

**STATE OF NORTH CAROLINA
UTILITIES COMMISSION
RALEIGH**

DOCKET NO. W-354, SUB 384

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

IN THE MATTER OF
APPLICATION BY CAROLINA WATER SERVICE, INC. OF NORTH CAROLINA
FOR AUTHORITY TO ADJUST AND INCREASE RATES AND CHARGES FOR
WATER AND SEWER UTILITY SERVICE IN ALL SERVICE AREAS IN
NORTH CAROLINA

PREFILED DIRECT TESTIMONY OF

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PARTNER
SCOTTMADDEN, INC.

ON BEHALF OF

CAROLINA WATER SERVICE, INC. OF NORTH CAROLINA

July 2, 2021

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I. INTRODUCTION

A. WITNESS IDENTIFICATION

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Dylan W. D’Ascendis. My business address is 3000 Atrium Way, Suite 241, Mount Laurel, NJ 08054.

Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?

A. I am a Partner at ScottMadden, Inc.

B. BACKGROUND AND QUALIFICATIONS

Q. PLEASE SUMMARIZE YOUR PROFESSIONAL EXPERIENCE AND EDUCATIONAL BACKGROUND.

A. I have offered expert testimony on behalf of investor-owned utilities in over 30 state regulatory commissions in the United States, the Federal Energy Regulatory Commission, the Alberta Utility Commission, and one American Arbitration Association panel on issues including, but not limited to, common equity cost rate, rate of return, valuation, capital structure, class cost of service, and rate design.

On behalf of the American Gas Association (“AGA”), I calculate the AGA Gas Index, which serves as the benchmark against which the performance of the American Gas Index Fund (“AGIF”) is measured on a monthly basis. The AGA Gas Index and AGIF are a market capitalization weighted index and mutual fund, respectively, comprised of the common stocks of the publicly traded corporate members of the AGA.

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I am a member of the Society of Utility and Regulatory Financial Analysts (“SURFA”). In 2011, I was awarded the professional designation “Certified Rate of Return Analyst” by SURFA, which is based on education, experience, and the successful completion of a comprehensive written examination.

I am also a member of the National Association of Certified Valuation Analysts (“NACVA”) and was awarded the professional designation “Certified Valuation Analyst” by the NACVA in 2015.

I am a graduate of the University of Pennsylvania, where I received a Bachelor of Arts degree in Economic History. I have also received a Master of Business Administration with high honors and concentrations in Finance and International Business from Rutgers University.

The details of my educational background and expert witness appearances are included in Appendix A.

II. PURPOSE OF TESTIMONY

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?

A. The purpose of my testimony is to present evidence on behalf of Carolina Water Service, Inc. of North Carolina (“CWSNC” or the “Company”) about the appropriate capital structure and corresponding cost rates the Company should be given the opportunity to earn on its jurisdictional rate base.

1 **Q. HAVE YOU PREPARED AN EXHIBIT IN SUPPORT OF YOUR**
2 **RECOMMENDATION?**

3 A. Yes. I have prepared D'Ascendis Exhibit No. 1, which contains Schedules
4 DWD-1 through DWD-8, and has been prepared by me or under my direct
5 supervision.

6 **Q. WHAT IS YOUR RECOMMENDED COST OF CAPITAL FOR CWSNC?**

7 A. I recommend the North Carolina Utilities Commission ("NCUC" or the
8 "Commission") authorize the Company the opportunity to earn an overall
9 rate of return of 7.63% based on CWSNC's parent, CORIX Regulated
10 Utilities, Inc.'s ("CRU") actual capital structure as of March 31, 2021. The
11 ratemaking capital structure consists of 52.03% long-term debt at an
12 embedded cost rate of 4.97% and 47.97% common equity at my
13 recommended common equity cost rate of 10.50%. The overall rate of
14 return is summarized on page 1 of Schedule DWD-1 and in Table 1 below:

15 **Table 1: Summary of Overall Rate of Return**

<u>Type of Capital</u>	<u>Ratios</u>	<u>Cost Rate</u>	<u>Weighted Cost Rate</u>
Long-Term Debt	52.03%	4.97%	2.59%
Common Equity	<u>47.97%</u>	10.50%	<u>5.04%</u>
Total	<u>100.00%</u>		<u>7.63%</u>

1 **III. SUMMARY**

2 **Q. PLEASE SUMMARIZE YOUR RECOMMENDED COMMON EQUITY**
3 **COST RATE.**

4 A. My recommended common equity cost rate of 10.50% is summarized on
5 page 2 of Schedule DWD-1. I have assessed the market-based common
6 equity cost rates of companies of relatively similar, but not necessarily
7 identical, risk to CWSNC. Using companies of relatively comparable risk as
8 proxies is consistent with the principles of fair rate of return established in
9 the *Hope*¹ and *Bluefield*² cases. No proxy group can be identical in risk to
10 any single company, so there must be an evaluation of relative risk between
11 the company and the proxy group to see if it is appropriate to make
12 adjustments to the proxy group's indicated rate of return.

13 My recommendation results from the application of several cost of
14 common equity models, specifically the Discounted Cash Flow ("DCF")
15 model, the Risk Premium Model ("RPM"), and the Capital Asset Pricing
16 Model ("CAPM"), to the market data of a proxy group of eight water
17 companies ("Utility Proxy Group") whose selection criteria will be discussed
18 below. In addition, I also applied the DCF, RPM, and CAPM to a proxy
19 group of domestic, non-price regulated companies comparable in total risk
20 to the Utility Proxy Group ("Non-Price Regulated Proxy Group").

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

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

The results derived from each are as follows:

Table 2: Summary of Common Equity Cost Rate

	Using Projected Interest Rates	Using Current Interest Rates
Discounted Cash Flow Model	8.63%	8.63%
Risk Premium Model	11.03%	10.53%
Capital Asset Pricing Model	10.16%	9.85%
Market Models Applied to Comparable Risk, Non-Price Regulated Companies	<u>10.68%</u>	<u>10.24%</u>
Indicated Range of Common Equity Cost Rates Before Adjustments for Company-Specific Risk	10.13% - 10.42%	9.81% - 10.05%
Size Adjustment	0.40%	0.40%
Indicated Range of Common Equity Cost Rates after Adjustment	<u>10.53% – 10.82%</u>	<u>10.21% – 10.45%</u>
Recommended Cost of Common Equity	<u>10.50%</u>	

After analyzing the indicated common equity cost rates derived through these models, the indicated range of common equity cost rates applicable to the Utility Proxy Group is from 10.13% to 10.42% using projected interest rates and 9.81% to 10.05% using current interest rates. This range is set by using the average and median model results.

The indicated range of common equity cost rates applicable to the Utility Proxy Group was then adjusted upward by 0.40% to reflect CWSNC's smaller size relative to the Utility Proxy Group. These adjustments result in Company-specific ranges of common equity cost rates from 10.53% to 10.82% using projected interest rates and 10.21% and 10.45% using

1 current interest rates. In view of these ranges of results, I recommend the
2 Commission consider a common equity cost rate of 10.50% for use in
3 setting rates for the Company.

4 **IV. GENERAL PRINCIPLES**

5 **Q. WHAT GENERAL PRINCIPLES HAVE YOU CONSIDERED IN ARRIVING**
6 **AT YOUR RECOMMENDED COMMON EQUITY COST RATE OF**
7 **10.50%?**

8 A. In unregulated industries, the competition of the marketplace is the principal
9 determinant of the price of products or services. For regulated public
10 utilities, regulation must act as a substitute for marketplace competition.
11 Assuring that the utility can fulfill its obligations to the public, while providing
12 safe and reliable service at all times, requires a level of earnings sufficient
13 to maintain the integrity of presently invested capital. Sufficient earnings
14 also permit the attraction of needed new capital at a reasonable cost, for
15 which the utility must compete with other firms of comparable risk,
16 consistent with the fair rate of return standards established by the
17 U.S. Supreme Court in the previously cited *Hope* and *Bluefield* decisions.
18 Consequently, marketplace data must be relied on in assessing a common
19 equity cost rate appropriate for ratemaking purposes. Just as the use of the
20 market data for the proxy group adds reliability to the informed expert's
21 judgment used in arriving at a recommended common equity cost rate, the
22 use of multiple generally accepted common equity cost rate models also

1 adds reliability and accuracy when arriving at a recommended common
2 equity cost rate.

3 **A. BUSINESS RISK**

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

6 A. Business risk is the riskiness of a company's common stock without the use
7 of debt and/or preferred capital. Examples of such general business risks
8 faced by all utilities (*i.e.*, electric, natural gas distribution, and water) include
9 size, the quality of management, the regulatory environment in which
10 utilities operate, customer mix and concentration of customers, service
11 territory growth, and capital intensity. All of these have a direct bearing on
12 earnings.

13 Consistent with the basic financial principle of risk and return,
14 business risk is important to the determination of a fair rate of return,
15 because the higher the level of risk, the higher the rate of return investors
16 demand.

