody's A rated public utility bonds were yielding 6.56%, on average, for the month of September 2003, while Moody's Baa rated public utility bonds were yielding 6.87%. This implies an equity risk premium range of between only 1.70% - 2.70% (over A rated public

utility bond yields) and 1.39% - 2.39% (over Baa rated public utility bond yields) relative to Mr. Murray's recommended common equity cost rate range of 8.26% - 9.26%.

As discussed previously, the cost of capital is prospective. It can be derived from page 2 of Schedule PMA-17, that the forecasted consensus yield on corporate Aaa bonds for the six quarters ended with the first quarter 2005 from the nearly 50 economists providing forecasts to Blue Chip Financial Forecasts, dated October 1, 2003, is 6.2%. Based upon the average yield spread between Aaa rated corporate bond yields and A and Baa rated public utility bond yields shown on Schedule PMA-19, of 0.98% (rounded to 1.0%) and 1.23% (rounded to 1.2%), it can be estimated that A and Baa rated public utility bonds will be yielding 7.2% and 7.4%, respectively, for the six quarters ending with the first quarter 2005. This implies a forecasted equity risk premium in the range of 1.06% - 2.06% (over A rated public utility bond yields) and 0.86% - 1.86% (over Baa rated public utility bond yields) relative to Mr. Murray's recommended common equity cost rate range of 8.26% - 9.26%.

In contrast, Mr. Murray's own range of risk premia is 340 to 546 basis points over U. S. Treasury bond yields utilized in his risk premium analysis. Even adjusting this range downward to reflect the 60 basis point difference in the forecasted yield on long-term Treasury bonds of 5.6% (see Schedule PMA-18) and the forecasted yield on Aaa corporate bonds of 6.2% discussed above, results in a range of risk premia of 280 to 486 basis points. In addition, my RPM analysis indicates that an appropriate risk premium for A rated public utility bonds is in the 4.5% (based upon a study of the holding period returns of A rated public utilities) to 5.8% (based upon the total market using the beta approach and applicable to A rated water companies) range (page 5 of Schedule PAM-9). Equity risk premia on the order of 0.86% to 2.39%, based upon historical and prospective public utility bond yields, are clearly inconsistent and inadequate compared with both Mr. Murray's own derived equity risk premium and those developed in my RPM analysis, as well as inconsistent with current and projected public utility bond yields.

In view of the foregoing, Mr. Murray's recommended common equity cost rate provides an inadequate equity risk premium for MAWC and should be rejected.

Q. You previously stated that Mr. Murray's recommended range of common equity cost rate of 8.26% - 9.26% does not provide MAWC with an adequate opportunity for pretax interest coverage. Please explain.

A. Mr. Murray's recommended common equity cost rate results in a range of before-income tax overall rate of return of 8.20% - 8.72% (see Schedule PMA-20). When such a range of before-income tax overall rate of return is applied to MAWC's actual capital structure and the actual weighted cost of debt which needs to be serviced by MAWC, an opportunity for a range of pretax interest coverage of 2.34 times (2.34x = 8.20%) 3.51%) to 2.48 times (2.48x = 8.72%) 3.51%) results. An opportunity for a range of pretax interest coverage of 2.34 – 2.48 times is substandard compared with S&P's financial target pretax interest coverage ratios for utilities whose bonds are rated A and are assigned a business position of "2" or "3", such as is likely for MAWC, as previously discussed and the companies in my proxy group of six water companies or Mr. Murray's comparable group. S&P requires an achieved range pretax interest coverage of 2.8 - 3.4 times for A rated utilities which are assigned a business position of "3" and 2.3 – 2.9 times for A rated utilities which are assigned a business position of "2", to obtain and maintain an A bond rating. Clearly, pretax interest coverage of 2.34 – 2.48 times falls significantly below the bottom of the range of pretax interest coverage of 2.8 – 3.4 times required by S&P in order for a utility with an assigned business position of "2" to obtain an A bond rating. Although a pretax interest coverage range of 2.34 – 2.48 times is near the midpoint of this range of pretax interest coverage for A rated utilities with a business position of "2", it is inadequate in light of two factors. First, the 2.8 to 3.4 and 2.3 – 2.9 times S&P target pretax interest coverage ranges are an achieved levels of coverage whereas the 2.34 – 2.48 times level of coverage implicit in Mr. Murray's recommendation

