

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

**IN THE MATTER OF THE APPLICATION OF)
ARTESIAN WATER COMPANY, INC.) PSC DOCKET NO. 14-132
FOR AUTHORITY TO INCREASE RATES AND)
CHARGES FOR WATER SERVICE)
(Filed April 11, 2014))**

**DIRECT TESTIMONY
OF
DAVID C. PARCELL
PRESIDENT
TECHNICAL ASSOCIATES, INC.**

**ON BEHALF OF
COMMISSION STAFF**

SEPTEMBER 24, 2014

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INTRODUCTION

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

A. My name is David C. Parcell. I am President and Senior Economist of Technical Associates, Inc. My business address is Suite 580, 9030 Stony Point Parkway, Richmond, Virginia 23235.

Q. Please summarize your educational background and professional experience.

A. I hold B.A. (1969) and M.A. (1970) degrees in economics from Virginia Polytechnic Institute and State University (Virginia Tech) and a M.B.A. (1985) from Virginia Commonwealth University. I have been a consulting economist with Technical Associates since 1970. I have provided cost of capital testimony in public utility ratemaking proceedings dating back to 1972. In connection with this, I have previously filed testimony and/or testified in more than 500 utility proceedings before about 50 regulatory agencies in the United States and Canada. Attachment 1 provides a more complete description of my education and relevant work experience.

Q. Have you previously testified before this commission?

A. Yes, I have. Since 1997, I have testified in approximately 20 public utility proceedings before this Commission, most on behalf of the Commission Staff. Several of these proceedings were Artesian Water Co., Inc. (“AWC”) rate proceedings.

Q. What is the purpose of your testimony in this proceeding?

A. Technical Associates has been retained by The Commission Staff to address the cost of capital issues in the current application of AWC. I have performed independent analyses and am recommending a cost of common equity, capital structure and total cost of capital

1 for AWC. In addition, since AWC is a subsidiary of Artesian Resources Corp., Inc.
2 (“ARC” or “Parent”), I have also evaluated ARC in my analyses.

3
4 **Q. Have you prepared an exhibit in support of your testimony?**

5 A. Yes, I have prepared one exhibit, identified as Schedule 1 through Schedule 13. This
6 exhibit was prepared either by me or under my direction. The information contained in
7 this exhibit is correct to the best of my knowledge and belief.

8
9 **RECOMMENDATIONS AND SUMMARY**

10
11 **Q. What are your recommendations in this proceeding?**

12 A. My overall cost of capital recommendation for AWC is shown on Schedule 1 and can be
13 summarized as follows:

14

	Percent	Cost	Return
Long-Term Debt	49.46%	5.84%	2.89%
Common Equity	50.54%	8.7-9.5%	4.40-4.80%
Total	100.00%		7.29-7.69%

17 (7.49% of Mid-Point)

18
19 **Q. Please summarize your analyses and conclusions.**

20 A. This proceeding is concerned with AWC’s regulated water utility operations in Delaware.
21 My analyses are concerned with the Company’s total cost of capital. The first step in
22 performing these analyses is the development of the appropriate capital structure. AWC
23 proposes use of its pro forma capital structure ratios as of September 30, 2014. I have
24 also used this capital structure in my analyses.

25 The second step in a cost of capital calculation is a determination of the embedded
26 cost rate of debt. I have used the proposed cost rate for long-term debt of AWC of 5.84
27 percent (i.e., the actual December 31, 2013 cost rate).

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1 The rate base is derived from the asset side of the utility's balance sheet as a
2 dollar amount and the rate of return is developed from the liabilities/owners' equity side
3 of the balance sheet as a percentage. Thus, the revenue impact of the cost of capital is
4 derived by multiplying the rate base by the rate of return, including income taxes.

5 The rate of return is developed from the cost of capital, which is estimated by
6 weighting the capital structure components (*i.e.* debt, preferred stock, and common
7 equity) by their percentages in the capital structure and multiplying these values by their
8 cost rates. This is also known as the weighted cost of capital.

9 Technically, "fair rate of return" is a legal and accounting concept that refers to an
10 ex post (after the fact) earned return on an asset base, while the cost of capital is an
11 economic and financial concept which refers to an ex ante (before the fact) expected, or
12 required, return on a capital base. In regulatory proceedings, however, the two terms are
13 often used interchangeably, and I have equated the two concepts in my testimony.

14 From an economic standpoint, a fair rate of return is normally interpreted to mean
15 that an efficient and economically managed utility will be able to maintain its financial
16 integrity, attract capital, and establish comparable returns for similar risk investments.
17 These concepts are derived from economic and financial theory and are generally
18 implemented using financial models and economic concepts.

19 Although I am not a lawyer and I do not offer a legal opinion, my testimony is
20 based on my understanding that two United States Supreme Court decisions provide the
21 controlling standards for a fair rate of return. The first decision is Bluefield Water Works
22 and Improvement Co. v. Public Serv. Comm'n of West Virginia, 262 U.S. 679 (1923). In
23 this decision, the Court stated:

24
25 The annual rate that will constitute just compensation depends upon many
26 circumstances and must be determined by the exercise of fair and
27 enlightened judgment, having regard to all relevant facts. A public utility
28 is entitled to such rates as will permit it to earn a return on the value of the

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1 property which it employs for the convenience of the public equal to that
2 generally being made at the same time and in the same general part of the
3 country on investments in other business undertakings which are attended
4 by corresponding risks and uncertainties; but it has no constitutional right
5 to profits such as are realized or anticipated in highly profitable enterprises
6 or speculative ventures. The return should be reasonably sufficient to
7 assure confidence in the financial soundness of the utility, and should be
8 adequate, under efficient and economical management, to maintain and
9 support its credit and enable it to raise the money necessary for the proper
10 discharge of its public duties. A rate of return may be reasonable at one
11 time, and become too high or too low by changes affecting opportunities
12 for investment, the money market, and business conditions generally.
13

14 It is generally understood that the Bluefield decision established the following
15 standards for a fair rate of return: comparable earnings, financial integrity, and capital
16 attraction. It also noted that required returns change over time, and there is an underlying
17 assumption that the utility be operated efficiently.

18 The second decision is Federal Power Comm'n v. Hope Natural Gas Co., 320
19 U.S. 591 (1942). In that decision, the Court stated:

20
21 The rate-making process under the [Natural Gas] Act, i.e., the fixing of
22 'just and reasonable' rates, involves a balancing of the investor and
23 consumer interests From the investor or company point of view it is
24 important that there be enough revenue not only for operating expenses
25 but also for the capital costs of the business. These include service on the
26 debt and dividends on the stock. By that standard the return to the equity
27 owner should be commensurate with returns on investments in other
28 enterprises having corresponding risks. That return, moreover, should be
29 sufficient to assure confidence in the financial integrity of the enterprise,
30 so as to maintain its credit and to attract capital.
31

32 The three economic and financial parameters in the Bluefield and Hope decisions
33 - comparable earnings, financial integrity, and capital attraction - reflect the economic
34 criteria encompassed in the "opportunity cost" principle of economics. The opportunity

1 cost principle provides that a utility and its investors should be afforded an opportunity
2 (not a guarantee) to earn a return commensurate with returns they could expect to achieve
3 on investments of similar risk. The opportunity cost principle is consistent with the
4 fundamental premise on which regulation rests, namely, that it is intended to act as a
5 surrogate for competition.
6

7 **Q. How can the Bluefield and Hope parameters be employed to estimate the cost of**
8 **capital for a utility?**

9 A. Neither the courts nor economic/financial theory has developed exact and mechanical
10 procedures for precisely determining the cost of capital. This is the case because the cost
11 of capital is an opportunity cost and is prospective-looking, which dictates that it must be
12 estimated. However, there are several useful models that can be employed to assist in
13 estimating the COE, which is the capital structure item that is the most difficult to
14 determine. These include the DCF, CAPM, CE and risk premium (“RP”) methods. I use
15 three methodologies to determine AWC’s COE: the DCF, CAPM, and CE methods. I
16 have not directly employed a RP model in my analyses although, as discussed later, my
17 CAPM analysis is a form of the RP methodology. Each of these methodologies will be
18 described in more detail later in my testimony.
19

20 **GENERAL ECONOMIC CONDITIONS**

21
22 **Q. Are economic and financial conditions important in determining the cost of capital**
23 **for a public utility?**

24 A. Yes. The cost of capital, for both fixed-cost (debt and preferred stock) components and
25 common equity, are determined in part by current and prospective economic and
26 financial conditions. At any given time, each of the following factors has an influence on
27 the cost of capital:

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- 1 • The level of economic activity (i.e., growth rate of the economy);
- 2 • The stage of the business cycle (i.e., recession, expansion, or transition);
- 3 • The level of inflation;
- 4 • The level and trend of interest rates; and,
- 5 • Expected economic conditions.

6
7 My understanding is that this position is consistent with the *Bluefield* decision that
8 noted “[a] rate of return may be reasonable at one time and become too high or too low
9 by changes affecting opportunities for investment, the money market, and business
10 conditions generally.” *Bluefield*, 262 U.S. at 693.

11
12 **Q. What indicators of economic and financial activity did you evaluate in your**
13 **analyses?**

14 A. I examined several sets of economic statistics from 1975 to the present. I chose such a
15 relatively long time period because it permits the evaluation of economic conditions over
16 four full business cycles, allowing for an assessment of changes in long-term trends.
17 Consideration of economic/financial conditions over a relatively long period of time
18 allows me to assess how such conditions have had impacts on the level and trends of the
19 cost of capital. This period also approximates the beginning and continuation of active
20 rate case activities by public utilities, which generally began in the mid-1970s.

21 A business cycle is commonly defined as a complete period of expansion
22 (recovery and growth) and contraction (recession). A full business cycle is a useful and
23 convenient period over which to measure levels and trends in long-term capital costs
24 because it incorporates the cyclical (i.e., stage of business cycle) influences, and thus,
25 permits a comparison of structural (or long-term) trends.

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1 **Q. Please describe the timeframe of the four prior business cycles and the current**
2 **cycle.**

3 A. The four prior complete cycles and current cycle cover the following periods:

<u>Business Cycle</u>	<u>Expansion Cycle</u>	<u>Contraction Period</u>
1975-1982	Mar. 1975-July 1981	Aug. 1981-Oct. 1982
1982-1991	Nov. 1982-July 1990	Aug.1990-Mar. 1991
1991-2001	Apr. 1991-Mar. 2001	Apr. 2001-Nov. 2001
2001-2009	Dec. 2001-Nov. 2007	Dec. 2007-June 2009
Current	July 2009-	

8 Source: National Bureau of Economic Research, "Business Cycle
9 Expansions and Contractions."

11 **Q. Do you have any general observations concerning the recent trends in economic**
12 **conditions and their impact on capital costs over this broad period?**

13 A. Yes, I do. Until the end of 2007, the United States economy had enjoyed general
14 prosperity and stability since the early 1980s.¹ This period had been characterized by
15 longer economic expansions, relatively tame contractions, low and declining inflation,
16 and declining interest rates and other capital costs.

17 However, in 2008 and 2009, the economy declined significantly, initially as a
18 result of the 2007 collapse of the "sub-prime" mortgage market and the related liquidity
19 crisis in the financial sector of the economy. Subsequently, this financial crisis
20 intensified with a more broad-based decline, initially based on a substantial increase in
21 petroleum prices and a dramatic decline in the U.S. financial sector, culminating with the
22 collapse and/or bailouts of a significant number of well-known institutions such as Bear
23 Stearns, Lehman Brothers, Merrill Lynch, Freddie Mac, Fannie Mae, AIG and Wachovia.
24 The recession also witnessed the demise of national companies such as Circuit City and
25 the bankruptcies of automotive manufacturers such as Chrysler and General Motors.

¹ There was a "Tech Bubble" in 1999-2000, in which prices of many technology stocks encountered a dramatic run-up that was followed by an equally dramatic decline in 2001-2002.

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1 This decline has been described as the worst financial crisis since the Great
2 Depression and has been referred to as the “Great Recession.” Since 2008, the U.S. and
3 other governments have implemented and continue to implement unprecedented actions
4 to attempt to correct or minimize the scope and effects of this recession.

5 The recession reached its low point in mid-2009 and the economy has since begun
6 to expand again, although at a slow and uneven rate.² However, the length and severity
7 of the recession, as well as a relatively slow and uneven recovery, indicates that the
8 impacts of the recession have been and will be felt for an extended period of time.

9
10 **Q. Please describe recent and current economic and financial conditions and their**
11 **impact on the cost of capital.**

12 A. It is apparent from the descriptions that follow that one impact of the Great Recession has
13 been a reduction in actual and expected investment returns and a corresponding reduction
14 in the costs of capital. This decline is evidenced by a reduction in both short-term and
15 long-term interest rates and in cost of equity model results emanating from the DCF,
16 CAPM and CE. It is also evident that regulatory agencies throughout the U.S. have
17 recognized the decline in capital costs by authorizing lower returns on common equity for
18 regulated utilities.

19 Schedule 2 shows several sets of relevant economic and financial statistics for the
20 cited time periods. Pages 1 and 2 contain general macroeconomic statistics; pages 3 and
21 4 show interest rates; and pages 5 and 6 contain equity market statistics.

22 Pages 1 and 2 show that 2007 was the sixth year of an economic expansion but, as
23 I previously noted, the economy subsequently entered a significant decline, as indicated
24 by the growth in real (i.e., adjusted for inflation) Gross Domestic Product (“GDP”),

² The U.S. Economy, as measured by changes in Gross Domestic Product (“GDP”) declined in the first
quarter of 2014.

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1 industrial production, and an increase in the unemployment rate. This recession lasted
2 until mid-2009, making it a longer-than-normal recession, as well as a much deeper
3 recession. Since then, economic growth has been erratic and lower than the initial
4 periods of prior expansions.