17 **Q. WHAT BUSINESS RISKS DO THE WATER AND WASTEWATER**
18 **INDUSTRIES FACE IN GENERAL?**

19 A. Water and wastewater utilities have an ever-increasing responsibility to be
20 stewards of the environment from which water supplies are drawn in order
21 to preserve and protect essential natural resources of the United States.
22 This increased environmental stewardship is a direct result of compliance
23 with the Safe Water Drinking Act, as well as a response to continuous

1 monitoring by the Environmental Protection Agency (“EPA”) and state and
2 local governments, of the water supply for potential contaminants and their
3 resultant regulations. This, plus aging infrastructure, necessitate additional
4 capital investment in the distribution and treatment of water, exacerbating
5 the pressure on free cash flows arising from increased capital expenditures
6 for infrastructure repair and replacement. The significant amount of capital
7 investment and, hence, high capital intensity, is a major risk factor for the
8 water and wastewater utility industry.

9 *Value Line Investment Survey* (“*Value Line*”) observes the following
10 about the water utility industry:

11 Following years and years of underinvestment, the
12 nation found itself with an aging water infrastructure
13 that is in poor condition. Many pipelines were installed
14 50 to 75 years ago. In badly need of replacement,
15 water utilities have been spending heavily to replace
16 old assets. This high level of expenditures will have to
17 be maintained for decades.

18 * * *

19 As we have highlighted in the past, one of the most
20 significant factors in determining the profitability of a
21 utility is the regulatory climate where it operates.
22 Fortunately for the Water Utility Industry, state
23 authorities and water utilities both realize what needs
24 to be done, and are working constructively to address
25 the issues. Regulators agree that the outlays being
26 made to upgrade the country’s infrastructure are
27 required, so they are allowing fair return on investment
28 to be made. Having a positive relationship may seem
29 reasonable, but this is not the case for gas and electric
30 utilities. Conflicts are not unusual.³

³ *Value Line Investment Survey*, April 9, 2021.

1 The water and wastewater industry also experiences low
2 depreciation rates. Depreciation rates are one of the principal sources of
3 internal cash flows for all utilities (through a utility's depreciation expense)
4 and are vital for a company to fund ongoing replacements and repairs of
5 water and wastewater systems. Water / wastewater utility assets have long
6 lives, and therefore have long capital recovery periods. As such, they face
7 greater risk due to inflation, which results in a higher replacement cost per
8 dollar of net plant.

9 Substantial capital expenditures, as noted by *Value Line*, will require
10 significant financing. The three sources of financing typically used are debt,
11 equity (common and preferred), and cash flow. All three are intricately
12 linked to the opportunity to earn a sufficient rate of return as well as the
13 ability to achieve that return. Consistent with *Hope* and *Bluefield*, the return
14 must be sufficient to maintain credit quality as well as enable the attraction
15 of necessary new capital, be it debt or equity capital. If unable to raise debt
16 or equity capital, the utility must turn to either retained earnings or free cash
17 flow,⁴ both of which are directly linked to earning a sufficient rate of return.
18 The level of free cash flow represents a utility's ability to meet the needs of
19 its debt and equity holders. If either retained earnings or free cash flow is
20 inadequate, it will be nearly impossible for the utility to attract the needed
21 capital for new infrastructure investment necessary to ensure quality service

⁴ Free Cash Flow = Operating Cash Flow (Funds From Operations) minus Capital Expenditures.

1 to its customers. An insufficient rate of return can be financially devastating
2 for utilities as well as a public safety issue for their customers.

3 The water and wastewater utility industry's high degree of capital
4 intensity and low depreciation rates, coupled with the need for substantial
5 infrastructure capital spending, require regulatory support in the form of
6 adequate and timely rate relief, and in particular, a sufficient authorized
7 return on common equity, so that the industry can successfully meet the
8 challenges it faces.

9 **B. FINANCIAL RISK**

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

12 A. Financial risk is the additional risk created by the introduction of debt and
13 preferred stock into the capital structure. The higher the proportion of debt
14 and preferred stock in the capital structure, the higher the financial risk (*i.e.*
15 likelihood of default). Therefore, consistent with the basic financial principle
16 of risk and return, investors demand a higher common equity return as
17 compensation for bearing higher default risk.

18 **Q. CAN BOND AND CREDIT RATINGS BE A PROXY FOR THE COMBINED**
19 **BUSINESS AND FINANCIAL RISK (*I.E.*, INVESTMENT RISK OF AN**
20 **ENTERPRISE)?**

21 A. Yes, similar bond ratings/issuer credit ratings reflect, and are representative
22 of, similar combined business and financial risks (*i.e.*, total risk) faced by

1 bond investors.⁵ Although specific business or financial risks may differ
2 between companies, the same bond/credit rating indicates that the
3 combined risks are roughly similar, albeit not necessarily equal, as the
4 purpose of the bond/credit rating process is to assess credit quality or credit
5 risk, and not common equity risk.

6 **Q. THAT BEING SAID, DO RATING AGENCIES REFLECT COMPANY SIZE**
7 **IN THEIR BOND RATINGS?**

8 A. No. Neither S&P nor Moody's have minimum company size requirements
9 for any given rating level. This means, all else equal, a relative size analysis
10 needs to be conducted for companies with similar bond ratings.

11 **V. CWSNC AND THE UTILITY PROXY GROUP**

12 **Q. ARE YOU FAMILIAR WITH THE OPERATIONS OF CWSNC?**

13 A. Yes. CWSNC is an operating subsidiary of CRU. The Company provides
14 water service to approximately 30,900 residential and commercial
15 customers in North Carolina.⁶ CWSNC's common stock is not publicly
16 traded.

17 **Q. PLEASE EXPLAIN HOW YOU CHOSE YOUR UTILITY PROXY GROUP.**

18 A. The basis of selection for the Utility Proxy Group was to select those
19 companies which meet the following criteria:

⁵ Risk distinctions within S&P's bond rating categories are recognized by a plus or minus, i.e., within the A category, an S&P rating can be at A+, A, or A-. Similarly, risk distinctions for Moody's ratings are distinguished by numerical rating gradations, i.e., within the A category, a Moody's rating can be A1, A2 and A3.

⁶ 2020 Annual Report of Carolina Water Service, Inc. of North Carolina.

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- (i) They are included in the Water Utility Group of *Value Line's* Standard Edition or Small & Midcap Edition (April 9, 2021);
- (ii) They have 70% or greater of 2020 total operating income and 70% or greater of 2020 total assets attributable to regulated water operations;
- (iii) At the time of preparation of this testimony, they had not publicly announced that they were involved in any major merger or acquisition activity (*i.e.*, one publicly-traded utility merging with or acquiring another);
- (iv) They have not cut or omitted their common dividends during the five years ending 2020 or through the time of the preparation of this testimony;
- (v) They have *Value Line* and Bloomberg Professional Services ("Bloomberg") adjusted betas;
- (vi) They have a positive *Value Line* five-year dividends per share ("DPS") growth rate projection; and
- (vii) They have *Value Line*, Zacks, Yahoo! Finance, or Bloomberg consensus five-year earnings per share ("EPS") growth rate projections.

The following eight companies met these criteria: American States Water Co., American Water Works Co., Inc., Artesian Resources

1 Corporation, California Water Service Group, Global Water Resources, Inc.,
2 Middlesex Water Co., SJW Corp., and The York Water Co.

3 **Q. PLEASE DESCRIBE SCHEDULE DWD-2, PAGE 1.**

4 A. Page 1 of Schedule DWD-2 contains comparative capitalization and
5 financial statistics for the Utility Proxy Group identified above for the years
6 2016 to 2020. During the five-year period ending 2020, the historically
7 achieved average earnings rate on book common equity for the group
8 averaged 10.23%. The average common equity ratio based on total
9 permanent capital (excluding short-term debt) was 49.39%, and the
10 average dividend payout ratio was 58.61%.

11 Total debt to earnings before interest, taxes, depreciation, and
12 amortization for the years 2016 to 2020 ranges between 3.73x and 5.32x,
13 with an average of 4.44x. Funds from operations to total debt range from
14 12.38% to 23.06%, with an average of 18.33%.

15 **VI. CAPITAL STRUCTURE**

16 **Q. WHAT CAPITAL STRUCTURE RATIOS DO YOU RECOMMEND BE**
17 **EMPLOYED IN DEVELOPING AN OVERALL FAIR RATE OF RETURN**
18 **APPROPRIATE FOR THE COMPANY?**

19 A. I recommend the use of CRU's capital structure as of March 31, 2021, which
20 consists of 52.03% long-term debt and 47.97% common equity as shown
21 on page 1 of Schedule DWD-1 to be used as CWSNC's ratemaking capital
22 structure in this proceeding.

1 **Q. HOW DOES CWSNC'S RATEMAKING COMMON EQUITY RATIO OF**
2 **47.97% COMPARE WITH THE EQUITY RATIOS MAINTAINED BY THE**
3 **COMPANIES IN YOUR UTILITY PROXY GROUP?**

4 A. CWSNC's ratemaking common equity ratio of 47.97% is reasonable and
5 consistent with the range of common equity ratios maintained, on average,
6 by the companies in the Utility Proxy Group on which I base my
7 recommended common equity cost rate. As shown on page 2 of Schedule
8 DWD-2, the common equity ratios of the Utility Proxy Group range from
9 21.91% to 59.28% in 2020. In my opinion, CWSNC's ratemaking equity
10 ratio of 47.97% falls within a reasonable range.