is an opportunity, not a realized result. Second, MAWC's opportunity for 2.34 – 2.48 times coverage implicit in Mr. Murray's recommended range of overall rate of return of 8.20% - 8.72% is influenced greatly by MAWC's embedded long-term debt cost rate of 6.22% which reflects the Company's prudent and significant use of low cost debt financing for which the Company should not be penalized.

Q. Mr. Murray notes at lines 10-15 on page 34 of his direct testimony that even the low end of his common equity cost rate range, 8.26% "allows enough earnings power for MAWC to meet the net earnings requirement of two times the amount of the annual interest pursuant to provision of the indentures" of MAWC. Please comment.

A. A comparison of an opportunity for pretax interest coverage to indenture coverage requirements is misplaced. Indenture coverage requirements are tests of protection for existing bondholders and not tests of capital attraction. Unless the opportunity for pretax interest coverage is sufficiently greater than the interest coverage required by a company's indentures, there will not be enough "earnings power" to attract any needed new capital, thus failing to meet the capital attraction standard for a fair rate of return set in the Hope[9] and Bluefield[10] U.S. Supreme Court decisions. Specifically, Bluefield states:

> The return should be reasonably sufficient to assure confidence in the financial soundness of the utility and should be adequate, under efficient and economical management, to maintain and support its credit and enable it to raise the money necessary for the proper discharge of its public duties.

Hope reinforced this concept of financial integrity and the capital attraction standard when it stated:

> The return to the equity owner . . . should be sufficient to assure confidence in the financial integrity of the enterprise so as to maintain its credit and to attract capital.

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

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

If MAWC is unable to attract new capital when needed, it will not be able to finance any new capital expenditures for infrastructure improvement and expansion.

In view of the foregoing, namely, that Mr. Murray's recommended range overall rate of return provides an inadequate opportunity for pretax interest coverage, Mr. Murray's recommendation should be rejected and the Company's requested overall rate of return, which provides a reasonable, if not conservative, opportunity for pretax interest coverage should be adopted by this MoPSC in the instant docket.

Q. Do you have any final comment regarding Mr. Murray's range of recommended common equity cost rate?

A. Yes. Schedule PMA-20 also shows the derivation of the actual range of common equity cost rate which is implicit in Mr. Murray's recommendation. As shown, if Mr. Murray's recommended range of overall rate of return is authorized by the MoPSC in this proceeding, MAWC will be allowed to earn a range of common equity cost rate of only 6.59% - 7.33%, with a midpoint of 6.96%, relative to its stand-alone common equity cost ratio expected at November 30, 2003 of 43.099%. Such a range of common equity cost rate is clearly insufficient and unreasonable. It is at or below the prospective cost of A rated public utility debt of 7.2% discussed previously, providing negligible or negative risk premia violating the basic financial precept of risk and return, namely that the greater the risk, the greater return required by investors. Given that common equity ownership is riskier than debt ownership, such negligible or negative risk premia is not reasonable and clearly not adequate for the common equity investor. Nor does a range of common equity cost rate of 6.59% - 7.33% provide adequate equity risk premia above MAWC's own debt cost rate of 6.22%.