5 Pages 1 and 2 also show the rate of inflation. As reflected in the Consumer Price
6 Index (“CPI”), for example, inflation rose significantly during the 1975-1982 business
7 cycle and reached double-digit levels in 1979-1980. The rate of inflation has declined
8 substantially since 1981. Since 2008, the CPI has been 3 percent or lower, with 2013
9 being only 1.5 percent. It is thus apparent that the rate of inflation has generally been
10 declining over the past several business cycles. Current levels of inflation are at the
11 lowest levels of the past 35 years, which is reflective of lower capital costs.³

12
13 **Q. What have been the trends in interest rates over the four prior business cycles and**
14 **at the current time?**

15 A. Pages 3 and 4 show several series of interest rates. Rates rose sharply to record levels in
16 1975-1981 when the inflation rate was high and generally rising. Interest rates declined
17 substantially in conjunction with inflation rates during the remainder of the 1980s and
18 throughout the 1990s and 2000s.

19 Since 2008, the Federal Reserve has lowered the Federal Funds rate (i.e., short-
20 term rate) to 0.25 percent, an all-time low. The Federal Reserve has also purchased U.S.
21 Treasury securities to stimulate the economy.⁴ As seen on page 4, in 2012 both U.S. and
22 corporate bond yields declined to their lowest levels in the past four business cycles and

³ The rate of inflation is one component of interest rate expectations of investors, who generally expect to receive a return in excess of the rate of inflation. Thus, a lower rate of inflation has a downward impact on interest rates and other capital costs.

⁴ This is referred to as Quantitative Easing (“QE”), in which the FED initially purchased some \$85 billion of U.S. Treasury Securities per month in order to stimulate the economy. The FED has recently announced its intention to “taper” its purchase of U.S. Treasury securities through October of 2014.

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1 in more than 35 years. Interest rates rose somewhat from those lows in 2013, but have
2 again declined over the past several months. Even with the 2013 increases, both
3 government and corporate lending rates remain at historically low levels, again reflective
4 of lower capital costs.

5
6 **Q. What does this schedule show for trends of common share prices?**

7 A. Pages 5 and 6 show several series of common stock prices and ratios. These indicate that
8 stock prices were essentially stagnant during the high inflation/high interest rate
9 environment of the late 1970s and early 1980s. The 1983-1991 business cycle and the
10 more recent cycles witnessed a significant upward trend in stock prices. The beginning
11 of the recent financial crisis saw stock prices decline precipitously, as stock prices in
12 2008 and early 2009 were down significantly from peak 2007 levels, reflecting the
13 financial/economic crisis. Beginning in the second quarter of 2009, prices have
14 recovered substantially and have ultimately reached and exceeded the levels achieved
15 prior to the “crash.”

16
17 **Q. What conclusions do you draw from your discussion of economic and financial
18 conditions?**

19 A. It is apparent that recent economic and financial circumstances have been different from
20 any that have prevailed since at least the 1930s. The late 2008-early 2009 deterioration in
21 stock prices, the decline in U.S. Treasury bond yields, and an increase in corporate bond
22 yields were evidenced in the then-evident “flight to safety.” Concurrently, there was a
23 decline in capital costs and returns, which significantly reduced the value of most
24 retirement accounts, investment portfolios and other assets. One significant aspect of this
25 has been a decline in investor expectations of returns, even with the return of stock prices
26 to levels achieved prior to the “crash.” This is evident in several ways: 1) lower interest
27 rates on bank deposits; 2) lower interest rates on U.S. Treasury and corporate bonds; 3),

1 lower increases in social security cost of living benefits;⁵ and 4), lower authorized returns
2 on common equity by regulatory commissions. Finally, as noted above, utility bond
3 interest rates are currently at levels below those prevailing prior to the financial crisis of
4 late 2008 to early 2009 and are near the lowest levels in the past 35 years.

5
6 **Q. How do these economic/financial conditions impact the determination of the cost of**
7 **capital for regulated utilities?**

8 A. The costs of capital for regulated utilities have declined in recent years. For example, the
9 current debt costs that utilities pay on new debt is near the low point of the last several
10 decades. In addition, it is apparent that the results of the traditional cost of equity models
11 (i.e., DCF, CAPM, CE) are lower than was the case prior to the Great Recession. In light
12 of this, it is not surprising that the average cost of equity authorized by state regulatory
13 agencies have continued to decline into 2014.

14
15 **AWC’S OPERATIONS AND BUSINESS RISKS**

16
17 **Q. Please describe AWC.**

18 A. AWC, the Applicant in this proceeding, is the oldest and largest public water utility in
19 Delaware, dating back to 1905 according to ARC’s 2013 Annual Report.

20
21 **Q. Please describe ARC.**

22 A. ARC is a holding company whose principal subsidiary is AWC. ARC also has the
23 following utility subsidiaries – Artesian Water Pennsylvania, Artesian Water Maryland,
24 and Artesian Wastewater. ARC also has several non-regulated subsidiaries, including

⁵ The 2014 increase in Social Security benefits is 1.5 percent – near an all-time low.

1 Artesian Wastewater Management, Artesian Utility Development, Artesian Development
2 Corp., and Artesian Consulting Engineers.

3 In 2013, 88 percent of ARC's operating revenues came from its Delaware utility
4 operations (Source: ARC Website). The significance of this is that, in spite of its non-
5 regulated subsidiaries, ARC is primarily a water utility in the eyes of investors.
6

7 **Q. How is AWC financed?**

8 A. ARC owns all of AWC's common stock. Virtually all of ARC's consolidated long-term
9 debt is accounted for by AWC (see Response to Staff Data Request PSC-COC-4). From
10 a financial perspective, ARC is dominated by AWC.
11

12 **CAPITAL STRUCTURE AND COST OF DEBT**

13
14 **Q. What is the importance of determining a proper capital structure in a regulatory
15 framework?**

16 A. A utility's capital structure is important because the concept of rate base - rate of return
17 regulation requires the capital structure to be utilized in estimating the total cost of
18 capital. Within this framework, it is proper to ascertain whether the utility's capital
19 structure is appropriate relative to its level of business risk and relative to other utilities.

20 As discussed in Section III of my testimony, the purpose of determining the
21 proper capital structure for a utility is to ascertain its capital costs. The rate base - rate of
22 return concept recognizes the assets employed in providing utility services and provides
23 for a return on these assets by identifying the liabilities and common equity (and their
24 cost rates) used to finance the assets. In this process, the rate base is derived from the
25 asset side of the balance sheet and the cost of capital is derived from the
26 liabilities/owners' equity side of the balance sheet. The inherent assumption in this

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1 procedure is that the dollar values of the capital structure and the rate base are
2 approximately equal and the former is utilized to finance the latter.

3 The common equity ratio (*i.e.* the percentage of common equity in the capital
4 structure) is the capital structure item which normally receives the most attention. This is
5 the case because common equity: (1) usually commands the highest cost rate; (2)
6 generates associated income tax liabilities; and (3) causes the most controversy since its
7 cost cannot be precisely determined.

8
9 **Q. What are the historic capital structure ratios of AWC and ARC?**

10 A. I have examined the historic (2009-2013) capital structure ratios of AWC and ARC
11 Utilities. See Schedule 3. AWC's common equity ratios are:

12
13

	<u>Including S-T Debt</u>	<u>Excluding S-T Debt</u>
2009	42.4%	44.1%
2010	43.4%	44.7%
2011	48.6%	48.6%
2012	49.3%	49.3%
2013	49.6%	49.6%

14
15
16
17

18 It is apparent that AWC has experienced a rising common equity ratio over the past five
19 years.

20 Correspondingly, ARC's common equity ratios are:

21
22

	<u>Including S-T Debt</u>	<u>Excluding S-T Debt</u>
2009	41.0%	46.2%
2010	41.5%	47.5%
2011	48.9%	51.5%
2012	50.3%	52.7%
2013	51.3%	53.6%

23
24
25

26 ARC has also experienced a rising equity ratio over this period.
27

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1 **Q. How do these capital structures compare to those of investor-owned water utilities?**

2 A. Schedule 4 shows the common equity ratios (including short-term debt in capitalization)
3 for the group of proxy water utilities identified in a following section of my testimony.
4 These are:

	<u>Value Line Water Group</u>
2009	47.0%
2010	46.5%
2011	47.3%
2012	48.9%
2013	51.9%

11 These common equity ratio ranges are similar to AWC's ratios. They are also similar to
12 those of ARC.

14 **Q. Have you also conducted analyses of the historic and projected common equity
15 ratios of your water proxy group?**

16 A. Yes, I have. Schedule 5 shows the five-year historic (2009-2013) and estimated 2017-19
17 common equity ratios (excluding short-term debt) for my water utility proxy group. The
18 summary results are as follows:

<u>Group</u>	<u>Five-Year Historic</u>		<u>2017-19 Estimated</u>	
	<u>Average</u>	<u>Median</u>	<u>Average</u>	<u>Median</u>
Proxy Group	50.7%	50.3%	51.4%	50.5%

22 These results indicate a common equity ratio of between 50 percent and 51 percent.

24 **Q. What capital structure ratio has AWC requested in this proceeding?**

25 A. AWC requests use of its pro forma capital structure as of September 30, 2014:

<u>Capital Item</u>	<u>%</u>
Long-Term Debt	49.46%
Common Equity	50.54%

1 **Q. What capital structure do you propose to use in this proceeding?**

2 A. I have used AWC's proposed capital structure

3

4 **Q. What is the cost rate of debt in the Company's Application?**

5 A. AWC's filing requests a cost of long term debt of 5.84 percent, which is the Company's
6 actual cost rate at December 31, 2013. I also use this rate in my cost of capital analyses.

7

8 **Q. Can the COE be determined with the same degree of precision as the cost of debt?**

9 A. No. The cost rates of debt are largely determined by interest payments, issue prices, and
10 related expenses. The COE, on the other hand, cannot be precisely quantified, primarily
11 because this cost is an opportunity cost. As mentioned previously, there are several
12 models that can be employed to estimate the COE. Three of the primary methods - DCF,
13 CAPM, and CE - are developed in the following sections of my testimony.

14

15

SELECTION OF PROXY GROUP

16

17 **Q. How have you estimated the COE for AWC?**

18 A. AWC is not a publicly-traded company. Its parent company (ARC) is publicly-traded.
19 Consequently, it is possible to directly apply COE models to ARC. However, in cost of
20 capital analyses, it is customary to analyze groups of comparison, or "proxy," companies
21 as a substitute for ARC to determine its COE.

22 I have accordingly selected such a group for comparison to ARC. This proxy
23 group is selected from the group of nine water utilities included in Value Line Investment
24 Survey and using the criteria listed on Schedule 6. This is the same proxy group
25 employed by AWC witness Ahern in her COE analyses.

26

27

1
2
3 **DCF ANALYSIS**

4 **Q. What is the theory and methodological basis of the DCF model?**

5 A. The DCF model is one of the oldest and most commonly-used models for estimating the
6 COE for public utilities. It is my understanding that the DCF methodology is most
7 preferred by the Delaware Commission in determining the cost of equity or regulated
8 utilities. The DCF model is based on the "dividend discount model" of financial theory,
9 which maintains that the value (price) of any security or commodity is the discounted
10 present value of all future cash flows.

11 The most common variant of the DCF model assumes that dividends are expected
12 to grow at a constant rate (the "constant growth" or "Gordon DCF model"). In this
13 framework, the cost of capital is derived from the following formula:

$$K = \frac{D}{P} + g$$

14 where: P = current price
15 D = current dividend rate
16 K = discount rate (cost of capital)
17 g = constant rate of expected growth
18

19 This formula essentially recognizes that the return expected or required by investors is
20 comprised of two factors: the dividend yield (current income) and expected growth in
21 dividends (future income).
22

23
24 **Q. Please explain how you employ the DCF model.**

1 A. I use the constant growth DCF model. In doing so, I combine the current dividend yield
2 for each group of proxy utility stocks described in the previous section with several
3 indicators of expected dividend growth.
4

5 **Q. How did you derive the dividend yield component of the DCF equation?**

6 A. Several methods can be used to calculate the dividend yield component. These methods
7 generally differ in the manner in which the dividend rate is employed (*i.e.* current versus
8 future dividends or annual versus quarterly compounding of dividends). I believe the
9 most appropriate dividend yield component is a quarterly compounding variant, which is
10 expressed as follows:

$$Yield = \frac{D_0(1 + 0.5g)}{P_0}$$

11
12 This dividend yield component recognizes the timing of dividend payments and dividend
13 increases.

14 The P_0 in my yield calculation is the average of the high and low stock price for
15 each proxy company for the most recent three month period (June-August 2014). The D_0
16 is the current annualized dividend rate for each proxy company.
17

18 **Q. How do you estimate the dividend growth component of the DCF equation?**

19 A. The DCF model's dividend growth rate component is usually the most crucial and
20 controversial element involved in using this methodology. The objective of estimating
21 the dividend growth component is to reflect the growth expected by investors that is
22 embodied in the price (and yield) of a company's stock. As such, it is important to
23 recognize that individual investors have different expectations and consider alternative
24 indicators in deriving their expectations. This is evidenced by the fact that every
25 investment decision resulting in the purchase of a particular stock is matched by another
26 investment decision to sell that stock.

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1 A wide array of indicators exists for estimating investors' growth expectations.
2 As a result, it is evident that investors do not always use one single indicator of growth.
3 It therefore is necessary to consider alternative dividend growth indicators in deriving the
4 growth component of the DCF model. I have considered five indicators of growth in my
5 DCF analyses. These are:

- 6 1. Years 2009-2013 (5-year average) earnings retention, or fundamental
7 growth;
- 8 2. Five-year average of historic growth in earnings per share (EPS),
9 dividends per share (DPS), and book value per share (BVPS);
- 10 3. Years 2014, 2015 and 2017-2019 projections of earnings retention growth
11 (per Value Line);
- 12 4. Years 2011-2013 to 2017-2019 projections of EPS, DPS, and BVPS (per
13 Value Line); and,
- 14 5. Five-year projections of EPS growth (per First Call).