11 **Q. WHAT LONG-TERM DEBT COST RATE IS MOST APPROPRIATE FOR**
12 **CWSNC IN THIS PROCEEDING?**

13 A. CRU's actual long-term debt cost rate of 4.97% is reasonable and
14 appropriate as CWSNC's cost of long-term debt in this proceeding.

15 **VII. COMMON EQUITY COST RATE MODELS**

16 **Q. Is it important that cost of common equity models be market based?**

17 A. Yes. A public utility must compete for equity in capital markets along with
18 all other companies of comparable risk, which includes non-utilities. The
19 cost of common equity is thus determined based on equity market
20 expectations for the returns of those comparable risk companies. If an
21 individual investor is choosing to invest their capital among companies of

1 comparable risk, they will choose a company providing a higher return over
2 a company providing a lower return.

3 **Q. ARE YOUR COST OF COMMON EQUITY MODELS MARKET-BASED**
4 **MODELS?**

5 A. Yes. The DCF model is market-based because market prices are used in
6 developing the dividend yield component of the model. The RPM is market-
7 based because the bond ratings and expected bond yields used in the
8 application of the RPM reflect the market's assessment of bond/credit risk.
9 In addition, the use of beta coefficients (β) to determine the equity risk
10 premium reflects the market's assessment of market/systematic risk, since
11 beta coefficients are derived from regression analyses of market prices.
12 The Predictive Risk Premium Model ("PRPM") uses monthly market returns
13 in addition to expectations of the risk-free rate. The CAPM is market-based
14 for many of the same reasons that the RPM is market-based (*i.e.*, the use
15 of expected bond yields and beta coefficients). Selection of the comparable
16 risk non-price regulated companies is market-based because it is based on
17 statistics which result from regression analyses of market prices and reflect
18 the market's assessment of total risk.

19 **A. DISCOUNTED CASH FLOW MODEL**

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

21 A. The theory underlying the DCF model is that the present value of an
22 expected future stream of net cash flows during the investment holding

1 period can be determined by discounting those cash flows at the cost of
2 capital, or the investors' capitalization rate. DCF theory indicates that an
3 investor buys a stock for an expected total return rate, which is derived from
4 cash flows received in the form of dividends plus appreciation in market
5 price (the expected growth rate). Mathematically, the dividend yield on
6 market price plus a growth rate equals the capitalization rate, *i.e.*, the total
7 common equity return rate expected by investors.

8 **Q. WHICH VERSION OF THE DCF MODEL DID YOU USE?**

9 A. I used the single-stage constant growth DCF model.

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

12 A. The unadjusted dividend yields are based on the proxy companies'
13 dividends as of April 16, 2021, divided by the average of closing market
14 prices for the 60 trading days ending April 16, 2021.⁷

15 **Q. PLEASE EXPLAIN YOUR ADJUSTMENT TO THE DIVIDEND YIELD.**

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

20 DCF theory calls for the use of the full growth rate, or D_1 , in
21 calculating the dividend yield component of the model. Since the various

⁷ See, Schedule DWD-3, page 1, Column 1.

1 companies in the Utility Proxy Group increase their quarterly dividend at
2 various times during the year, a reasonable assumption is to reflect one-
3 half the annual dividend growth rate in the dividend yield component, or
4 $D_{1/2}$. Because the dividend should be representative of the next 12-month
5 period, my adjustment is a conservative approach that does not overstate
6 the dividend yield. Therefore, the actual average dividend yields in Column
7 1 on page 1 of Schedule DWD-3 have been adjusted upward to reflect one-
8 half the average projected growth rate shown in Column 7.

9 **Q. PLEASE EXPLAIN THE BASIS OF THE GROWTH RATES YOU**
10 **APPLIED TO THE UTILITY PROXY GROUP IN YOUR DCF MODEL.**

11 A. Investors with more limited resources than institutional investors are likely
12 to rely on widely available financial information services, such as *Value*
13 *Line*, *Zacks*, *Yahoo! Finance*, and *Bloomberg*. Investors realize that
14 analysts have significant insight into the dynamics of the industries and
15 individual companies they analyze, as well as companies' abilities to
16 effectively manage the effects of changing laws and regulations, and ever-
17 changing economic and market conditions. For these reasons, I used
18 analysts' five-year forecasts of EPS growth in my DCF analysis.

19 Over the long run, there can be no growth in DPS without growth in
20 EPS. Security analysts' earnings expectations have a more significant
21 influence on market prices than dividend expectations. Thus, the use of
22 earnings growth rates in a DCF analysis provides a better match between

1 investors' market price appreciation expectations and the growth rate
2 component of the DCF.

3 **Q. PLEASE SUMMARIZE THE CONSTANT GROWTH DCF MODEL**
4 **RESULTS.**

5 A. As shown on page 1 of Schedule DWD-3, the mean result of the application
6 of the single-stage DCF model is 9.11%, the median result is 8.14%, and
7 the average of the two is 8.63% for the Utility Proxy Group. In arriving at a
8 conclusion for the DCF-indicated common equity cost rate for the Utility
9 Proxy Group, I have relied on an average of the mean and the median
10 results of the DCF. This approach takes into consideration all the proxy
11 companies' results, while mitigating the high and low outliers of those
12 individual results.

13 **B. THE RISK PREMIUM MODEL**

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

15 A. The RPM is based on the fundamental financial principle of risk and return,
16 namely, that investors require greater returns for bearing greater risk. The
17 RPM recognizes that common equity capital has greater investment risk
18 than debt capital, as common equity shareholders are behind debt holders
19 in any claim on a company's assets and earnings. As a result, investors
20 require higher returns from common stocks than from investment in bonds,
21 to compensate them for bearing the additional risk.

22 While it is possible to directly observe bond returns and yields,
23 investors' required common equity return cannot be directly determined or

1 observed. According to RPM theory, one can estimate a common equity
2 risk premium over bonds (either historically or prospectively), and use that
3 premium to derive a cost rate of common equity. The cost of common equity
4 equals the expected cost rate for long-term debt capital, plus a risk premium
5 over that cost rate, to compensate common shareholders for the added risk
6 of being unsecured and last-in-line for any claim on the corporation's assets
7 and earnings in the event of a liquidation.

8 **Q. PLEASE EXPLAIN HOW YOU DERIVED YOUR INDICATED COST OF**
9 **COMMON EQUITY BASED ON THE RPM.**

10 A. I relied on the results of the application of two risk premium methods. The
11 first method is the PRPM, while the second method is a risk premium model
12 using a total market approach.

13 **Q. PLEASE EXPLAIN THE PRPM.**

14 A. The PRPM, published in the *Journal of Regulatory Economics* and *The*
15 *Electricity Journal*⁸, was developed from the work of Robert F. Engle who
16 shared the Nobel Prize in Economics in 2003 “for methods of analyzing
17 economic time series with time-varying volatility (“ARCH”).⁹ Engle found
18 that volatility changes over time and is related from one period to the next,

⁸ Autoregressive conditional heteroscedasticity. See “A New Approach for Estimating the Equity Risk Premium for Public Utilities”, Pauline M. Ahern, Frank J. Hanley and Richard A. Michelfelder, Ph.D. *The Journal of Regulatory Economics* (December 2011), 40:261-278 and “Comparative Evaluation of the Predictive Risk Premium Model, the Discounted Cash Flow Model and the Capital Asset Pricing Model for Estimating the Cost of Common Equity”, Richard A. Michelfelder, Ph.D, Pauline M. Ahern, Dylan W. D’Ascendis, and Frank J. Hanley, *The Electricity Journal* (May 2013), 84-89.

⁹ www.nobelprize.org.

1 especially in financial markets. Engle discovered that the volatility in prices
2 and returns clusters over time and is therefore highly predictable and can
3 be used to predict future levels of risk and risk premiums.

4 The PRPM estimates the risk / return relationship directly, as the
5 predicted equity risk premium is generated by the prediction of volatility or
6 risk. The PRPM is not based on an estimate of investor behavior, but rather
7 on the evaluation of the results of that behavior (*i.e.*, the variance of
8 historical equity risk premiums).

9 The inputs to the model are the historical returns on the common
10 shares of each company in the Utility Proxy Group minus the historical
11 monthly yield on long-term U.S. Treasury securities through March 2021.
12 Using a generalized form of ARCH, known as GARCH, I calculated each
13 Utility Proxy Group company's projected equity risk premium using Eviews®
14 statistical software. When the GARCH Model is applied to the historical
15 return data, it produces a predicted GARCH variance series¹⁰ and a
16 GARCH coefficient¹¹. Multiplying the predicted monthly variance by the
17 GARCH coefficient, then annualizing it¹², produces the predicted annual
18 equity risk premium. I then added the forecasted 30-year U.S. Treasury
19 Bond yield, 2.73%¹³, to each company's PRPM-derived equity risk premium
20 to arrive at an indicated cost of common equity. The 30-year Treasury yield

10 Illustrated on Columns 1 and 2 of page 2 of Schedule DWD-4.

11 Illustrated on Column 4 of page 2 of Schedule DWD-4.

12 Annualized Return = $(1 + \text{Monthly Return})^{12} - 1$.

13 See, Column 6 of page 2 of Schedule DWD-4.

1 is a consensus forecast derived from the Blue Chip Financial Forecasts
2 ("Blue Chip")¹⁴. The mean PRPM indicated common equity cost rate for the
3 Utility Proxy Group is 12.72%, the median is 11.53%, and the average of
4 the two is 12.13%. Consistent with my reliance on the average of the
5 median and mean results of the DCF, I relied on the average of the mean
6 and median results of the Utility Proxy Group PRPM to calculate a cost of
7 common equity rate of 12.13%.