Nor does a range of common equity cost rate of 6.59% - 7.33% approach the level of earnings expected by Value Line for the four companies in Mr. Murray's group of comparable water companies. The latest Value Line Ratings & Reports (Standard

Edition) for American States Water Company, California Water Service Group, and Philadelphia Suburban Corp. (there is no Rating & Report (Standard Edition) for Middlesex Water Company) indicate that Value Line expects them to earn 10.0%, 10.5% and 15.0% on book common equity over the next 3-5 years averaging 11.8%. While these forecasts are for earnings on book common equity, it must be remembered that the return on common equity authorized in this proceeding will be applied to the book value of the common equity financed portion of MAWC's and will therefore become MAWC's opportunity for earnings on book value. An opportunity to earn a return on book common equity of 6.59% - 7.33% is woefully inadequate in comparison with these expected returns on book common equity of comparable water companies. Likewise, Mr. Murray's recommended common equity cost rate range of 8.26% - 9.26% relative to a common equity ratio of 31.85%, even if applied to MAWC's actual common equity ratio, is also woefully inadequate in comparison with the expected returns on book common equity of comparable water companies. Such ranges of common equity cost rate are also inconsistent with the comparability of returns standard enunciated in the Hope decision which states:

> The return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks

Clearly ranges of common equity cost rate of either 8.26% - 9.26% or 6.59% - 7.33% do not meet the standards set in the Hope decision. Therefore, Mr. Murray's recommended range of common equity cost rate and his recommended consolidated American Water capital structure should be rejected by the MoPSC in setting rates for MAWC in this proceeding.

In fact, Mr. Murray's recommended overall rate of return for MAWC based upon American Water's consolidated capital structure and a range of common equity cost rate of 8.26% - 9.26% is inconsistent with his own testimony on page 20, lines 8-11 where he states:

> Assuming that the various forms of capital are within a reasonable balance and are costed correctly, the resulting total weighted cost of

capital, when applied to rate base, will provide the funds necessary to service the various forms of capital. Thus, the total WACC corresponds to a fair rate of return for the utility company.

The various forms of capital in the American Water consolidated capital structure are not in a reasonable balance vis-à-vis that of the comparable water companies nor vis-à-vis S&P's financial target benchmark ratios of total debt to total capital. Nor do the various forms of capital in the American Water consolidated capital structure represent the capital financing MAWC's rate base. The various forms of capital in the American Water consolidated capital structure contain significantly greater financial risk than the comparable companies upon whose market data Mr. Murray based his recommended range of common equity cost rate. Without adequately reflecting this increased financial risk in his recommended range of common equity cost rate, "the resulting total weighted cost of capital, when applied to rate base" will not provide the funds necessary to service the various forms of MAWC's actual capital structure. Consequently, Mr. Murray's recommended overall cost of capital does not correspond to a fair rate of return for MAWC. Therefore, Mr. Murray's recommendations should be rejected by the MoPSC and the Company's proposed capital structure and overall rate of return should be adopted.

V. TESTIMONY OF OPC WITNESS MARK BURDETTE

A. Capital Asset Pricing Model

Q. On page 19, lines 7-8 of his direct testimony, Mr. Burdette states that he uses the historical yield on intermediate-length U.S. Government securities as the risk-free rate in his application of the CAPM. Please comment.

A. Mr. Burdette's use of the historical yield on intermediate-length U.S. Government securities as the risk-free rate is flawed for two reasons; 1) it is the incorrect security to use in developing the historical market equity risk premium; and 2) an historical risk-free rate is inappropriate to use as the risk-free rate in the CAPM formula.

First, as discussed at length in my direct testimony at pages 40-41, the historical yield on long-term Treasury securities is the appropriate yield to use in deriving an historical market equity risk premium for a CAPM analysis. The yield on long-term Treasury securities is almost risk-free and its term is consistent with the long-term cost of capital to public utilities and with the long-term investment horizon inherent in utilities' common stocks and presumed in the standard DCF model employed by all witnesses in the current proceeding. In contrast, the intermediate-term government bonds reported by Ibbotson Associates have an approximate maturity of only 5 years. Ibbotson Associates state[11]:

> The horizon of the chosen Treasury security should match the horizon of whatever is being valued

In addition, in deriving the historical equity risk premium to be used in his CAPM analysis, Mr. Burdette incorrectly subtracted the total return on the risk-free rate proxy from the total return on the market. The appropriate return to be deducted from the total return on the market is the income return on the risk-free rate proxy as previously discussed.. The arithmetic mean income return on intermediate-term government bonds for the years 1926-2002 reported by Ibbotson Associates is 4.8%. Hence, even if these bonds were appropriate as the risk-free rate, Mr. Burdette's historical market equity risk premia are understated by 80 basis points. Therefore, correctly calculated his market equity risk premia would be, 7.4% and 9.75% (7.4% = 12.2% - 4.8% and 9.75% = 14.55% - 4.8%) (see lines 10-12 of Mr. Burdette's direct testimony for the total market returns he utilized).