15 I believe this combination of growth indicators is a representative and appropriate set
16 with which to begin the process of estimating investor expectations of dividend growth
17 for the group of proxy companies. I also believe that these growth indicators reflect the
18 types of information that investors consider in making their investment decisions. As I
19 indicated previously, investors have an array of information available to them, all of
20 which should be expected to have some impact on their decision-making process.

21 **Q. Please describe your DCF calculations.**

22 A. Schedule 7 presents my DCF analysis. Page 1 shows the calculation of the "raw" (*i.e.*
23 prior to adjustment for growth) dividend yield for each proxy company. Pages 2 and 3
24 show the growth rates for the groups of proxy companies. Page 4 shows the DCF
25

1 calculations, which are presented on several bases: mean, median, and high values.

2 These results can be summarized as follows:

3

	<u>Mean</u>	<u>Median</u>	<u>Mean High¹</u>	<u>Median High¹</u>
4 Value Line Water Group	7.6%	7.5%	8.7%	8.7%

5

6 ¹Using only the highest growth rate.

7

8 I note that the individual DCF calculations shown on Schedule 7 should not be
9 interpreted to reflect the expected cost of capital for individual companies in the proxy
10 groups; rather, the individual values shown should be interpreted as alternative
11 information considered by investors.

12

13 **Q. What do you conclude from your DCF analyses?**

14 A. The DCF rates resulting from the analysis of the proxy group falls into a wide range
15 between 7.5 percent and 8.7 percent. The highest DCF rates are 8.7 percent. I believe a
16 8.7 percent represents the current DCF-derived COE for the proxy group. I recommend a
17 cost of equity of 8.7 percent for AWC, which focuses on the upper portion of the DCF
18 range.

19

20 **CAPM ANALYSIS**

21

22 **Q. Please describe the theory and methodological basis of the CAPM.**

23 A. CAPM was developed in the 1960s and 1970s as an extension of modern portfolio theory
24 (MPT), which studies the relationships among risk, diversification, and expected returns.
25 The CAPM describes and measures the relationship between a security's investment risk
26 and its market rate of return.

27

1 **Q. How is the CAPM derived?**

2 A. The general form of the CAPM is:

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

3

4

5 where: K = cost of equity

6 R_f = risk free rate

7 R_m = return on market

8 β = beta

9 $R_m - R_f$ = market risk premium

10

11 The CAPM is a variant of the RP method. I believe the CAPM is generally superior to
12 the simple RP method because the CAPM specifically recognizes the risk of a particular
13 company or industry (*i.e.*, beta), whereas the simple RP method assumes the same COE
14 for all companies exhibiting similar bond ratings or other characteristics.

15

16 **Q. What do you use for the risk-free rate?**

17 A. The first input of the CAPM is the risk-free rate (R_f). The risk-free rate reflects the level
18 of return that can be achieved without accepting any risk.

19 In CAPM applications, the risk-free rate is generally recognized by use of U.S.
20 Treasury securities. Two general types of U.S. Treasury securities are often utilized as
21 the R_f component, short-term U.S. Treasury bills and long-term U.S. Treasury bonds.

22 I have performed CAPM calculations using the three-month average yield (June-
23 August 2014) for 20-year U.S. Treasury bonds. I use the yields on long-term Treasury
24 bonds since this matches the long-term perspective of COE analyses. Over this three-
25 month period, these bonds had an average yield of 3.05 percent.

26

27 **Q. What is beta and what betas do you employ in your CAPM?**

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1 A. Beta is a measure of the relative volatility (and thus risk) of a particular stock in relation
2 to the overall market. Betas less than 1 are considered less risky than the market,
3 whereas betas greater than 1 are more risky. Utility stocks traditionally have had betas
4 below 1. I utilize the most recent Value Line betas for each company in my proxy group.
5

6 **Q. How do you estimate the market risk premium component?**

7 A. The market risk premium component ($R_m - R_f$) represents the investor-expected premium
8 of common stocks over the risk-free rate, or government bonds. For the purpose of
9 estimating the market risk premium, I considered alternative measures of returns of the
10 S&P 500 (a broad-based group of large U.S. companies) and 20-year U.S. Treasury
11 bonds.

12 First, I compared the actual annual returns on equity of the S&P 500 with the
13 actual annual yields of U.S. Treasury bonds. Schedule 8 shows the return on equity for
14 the S&P 500 group for the period 1978-2013 (all available years reported by S&P). This
15 schedule also indicates the annual yields on 20-year U.S. Treasury bonds and the annual
16 differentials (*i.e.* risk premiums) between the S&P 500 and U.S. Treasury 20-year bonds.
17 Based upon these returns, I conclude that the risk premium from this analysis is 6.75
18 percent.

19 I next considered the total returns (*i.e.* dividends/interest plus capital gains/losses)
20 for the S&P 500 group as well as for long-term government bonds, as tabulated by
21 Morningstar (formerly Ibbotson Associates), using both arithmetic and geometric means.
22 I considered the total returns for the entire 1926-2013 period, which are as follows:

23

	<u>S&P 500</u>	<u>L-T Gov't Bonds</u>	<u>Risk Premium</u>
24 Arithmetic	12.1%	5.9%	6.2%
25 Geometric	10.1%	5.5%	4.6%

26 I conclude from this analysis that the expected risk premium is about 5.85 percent (*i.e.*
27 average of all three risk premiums: 6.75 percent from Schedule 8; 6.2 percent arithmetic

1 and 4.6 percent geometric from Morningstar). I believe that a combination of arithmetic
2 and geometric means is appropriate since investors have access to both types of means
3 and presumably, both types are reflected in investment decisions and thus, stock prices
4 and the cost of capital.

5
6 **Q. What are your CAPM results?**

7 A. Schedule 9 shows my CAPM calculations. The results are:

8

	<u>Mean</u>	<u>Median</u>
9 Value Line Water Group	7.1%	7.1%

10 **Q. What is your conclusion concerning the CAPM COE?**

11 A. The CAPM results collectively indicate a COE of 7.1 percent for the group of proxy
12 utilities. I conclude that an appropriate COE estimation for AWC is 7.1 percent.

13
14 **CE ANALYSIS**

15
16 **Q. Please describe the basis of the CE methodology.**

17 A. The CE method is derived from the "corresponding risk" concept discussed in the
18 Bluefield and Hope cases. This method is thus based upon the economic concept of
19 opportunity cost. As previously noted, the cost of capital is an opportunity cost: the
20 prospective return available to investors from alternative investments of similar risk.

21 The CE method is designed to measure the returns expected to be earned on the
22 original cost book value of similar risk enterprises. Thus, it provides a direct measure of
23 the fair return, since it translates into practice the competitive principle upon which
24 regulation rests.

25 The CE method normally examines the experienced and/or projected returns on
26 book common equity. The logic for examining returns on book equity follows from the
27 use of original cost rate base regulation for public utilities, which uses a utility's book

1 common equity to determine the cost of capital. This cost of capital is, in turn, used as
2 the fair rate of return which is then applied (multiplied) to the book value of rate base to
3 establish the dollar level of capital costs to be recovered by the utility. This technique is
4 thus consistent with the rate base-rate of return methodology used to set utility rates.
5

6 **Q. How do you apply the CE methodology in your analysis of AWC's COE?**

7 A. I apply the CE methodology by examining realized returns on equity for the group of
8 proxy water companies, as well as unregulated companies, and evaluating investor
9 acceptance of these returns by reference to the resulting market-to-book ratios. In this
10 manner it is possible to assess the degree to which a given level of return equates to the
11 cost of capital. It is generally recognized for utilities that market-to-book ratios of greater
12 than one (*i.e.* 100 percent) reflect a situation where a company is able to attract new
13 equity capital without dilution (*i.e.* above book value). As a result, one objective of a fair
14 cost of equity is the maintenance of stock prices at or above book value. There is no
15 regulatory obligation to set rates designed to maintain a market-to-book ratio
16 significantly above one.

17 I further note that my CE analysis is based upon market data (through the use of
18 market-to-book ratios) and is thus essentially a market test. As a result, my CE analysis
19 is not subject to the criticisms occasionally made by some who maintain that past earned
20 returns do not represent the cost of capital. In addition, my CE analysis also uses
21 prospective returns and thus is not backward looking.
22

23 **Q. What time periods do you examine in your CE analysis?**

24 A. My CE analysis considers the experienced equity returns of the proxy group of utilities
25 for the period 2002-2013 (*i.e.* the last twelve years). The CE analysis requires that I
26 examine a relatively long period of time in order to determine trends in earnings over at
27 least a full business cycle. Further, in estimating a fair level of return for a future period,

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1 it is important to examine earnings over a diverse period of time in order to avoid any
2 undue influence from unusual or abnormal conditions that may occur in a single year or
3 shorter period. Therefore, in forming my judgment of the current cost of equity, I
4 focused on two periods: 2009-2013 (the current business cycle) and 2002-2008 (the most
5 recent business cycle). I have also considered projected returns on equity for 2014, 2015
6 and 2017-2019.

7
8 **Q. Please describe your CE analysis.**

9 A. Schedules 10 and 11 contain summaries of experienced returns on equity for two groups
10 of companies, while Schedule 12 presents a risk comparison of utilities versus
11 unregulated firms.

12 Schedule 10 shows the earned returns on average common equity and market-to-
13 book ratios for the group of proxy utilities. These can be summarized as follows:

	<u>Value Line</u> <u>Water Group</u>
Historic ROE	
Mean	9.5-9.9%
Median	9.0-9.7%
Historic M/B	
Mean	189-232%
Median	175-219%
Prospective ROE	
Mean	10.1-10.6%
Median	9.5-10.3%

14
15
16
17
18
19
20
21
22
23 These results indicate that historic returns of 9.0 percent to 9.9 percent have been
24 adequate to produce market-to-book ratios of 175 percent to 232 percent for the group of
25 utilities. Furthermore, projected returns on equity for 2014, 2015 and 2017-2019 are
26 within a range of 9.5 percent to 10.6 percent for the utility group. These relate to 2013
27 market-to-book ratios of 180 percent or greater.

1 **Q. Do you also review the earnings of unregulated firms?**

2 A. Yes. As an alternative, I also examine the Standard & Poor's 500 Composite group. This
3 is a well recognized group of firms that is widely utilized in the investment community
4 and is indicative of the competitive sector of the economy. Schedule 11 presents the
5 earned returns on equity and market-to-book ratios for the S&P 500 group over the past
6 twelve years (i.e., 2002-2013). As this exhibit indicates, over the three business cycle
7 periods, this group's average earned returns ranged from 12.4 percent to 13.6 percent,
8 with average market-to-book ratios ranging between 209 percent and 341 percent.

9

10 **Q. How can the above information be used to estimate AWC's COE?**

11 A. The recent earnings of the proxy utilities and S&P 500 groups can be viewed as an
12 indication of the level of return realized and expected in the regulated and competitive
13 sectors of the economy. In order to apply these returns to the COE for the proxy utilities,
14 however, it is necessary to compare the risk levels of the water utilities and the
15 competitive companies. I do this in Schedule 12, which compares several risk indicators
16 for the S&P 500 group and the water utility group. The information in Schedule 12
17 indicates that the S&P 500 group is more risky than the water utility proxy group.

18

19 **Q. What COE is indicated by your CE analysis?**

20 A. Based on recent earnings and market-to-book ratios, my CE analysis indicates that the
21 COE for the proxy utilities is no more than 9.0 percent to 10.0 percent (9.5 percent mid-
22 point). Recent returns of 9.0 percent to 9.9 percent have resulted in market-to-book ratios
23 more than 170 percent. Prospective returns of 9.5 percent to 10.6 percent have been
24 accompanied by market-to-book ratios over 180 percent. As a result, it is apparent that
25 authorized returns below this level would continue to result in market-to-book ratios of
26 well above 100 percent. An earned return of 9.5 percent should thus result in a market-
27 to-book ratio well above 100 percent. As I indicated earlier, the fact that market-to-book

1 ratios substantially exceed 100 percent indicates that historic and prospective returns of
2 over 9.5 percent reflect earnings levels that are well above the actual cost of equity for
3 those regulated companies. I also note that a company whose stock sells above book
4 value can attract capital in a way that enhances the book value of existing stockholders,
5 thus creating a favorable environment for financial integrity.

6
7 **RETURN ON EQUITY RECOMMENDATION**
8

9 **Q. Please summarize the results of your three COE analyses.**

10 A. My three COE analyses produce the following:

11	DCF	8.7%
12	CAPM	7.1%
13	CE	9.5%

14
15 These results indicate an overall broad range of 7.1 percent to 9.5 percent, which focuses
16 on the respective individual model results. I recommend a COE range of 8.7 percent to
17 9.5 percent for AWC. This range includes my DCF result (8.7 percent), and my CE
18 result (9.5 percent). For the purposes of this proceeding, I recommend the average of
19 these values, which is 9.10 percent.

20
21 **Q. It appears that your CAPM results are less than your DCF and CE results. Does
22 this imply that the CAPM results should not be considered in determining the cost
23 of equity for AWC?**

24 A. No. It is apparent that the CAPM results are less than the DCF and CE results. There are
25 two reasons for the lower CAPM results. First, risk premiums are lower currently than
26 was the case in prior years. This is the result of lower equity returns that have been
27 experienced over the past several years. This is also reflective of a decline in investor

1 expectations of equity returns and risk premiums. Second, the level of interest rates on
2 U.S. Treasury bonds (i.e., the risk free rate) has been lower in recent years. This is
3 partially the result of the actions of the Federal Reserve System to stimulate the economy.
4 This also impacts investor expectations of returns in a negative fashion. I note that,
5 initially, investors may have believed that the decline in Treasury yields was a temporary
6 factor that would soon be replaced by a rise in interest rates. However, this has not been
7 the case as interest rates have remained low and continued to decline for the past four-
8 plus years. The Federal Reserve has further announced its intention to continue stimulus
9 (and maintain low interest rates) through at least 2014. As a result, it cannot be
10 maintained that low interest rates (and low CAPM results) are temporary and do not
11 reflect investor expectations. Consequently, the CAPM results should be considered as
12 one factor in determining the cost of equity for AWC.