8 **Q. PLEASE DESCRIBE YOUR SELECTION OF A RISK-FREE RATE OF**
9 **RETURN.**

10 A. As shown in Schedules DWD-4 and 5, the risk-free rate adopted for
11 applications of the RPM and CAPM is 2.73%. This risk-free rate is based
12 on the average of the *Blue Chip* consensus forecast of the expected yields
13 on 30-year U.S. Treasury bonds for the six quarters ending with the third
14 calendar quarter of 2022, and long-term projections for the years 2022 to
15 2026 and 2027 to 2031.

16 **Q. WHY DO YOU USE THE PROJECTED 30-YEAR TREASURY YIELD IN**
17 **YOUR ANALYSES?**

18 A. The yield on long-term U.S. Treasury bonds is almost risk-free and its term
19 is consistent with the long-term cost of capital to public utilities measured
20 by the yields on Moody's A2-rated public utility bonds; the long-term
21 investment horizon inherent in utilities' common stocks; and the long-term

¹⁴ *Blue Chip Financial Forecasts*, December 1, 2020 at p. 14 and April 1, 2021 at p. 2.

1 life of the jurisdictional rate base to which the allowed fair rate of return (*i.e.*,
2 cost of capital) will be applied. In contrast, short-term U.S. Treasury yields
3 are more volatile and largely a function of Federal Reserve monetary policy.

4 **Q. DID YOU INCLUDE CURRENT INTEREST RATES IN YOUR**
5 **ANALYSES?**

6 Yes. Even though I do not agree with using current interest rates in a rate
7 of return analysis, I recognize that the Commission has stated its preference
8 for the use of current, and not projected, interest rates.¹⁵ As such, in
9 addition to my normal practice of relying on projected interest rates, I have
10 also presented my ROE analyses based on current interest rates.

11 **Q. WHY DON'T YOU AGREE WITH THE USE OF CURRENT INTEREST**
12 **RATES IN RISK PREMIUM-BASED MODELS?**

13 A. Because both ratemaking and the cost of capital are prospective or forward-
14 looking, the cost of capital, including the cost rate of common equity, is
15 prospective or forward-looking in that it reflects investors' expectations of
16 future capital markets, including an expectation of interest rate levels, as
17 well as future risks. Ratemaking is also forward-looking in that the rates set
18 will be in effect for a period in the future.

19 **Q. PLEASE EXPLAIN THE TOTAL MARKET APPROACH RPM.**

20 A. The total market approach RPM adds a prospective public utility bond yield
21 to an average of: 1) an equity risk premium that is derived from a beta-

¹⁵ See, North Carolina Utilities Commission, Docket Nos. W-354, Sub 363, 364, 365, Order Granting Partial Rate Increase and Requiring Customer Notice, at 72.

1 adjusted total market equity risk premium, and 2) an equity risk premium
2 based on the S&P Utilities Index.

3 **Q. PLEASE EXPLAIN THE BASIS OF THE EXPECTED BOND YIELD OF**
4 **3.91% APPLICABLE TO THE UTILITY PROXY GROUP.**

5 A. The first step in the total market approach RPM analysis is to determine the
6 expected bond yield. Because both ratemaking and the cost of capital,
7 including common equity cost rate, are prospective in nature, a prospective
8 yield on similarly-rated long-term debt is essential. I rely on a consensus
9 forecast of about 50 economists of the expected yield on Aaa-rated
10 corporate bonds for the six calendar quarters ending with the third calendar
11 quarter of 2022, and the long-term projections for 2022 to 2026, and 2027
12 to 2031 from *Blue Chip*. As shown on line No. 1 of page 3 of Schedule
13 DWD-4, the average expected yield on Moody's Aaa-rated corporate bonds
14 is 3.44%. In order to derive an expected yield on A2-rated public utility
15 bonds, I make an upward adjustment of 0.42%, which represents a recent
16 spread between Aaa-rated corporate bonds and A2-rated public utility
17 bonds, in order to adjust the expected Aaa-rated corporate bond yield to an
18 equivalent Moody's A2-rated public utility bond.¹⁶ Adding that recent 0.42%
19 spread to the expected Aaa-rated corporate bond yield of 3.44% results in
20 an expected A2-rated public utility bond of 3.86%.

¹⁶ As shown on Line No. 2 and explained in Note 2 of page 3 of Schedule DWD-4.

1 Since the Utility Proxy Group’s average Moody’s long-term issuer
 2 rating is A2/A3, another adjustment to the expected A2-rated public utility
 3 bond yield is needed to reflect the difference in bond ratings. An upward
 4 adjustment of 0.05%, which represents one-sixth of a recent spread
 5 between A2- and Baa2-rated public utility bond yields, is necessary to make
 6 the A2-rated prospective bond yield applicable to an A2/A3-rated public
 7 utility bond.¹⁷ Adding the 0.05% to the 3.86% prospective A2-rated public
 8 utility bond yield results in a 3.91% expected bond yield for the Utility Proxy
 9 Group.

10 **Table 3: Summary of the Calculation of the Utility Proxy Group**
 11 **Projected Bond Yield¹⁸**

Prospective Yield on Moody’s Aaa-Rated Corporate Bonds (<i>Blue Chip</i>)	3.44%
Adjustment to Reflect Yield Spread Between Moody’s Aaa- Rated Corporate Bonds and Moody’s A2-Rated Utility Bonds	0.42%
Adjustment to Reflect the Utility Proxy Group’s Average Moody’s Bond Rating of A2/A3	<u>0.05%</u>
Prospective Bond Yield Applicable to the Utility Proxy Group	<u>3.91%</u>

12 To develop the indicated ROE using the total market approach RPM,
 13 this prospective bond yield is then added to the average of the three
 14 different equity risk premiums described below.

¹⁷ As shown on line 4 and explained in note 3, page 3 of Schedule DWD-4. Moody’s does not provide public utility bond yields for A2/A3-rated bonds. As such, it was necessary to estimate the difference between A2-rated and A2/A3-rated public utility bonds. Because there are three steps between Baa2 and A2 (Baa2 to Baa1, Baa1 to A3, and A3 to A2) I assumed an adjustment of one-sixth of the difference between the A2-rated and Baa2-rated public utility bond yield was appropriate.

¹⁸ As shown on page 3 of Attachment DWD-4.

1 **Q. PLEASE EXPLAIN HOW THE BETA-DERIVED EQUITY RISK PREMIUM**
2 **IS DETERMINED.**

3 A. The components of the beta-derived risk premium model are: 1) an
4 expected market equity risk premium over corporate bonds, and 2) the beta
5 coefficient. The derivation of the beta-derived equity risk premium that I
6 applied to the Utility Proxy Group is shown on lines 1 through 9 of page 8
7 of Schedule DWD-4. The total beta-derived equity risk premium I applied
8 was based on an average of: 1) Ibbotson-based equity risk premiums; 2)
9 *Value Line*-based equity risk premiums; and 3) Bloomberg-based equity risk
10 premium. Each of these is described in turn.

11 **Q. HOW DID YOU DERIVE A MARKET EQUITY RISK PREMIUM BASED**
12 **ON LONG-TERM HISTORICAL DATA?**

13 A. To derive a historical market equity risk premium, I used the most recent
14 holding period returns for the large company common stocks from the
15 Stocks, Bonds, Bills, and Inflation ("SBBI") 2021 Yearbook ("SBBI –
16 2021")¹⁹ less the average historical yield on Moody's Aaa/Aa-rated
17 corporate bonds for the period 1928 to 2020. The use of holding period
18 returns over a very long period of time is appropriate because it is consistent
19 with the long-term investment horizon presumed by investing in a going
20 concern, *i.e.*, a company expected to operate in perpetuity.

¹⁹ SBBI Appendix A Tables: Morningstar Stocks, Bonds, Bills, & Inflation 1926-2020.

1 SBBI's long-term arithmetic mean monthly total return rate on large
2 company common stocks was 11.94% and the long-term arithmetic mean
3 monthly yield on Moody's Aaa/Aa-rated corporate bonds was 6.02% from
4 1928 to 2020.²⁰ As shown on line 1 of page 8 of Schedule DWD-4,
5 subtracting the mean monthly bond yield from the total return on large
6 company stocks results in a long-term historical equity risk premium of
7 5.92%.