Second, as also previously discussed, the cost of capital and ratemaking are prospective. Therefore, the appropriate yield to which the market equity risk premium is added in a CAPM analysis is the forecasted yield on long-term U.S. Treasury bonds and not an historical yield on either long-term or intermediate-term U. S. Treasury bonds. On Schedule PMA-21 I have corrected Mr. Burdette's CAPM analysis to reflect the proper

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[11] Id., at p. 53.

derivation of the market equity risk premium, i.e., subtracting the historical income return on long-term U. S. government bonds of 5.2% from the total market returns utilized by Mr. Burdette of 12.2% and 14.55%, which results in market equity risk premia of 7.0% and 9.35%, which average 8.2%. Schedule PMA-21 also corrects Mr. Burdette's CAPM analysis to include the proper risk-free rate, i.e., the 5.6% consensus forecasted yield on long-term U. S. government bonds derived in note 1 on the schedule. Properly calculated, without regard to consideration of a forecasted market equity risk premium which will be discussed subsequently, the CAPM result shown on Schedule PMA-21 is 10.68%. A CAPM cost rate of 10.68% does not support Mr. Burdette's DCF results of 9.48% and 9.98%.

In addition, Mr. Burdette relied exclusively upon historical market equity risk premia which is in direct contrast to his use of both historical and projected growth rates in his application of the DCF model. Because the cost of capital is prospective and while the arithmetic mean of long-term historical stock market returns can provide insight into investor's expectations of stock market returns as previously discussed, it is also appropriate to use an estimate of the forecasted or projected stock market return. The forecasted market equity risk premium of 8.8%, previously discussed, when averaged with Mr. Burdette's historical equity risk premium of 8.2% as corrected on Schedule PMA-21, results in a market equity risk premium of 8.5%.

In the top half of Schedule PMA-22, I have derived the traditional CAPM, the one applied by Mr. Burdette, using the correct forecasted risk-free rate of 5.6% and a market equity risk premium based upon both the arithmetic mean historical market equity risk premium correctly calculated as described above and the forecasted market equity risk premium based upon Value Line's projections as described in note 3 on Schedule PMA-22. This results in a CAPM derived common equity cost rate of 10.87%, which is significantly greater than the midpoint of Mr. Burdette's CAPM derived cost rates of 9.83%, based upon an historical intermediate term risk-free rate and incorrectly

calculated equity risk premium for the years 1926-2002. A CAPM cost rate of 10.87% does not corroborate Mr. Burdette's DCF results of 9.48% to 9.98%.

Q. You have stated that Mr. Burdette failed to apply the empirical CAPM to account for the fact that Security Market Line (SML) as described by the traditional CAPM is not as steeply sloped as the predicted SML. Please comment.

A. As discussed previously and in my direct testimony at lines 1-27 on page 39 of my direct testimony, while numerous tests of the CAPM have confirmed its validity, these tests have determined that "the implied intercept term exceeds the risk-free rate and the slope term is less than predicted by the CAPM."[12] These tests have also indicated that the expected return on a security is related to its risk by the following formula:

$$K = R_F + 0.25(R_M - R_F) + 0.75\beta(R_M - R_F)$$

Applying this formula using the corrected risk-free rate and market equity risk premium described previously, yields an empirical CAPM derived common equity cost rate of 11.68% for Mr. Burdette's comparable water companies as shown in the bottom half of Schedule PMA-22. An 11.68% empirical CAPM result when averaged with the corrected traditional CAPM result of 10.87% results in an average CAPM result of 11.28%, which also does not corroborate Mr. Burdette's DCF results of 9.48% to 9.98%.