13

14

TOTAL COST OF CAPITAL

15

16 **Q. What is the total cost of capital for AWC?**

17 A. Schedule 1 reflects the total cost of capital for AWC using the proposed capital structure
18 and embedded cost of debt, as well as my COE recommendations. The resulting total
19 cost of capital is a range of 7.29 percent to 7.69 percent. I recommend a 7.49 percent
20 total cost of capital for AWC.

21

22

COMMENTS ON COMPANY TESTIMONY

23

24 **Q. What cost of capital has AWC requested in its Application?**

25 A. The Company's filing requests a total cost of capital of 8.40 percent, which incorporates
26 a COE of 10.9 percent. The 10.9 percent requested COE is developed in the testimony of
27 AWC witness Pauline M. Ahern.

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1 **Q. How does she derive her COE recommendation?**

2 A. Ms. Ahern performs the following cost of equity analyses and derives the indicated
3 results:

	Ahern Group of Nine AUS Water Utility Companies
	<hr/>
6 DCF Model	8.58%
7 Risk Premium Model	11.26%
8 CAPM	9.92%
9 Market Models Applied To Non-Price Regulated Companies	10.98%
10 Indicated Median Cost of Equity	10.45%
11 Flotation Cost Adjustment	0.20%
12 Business Risk Adjustment	0.25%
13 Indicated COE	10.90%

14 **Q. Do you have any disagreements with any or all of Ms. Ahern’s methodologies and
15 recommendations?**

16 A. Yes. I have disagreements with several of her cost of equity methodologies and
17 conclusions, as well as her proposed 0.20 percent “flotation cost adjustment” and 0.25
18 percent “business risk adjustment” for AWC.

19
20 **Q. Please begin with her DCF model and conclusions.**

21 A. Ms. Ahern’s 8.58 percent DCF conclusion is shown on Schedule PMA-6. This is similar
22 to my DCF results.

23
24 **Q. Ms. Ahern maintains in her testimony on Page 26-30, that the DCF model cannot be
25 used as an estimate of the cost of equity for a utility when the market price of utility
26 stocks exceeds the book value. Do you agree with this position?**

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1 A. No. I do not. Knowledgeable and/or informed investors are aware of the fact that most
2 utilities have their rates set based on the book value of their assets (i.e., rate base and
3 capital structure). This knowledge is reflected in the prices that investors are willing to
4 pay for stocks and thus, is reflected in DCF cost rates. To not accept the DCF cost rates,
5 as Ms. Ahern implicitly proposes, amounts to a disregard of actual stock values in order
6 to develop a DCF cost rate. This is clearly a violation of the principle of “efficient
7 markets,” which Ms. Ahern cites extensively in her testimony. If one believes that
8 markets are efficient, there is no reason to disregard market models based on stock prices.
9

10 **Q. Please describe Ms. Ahern’s risk premium methodology and conclusions.**

11 A. Ms. Ahern performs two types of risk premium analyses. First, she employs a Predictive
12 Risk Premium Model™ (“PRPM™”) which produces a 11.67 percent cost of equity.
13 Second, she develops her Adjusted Market Approach risk premium methodology to
14 arrive at a risk premium cost of equity of 10.03 percent. Her risk premium method
15 conclusion and recommendation is 11.26 percent (Schedule PMA-8), which gives 75
16 percent weighting to the PRPM™ approach and 25 percent weighting to the Adjusted
17 Market Approach.
18

19 **Q. What is Ms. Ahern’s first risk premium methodology?**

20 A. Ms. Ahern first performs a relatively new type of risk premium approach, which is her
21 PRPM™ approach. This approach is new and untried. Significantly, the result of this
22 methodology is a 11.67 percent cost of equity conclusion, which greatly exceeds (i.e.,
23 nearly 160 basis points) the results of her Adjusted Market Approach risk premium
24 approach. She gives three times more weight to the PRPM™ approach than the Adjusted
25 Market Approach to arrive at her 11.26 percent risk premium method (Schedule PMA-8).
26 I again note that, not only does her PRPM™ approach produce a much higher cost of

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1 equity result, the approach is also a component in her Adjustment Market Approach
2 methodologies and has the effect of raising the results of this methodology as well.

3
4 **Q. Do you agree with her Adjusted Market Approach methodology and conclusions?**

5 A. No, I do not. I first disagree with the average equity risk premium level of 4.76 percent
6 she employs in her Adjusted Market Approach. Ms. Ahern uses two studies to derive her
7 4.76 percent Adjusted Market Approach risk premium and averages the two results to
8 arrive at her results. First, she compares total returns for the S&P 500 Index over the
9 1926-2012 period with arithmetic returns on Aaa and Aa-rated corporate bonds (5.60
10 percent risk premium) as well as the PRPMTM over the same period (9.26 percent risk
11 premium). She also uses projected total returns on stocks versus prospective yields on
12 corporate bonds (8.95 percent). These produce an average risk premium of 6.98 percent.
13 She then multiplies the 6.98 percent average risk premium by the 0.65 average beta of her
14 proxy group (in a CAPM context) to develop a 4.54 percent equity risk premium
15 (Schedule PMA-8, page 8).

16 There are several problems with her methodologies. Her use of total stock returns
17 over the 1926-2012 period, in connection with bond yields over the same long period,
18 seems to imply that investors in 2014 expect such relationships to be the same. There is
19 no demonstration that current investors expect such relationships to exist at the current
20 time. Her methodology is also a mis-match since it compares holding period returns (i.e.,
21 capital gains/losses plus income) with yields on bonds (i.e., only income return). In
22 addition, the 1926-2012 period was heavily influenced by the Great Depression, World
23 War II, the high inflation/interest rate environment of the 1970s/1980s, etc. Such factors
24 are not prevalent currently and have the effect of inflating risk premiums over those
25 expected by investors. I believe Ms. Ahern's analyses over-state the required risk
26 premiums at the present time. In addition, I find it inconsistent on her part to defend use
27 of historic data going back to 1926 in her risk premium and CAPM analyses, and to then

1 ignore historic data in her DCF analyses. I do not see how an investor would place equal
2 weight between returns in 1926 and 2014 in one type of analysis (i.e., risk premium and
3 CAPM) and then give no weight whatsoever to recent (i.e., 5 years) experience in DCF
4 analysis. I also disagree with Ms. Ahern's use of projected equity returns, which are
5 largely dependent on assumed stock market values. This is speculative.

6
7 **Q. You indicate that Ms. Ahern's risk premium and CAPM analyses use forecasted**
8 **yields on U.S. Treasury Bonds. Why do you disagree with this?**

9 A. It is proper to use the current yield, rather than a projected yield, as the risk-free rate in a
10 risk premium and CAPM context. This is the case since the current yield is known and
11 measurable and reflects investors' collective assessment of all relevant capital market
12 conditions. Prospective interest rates, in contrast, are not measurable and not achievable.
13 For example, if the current yield on 20-year U.S. Treasury Bonds is 3.0 percent, this
14 reflects the rate that investors can actually receive on their investment. Investors cannot
15 receive a prospective yield on their investments since such a yield is not actual but rather
16 speculative.

17 Use of the current yield in a DCF context is similar to using the current risk-free
18 rate in a CAPM context. Analysts do not use prospective stock prices as the basis for the
19 dividend yield in a DCF analysis, as use of prospective stock prices is speculative. Use
20 of current stock prices is appropriate as this is consistent with the efficient market
21 hypothesis that Ms. Ahern cites throughout her testimony. Likewise, current levels of
22 interest rates reflect all current information (i.e., the efficient market hypothesis) and
23 should be used as the risk-free rate in the CAPM.

24
25 **Q. Please describe Ms. Ahern's CAPM analyses.**

26 A. Ms. Ahern performs two sets of CAPM analyses. Her first CAPM is a "traditional"
27 CAPM, where she concludes that 9.80 percent is the CAPM cost. This uses a risk free

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1 rate of 4.40 percent (projected yield on 30-year U.S. Treasury bonds), Value Line beta
2 and a risk premium of 7.96 percent. I note that current 30-year Treasury bonds currently
3 yield well below 4.40 percent, which indicates that her prospective yield is excessive.

4 I also disagree with the 7.96 percent market risk premium Ms. Ahern employs in
5 her CAPM analyses. This market risk premium is developed in a similar fashion to those
6 in his risk premium analyses. For the same reasons cited above, Ms. Ahern's risk
7 premium values are over-stated.

8 Ms. Ahern also performs an "empirical" CAPM analysis, wherein she assigns 75
9 percent weight to actual betas for the proxy groups of water utilities and a 25 percent
10 weight to an assumed beta of 1.0 (i.e., the market beta). I disagree with this empirical
11 CAPM.

12
13 **Q. Ms. Ahern proposes adoption of a 20 basis point adjustment for flotation costs. Do**
14 **you agree with this?**

15 A. No, I do not. There has been no demonstration that AWC is entitled to such an
16 adjustment. The Company was asked a data request (PSC-ROR-8) asking for certain
17 information for "each instance since 2000 that ARC has made a public offering of
18 common stock", including "issuance costs related to public offering". AWC's response
19 (attached as Schedule 13) lists only one such offering (in 2011) and no issuance costs
20 were identified. In addition, the response indicates that ARC's book value per share
21 actually increased from \$12.47 to \$13.00 as a result of this offering. Thus, existing ARC
22 stockholders actually experienced a gain from this issuance.

23
24 **Q. Do you agree with the proposition that AWC should be entitled to a size or credit**
25 **risk adjustment?**

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1 A. No, I do not. AWC’s ratepayers should not be charged water rates which reflect in
2 incremental return to reflect the size of the Company. Such an increment is not justified
3 and not appropriate.
4

5 **Q. Is it proper to compare the size of AWC to the water proxy companies and make**
6 **risk comparisons based upon the size differentials between them?**

7 A. No, it is not proper. Most of the proxy water utilities have multiple subsidiaries that
8 operate in different jurisdictions. Following Ms. Ahern’s reasoning, each of the
9 subsidiaries of the proxy water utilities should be considered as more risky than the proxy
10 group since, by definition, they would have to be smaller. This reasoning is flawed, since
11 these individual water company subsidiaries do not raise their equity capital directly from
12 investors, but rather do so as a consolidated entity.
13

14 **Q. Can you provide any evidence that “size” or “Business Risk” Adjustments are not**
15 **generally recognized as risk factors in regulatory proceedings such as this one?**

16 A. Yes, I can. The table below reflects the average size (as measured by net plant) and
17 currently authorized returns on equity or various types of regulated utilities:
18

<u>Industry</u>	<u>Average Net Plant</u>	<u>Average Authorized ROE</u>
Electric	\$17,199.2	10.45%
Combination Electric-Gas	\$15,985.6	10.34%
Natural Gas	\$3,308.0	10.54%
Water	\$2,409.8	9.97%

26 Source: AUS Utility Reports, September 2014.
27

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1 As this indicates, water utilities are the smallest type of utility, yet they have the lowest
2 average authorized returns on equity. This is indicative that size, per se, should not
3 govern the level of return on equity.

4

5 **Q. Does this conclude your Direct Testimony?**

6 A. Yes, it does.

7

8

BACKGROUND AND EXPERIENCE PROFILE
DAVID C. PARCELL, MBA, CRRA
PRESIDENT/SENIOR ECONOMIST

EDUCATION

1985	M.B.A., Virginia Commonwealth University
1970	M.A., Economics, Virginia Polytechnic Institute and State University, (Virginia Tech)
1969	B.A., Economics, Virginia Polytechnic Institute and State University, (Virginia Tech)

POSITIONS

2007-Present	President, Technical Associates, Inc.
1995-2007	Executive Vice President and Senior Economist, Technical Associates, Inc.
1993-1995	Vice President and Senior Economist, C. W. Amos of Virginia
1972-1993	Vice President and Senior Economist, Technical Associates, Inc.
1969-1972	Research Economist, Technical Associates, Inc.
1968-1969	Research Associate, Department of Economics, Virginia Polytechnic Institute and State University

ACADEMIC HONORS

Omicron Delta Epsilon - Honor Society in Economics
Beta Gamma Sigma - National Scholastic Honor Society of Business Administration
Alpha Iota Delta - National Decision Sciences Honorary Society
Phi Kappa Phi - Scholastic Honor Society

PROFESSIONAL DESIGNATIONS

Certified Rate of Return Analyst - Founding Member

RELEVANT EXPERIENCE

Financial Economics -- Advised and assisted many Virginia banks and savings and loan associations on organizational and regulatory matters. Testified approximately 25 times before the Virginia State Corporation Commission and the Regional Administrator of National Banks on matters related to branching and organization for banks, savings and loan associations, and consumer finance companies. Advised financial institutions on interest rate structure and loan maturity. Testified before Virginia State Corporation Commission on maximum rates for consumer finance companies.

Testified before several committees and subcommittees of Virginia General Assembly on numerous banking matters.

Clients have included First National Bank of Rocky Mount, Patrick Henry National Bank, Peoples Bank of Danville, Blue Ridge Bank, Bank of Essex, and Signet Bank.

Published articles in law reviews and other periodicals on structure and regulation of banking/financial services industry.

Utility Economics -- Performed numerous financial studies of regulated public utilities. Testified in over 300 cases before some thirty state and federal regulatory agencies.

Prepared numerous rate of return studies incorporating cost of equity determination based on DCF, CAPM, comparable earnings and other models. Developed procedures for identifying differential risk characteristics by nuclear construction and other factors.

Conducted studies with respect to cost of service and indexing for determining utility rates, the development of annual review procedures for regulatory control of utilities, fuel and power plant cost recovery adjustment clauses, power supply agreements among affiliates, utility franchise fees, and use of short-term debt in capital structure.