8 I used the arithmetic mean monthly total return rates for the large
9 company stocks and yields (income returns) for the Moody's Aaa/Aa-rated
10 corporate bonds, because they are appropriate for the purpose of
11 estimating the cost of capital as noted in SBBI – 2021.²¹ The use of the
12 arithmetic mean return rates and yields is appropriate because historical
13 total returns and equity risk premiums provide insight into the variance and
14 standard deviation of returns needed by investors in estimating future risk
15 when making a current investment. If investors relied on the geometric
16 mean of historical equity risk premiums, they would have no insight into the
17 potential variance of future returns because the geometric mean relates the
18 change over many periods to a constant rate of change, thereby obviating
19 the year-to-year fluctuations, or variance, which is critical to risk analysis.

²⁰ As explained in Note 1 on page 9 of Schedule DWD-4.

²¹ SBBI – 2021, at 10-22 – 10-23.

1 **Q. PLEASE EXPLAIN THE DERIVATION OF THE REGRESSION-BASED**
2 **MARKET EQUITY RISK PREMIUM.**

3 A. To derive the regression analysis-derived market equity risk premium of
4 8.83%, shown on line 2 of page 8 of Schedule DWD-4, I used the same
5 monthly annualized total returns on large company common stocks relative
6 to the monthly annualized yields on Moody's Aaa/Aa-rated corporate bonds
7 as mentioned above. The relationship between interest rates and the
8 market equity risk premium was modeled using the observed monthly
9 market equity risk premium as the dependent variable, and the monthly
10 yield on Moody's Aaa/Aa-rated corporate bonds as the independent
11 variable. I used a linear Ordinary Least Squares ("OLS") regression, in
12 which the market equity risk premium is expressed as a function of the
13 Moody's Aaa/Aa-rated corporate bonds yield:

$$RP = \alpha + \beta (R_{Aaa/Aa})$$

15 **Q. PLEASE EXPLAIN THE DERIVATION OF A PRPM EQUITY RISK**
16 **PREMIUM.**

17 A. I used the same PRPM approach described previously to develop another
18 equity risk premium estimate. The inputs to the model are the historical
19 monthly returns on large company common stocks minus the monthly yields
20 on Aaa/Aa-rated corporate bonds during the period from January 1928

1 through March 2021.²² Using the previously discussed generalized form of
2 ARCH, known as GARCH, the projected equity risk premium is determined
3 using Eviews[®] statistical software. The resulting PRPM predicted market
4 equity risk premium is 9.40%.²³

5 **Q. PLEASE EXPLAIN THE DERIVATION OF A PROJECTED EQUITY RISK**
6 **PREMIUM BASED ON VALUE LINE DATA FOR YOUR RPM ANALYSIS.**

7 A. As noted previously, because both ratemaking and the cost of capital are
8 prospective, a prospective market equity risk premium is needed. The
9 derivation of the forecasted or prospective market equity risk premium can
10 be found in note 4 on page 9 of Schedule DWD-4. Consistent with my
11 calculation of the dividend yield component in my DCF analysis, this
12 prospective market equity risk premium is derived from an average of the
13 three- to five-year median market price appreciation potential by *Value Line*
14 for the 13 weeks ending April 16, 2021, plus an average of the median
15 estimated dividend yield for the common stocks of the 1,700 firms covered
16 in *Value Line's* Standard Edition.²⁴

17 The average median expected price appreciation is 28%, which
18 translates to an 6.37% annual appreciation, and when added to the average
19 of *Value Line's* median expected dividend yields of 1.87%, equates to a
20 forecasted annual total return rate on the market of 8.24%. The forecasted

22 Data from January 1928 – December 2020 is from SBBI – 2021. Data from January –
March 2021 is from Bloomberg Professional Services.

23 Shown on Line No. 3 on page 8 of Schedule DWD-4.

24 As explained in detail in page 2, note 1 of Schedule DWD-5.

1 Aaa-rated bond yield of 3.44% is deducted from the total market return of
2 8.24%, resulting in an equity risk premium of 4.80%, shown on page 8, line
3 4 of Schedule DWD-4.

4 **Q. PLEASE EXPLAIN THE DERIVATION OF AN EQUITY RISK PREMIUM**
5 **BASED ON THE S&P 500 COMPANIES.**

6 A. Using data from *Value Line*, I calculated an expected total return on the S&P
7 500 using expected dividend yields and long-term growth estimates as a
8 proxy for capital appreciation. The expected total return for the S&P 500 is
9 14.10%. Subtracting the prospective yield on Aaa-rated Corporate bonds
10 of 3.44% results in a 10.66% projected equity risk premium.

11 **Q. PLEASE EXPLAIN THE DERIVATION OF AN EQUITY RISK PREMIUM**
12 **BASED ON BLOOMBERG DATA.**

13 A. Using data from Bloomberg, I calculated an expected total return on the
14 S&P 500 using expected dividend yields and long-term growth estimates as
15 a proxy for capital appreciation, identical to the method described above.
16 The expected total return for the S&P 500 is 14.01%. Subtracting the
17 prospective yield on Aaa-rated Corporate bonds of 3.44% results in a
18 10.57% projected equity risk premium.

1 Q. WHAT IS YOUR CONCLUSION OF A BETA-DERIVED EQUITY RISK
2 PREMIUM FOR USE IN YOUR RPM ANALYSIS?

3 A. I gave equal weight to the six equity risk premiums in arriving at my
4 conclusion of 8.36%.²⁵

5 **Table 4: Summary of the Calculation of the Equity Risk Premium**
6 **Using Total Market Returns²⁶**

Historical Spread Between Total Returns of Large Stocks and Aaa and Aa2-Rated Corporate Bond Yields (1928 – 2020)	5.92%
Regression Analysis on Historical Data	8.83%
PRPM Analysis on Historical Data	9.40%
Prospective Equity Risk Premium using Total Market Returns from <i>Value Line</i> Summary & Index less Projected Aaa Corporate Bond Yields	4.80%
Prospective Equity Risk Premium using Measures of Capital Appreciation and Income Returns from <i>Value Line</i> for the S&P 500 less Projected Aaa Corporate Bond Yields	10.66%
Prospective Equity Risk Premium using Measures of Capital Appreciation and Income Returns from Bloomberg Professional Services for the S&P 500 less Projected Aaa Corporate Bond Yields	<u>10.57%</u>
Average	<u>8.36%</u>

7 After calculating the average market equity risk premium of 8.36%, I
8 adjusted it by beta to account for the risk of the Utility Proxy Group. As
9 discussed below, the beta coefficient is a meaningful measure of
10 prospective relative risk to the market as a whole and is a logical means by
11 which to allocate a company’s, or proxy group’s, share of the market’s total
12 equity risk premium relative to corporate bond yields. As shown on page 1
13 of Schedule DWD-5, the average of the mean and median beta coefficient

²⁵ See, Line No. 7 on page 8 of Schedule DWD-4.

²⁶ As shown on page 8 of Attachment DWD-4.

1 for the Utility Proxy Group is 0.78. Multiplying the beta coefficient of the
2 Utility Proxy Group of 0.78 by the market equity risk premium of 8.36%
3 results in a beta-adjusted equity risk premium of 6.52% for the Utility Proxy
4 Group.

5 **Q. HOW DID YOU DERIVE THE EQUITY RISK PREMIUM BASED ON THE**
6 **S&P UTILITY INDEX AND MOODY'S A-RATED PUBLIC UTILITY**
7 **BONDS?**

8 A. I estimated three equity risk premiums based on S&P Utility Index holding
9 returns, and two equity risk premiums based on the expected returns of the
10 S&P Utilities Index, using *Value Line* and Bloomberg data, respectively.
11 Turning first to the S&P Utility Index holding period returns, I derived a long-
12 term monthly arithmetic mean equity risk premium between the S&P Utility
13 Index total returns of 10.65% and monthly A-rated public utility bond yields
14 of 6.49% from 1928 to 2020, to arrive at an equity risk premium of 4.16%.²⁷
15 I then used the same historical data to derive an equity risk premium of
16 6.45% based on a regression of the monthly equity risk premiums. The final
17 S&P Utility Index holding period equity risk premium involved applying the
18 PRPM using the historical monthly equity risk premiums from January 1928
19 to March 2021 to arrive at a PRPM-derived equity risk premium of 4.77%
20 for the S&P Utility Index.

²⁷ As shown on Line No. 1 on page 12 of Schedule DWD-4.

I then derived expected total returns on the S&P Utilities Index of 10.49% and 9.31% using data from *Value Line* and Bloomberg, respectively, and subtracted the prospective A2-rated public utility bond yield (3.86%²⁸), which results in risk premiums of 6.63% and 5.45%, respectively. As with the market equity risk premiums, I averaged each risk premium to arrive at my utility-specific equity risk premium of 5.49%.

Table 5: Summary of the Calculation of the Equity Risk Premium Using S&P Utility Index Holding Returns²⁹

Historical Spread Between Total Returns of the S&P Utilities Index and A2-Rated Utility Bond Yields (1928 – 2020)	4.16%
Regression Analysis on Historical Data	6.45%
PRPM Analysis on Historical Data	4.77%
Prospective Equity Risk Premium using Measures of Capital Appreciation and Income Returns from <i>Value Line</i> for the S&P Utilities Index less Projected A2 Utility Bond Yields	6.63%
Prospective Equity Risk Premium using Measures of Capital Appreciation and Income Returns from Bloomberg Professional Services for the S&P Utilities Index less Projected A2 Utility Bond Yields	<u>5.45%</u>
Average	<u>5.49%</u>

Q. WHAT IS YOUR CONCLUSION OF AN EQUITY RISK PREMIUM FOR USE IN YOUR TOTAL MARKET APPROACH RPM ANALYSIS?

A. The equity risk premium I applied to the Utility Proxy Group is 6.01%, which is the average of the beta-derived and the S&P utility equity risk premiums of 6.52% and 5.49%, respectively.³⁰

²⁸ Derived on Line No. 3 of page 3 of Schedule DWD-4.