B. Recommended of Common Equity Cost Rate

Q. Please discuss the opportunity for pretax interest coverage of 2.77 – 2.86 times implicit in Mr. Burdette's recommended range of common equity cost rate of 9.50% - 10.00%.

A. Mr. Burdette's recommended common equity cost rate results in a range of before-income tax coverage of 2.77 times based upon the low end of his recommended common equity cost rate range of 9.50% as shown on Schedule MB-11 and 2.86 times based

upon the high end of his recommended common equity cost rate range of 10.00% as can be derived from the information shown on Schedule MB-11. An opportunity for a range of pretax interest coverage of 2.77 – 2.86 times is substandard or barely adequate compared with S&P's financial target pretax interest coverage ratios for utilities whose bonds are rated A and are assigned a business position of "2" or "3", such as is likely for MAWC, as previously discussed and the companies in my proxy group of six water companies and Mr. Burdette's comparable group. S&P requires an achieved range pretax interest coverage of 2.8 - 3.4 times for A rated utilities which are assigned a business position of "3" and 2.3 – 2.9 times for A rated utilities which are assigned a business position of "2, to obtain and maintain an A bond rating. Although a pretax interest coverage range of 2.77 – 2.86 times is near the low point of the range of pretax interest coverage for A rated utilities with a business position of "3" and falls within the range of pretax interest coverage for A rated utilities with a business position of "2", it is inadequate in light of two factors. First, the 2.8 to 3.4 and 2.3 – 2.9 times S&P target pretax interest coverage are achieved levels of coverage whereas the 2.77 – 2.86 times level of coverage implicit in Mr. Burdette's recommendation is an opportunity, not a realized result. Second, MAWC's opportunity for 2.77 – 2.86 times coverage implicit in Mr. Burdette's recommended range of overall rate of return of 7.45% - 7.67% is influenced greatly by MAWC's low embedded long-term debt cost rate of 6.23% which reflects the Company's prudent and significant use of low cost debt financing for which the Company should not be penalized.

VI. INFRASTRUCTURE SYSTEM REPLACEMENT SURCHARGE (ISRS)

Q. Please comment on OPC Witness Burdette's contention that the ISRS reduces MAWC's risk and thus, in the opinion of Mr. Burdette, it's authorized return on common equity should be set in the lower portion of any range under consideration.

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[12] Roger A. Morin, Regulatory Finance – Utilities' Cost of Capital, 1994, Public Utilities Reports, Inc., Arlington,

A. Although the existence of the ISRS is risk reducing in the absolute, it is does not significantly reduce MAWC's risk vis-à-vis the risk of the water companies in any of the proxy groups utilized by the rate of return witnesses in the current proceeding. A significant number of these water companies either have such a surcharge in place or have one available, if requested. And, the largest company in any of the proxy groups relied upon in this proceeding, Philadelphia Suburban Corp., has such a surcharge in place for three of its five largest operating water subsidiaries. Clearly, investors are aware of the existence of surcharges and the possibility that where they are currently in place any water company can request such a surcharge and where they are not currently in place, they may be put in place as the various regulatory commissions around the U. S. realize the benefits of such surcharges. Consistent with the Efficient Market Hypothesis, as previously discussed, the market has already taken into account the existence or the possibility of existence in the near future of such surcharges and any risk reduction due to such surcharges is already reflected in the prices investors are willing to pay for the common stock of water utilities. Therefore, the risk of MAWC is not reduced vis-à-vis the average risk of the water companies utilized by all the rate of return witnesses in the current proceeding, all else equal, i.e., giving consideration only to the impact on risk of the existence of the ISRS. Hence, it is not necessary to either reduce a cost of common equity determination for MAWC nor to "consider a return on equity in the lower portion of any range under consideration" as recommended by Mr. Burdette.

Q. Does that conclude your rebuttal testimony?

A. Yes.