Presented expert testimony before federal regulatory agencies Federal Energy Regulatory Commission, Federal Power Commission, and National Energy Board (Canada), state regulatory agencies in Alabama, Alaska, Arizona, Arkansas, California, Connecticut, Delaware, District of Columbia, Florida, Georgia, Hawaii, Illinois, Indiana, Kansas, Kentucky, Maine, Maryland, Missouri, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, Ohio, Oklahoma, Ontario (Canada), Pennsylvania, South Carolina, Texas, Utah, Vermont, Virginia, West Virginia, Washington, Wisconsin, and Yukon Territory (Canada).

Published articles in law reviews and other periodicals on the theory and purpose of regulation and other regulatory subjects.

Clients served include state regulatory agencies in Alaska, Arizona, Delaware, Missouri, North Carolina, Ontario (Canada), and Virginia; consumer advocates and attorneys general in Alabama, Arizona, District of Columbia, Florida, Georgia, Hawaii, Illinois, Indiana, Kansas, Kentucky, Maryland, Nevada, New Mexico, Ohio, Oklahoma, Pennsylvania, South Carolina, Texas, Utah, Vermont, Virginia, and West Virginia; federal agencies including Defense Communications Agency, the Department of Energy, Department of the Navy, and General Services Administration; and various organizations such as Bath Iron Works, Illinois Citizens' Utility Board, Illinois Governor's Office of Consumer Services, Illinois Small Business Utility Advocate, Wisconsin's Environmental Decade, Wisconsin's Citizens Utility Board, and Old Dominion Electric Cooperative.

Insurance Economics -- Conducted analyses of the relationship between the investment income earned by insurance companies on their portfolios and the premiums charged for insurance. Analyzed impact of diversification on financial strength of Blue Cross/Blue Shield Plans in Virginia.

Conducted studies of profitability and cost of capital for property/casualty insurance industry. Evaluated risk of and required return on surplus for various lines of insurance business.

Presented expert testimony before Virginia State Corporation Commission concerning cost of capital and expected gains from investment portfolio. Testified before insurance bureaus of Maine, New Jersey, North Carolina, Rhode Island, South Carolina and Vermont concerning cost of equity for insurance companies.

Prepared cost of capital and investment income return analyses for numerous insurance companies concerning several lines of insurance business. Analyses used by Virginia Bureau of Insurance for purposes of setting rates.

Special Studies -- Conducted analyses which evaluated the financial and economic implications of legislative and administrative changes. Subject matter of analyses include returnable bottles, retail beer sales, wine sales regulations, taxi-cab taxation, and bank regulation. Testified before several Virginia General Assembly subcommittees.

Testified before Virginia ABC Commission concerning economic impact of mixed beverage license.

Clients include Virginia Beer Wholesalers, Wine Institute, Virginia Retail Merchants Association, and Virginia Taxicab Association.

Franchise, Merger & Anti-Trust Economics -- Conducted studies on competitive impact on market structures due to joint ventures, mergers, franchising and other business restructuring. Analyzed the costs and benefits to parties involved in mergers. Testified in federal courts and before banking and other regulatory bodies concerning the structure and performance of markets, as well as on the impact of restrictive practices.

Clients served include Dominion Bankshares, asphalt contractors, and law firms.

Transportation Economics -- Conducted cost of capital studies to assess profitability of oil pipelines, trucks, taxicabs and railroads. Analyses have been presented before the Federal Energy Regulatory Commission and Alaska Pipeline Commission in rate proceedings. Served as a consultant to the Rail Services Planning Office on the reorganization of rail services in the U.S.

Economic Loss Analyses -- Testified in federal courts, state courts, and other adjudicative forums regarding the economic loss sustained through personal and business injury whether due to bodily harm, discrimination, non-performance, or anticompetitive practices. Testified on economic loss to a commercial bank resulting from publication of adverse information concerning solvency. Testimony has been presented on behalf of private individuals and

business firms.

MEMBERSHIPS

American Economic Association
Virginia Association of Economists
Richmond Society of Financial Analysts
Financial Analysts Federation
Society of Utility and Regulatory Financial Analysts
 Board of Directors 1992-2000
 Secretary/Treasurer 1994-1998
 President 1998-2000

RESEARCH ACTIVITY

Books and Major Research Reports

"Stock Price As An Indicator of Performance," Master of Arts Thesis, Virginia Tech, 1970

"Revision of the Property and Casualty Insurance Ratemaking Process Under Prior Approval in the Commonwealth of Virginia," prepared for the Bureau of Insurance of the Virginia State Corporation Commission, with Charles Schotta and Michael J. Ileo, 1971

"An analysis of the Virginia Consumer Finance Industry to Determine the Need for Restructuring the Rate and Size Ceilings on Small Loans in Virginia and the Process by which They are Governed," prepared for the Virginia Consumer Finance Association, with Michael J. Ileo, 1973

State Banks and the State Corporation Commission: A Historical Review, Technical Associates, Inc., 1974

"A Study of the Implications of the Sale of Wine by the Virginia Department of Alcoholic Beverage Control", prepared for the Virginia Wine Wholesalers Association, Virginia Retail Merchants Association, Virginia Food Dealers Association, Virginia Association of Chain Drugstores, Southland Corporation, and the Wine Institute, 1983.

"Performance and Diversification of the Blue Cross/Blue Shield Plans in Virginia: An Operational Review", prepared for the Bureau of Insurance of the Virginia State Corporation Commission, with Michael J. Ileo and Alexander F. Skirpan, 1988.

The Cost of Capital - A Practitioners' Guide, Society of Utility and Regulatory Financial Analysts, 1997 (previous editions in 1991, 1992, 1993, 1994, and 1995).

Papers Presented and Articles Published

"The Differential Effect of Bank Structure on the Transmission of Open Market Operations," Western Economic Association Meeting, with Charles Schotta, 1971

"The Economic Objectives of Regulation: The Trend in Virginia," (with Michael J. Ileo), William and Mary Law Review, Vol. 14, No. 2, 1973

"Evolution of the Virginia Banking Structure, 1962-1974: The Effects of the Buck-Holland Bill", (with Michael J. Ileo), William and Mary Law Review, Vol. 16, No. 3, 1975

"Banking Structure and Statewide Branching: The Potential for Virginia", William and Mary Law Review, Vol. 18, No. 1, 1976

"Bank Expansion and Electronic Banking: Virginia Banking Structure Changes Past, Present, and Future," William and Mary Business Review," Vol. 1, No. 2, 1976

"Electronic Banking - Wave of the Future?" (with James R. Marchand), Journal of Management and Business Consulting, Vol. 1, No. 1, 1976

"The Pricing of Electricity" (with James R. Marchand), Journal of Management and Business Consulting, Vol. 1, No. 2, 1976

"The Public Interest - Bank and Savings and Loan Expansion in Virginia" (with Richard D. Rogers), University of Richmond Law Review, Vol. 11, No. 3, 1977

"When Is It In the 'Public Interest' to Authorize a New Bank?", University of Richmond Law Review, Vol. 13, No. 3, 1979

"Banking Deregulation and Its Implications on the Virginia Banking Structure," William and Mary Business Review, Vol. 5, No. 1, 1983

"The Impact of Reciprocal Interstate Banking Statutes on The Performance of Virginia Bank Stocks", with William B. Harrison, Virginia Social Science Journal, Vol. 23, 1988

"The Financial Performance of New Banks in Virginia", Virginia Social Science Journal, Vol. 24, 1989

"Identifying and Managing Community Bank Performance After Deregulation", with William B. Harrison, Journal of Managerial Issues, Vol. II, No. 2, Summer 1990

"The Flotation Cost Adjustment To Utility Cost of Common Equity - Theory, Measurement and Implementation," presented at Twenty-Fifth Financial Forum, National

Society of Rate of Return Analysts, Philadelphia, Pennsylvania, April 28, 1993.

Biography of Myon Edison Bristow, Dictionary of Virginia Biography, Volume 2, 2001.

**ARTESIAN WATER COMPANY
TOTAL COST OF CAPITAL**

Item	Amount 1/	Percent	Cost		Weighted Cost	
Long-Term Debt	\$103,870,492	49.46%	5.84%	1/	2.89%	
Equity	\$106,147,273	50.54%	8.70%	9.50%	4.40%	4.80%
Total	\$210,017,765	100.00%			7.29%	7.69%
					7.49% (Mid-point)	

1/ Pro Forma balances, as contained in Schedule DLV-4B-S of Supplemental Filing.

ECONOMIC INDICATORS

Year	Real GDP* Growth	Industrial Production Growth	Unemployment Rate	Consumer Price Index
1975 - 1982 Cycle				
1975	-1.1%	-8.9%	8.5%	7.0%
1976	5.4%	10.8%	7.7%	4.8%
1977	5.5%	5.9%	7.0%	6.8%
1978	5.0%	5.7%	6.0%	9.0%
1979	2.8%	4.4%	5.8%	13.3%
1980	-0.2%	-1.9%	7.0%	12.4%
1981	1.8%	1.9%	7.5%	8.9%
1982	-2.1%	-4.4%	9.5%	3.8%
1983 - 1991 Cycle				
1983	4.0%	3.7%	9.5%	3.8%
1984	6.8%	9.3%	7.5%	3.9%
1985	3.7%	1.7%	7.2%	3.8%
1986	3.1%	0.9%	7.0%	1.1%
1987	2.9%	4.9%	6.2%	4.4%
1988	3.8%	4.5%	5.5%	4.4%
1989	3.5%	1.8%	5.3%	4.6%
1990	1.8%	-0.2%	5.6%	6.1%
1991	-0.5%	-2.0%	6.8%	3.1%
1992 - 2001 Cycle				
1992	3.0%	3.1%	7.5%	2.9%
1993	2.7%	3.4%	6.9%	2.7%
1994	4.0%	5.5%	6.1%	2.7%
1995	3.7%	4.8%	5.6%	2.5%
1996	4.5%	4.3%	5.4%	3.3%
1997	4.5%	7.3%	4.9%	1.7%
1998	4.2%	5.8%	4.5%	1.6%
1999	3.7%	4.5%	4.2%	2.7%
2000	4.1%	4.0%	4.0%	3.4%
2001	1.1%	-3.4%	4.7%	1.6%
2002 - 2009 Cycle				
2002	1.8%	0.2%	5.8%	2.4%
2003	2.8%	1.2%	6.0%	1.9%
2004	3.8%	2.3%	5.5%	3.3%
2005	3.4%	3.2%	5.1%	3.4%
2006	2.7%	2.2%	4.6%	2.5%
2007	1.8%	2.5%	4.6%	4.1%
2008	-0.3%	-3.4%	5.8%	0.1%
2009	-2.8%	-11.3%	9.3%	2.7%
Current Cycle				
2010	2.5%	5.7%	9.6%	1.5%
2011	1.6%	3.3%	8.9%	3.0%
2012	2.3%	3.8%	8.1%	1.7%
2013	2.2%	2.9%	7.4%	1.5%

*GDP=Gross Domestic Product

Source: Council of Economic Advisors, Economic Indicators, various issues.

ECONOMIC INDICATORS

Year	Real GDP* Growth	Industrial Production Growth	Unemployment Rate	Consumer Price Index
2002				
1st Qtr.	2.7%	-3.8%	5.6%	2.8%
2nd Qtr.	2.2%	-1.2%	5.9%	0.9%
3rd Qtr.	2.4%	0.8%	5.8%	2.4%
4th Qtr.	0.2%	1.4%	5.9%	1.6%
2003				
1st Qtr.	1.2%	1.1%	5.8%	4.8%
2nd Qtr.	3.5%	-0.9%	6.2%	0.0%
3rd Qtr.	7.5%	-0.9%	6.1%	3.2%
4th Qtr.	2.7%	1.5%	5.9%	-0.3%
2004				
1st Qtr.	3.0%	2.8%	5.6%	5.2%
2nd Qtr.	3.5%	4.9%	5.6%	4.4%
3rd Qtr.	3.6%	4.6%	5.4%	0.8%
4th Qtr.	2.5%	4.3%	5.4%	3.6%
2005				
1st Qtr.	4.1%	3.8%	5.3%	4.4%
2nd Qtr.	1.7%	3.0%	5.1%	1.6%
3rd Qtr.	3.1%	2.7%	5.0%	8.8%
4th Qtr.	2.1%	2.9%	4.9%	-2.0%
2006				
1st Qtr.	5.4%	3.4%	4.7%	4.8%
2nd Qtr.	1.4%	4.5%	4.6%	4.8%
3rd Qtr.	0.1%	5.2%	4.7%	0.4%
4th Qtr.	3.0%	3.5%	4.5%	0.0%
2007				
1st Qtr.	0.9%	2.5%	4.5%	4.8%
2nd Qtr.	3.2%	1.6%	4.5%	5.2%
3rd Qtr.	2.3%	1.8%	4.6%	1.2%
4th Qtr.	2.9%	1.7%	4.8%	6.4%
2008				
1st Qtr.	-1.8%	1.9%	4.9%	2.8%
2nd Qtr.	1.3%	0.2%	5.3%	7.6%
3rd Qtr.	-3.7%	-3.0%	6.0%	2.8%
4th Qtr.	-8.9%	6.0%	6.9%	-13.2%
2009				
1st Qtr.	-5.3%	-11.6%	8.1%	2.4%
2nd Qtr.	-0.3%	-12.9%	9.3%	3.2%
3rd Qtr.	1.4%	-9.3%	9.6%	2.0%
4th Qtr.	4.0%	-4.5%	10.0%	2.5%
2010				
1st Qtr.	1.6%	2.7%	9.7%	0.9%
2nd Qtr.	3.9%	6.5%	9.7%	-1.2%
3rd Qtr.	2.8%	6.9%	9.6%	2.8%
4th Qtr.	2.8%	6.2%	9.6%	2.8%
2011				
1st Qtr.	-1.5%	5.4%	9.0%	4.8%
2nd Qtr.	2.9%	3.6%	9.0%	3.2%
3rd Qtr.	0.8%	3.3%	9.1%	2.4%
4th Qtr.	4.6%	4.0%	8.7%	0.4%
2012				
1st Qtr.	2.3%	4.5%	8.3%	3.2%
2nd Qtr.	1.6%	4.7%	8.2%	0.0%
3rd Qtr.	2.5%	3.4%	8.1%	4.0%
4th Qtr.	0.1%	2.8%	7.8%	0.0%
2013				
1st Qtr.	2.7%	2.5%	7.7%	2.0%
2nd Qtr.	1.8%	2.0%	7.6%	1.2%
3rd Qtr.	4.5%	2.6%	7.3%	1.6%
4th Qtr.	3.5%	3.3%	7.0%	1.2%
2014				
1st Qtr.	-2.1%	3.3%	6.7%	1.6%
2nd Qtr.	4.0%	4.2%	6.2%	4.0%

*GDP=Gross Domestic Product

Source: Council of Economic Advisors, Economic Indicators, various issues.