²⁹ As shown on page 12 of Attachment DWD-4.

³⁰ As shown on page 7 of Schedule DWD-4.

1 **Q. WHAT IS THE INDICATED RPM COMMON EQUITY COST RATE BASED**
 2 **ON THE TOTAL MARKET APPROACH?**

3 A. As shown on Line No. 7 of Schedule DWD-4, page 3, I calculated a common
 4 equity cost rate of 9.92% for the Utility Proxy Group based on the total
 5 market approach of the RPM.

6 **Table 6: Summary of the Total Market Return Risk Premium Model³¹**

Prospective Moody's A2/A3-Rated Utility Bond Applicable to the Utility Proxy Group	3.91%
Prospective Equity Risk Premium	<u>6.01%</u>
Indicated Cost of Common Equity	<u>9.92%</u>

7 **Q. WHAT ARE THE RESULTS OF YOUR APPLICATION OF THE PRPM**
 8 **AND THE TOTAL MARKET APPROACH RPM?**

9 A. As shown on page 1 of Schedule DWD-4, the indicated RPM-derived
 10 common equity cost rate is 11.03%, which gives equal weight to the PRPM
 11 (12.13%) and the adjusted market approach results (9.92%).

12 **C. THE CAPITAL ASSET PRICING MODEL**

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

14 A. CAPM theory defines risk as the co-variability of a security's returns with
 15 the market's returns as measured by the beta coefficient (β). A beta
 16 coefficient less than 1.0 indicates lower variability than the market as a
 17 whole, while a beta coefficient greater than 1.0 indicates greater variability
 18 than the market.

³¹ As shown on page 3 of Attachment DWD-4.

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

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

11 Where: R_s = Return rate on the common stock;

12 R_f = Risk-free rate of return;

13 R_m = Return rate on the market as a whole; and

14 β = Adjusted beta coefficient (volatility of the
15 security relative to the market as a whole).
16

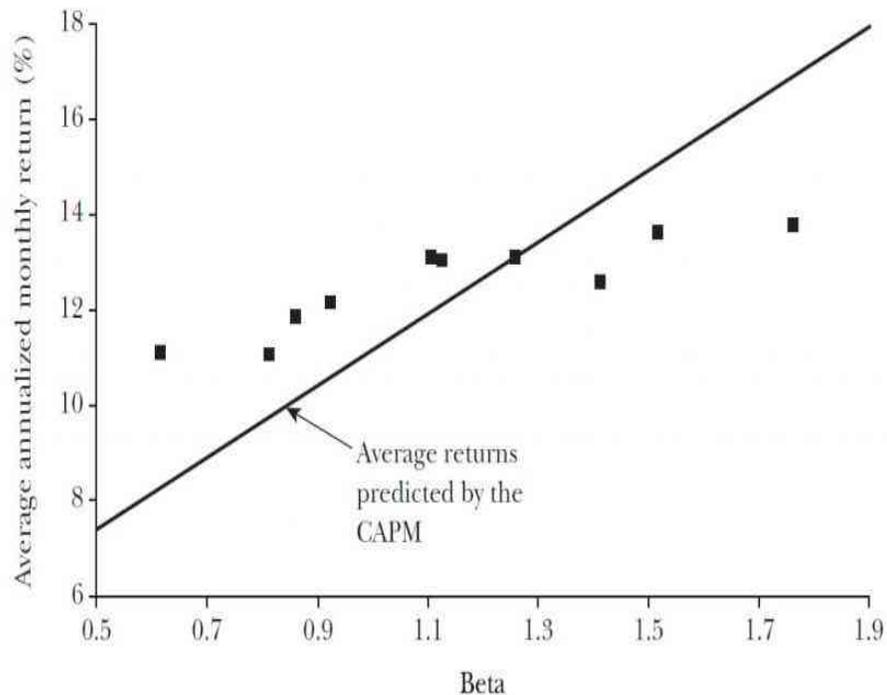
17 Numerous tests of the CAPM have measured the extent to which
18 security returns and beta coefficients are related as predicted by the CAPM,
19 confirming its validity. The empirical CAPM (“ECAPM”) reflects the reality
20 that while the results of these tests support the notion that the beta
21 coefficient is related to security returns, the empirical Security Market Line
22 (“SML”) described by the CAPM formula is not as steeply sloped as the

1 predicted SML.³² The ECAPM reflects this empirical reality. Fama and
 2 French clearly state regarding Figure 2, below, that “[t]he returns on the low
 3 beta portfolios are too high, and the returns on the high beta portfolios are
 4 too low.”³³

Figure 2

<http://pubs.aeaweb.org/doi/pdfplus/10.1257/0895330042162430>

Average Annualized Monthly Return versus Beta for Value Weight Portfolios Formed on Prior Beta, 1928–2003



5 In addition, Morin observes that while the results of these tests
 6 support the notion that beta is related to security returns, the empirical SML
 7

³² Roger A. Morin, New Regulatory Finance, (Public Utilities Reports, Inc., 2006) at 175. (“Morin”)

³³ Eugene F. Fama and Kenneth R. French, “The Capital Asset Pricing Model: Theory and Evidence”, Journal of Economic Perspectives, Vol. 18, No. 3, Summer 2004 at 33 (“Fama & French”). <http://pubs.aeaweb.org/doi/pdfplus/10.1257/0895330042162430>.

1 described by the CAPM formula is not as steeply sloped as the predicted
2 SML. Morin states:

3 With few exceptions, the empirical studies agree that ... low-
4 beta securities earn returns somewhat higher than the CAPM
5 would predict, and high-beta securities earn less than
6 predicted.³⁴

7 * * *

8 Therefore, the empirical evidence suggests that the expected
9 return on a security is related to its risk by the following
10 approximation:

$$11 \quad K = R_F + x (R_M - R_F) + (1-x) \beta(R_M - R_F)$$

12 where x is a fraction to be determined empirically. The value
13 of x that best explains the observed relationship [is] Return =
14 0.0829 + 0.0520 β is between 0.25 and 0.30. If x = 0.25, the
15 equation becomes:

$$16 \quad K = R_F + 0.25(R_M - R_F) + 0.75 \beta(R_M - R_F)^{35}$$

17 Fama and French provide similar support for the ECAPM when they
18 state:

19 The early tests firmly reject the Sharpe-Lintner version of the
20 CAPM. There is a positive relation between beta and average
21 return, but it is too 'flat.'... The regressions consistently find
22 that the intercept is greater than the average risk-free rate...
23 and the coefficient on beta is less than the average excess
24 market return... This is true in the early tests... as well as in
25 more recent cross-section regressions tests, like Fama and
26 French (1992).³⁶

27 Finally, Fama and French further note:

28 Confirming earlier evidence, the relation between beta and
29 average return for the ten portfolios is much flatter than the
30 Sharpe-Linter CAPM predicts. The returns on low beta

34 Morin, at 175.

35 Morin, at 190.

36 Fama & French, at 32.

1 portfolios are too high, and the returns on the high beta
2 portfolios are too low. For example, the predicted return on
3 the portfolio with the lowest beta is 8.3 percent per year; the
4 actual return as 11.1 percent. The predicted return on the
5 portfolio with the highest beta is 16.8 percent per year; the
6 actual is 13.7 percent.³⁷

7
8 Clearly, the justification from Morin, Fama, and French along with
9 their reviews of other academic research on the CAPM, validate the use of
10 the ECAPM. In view of theory and practical research, I have applied both
11 the traditional CAPM and the ECAPM to the companies in the Utility Proxy
12 Group and averaged the results.

13 **Q. WHAT BETA COEFFICIENTS DID YOU USE IN YOUR CAPM**
14 **ANALYSIS?**

15 A. With respect to the beta coefficient, I considered two methods of calculation:
16 1) the average of the beta coefficients of the Utility Proxy Group companies
17 reported by Bloomberg Professional Services, and 2) the average of the
18 beta coefficients of the Utility Proxy Group companies as reported by *Value*
19 *Line*. While both of those services adjust their calculated (or “raw”) beta
20 coefficients to reflect the tendency of the beta coefficient to regress to the
21 market mean of 1.00, *Value Line* calculates the beta coefficient over a five-
22 year period, while Bloomberg’s calculation is based on two years of data.

³⁷ *Ibid.*, at 33.

1 **Q. PLEASE DESCRIBE YOUR SELECTION OF A RISK-FREE RATE OF**
2 **RETURN.**

3 A. As discussed previously, the risk-free rate adopted for both applications of
4 the CAPM is 2.73%. I also present my CAPM analysis using a current risk-
5 free rate of 2.07%, which is the three-month average 30-year Treasury bond
6 yield ending March 2021.

7 **Q. PLEASE EXPLAIN THE ESTIMATION OF THE EXPECTED RISK**
8 **PREMIUM FOR THE MARKET USED IN YOUR CAPM ANALYSES.**

9 A. The basis of the market risk premium is explained in detail in note 1 on page
10 2 of Schedule DWD-5. As discussed previously, the market risk premium
11 is derived from an average of:

- 12 (i) Ibbotson-based market risk premiums;
- 13 (ii) *Value Line* data-based market risk premiums; and
- 14 (iii) Bloomberg data-based market risk premiums.

15 The long-term income return on U.S. Government Securities of
16 5.05% was deducted from the SBBI - 2021 monthly historical total market
17 return of 12.20%, which results in an historical market equity risk premium
18 of 7.15%.³⁸ I applied a linear OLS regression to the monthly annualized
19 historical returns on the S&P 500 relative to historical yields on long-term
20 U.S. Government Securities from SBBI - 2021. That regression analysis
21 yielded a market equity risk premium of 9.54%. The PRPM market equity

³⁸ SBBI – 2021, at Appendix A-1 (1) through A-1 (3) and Appendix A-7 (19) through A-7 (21).

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risk premium is 10.46% and is derived using the PRPM relative to the yields on long-term U.S. Treasury securities from January 1926 through March 2021.

The *Value Line*-derived forecasted total market equity risk premium is derived by deducting the forecasted risk-free rate of 2.73%, discussed above, from the *Value Line* projected total annual market return of 8.24%, resulting in a forecasted total market equity risk premium of 5.51%. The S&P 500 projected market equity risk premium using *Value Line* data is derived by subtracting the projected risk-free rate of 2.73% from the projected total return of the S&P 500 of 14.10%. The resulting market equity risk premium is 11.37%.

The S&P 500 projected market equity risk premium using Bloomberg data is derived by subtracting the projected risk-free rate of 2.73% from the projected total return of the S&P 500 of 14.01%. The resulting market equity risk premium is 11.28%.

These six market risk premiums, when averaged, result in an average total market equity risk premium of 9.22%.

Table 7: Summary of the Calculation of the Market Risk Premium for use in the CAPM³⁹

Historical Spread Between Total Returns of Large Stocks and Long-Term Government Bond Yields (1926 – 2020)	7.15%
Regression Analysis on Historical Data	9.54%
PRPM Analysis on Historical Data	10.46%

³⁹ As shown on page 2 of Schedule DWD-5.

Prospective Equity Risk Premium using Total Market Returns from <i>Value Line</i> Summary & Index less Projected 30-Year Treasury Bond Yields	5.51%
Prospective Equity Risk Premium using Measures of Capital Appreciation and Income Returns from <i>Value Line</i> for the S&P 500 less Projected 30-Year Treasury Bond Yields	11.37%
Prospective Equity Risk Premium using Measures of Capital Appreciation and Income Returns from Bloomberg Professional Services for the S&P 500 less Projected 30-Year Treasury Bond Yields	<u>11.28%</u>
Average	<u>9.22%</u>

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Q. WHAT ARE THE RESULTS OF YOUR APPLICATION OF THE TRADITIONAL AND EMPIRICAL CAPM TO THE UTILITY PROXY GROUP?

A. As shown on page 1 of Schedule DWD-5, the mean result of my CAPM/ECAPM analysis is 10.17%, the median is 10.14%, and the average of the two is 10.16%. Consistent with my reliance on the average of mean and median DCF results discussed above, the indicated common equity cost rate using the CAPM/ECAPM is 10.16%.

D. COMMON EQUITY COST RATES FOR A PROXY GROUP OF DOMESTIC, NON-PRICE REGULATED COMPANIES BASED ON THE DCF, RPM, AND CAPM

Q. WHY DID YOU ALSO CONSIDER A PROXY GROUP OF DOMESTIC, NON-PRICE REGULATED COMPANIES?

A. In the *Hope* and *Bluefield* cases, the U.S. Supreme Court did not specify that comparable risk companies had to be utilities. Since the purpose of rate regulation is to be a substitute for the competition of the marketplace, non-price regulated firms operating in the competitive marketplace make an

1 excellent proxy if they are comparable in total risk to the Utility Proxy Group
2 being used to estimate the cost of common equity. The selection of such
3 domestic, non-price regulated competitive firms theoretically and
4 empirically results in a proxy group which is comparable in total risk to the
5 Utility Proxy Group.

6 **Q. HOW DID YOU SELECT NON-PRICE REGULATED COMPANIES THAT**
7 **ARE COMPARABLE IN TOTAL RISK TO THE UTILITY PROXY GROUP?**

8 A. In order to select a proxy group of domestic, non-price regulated companies
9 similar in total risk to the Utility Proxy Group, I relied on the beta coefficients
10 and related statistics derived from *Value Line* regression analyses of weekly
11 market prices over the most recent 260 weeks (*i.e.*, five years). Using these
12 selection criteria resulted in a proxy group of 20 domestic, non-price
13 regulated firms comparable in total risk to the Utility Proxy Group. Total risk
14 is the sum of non-diversifiable market risk and diversifiable company-
15 specific risks. The criteria used in the selection of the domestic, non-price
16 regulated firms was:

- 17 (i) They must be covered by *Value Line Investment Survey* (Standard
18 Edition);
19 (ii) They must be domestic, non-price regulated companies, *i.e.*, non-
20 utilities;

1 (iii) Their beta coefficients must lie within plus or minus two standard
2 deviations of the average unadjusted beta coefficient of the Utility
3 Proxy Group; and

4 (iv) The residual standard errors of the *Value Line* regressions which
5 gave rise to the unadjusted beta coefficients must lie within plus or
6 minus two standard deviations of the average residual standard error
7 of the Utility Proxy Group.

8 Beta coefficients are a measure of market or systematic risk, which
9 is not diversifiable. The residual standard errors of the regressions were
10 used to measure each firm's company-specific, diversifiable risk.
11 Companies that have similar beta coefficients and similar residual standard
12 errors resulting from the same regression analyses have similar total
13 investment risk.

14 **Q. HAVE YOU PREPARED A SCHEDULE WHICH SHOWS THE DATA**
15 **FROM WHICH YOU SELECTED THE 20 DOMESTIC, NON-PRICE**
16 **REGULATED COMPANIES THAT ARE COMPARABLE IN TOTAL RISK**
17 **TO THE UTILITY PROXY GROUP?**

18 A. Yes, the basis of my selection, and both proxy groups' regression statistics,
19 are shown in Schedule DWD-6.

1 **Q. DID YOU CALCULATE COMMON EQUITY COST RATES USING THE**
2 **DCF, RPM, AND CAPM FOR THE NON-PRICE REGULATED PROXY**
3 **GROUP?**

4 A. Yes. Because the DCF, RPM, and CAPM have been applied in an identical
5 manner as described above, I will not repeat the details of the rationale and
6 application of each model. One exception is in the application of the RPM,
7 where I did not use public utility-specific equity risk premiums, nor did I apply
8 the PRPM to the individual companies.

9 Page 2 of Schedule DWD-7 contains the derivation of the DCF cost
10 rates. As shown, the indicated common equity cost rate using the DCF for
11 the Non-Price Regulated Proxy Group comparable in total risk to the Utility
12 Proxy Group, is 11.75%.

13 Pages 3 through 5 of DWD-7 contain the data and calculations that
14 support the 10.58% RPM cost rate. As shown on Line No. 1 of page 3 of
15 Schedule DWD-7, the consensus prospective yield on Moody's Baa-rated
16 corporate bonds for the six quarters ending in the third quarter of 2022, and
17 for the years 2022 to 2026 and 2027 to 2031, is 4.36%.⁴⁰ Because the Non-
18 Price Regulated Proxy Group has an average Moody's bond rating of Baa1,
19 a downward adjustment of 0.13% to the prospective Baa2-rated bond yield
20 is necessary to reflect the difference in bond ratings.⁴¹ Subtracting 0.13%
21 from the prospective Baa2-rated bond yield of 4.36% is 4.23%.

⁴⁰ *Blue Chip Financial Forecasts*, December 1, 2020, at p. 14 and April 1, 2021, at p. 2.
⁴¹ As demonstrated on Schedule DWD-7, page 3, note 2.

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When the beta-adjusted risk premium of 6.35%⁴² relative to the Non-Price Regulated Proxy Group is added to the prospective Baa1-rated corporate bond yield of 4.36%, the indicated RPM cost rate is 10.58%.

Page 6 of DWD-7 contains the inputs and calculations that support my indicated CAPM/ECAPM cost rate of 10.02%.

Q. WHAT IS THE COST RATE OF COMMON EQUITY BASED ON THE NON-PRICE REGULATED PROXY GROUP COMPARABLE IN TOTAL RISK TO THE UTILITY PROXY GROUP?

A. As shown on page 1 of Schedule DWD-7, the results of the DCF, RPM, and CAPM applied to the Non-Price Regulated Proxy Group comparable in total risk to the Utility Proxy Group are 11.75%, 10.58%, and 10.02%, respectively. The average of the mean and median of these models is 10.68%, which I used as the indicated common equity cost rate for the Non-Price Regulated Proxy Group.