INTEREST RATES

Year	Prime Rate	US Treasury T Bills 3 Month	US Treasury T Bonds 10 Year	Utility Bonds Aaa	Utility Bonds Aa	Utility Bonds A	Utility Bonds Baa
1975 - 1982 Cycle							
1975	7.86%	5.84%	7.99%	9.03%	9.44%	10.09%	10.96%
1976	6.84%	4.99%	7.61%	8.63%	8.92%	9.29%	9.82%
1977	6.83%	5.27%	7.42%	8.19%	8.43%	8.61%	9.06%
1978	9.06%	7.22%	8.41%	8.87%	9.10%	9.29%	9.62%
1979	12.67%	10.04%	9.44%	9.86%	10.22%	10.49%	10.96%
1980	15.27%	11.51%	11.46%	12.30%	13.00%	13.34%	13.95%
1981	18.89%	14.03%	13.93%	14.64%	15.30%	15.95%	16.60%
1982	14.86%	10.69%	13.00%	14.22%	14.79%	15.86%	16.45%
1983 - 1991 Cycle							
1983	10.79%	8.63%	11.10%	12.52%	12.83%	13.66%	14.20%
1984	12.04%	9.58%	12.44%	12.72%	13.66%	14.03%	14.53%
1985	9.93%	7.48%	10.62%	11.68%	12.06%	12.47%	12.96%
1986	8.33%	5.98%	7.68%	8.92%	9.30%	9.58%	10.00%
1987	8.21%	5.82%	8.39%	9.52%	9.77%	10.10%	10.53%
1988	9.32%	6.69%	8.85%	10.05%	10.26%	10.49%	11.00%
1989	10.87%	8.12%	8.49%	9.32%	9.56%	9.77%	9.97%
1990	10.01%	7.51%	8.55%	9.45%	9.65%	9.86%	10.06%
1991	8.46%	5.42%	7.86%	8.85%	9.09%	9.36%	9.55%
1992 - 2001 Cycle							
1992	6.25%	3.45%	7.01%	8.19%	8.55%	8.69%	8.86%
1993	6.00%	3.02%	5.87%	7.29%	7.44%	7.59%	7.91%
1994	7.15%	4.29%	7.09%	8.07%	8.21%	8.31%	8.63%
1995	8.83%	5.51%	6.57%	7.68%	7.77%	7.89%	8.29%
1996	8.27%	5.02%	6.44%	7.48%	7.57%	7.75%	8.16%
1997	8.44%	5.07%	6.35%	7.43%	7.54%	7.60%	7.95%
1998	8.35%	4.81%	5.26%	6.77%	6.91%	7.04%	7.26%
1999	8.00%	4.66%	5.65%	7.21%	7.51%	7.62%	7.88%
2000	9.23%	5.85%	6.03%	7.88%	8.06%	8.24%	8.36%
2001	6.91%	3.44%	5.02%	7.47%	7.59%	7.78%	8.02%
2002 - 2009 Cycle							
2002	4.67%	1.62%	4.61%		[1] 7.19%	7.37%	8.02%
2003	4.12%	1.01%	4.01%		6.40%	6.58%	6.84%
2004	4.34%	1.38%	4.27%		6.04%	6.16%	6.40%
2005	6.19%	3.16%	4.29%		5.44%	5.65%	5.93%
2006	7.96%	4.73%	4.80%		5.84%	6.07%	6.32%
2007	8.05%	4.41%	4.63%		5.94%	6.07%	6.33%
2008	5.09%	1.48%	3.66%		6.18%	6.53%	7.25%
2009	3.25%	0.16%	3.26%		5.75%	6.04%	7.06%
Current Cycle							
2010	3.25%	0.14%	3.22%		5.24%	5.46%	5.96%
2011	3.25%	0.06%	2.78%		4.78%	5.04%	5.57%
2012	3.25%	0.09%	1.80%		3.83%	4.13%	4.86%
2013	3.25%	0.06%	2.35%		4.24%	4.47%	4.98%

[1] Note: Moody's has not published Aaa utility bond yields since 2001.

Sources: Council of Economic Advisors, Economic Indicators; Moody's Bond Record; Federal Reserve Bulletin; various issues.

INTEREST RATES

	Prime Rate	US Treasury T Bills 3 Month	US Treasury T Bonds 10 Year	Utility Bonds Aaa [1]	Utility Bonds Aa	Utility Bonds A	Utility Bonds Baa
2007							
Jan	8.25%	4.96%	4.76%		5.78%	5.06%	6.16%
Feb	8.25%	5.02%	4.72%		5.73%	5.00%	6.10%
Mar	8.25%	4.07%	4.56%		5.66%	5.85%	6.10%
Apr	8.25%	4.88%	4.60%		5.63%	5.07%	6.24%
May	8.25%	4.77%	4.75%		5.66%	5.09%	6.23%
June	8.25%	4.63%	5.10%		6.18%	6.30%	6.54%
July	8.25%	4.84%	5.00%		6.11%	6.25%	6.40%
Aug	8.25%	4.34%	4.67%		6.11%	6.24%	6.51%
Sept	7.75%	4.01%	4.52%		6.10%	6.18%	6.45%
Oct	7.50%	3.97%	4.53%		6.04%	6.11%	6.36%
Nov	7.50%	3.49%	4.15%		5.87%	5.97%	6.27%
Dec	7.25%	3.09%	4.10%		6.03%	6.16%	6.51%
2008							
Jan	6.00%	2.86%	3.74%		5.87%	6.02%	6.35%
Feb	6.00%	2.21%	3.74%		6.04%	6.21%	6.60%
Mar	5.25%	1.38%	3.51%		5.99%	6.21%	6.68%
Apr	5.00%	1.32%	3.68%		5.99%	6.29%	6.82%
May	5.00%	1.71%	3.88%		6.07%	6.27%	6.79%
June	5.00%	1.90%	4.10%		6.19%	6.38%	6.93%
July	5.00%	1.72%	4.01%		6.13%	6.40%	6.97%
Aug	5.00%	1.70%	3.80%		6.09%	6.37%	6.98%
Sept	5.00%	1.46%	3.80%		6.13%	6.49%	7.15%
Oct	4.00%	0.84%	3.81%		6.05%	7.56%	8.58%
Nov	4.00%	0.30%	3.53%		6.83%	7.80%	8.98%
Dec	3.25%	0.04%	2.42%		5.93%	6.54%	8.13%
2009							
Jan	3.25%	0.12%	2.52%		6.01%	6.30%	7.90%
Feb	3.25%	0.31%	2.87%		6.11%	6.30%	7.74%
Mar	3.25%	0.25%	2.82%		6.14%	6.42%	8.00%
Apr	3.25%	0.17%	2.93%		6.20%	6.48%	8.03%
May	3.25%	0.15%	3.29%		6.23%	6.49%	7.76%
June	3.25%	0.17%	3.72%		6.13%	6.20%	7.30%
July	3.25%	0.19%	3.56%		5.83%	5.97%	6.87%
Aug	3.25%	0.18%	3.59%		5.33%	5.71%	6.36%
Sept	3.25%	0.13%	3.40%		5.15%	5.53%	6.12%
Oct	3.25%	0.08%	3.39%		5.23%	5.55%	6.14%
Nov	3.25%	0.05%	3.40%		5.33%	5.64%	6.18%
Dec	3.25%	0.07%	3.59%		5.52%	5.70%	6.26%
2010							
Jan	3.25%	0.06%	3.73%		5.55%	5.77%	6.16%
Feb	3.25%	0.10%	3.60%		5.66%	5.87%	6.25%
Mar	3.25%	0.15%	3.73%		5.64%	5.84%	6.22%
Apr	3.25%	0.15%	3.85%		5.62%	5.81%	6.10%
May	3.25%	0.16%	3.42%		5.20%	5.50%	5.97%
June	3.25%	0.12%	3.20%		5.22%	5.46%	6.18%
July	3.25%	0.16%	3.01%		4.90%	5.29%	5.98%
Aug	3.25%	0.15%	2.70%		4.75%	5.01%	5.55%
Sept	3.25%	0.15%	2.65%		4.74%	5.01%	5.53%
Oct	3.25%	0.13%	2.54%		4.66%	5.10%	5.62%
Nov	3.25%	0.13%	2.78%		5.12%	5.37%	6.04%
Dec	3.25%	0.15%	3.29%		5.32%	5.56%	6.04%
2011							
Jan	3.25%	0.15%	3.30%		5.20%	5.57%	6.06%
Feb	3.25%	0.14%	3.58%		5.42%	5.88%	6.10%
Mar	3.25%	0.11%	3.41%		5.33%	5.58%	5.97%
Apr	3.25%	0.06%	3.46%		5.32%	5.55%	5.96%
May	3.25%	0.04%	3.17%		5.08%	5.32%	5.74%
June	3.25%	0.04%	3.00%		5.04%	5.26%	5.67%
July	3.25%	0.03%	3.00%		5.05%	5.27%	5.70%
Aug	3.25%	0.05%	2.30%		4.44%	4.69%	5.22%
Sept	3.25%	0.02%	1.98%		4.24%	4.48%	5.11%
Oct	3.25%	0.02%	2.15%		4.21%	4.52%	5.24%
Nov	3.25%	0.01%	2.01%		3.92%	4.25%	4.93%
Dec	3.25%	0.02%	1.98%		4.00%	4.33%	5.07%
2012							
Jan	3.25%	0.02%	1.97%		4.03%	4.34%	5.08%
Feb	3.25%	0.08%	1.97%		4.02%	4.36%	5.02%
Mar	3.25%	0.09%	2.17%		4.16%	4.48%	5.13%
Apr	3.25%	0.08%	2.05%		4.10%	4.40%	5.11%
May	3.25%	0.06%	1.80%		3.92%	4.20%	4.97%
June	3.25%	0.09%	1.62%		3.76%	4.08%	4.91%
July	3.25%	0.10%	1.53%		3.58%	3.93%	4.85%
Aug	3.25%	0.11%	1.68%		3.85%	4.00%	4.88%
Sept	3.25%	0.10%	1.72%		3.86%	4.02%	4.81%
Oct	3.25%	0.10%	1.75%		3.88%	3.91%	4.54%
Nov	3.25%	0.11%	1.65%		3.60%	3.84%	4.42%
Dec	3.25%	0.08%	1.72%		3.75%	4.00%	4.56%
2013							
Jan	3.25%	0.07%	1.91%		3.90%	4.15%	4.86%
Feb	3.25%	0.10%	1.88%		3.95%	4.18%	4.74%
Mar	3.25%	0.09%	1.96%		3.90%	4.15%	4.66%
Apr	3.25%	0.08%	1.76%		3.74%	4.00%	4.49%
May	3.25%	0.05%	1.93%		3.91%	4.17%	4.65%
June	3.25%	0.05%	2.30%		4.27%	4.53%	5.08%
July	3.25%	0.04%	2.58%		4.44%	4.68%	5.21%
Aug	3.25%	0.04%	2.74%		4.53%	4.73%	5.28%
Sept	3.25%	0.02%	2.61%		4.58%	4.80%	5.31%
Oct	3.25%	0.06%	2.62%		4.48%	4.70%	5.17%
Nov	3.25%	0.07%	2.72%		4.56%	4.77%	5.24%
Dec	3.25%	0.07%	2.90%		4.59%	4.81%	5.25%
2014							
Jan	3.25%	0.05%	2.86%		4.44%	4.63%	5.09%
Feb	3.25%	0.06%	2.71%		4.38%	4.53%	5.01%
Mar	3.25%	0.05%	2.72%		4.40%	4.51%	5.00%
Apr	3.25%	0.04%	2.71%		4.30%	4.41%	4.85%
May	3.25%	0.03%	2.56%		4.16%	4.26%	4.89%
June	3.25%	0.03%	2.60%		4.23%	4.26%	4.73%
July	3.25%	0.03%	2.54%		4.16%	4.23%	4.66%
Aug	3.25%				4.07%	4.13%	4.65%

[1] Note: Moody's has not published Aaa utility bond yields since 2001.

Sources: Council of Economic Advisors, Economic Indicators; Moody's Bond Record; Federal Reserve Bulletin, various issues.

STOCK PRICE INDICATORS

	S&P Composite [1]	NASDAQ Composite [1]	DJIA	S&P D/P	S&P E/P
1975 - 1982 Cycle					
1975			802.49	4.31%	9.15%
1976			974.92	3.77%	8.90%
1977			894.63	4.62%	10.79%
1978			820.23	5.28%	12.03%
1979			844.40	5.47%	13.46%
1980			891.41	5.26%	12.66%
1981			932.92	5.20%	11.96%
1982			884.36	5.81%	11.60%
1983 - 1991 Cycle					
1983			1,190.34	4.40%	8.03%
1984			1,178.48	4.64%	10.02%
1985			1,328.23	4.25%	8.12%
1986			1,792.76	3.49%	6.09%
1987			2,275.99	3.08%	5.48%
1988	[1]	[1]	2,060.82	3.64%	8.01%
1989	322.84		2,508.91	3.45%	7.41%
1990	334.59		2,678.94	3.61%	6.47%
1991	376.18	491.69	2,929.33	3.24%	4.79%
1992 - 2001 Cycle					
1992	415.74	\$599.26	3,284.29	2.99%	4.22%
1993	451.21	715.16	3,522.06	2.78%	4.46%
1994	460.42	751.65	3,793.77	2.82%	5.83%
1995	541.72	925.19	4,493.76	2.56%	6.09%
1996	670.50	1,164.96	5,742.89	2.19%	5.24%
1997	873.43	1,469.49	7,441.15	1.77%	4.57%
1998	1,085.50	1,794.91	8,625.52	1.49%	3.46%
1999	1,327.33	2,728.15	10,464.88	1.25%	3.17%
2000	1,427.22	2,783.67	10,734.90	1.15%	3.63%
2001	1,194.18	2,035.00	10,189.13	1.32%	2.95%
2002 - 2009 Cycle					
2002	993.94	1,539.73	9,226.43	1.61%	2.92%
2003	965.23	1,647.17	8,993.59	1.77%	3.84%
2004	1,130.65	1,986.53	10,317.39	1.72%	4.89%
2005	1,207.23	2,099.32	10,547.67	1.83%	5.36%
2006	1,310.46	2,263.41	11,408.67	1.87%	5.78%
2007	1,477.19	2,578.47	13,169.98	1.86%	5.29%
2008	1,220.04	2,161.65	11,252.62	2.37%	3.54%
2009	948.05	1,845.38	8,876.15	2.40%	1.86%
Current Cycle					
2010	1,139.97	2,349.89	10,662.80	1.98%	6.04%
2011	1,268.89	2,677.44	11,966.36	2.05%	6.77%
2012	1,379.35	2,965.56	12,967.08	2.24%	6.20%
2013	1,462.51	3,537.69	14,999.67	2.14%	5.57%

[1] Note: this source did not publish the S&P Composite prior to 1988 and the NASDAQ Composite prior to 1991.

Source: Council of Economic Advisors, Economic Indicators, various issues.

STOCK PRICE INDICATORS

	S&P Composite	NASDAQ Composite	DJIA	S&P D/P	S&P E/P
2004					
1st Qtr.	1,133.29	2,041.95	10,488.43	1.64%	4.62%
2nd Qtr.	1,122.87	1,984.13	10,289.04	1.71%	4.92%
3rd Qtr.	1,104.15	1,872.90	10,129.85	1.79%	5.18%
4th Qtr.	1,162.07	2,050.22	10,362.25	1.75%	4.83%
2005					
1st Qtr.	1,191.98	2,056.01	10,648.48	1.77%	5.11%
2nd Qtr.	1,181.65	2,012.24	10,382.35	1.85%	5.32%
3rd Qtr.	1,225.91	2,144.61	10,532.24	1.83%	5.42%
4th Qtr.	1,262.07	2,246.09	10,827.79	1.86%	5.60%
2006					
1st Qtr.	1,283.04	2,287.97	10,996.04	1.85%	5.61%
2nd Qtr.	1,281.77	2,240.46	11,188.84	1.90%	5.86%
3rd Qtr.	1,288.40	2,141.97	11,274.49	1.91%	5.88%
4th Qtr.	1,389.48	2,390.26	12,175.30	1.81%	5.75%
2007					
1st Qtr.	1,425.30	2,444.85	12,470.97	1.84%	5.85%
2nd Qtr.	1,496.43	2,552.37	13,214.26	1.82%	5.65%
3rd Qtr.	1,490.81	2,609.68	13,488.43	1.86%	5.15%
4th Qtr.	1,494.09	2,701.59	13,502.95	1.91%	4.51%
2008					
1st Qtr.	1,350.19	2,332.91	12,383.86	2.11%	4.55%
2nd Qtr.	1,371.65	2,426.26	12,508.59	2.10%	4.05%
3rd Qtr.	1,251.94	2,290.87	11,322.40	2.29%	3.94%
4th Qtr.	909.80	1,599.64	8,795.61	2.98%	1.65%
2009					
1st Qtr.	809.31	1,485.14	7,774.06	3.00%	0.86%
2nd Qtr.	892.23	1,731.41	8,327.83	2.45%	0.82%
3rd Qtr.	996.68	1,985.25	9,229.93	2.16%	1.19%
4th Qtr.	1,088.70	2,162.33	10,172.78	1.99%	4.57%
2010					
1st Qtr.	1,121.60	2,274.88	10,454.42	1.94%	5.21%
2nd Qtr.	1,135.25	2,343.40	10,570.54	1.97%	6.51%
3rd Qtr.	1,096.39	2,237.97	10,390.24	2.09%	6.30%
4th Qtr.	1,204.00	2,534.62	11,236.02	1.95%	6.15%
2011					
1st Qtr.	1,302.74	2,741.01	12,024.62	1.85%	6.13%
2nd Qtr.	1,319.04	2,766.64	12,370.73	1.97%	6.35%
3rd Qtr.	1,237.12	2,613.11	11,671.47	2.15%	7.69%
4th Qtr.	1,225.65	2,600.91	11,798.65	2.25%	6.91%
2012					
1st Qtr.	1,347.44	2,902.90	12,839.80	2.12%	6.29%
2nd Qtr.	1,350.39	2,928.62	12,765.58	2.30%	6.45%
3rd Qtr.	1,402.21	3,029.86	13,118.72	2.27%	6.00%
4th Qtr.	1,418.21	3,001.69	13,142.91	2.28%	6.07%
2013					
1st Qtr.	1,514.41	3,177.10	14,000.30	2.21%	5.59%
2nd Qtr.	1,609.77	3,369.49	14,961.28	2.15%	5.66%
3rd Qtr.	1,675.31	3,643.63	15,255.25	2.14%	5.61%
4th Qtr.	1,770.45	3,960.54	15,751.96	2.06%	5.42%
2014					
1st Qtr.	1,834.30	4,210.05	16,170.26	2.04%	5.38%
2nd Qtr.	1,900.37	4,195.81	16,603.50	2.06%	

Source: Council of Economic Advisors, Economic Indicators, various issues.

**ARTESIAN WATER COMPANY
CAPITAL STRUCTURE RATIOS
2009 - 2013**

YEAR	COMMON EQUITY	LONG-TERM DEBT	SHORT-TERM DEBT
2009	\$82,793,732 42.4% 44.1%	\$104,864,258 53.8% 55.9%	\$7,434,116 3.8%
2010	\$84,528,424 43.4% 44.7%	\$104,480,753 53.7% 55.3%	\$5,587,755 2.9%
2011	\$100,899,561 48.6% 48.6%	\$106,538,555 51.4% 51.4%	\$0 0.0%
2012	\$103,374,808 49.3% 49.3%	\$106,257,234 50.7% 50.7%	\$0 0.0%
2013	\$103,956,004 49.6% 49.6%	\$105,510,320 50.4% 50.4%	\$0 0.0%

Note: Percentages may not total 100.0% due to rounding.

Source: Response to PSC-ROR-4.

ARTESIAN RESOURCES CORPORATION
CAPITAL STRUCTURE RATIOS
2009 - 2013

YEAR	EQUITY	LONG-TERM DEBT	SHORT-TERM DEBT
2009	\$91,174,208 41.0% 46.2%	\$106,024,918 47.7% 53.8%	\$25,123,014 11.3%
2010	\$95,145,814 41.5% 47.5%	\$105,061,083 45.8% 52.5%	\$29,071,264 12.7%
2011	\$112,996,946 48.9% 51.5%	\$106,538,555 46.1% 48.5%	\$11,739,830 5.1%
2012	\$118,180,974 50.3% 52.7%	\$106,257,234 45.2% 47.3%	\$10,716,920 4.6%
2013	\$121,835,307 51.3% 53.6%	\$105,510,320 44.4% 46.4%	\$10,332,110 4.3%

Note: Percentages may not total 100.0% due to rounding.

Source: Response to PSC-ROR-4.

**AUS UTILITY REPORTS
WATER UTILITY GROUP
AVERAGE COMMON EQUITY RATIOS**

Year	Common Equity Ratio
2009	47.0%
2010	46.5%
2011	47.3%
2012	48.9%
2013	51.9%

Note: Averages include short-term debt.

Source: AUS Utility Reports.

**PROXY COMPANIES
COMMON EQUITY RATIOS**

	2009	2010	2011	2012	2013	2009-13 Average	Est'd 2017-19
Value Line Water Group							
American States Water Co.	54.1%	55.7%	54.6%	57.8%	60.2%	56.5%	57.5%
American Water Works	43.1%	43.2%	44.2%	46.1%	47.6%	44.8%	45.0%
Aqua America Inc.	44.4%	43.4%	47.3%	47.3%	51.1%	46.7%	48.0%
Artesian Resources	46.2%	47.5%	51.5%	52.7%	53.6%	50.3%	
California Water Service Group	52.9%	47.6%	48.3%	52.2%	58.4%	51.9%	51.0%
Connecticut Water Service, Inc.	49.1%	50.2%	46.5%	50.8%	52.9%	49.9%	57.0%
Middlesex Water	52.1%	55.8%	56.6%	57.4%	58.7%	56.1%	56.0%
SJW Corporation	50.6%	46.3%	43.4%	45.0%	48.9%	46.8%	46.5%
York Water Company	54.3%	51.7%	52.9%	54.0%	54.9%	53.6%	50.0%
Average						50.7%	51.4%
Median						50.3%	50.5%

Note: Common equity ratios exclude short-term debt.

Source: Value Line Investment Survey.

PROXY COMPANIES

Company	Market Capitalization (\$ thousands)	Percent Reg Water Revenues	Common Equity Ratio	Value Line Safety	S&P Stock Ranking	S&P Bond Rating
Value Line Water Group						
American States Water Co.	\$1,300,000	69%	60%	2	A	A+
American Water Works	\$8,700,000	89%	48%	3	NR	A+
Aqua America Inc.	\$4,400,000	98%	51%	2	A	AA-
Artesian Resources	\$193,465	94%	54%	3	A-	NR
California Water Service Group	\$1,100,000	100%	58%	3	A-	A/A-
Connecticut Water Service, Inc.	\$375,000	100%	53%	3	B+	A/A-
Middlesex Water	\$350,000	88%	59%	2	A-	A
SJW Corporation	\$550,000	95%	49%	3	B	A
York Water Company	\$250,000	100%	55%	2	A	A-

Sources: AUS Utility Reports, Value Line.

**PROXY COMPANIES
DIVIDEND YIELD**

COMPANY	Qtr DPS	June - August, 2014			YIELD	
		DPS	HIGH	LOW		AVERAGE
Value Line Water Group						
American States Water Co.	\$0.213	\$0.85	\$34.00	\$29.41	\$31.71	2.7%
American Water Works	\$0.310	\$1.24	\$50.64	\$45.98	\$48.31	2.6%
Aqua America Inc.	\$0.165	\$0.66	\$26.29	\$23.12	\$24.71	2.7%
Artesian Resources	\$0.212	\$0.85	\$22.85	\$20.78	\$21.82	3.9%
California Water Service Group	\$0.163	\$0.65	\$24.78	\$21.29	\$23.04	2.8%
Connecticut Water Service, Inc.	\$0.258	\$1.03	\$34.80	\$31.00	\$32.90	3.1%
Middlesex Water	\$0.190	\$0.76	\$21.76	\$20.10	\$20.93	3.6%
SJW Corporation	\$0.188	\$0.75	\$28.25	\$25.46	\$26.86	2.8%
York Water Company	\$0.143	\$0.57	\$21.20	\$18.85	\$20.03	2.9%
Average						3.0%

Source: Yahoo! Finance.

**PROXY COMPANIES
RETENTION GROWTH RATES**

COMPANY	2009	2010	2011	2012	2013	Average	2014	2015	2017-'19	Average
Value Line Water Group										
American States Water Co.	3.2%	5.8%	5.3%	6.6%	6.8%	5.5%	6.0%	5.0%	5.5%	5.5%
American Water Works	1.8%	2.8%	3.5%	3.6%	4.7%	3.3%	4.0%	4.5%	5.5%	4.7%
Aqua America Inc.	2.7%	3.7%	4.6%	4.3%	6.7%	4.4%	6.5%	7.0%	6.0%	6.5%
Artesian Resources	2.1%	2.0%	0.5%	2.5%	0.9%	1.6%				
California Water Service Group	3.8%	3.0%	2.3%	3.4%	3.4%	3.2%	3.0%	5.0%	4.0%	4.0%
Connecticut Water Service, Inc.	2.3%	1.6%	1.4%	2.8%	3.8%	2.4%	4.0%	3.5%	3.5%	3.7%
Middlesex Water	0.1%	2.1%	1.0%	1.4%	2.5%	1.4%	2.5%	2.5%	3.0%	2.7%
SJW Corporation	1.2%	1.2%	3.1%	3.3%	2.8%	2.3%	3.0%	3.5%	3.5%	3.3%
York Water Company	1.9%	2.7%	2.5%	2.4%	2.4%	2.4%	4.0%	4.5%	4.0%	4.2%
Average						2.9%				4.3%

Source: Value Line Investment Survey.

**PROXY COMPANIES
PER SHARE GROWTH RATES**

COMPANY	5-Year Historic Growth Rates				Est'd '11-'13 to '17-'19 Growth Rates			
	EPS	DPS	BVPS	Average	EPS	DPS	BVPS	Average
Value Line Water Group								
American States Water Co.	13.0%	6.5%	6.5%	8.7%	6.0%	9.0%	4.5%	6.5%
American Water Works					7.5%	7.5%	2.0%	5.7%
Aqua America Inc.	11.0%	7.0%	6.0%	8.0%	8.5%	9.0%	5.5%	7.7%
Artesian Resources	1.0%	3.5%	4.0%	2.8%				
California Water Service Group	4.0%	1.5%	4.5%	3.3%	7.5%	7.0%	4.5%	6.3%
Connecticut Water Service, Inc.	8.0%	2.0%	8.0%	6.0%	5.0%	3.0%	5.5%	4.5%
Middlesex Water	1.5%	1.5%	3.0%	2.0%	4.5%	2.0%	2.5%	3.0%
SJW Corporation	0.5%	3.5%	2.5%	2.2%	7.0%	5.0%	6.0%	6.0%
York Water Company	5.0%	2.5%	5.0%	4.2%	7.0%	5.5%	2.5%	5.0%
Average				4.6%				5.6%

Source: Value Line Investment Survey.

**PROXY COMPANIES
DCF COST RATES**

COMPANY	ADJUSTED YIELD	HISTORIC RETENTION GROWTH	PROSPECTIVE RETENTION GROWTH	HISTORIC PER SHARE GROWTH	PROSPECTIVE PER SHARE GROWTH	FIRST CALL EPS GROWTH	AVERAGE GROWTH	DCF RATES
Value Line Water Group								
American States Water Co.	2.8%	5.5%	5.5%	8.7%	6.5%	1.0%	5.4%	8.2%
American Water Works	2.6%	3.3%	4.7%		5.7%	8.5%	5.5%	8.2%
Aqua America Inc.	2.8%	4.4%	6.5%	8.0%	7.7%	4.0%	6.1%	8.9%
Artesian Resources	3.9%	1.6%		2.8%		4.0%	2.8%	6.8%
California Water Service Group	2.9%	3.2%	4.0%	3.3%	6.3%	6.0%	4.6%	7.5%
Connecticut Water Service, Inc.	3.2%	2.4%	3.7%	6.0%	4.5%	5.0%	4.3%	7.5%
Middlesex Water	3.7%	1.4%	2.7%	2.0%	3.0%	2.7%	2.4%	6.0%
SJW Corporation	2.9%	2.3%	3.3%	2.2%	6.0%	14.0%	5.6%	8.4%
York Water Company	2.9%	2.4%	4.2%	4.2%	5.0%	4.9%	4.1%	7.0%
Mean	3.1%	2.9%	4.3%	4.6%	5.6%	5.6%	4.5%	7.6%
Median	2.9%	2.4%	4.1%	3.8%	5.8%	4.9%	4.6%	7.5%
Composite - Mean		6.0%	7.4%	7.7%	8.7%	8.6%	7.6%	
Composite - Median		5.3%	7.0%	6.6%	8.7%	7.8%	7.5%	

Note: negative values not used in calculations.

Sources: Prior pages of this schedule.

**STANDARD & POOR'S 500 COMPOSITE
20-YEAR U.S. TREASURY BOND YIELDS
RISK PREMIUMS**

Year	EPS	BVPS	ROE	20-YEAR T-BOND INCOME	RISK PREMIUM
1977		\$79.07			
1978	\$12.33	\$85.35	15.00%	7.90%	7.10%
1979	\$14.86	\$94.27	16.55%	8.86%	7.69%
1980	\$14.82	\$102.48	15.06%	9.97%	5.09%
1981	\$15.36	\$109.43	14.50%	11.55%	2.95%
1982	\$12.64	\$112.46	11.39%	13.50%	-2.11%
1983	\$14.03	\$116.93	12.23%	10.38%	1.85%
1984	\$16.64	\$122.47	13.90%	11.74%	2.16%
1985	\$14.61	\$125.20	11.80%	11.25%	0.55%
1986	\$14.48	\$126.82	11.49%	8.98%	2.51%
1987	\$17.50	\$134.07	13.42%	7.92%	5.50%
1988	\$23.75	\$141.32	17.25%	8.97%	8.28%
1989	\$22.87	\$147.26	15.85%	8.81%	7.04%
1990	\$21.73	\$153.01	14.47%	8.19%	6.28%
1991	\$16.29	\$158.85	10.45%	8.22%	2.23%
1992	\$18.86	\$149.74	12.22%	7.29%	4.93%
1993	\$21.89	\$180.88	13.24%	7.17%	6.07%
1994	\$30.60	\$193.06	16.37%	6.59%	9.78%
1995	\$33.96	\$216.51	16.58%	7.60%	8.98%
1996	\$38.73	\$237.08	17.08%	6.18%	10.90%
1997	\$39.72	\$249.52	16.33%	6.64%	9.69%
1998	\$37.71	\$266.40	14.62%	5.83%	8.79%
1999	\$48.17	\$290.68	17.29%	5.57%	11.72%
2000	\$50.00	\$325.80	16.22%	6.50%	9.72%
2001	\$24.70	\$338.37	7.44%	5.53%	1.91%
2002	\$27.59	\$321.72	8.36%	5.59%	2.77%
2003	\$48.73	\$367.17	14.15%	4.80%	9.35%
2004	\$58.55	\$414.75	14.98%	5.02%	9.96%
2005	\$69.93	\$453.06	16.12%	4.69%	11.43%
2006	\$81.51	\$504.39	17.03%	4.68%	12.35%
2007	\$66.17	\$529.59	12.80%	4.86%	7.94%
2008	\$14.88	\$451.37	3.03%	4.45%	-1.42%
2009	\$50.97	\$513.58	10.56%	3.47%	7.09%
2010	\$77.35	\$579.14	14.16%	4.25%	9.91%
2011	\$86.58	\$613.14	14.52%	3.81%	10.71%
2012	\$86.51	\$666.97	13.52%	2.40%	11.12%
2013	\$108.67	\$769.86	15.13%	2.86%	12.27%
Average					6.75%

Source: Standard & Poor's Analysts' Handbook, Ibbotson Associates Handbook.

**PROXY COMPANIES
CAPM COST RATES**

COMPANY	RISK-FREE RATE	BETA	RISK PREMIUM	CAPM RATES
Value Line Water Group				
American States Water Co.	3.05%	0.70	5.85%	7.1%
American Water Works	3.05%	0.70	5.85%	7.1%
Aqua America Inc.	3.05%	0.70	5.85%	7.1%
Artesian Resources	3.05%	0.55	5.85%	6.3%
California Water Service Group	3.05%	0.70	5.85%	7.1%
Connecticut Water Service, Inc.	3.05%	0.65	5.85%	6.9%
Middlesex Water	3.05%	0.70	5.85%	7.1%
SJW Corporation	3.05%	0.80	5.85%	7.7%
York Water Company	3.05%	0.75	5.85%	7.4%
Mean				7.1%
Median				7.1%

Sources: Value Line Investment Survey, Standard & Poor's Analysts' Handbook, Federal Reserve.

20-year Treasury Bonds	
Month	Rate
June 2014	3.15%
July 2014	3.07%
Aug. 2014	2.94%
Average	3.05%

**PROXY COMPANIES
RATES OF RETURN ON AVERAGE COMMON EQUITY**

COMPANY	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2002-2008 Average	2009-2013 Average	2014	2015	2017-19
	Value Line Water Group																
American States Water Co.	9.6%	5.6%	8.0%	10.4%	8.2%	9.3%	7.2%	8.8%	9.0%	11.7%	12.5%	13.2%	8.3%	11.0%	12.5%	12.0%	12.5%
American Water Works	13.9%	12.3%	11.4%	11.5%	11.0%	10.0%	9.6%	9.6%	9.6%	15.8%	8.2%	8.1%	8.3%	10.4%	9.0%	9.5%	10.5%
Aque America Inc.	9.6%	7.4%	7.6%	8.9%	10.2%	8.5%	7.4%	8.1%	10.9%	11.8%	14.9%	15.2%	11.4%	12.5%	13.5%	14.5%	14.0%
Artesian Resources	9.6%	8.7%	9.8%	9.3%	7.6%	4.9%	10.1%	7.4%	8.8%	6.5%	8.5%	6.9%	8.5%	7.6%	8.0%	9.0%	10.0%
California Water Service Group	11.6%	11.2%	11.4%	12.0%	7.5%	8.9%	9.2%	9.7%	8.8%	8.5%	10.6%	8.8%	8.6%	8.8%	10.0%	9.0%	8.5%
Connecticut Water Service, Inc.	9.8%	8.2%	8.3%	8.4%	8.6%	8.8%	8.8%	7.0%	9.0%	7.6%	7.9%	8.9%	8.7%	8.1%	8.5%	8.5%	9.0%
Middlesex Water	9.4%	9.8%	11.3%	11.5%	18.2%	8.3%	11.2%	6.0%	9.6%	8.0%	8.3%	7.5%	11.4%	7.9%	7.5%	8.0%	8.0%
SJW Corporation	16.7%	11.7%	12.2%	11.8%	10.5%	9.7%	9.4%	9.6%	10.0%	9.7%	9.5%	9.5%	11.7%	9.7%	11.5%	12.0%	12.0%
York Water Company																	
Average	11.3%	9.4%	10.0%	10.5%	10.2%	8.6%	9.1%	8.3%	9.3%	9.9%	9.9%	9.8%	9.9%	9.5%	10.1%	10.3%	10.6%
Median	9.7%	9.3%	10.6%	11.0%	9.4%	8.9%	9.3%	8.5%	9.0%	9.7%	9.1%	8.9%	9.7%	9.0%	9.5%	9.3%	10.3%

Source: AUS Utility Reportgs

**PROXY COMPANIES
 MARKET TO BOOK RATIOS**

COMPANY	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2002-2008 Average	2009-2013 Average
Value Line Water Group														
American States Water Co.	176%	178%	181%	230%	205%	219%	210%	189%	167%	162%	234%	244%	200%	199%
American Water Works	304%	280%	321%	436%	332%	259%	238%	90%	117%	138%	166%	172%		137%
Aqua America Inc.	159%	207%	214%	215%	198%	150%	117%	221%	264%	243%	332%	292%	310%	270%
Artesian Resources	199%	189%	218%	264%	223%	219%	222%	150%	154%	131%	148%	147%	180%	146%
California Water Service Group	275%	266%	233%	216%	211%	199%	173%	190%	172%	163%	174%	182%	219%	176%
Connecticut Water Service, Inc.	225%	265%	214%	214%	178%	184%	141%	174%	194%	204%	173%	182%	225%	188%
Middlesex Water	199%	189%	218%	264%	307%	236%	175%	225%	162%	160%	168%	175%	203%	168%
SJW Corporation	277%	335%	275%	367%	309%	266%	190%	203%	235%	234%	233%	260%	288%	233%
York Water Company														
Average	227%	239%	234%	276%	245%	217%	183%	181%	181%	178%	200%	204%	232%	189%
Median	212%	236%	218%	247%	217%	219%	183%	189%	167%	163%	174%	182%	219%	175%

Source: AUS Utility Reportgts

**STANDARD & POOR'S 500 COMPOSITE
RETURNS AND MARKET-TO-BOOK RATIOS
2002 - 2013**

YEAR	RETURN ON AVERAGE EQUITY	MARKET-TO BOOK RATIO
2002	8.4%	296%
2003	14.2%	278%
2004	15.0%	291%
2005	16.1%	278%
2006	17.0%	277%
2007	12.8%	284%
2008	3.0%	224%
2009	10.6%	187%
2010	14.2%	208%
2011	14.6%	208%
2012	13.5%	214%
2013	15.1%	228%
Averages:		
2002-2008	12.4%	275%
2009-2012	13.6%	209%

Source: Standard & Poor's Analyst's Handbook, 2014 edition.

RISK INDICATORS

COMPANY	VALUE LINE SAFETY	VALUE LINE BETA	VALUE LINE FINANCIAL STRENGTH	S & P STOCK RANKING
Value Line Water Group				
American States Water Co.	2	0.70	A	4.00
American Water Works	3	0.70	B+	3.33
Aqua America Inc.	2	0.70	B++	3.67
Artesian Resources	3	0.55	B	3.00
California Water Service Group	3	0.70	B++	3.67
Connecticut Water Service, Inc.	3	0.65	B+	3.33
Middlesex Water	2	0.70	B++	3.67
SJW Corporation	3	0.80	B+	3.33
York Water Company	2	0.75	B+	3.33
	2.6	0.69	B+/B++	3.48

RISK INDICATORS

GROUP	VALUE LINE SAFETY	VALUE LINE BETA	VALUE LINE FIN STR	S & P STK RANK
S & P's 500 Composite	2.7	1.05	B++	B
Value Line Water Group	2.6	0.69	B+/B++	A-

Sources: Value Line Investment Survey, Standard & Poor's Stock Guide.

Definitions:

Safety rankings are in a range of 1 to 5, with 1 representing the highest safety or lowest risk.

Beta reflects the variability of a particular stock, relative to the market as a whole. A stock with a beta of 1.0 moves in concert with the market, a stock with a beta below 1.0 is less variable than the market, and a stock with a beta above 1.0 is more variable than the market.

Financial strengths range from C to A++, with the latter representing the highest level.

Common stock rankings range from D to A+, with the later representing the highest level.

In the Matter of the Application of
Artesian Water Company, Inc.
For a Revision of Rates
(Filed April 11, 2014)
PSC Docket No. 14-132
RESPONSES TO INITIAL DATA REQUESTS

PSC-ROR-8 Please provide identify each instance since 2000 that ARC has make a public offering of common stock and provide the following information for each listed public offering:

- a. Date of offering;
- b. Number of shares sold;
- c. Price per share;
- d. Book value per share at time of offering;
- e. Issuance costs related to public offering.

Response: The last instance of ARC issuing common shares occurred in 2011. Details of this offering are provided in Tab 8 of Volume 2 of the Application of Artesian Water Company, Inc. For A Revision Of Rates filed April 11, 2014. The book value per share prior to issuance was \$12.47. Following the issuance the book value per share was \$13.00. See the attached document labeled PSC-ROR-8-0001 for the calculation of book price per share.

Provided by: David L. Valcarenghi
Manager of Rates and Regulations

Date: August 8, 2014

Total cost of issuance \$ 214,331

Book Value Before Issuance

Total Equity as of June 30, 2011 \$ 95,705,024

Common Stock as of June 30, 2011 7,828,245

Less Treasury Stock (152,929)

7,675,316

Book Value 12.47

Book Value After Issuance

Total Equity as of June 30, 2011 \$ 95,705,024

Net Cash Proceeds from Stock Offering 15,641,646

\$ 111,346,670

Common Stock as of June 30, 2011 7,828,245

Less Treasury Stock (152,929)

7,675,316

Total Shares Issued Including Over-Allotment 888,290

8,563,606

Book Value 13.00