VIII. CONCLUSION OF COMMON EQUITY COST RATE BEFORE ADJUSTMENT

Q. WHAT IS THE INDICATED RANGE OF COMMON EQUITY COST RATES BEFORE ADJUSTMENTS?

A. Based on the results of the application of multiple cost of common equity models to the Utility Proxy Group, indicated ranges of ROEs attributable to

⁴² Derived on page 5 of Schedule DWD-7.

1 the Utility Proxy Group are from 10.13% to 10.42% using projected risk-free
2 rates and 9.81% to 10.05% using current interest rates.

3 I used multiple cost of common equity models as primary tools in
4 arriving at my recommended common equity cost rate, because no single
5 model is so inherently precise that it can be relied on solely to the exclusion
6 of other theoretically sound models. The use of multiple models adds
7 reliability to the estimation of the common equity cost rate, and the prudence
8 of using multiple cost of common equity models is supported in both the
9 financial literature and regulatory precedent.

10 As discussed previously, after determining the indicated range of
11 ROE attributable to a comparable group, there must be an evaluation of
12 relative risk between that group and the target company to determine
13 whether it is appropriate to apply adjustments to the comparable group's
14 indicated ROE to better reflect the target company's specific risks.

15 **IX. ADJUSTMENTS TO THE COMMON EQUITY COST RATE**

16 **A. SIZE ADJUSTMENT**

17 **Q. DOES CWSNC'S SMALLER SIZE COMPARED WITH THE UTILITY
18 PROXY GROUP INCREASE ITS BUSINESS RISK?**

19 A. Yes. CWSNC's smaller size relative to the Utility Proxy Group companies
20 indicates greater relative business risk for the Company because, all else
21 being equal, size has a material bearing on risk.

22 Size affects business risk because smaller companies generally are

1 less able to cope with significant events that affect sales, revenues, and
2 earnings. For example, smaller companies face more risk exposure to
3 business cycles and economic conditions, both nationally and locally.
4 Additionally, the loss of revenues from a few larger customers would have
5 a greater effect on a small company than on a bigger company with a larger,
6 more diverse, customer base.

7 As further evidence illustrates that smaller firms are riskier, investors
8 generally demand greater returns from smaller firms to compensate for less
9 marketability and liquidity of their securities. Duff & Phelps' 2020 Valuation
10 Handbook – U.S. Guide to Cost of Capital (“D&P - 2020”) discusses the
11 nature of the small-size phenomenon, providing an indication of the
12 magnitude of the size premium based on several measures of size. In
13 discussing “Size as a Predictor of Equity Premiums,” D&P - 2020 states:

14 The size effect is based on the empirical observation that
15 companies of smaller size are associated with greater risk
16 and, therefore, have greater cost of capital [sic]. The “size” of
17 a company is one of the most important risk elements to
18 consider when developing cost of equity capital estimates for
19 use in valuing a business simply because size has been
20 shown to be a *predictor* of equity returns. In other words,
21 there is a significant (negative) relationship between size and
22 historical equity returns - as size *decreases*, returns tend to
23 *increase*, and vice versa. (footnote omitted) (emphasis in
24 original)⁴³

25 Furthermore, in “The Capital Asset Pricing Model: Theory and
26 Evidence,” Fama and French note size is indeed a risk factor which must

⁴³ Duff & Phelps 2020 Valuation Handbook – U.S. Guide to Cost of Capital, Wiley 2018, at 4-1.

1 be reflected when estimating the cost of common equity. On page 38, they
2 note:

3 . . . the higher average returns on small stocks and high
4 book-to-market stocks reflect unidentified state variables that
5 produce undiversifiable risks (covariances) in returns not
6 captured in the market return and are priced separately from
7 market betas.⁴⁴

8 Based on this evidence, Fama and French proposed their three-
9 factor model which includes a size variable in recognition of the effect size
10 has on the cost of common equity.

11 Also, it is a basic financial principle that the use of funds invested,
12 and not the source of funds, is what gives rise to the risk of any investment.⁴⁵

13 Eugene Brigham, a well-known authority, states:

14 A number of researchers have observed that portfolios of
15 small-firms (sic) have earned consistently higher average
16 returns than those of large-firm stocks; this is called the
17 "small-firm effect." On the surface, it would seem to be
18 advantageous to the small firms to provide average returns in
19 a stock market that are higher than those of larger firms. In
20 reality, it is bad news for the small firm; **what the small-firm
21 effect means is that the capital market demands higher
22 returns on stocks of small firms than on otherwise similar
23 stocks of the large firms.** (emphasis added)⁴⁶

24 Consistent with the financial principle of risk and return discussed
25 above, increased relative risk due to small size must be considered in the
26 allowed rate of return on common equity. Therefore, the Commission's

44 Fama & French, at 25-43.

45 Richard A. Brealey and Stewart C. Myers, Principles of Corporate Finance (McGraw-Hill Book Company, 1996), at 204-205, 229.

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

1 authorization of a cost rate of common equity in this proceeding must
2 appropriately reflect the unique risks of CWSNC, including its small size,
3 which is justified and supported above by evidence in the financial literature.

4 **Q. SHOULD THE COMMISSION CONSIDER CWSNC AS A STAND-ALONE**
5 **COMPANY?**

6 A. Yes, it should. Because it is CWSNC's rate base to which the overall rates
7 of return set forth in this proceeding will be applied, they should be
8 evaluated as a stand-alone entity. To do otherwise would be discriminatory,
9 confiscatory, and inaccurate. It is also a basic financial precept that the use
10 of the funds invested give rise to the risk of the investment. As Brealey and
11 Myers state:

12 The true cost of capital depends on the use to which the
13 capital is put.

14 ***

15 *Each project should be evaluated at its own opportunity cost*
16 *of capital; the true cost of capital depends on the use to which*
17 *the capital is put. (italics and bold in original) ⁴⁷*

18 Morin confirms Brealey and Myers when he states:

19 Financial theory clearly establishes that the cost of equity is
20 the risk-adjusted opportunity cost of the investors and not the
21 cost of the specific capital sources employed by the investors.
22 The true cost of capital depends on **the use to which the**
23 **capital is put and not on its source. The Hope and**
24 **Bluefield doctrines have made clear that the relevant**
25 **considerations in calculating a company's cost of capital**

⁴⁷ Richard A. Brealey and Stewart C. Myers, Principles of Corporate Finance, McGraw-Hill, Third Edition, 1988, at pp. 173, 198.

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are the alternatives available to investors and the returns and risks associated with those alternatives.⁴⁸

Additionally, Levy and Sarnat state:

The firm’s cost of capital is the discount rate employed to discount the firm’s average cash flow, hence obtaining the value of the firm. It is also the weighted average cost of capital, as we shall see below. The weighted average cost of capital should be employed for project evaluation... only in cases where the risk profile of the new projects is a “carbon copy” of the risk profile of the firm⁴⁹

Although Levy and Sarnat discuss a project’s cost of capital relative to a firm’s cost of capital, these principles apply equally to the use of a proxy group-based cost of capital. Each company must be viewed on its own merits, regardless of the source of its equity capital.

As *Bluefield* clearly states:

A public utility is entitled to such rates as will permit it to earn a return on the value of the property which it employs for the convenience of the public equal to that generally being made at the same time and in the same general part **of the country on investments in other business undertakings which are attended by corresponding risks and uncertainties;**⁵⁰

In other words, it is the “risks and uncertainties” surrounding the property employed for the “convenience of the public” which determines the appropriate level of rates. In this proceeding, the property employed “for the convenience of the public” is the rate base of CWSNC. Thus, it is only the risk of investment in CWSNC that is

⁴⁸ Morin, at 523.
⁴⁹ Haim Levy & Marshall Sarnat, Capital Investment and Financial Decisions, Prentice/Hall International, 1986, at 465.
⁵⁰ *Bluefield*, at 6.

1 **relevant to the determination of the cost of common equity to be**
2 **applied to the common equity-financed portion of that rate base.**

3 In addition, in the Fama and French article previously cited, the
4 authors⁵¹ **proposed that their three-factor model include the SMB**
5 **(Small Minus Big) factor, which indicates that small capitalization**
6 **firms are more risky than large capitalization firms, confirming that**
7 **size is a risk factor which must be taken into account in estimating the**
8 **cost of common equity.**

9 Consistent with the financial principle of risk and return discussed
10 **previously, and the stand-alone nature of ratemaking, an upward**
11 **adjustment must be applied to the indicated cost of common equity**
12 **derived from the cost of equity models of the proxy groups used in**
13 **this proceeding.**

14 **Q. IS THERE A WAY TO QUANTIFY A RELATIVE RISK ADJUSTMENT DUE**
15 **TO CWSNC'S SMALL SIZE RELATIVE TO THE UTILITY PROXY**
16 **GROUP?**

17 A. Yes. The Company has greater relative risk than the average company in
18 the Utility Proxy Group because of its smaller size compared with the group,
19 as measured by an estimated market capitalization of common equity for
20 CWSNC (whose common stock is not publicly-traded).

⁵¹ Fama & French, at 39.

Table 8: Size as Measured by Market Capitalization for the Company and the Utility Proxy Group⁵²

	Market Capitalization* (\$ Millions)	Times Greater Than the Company
CWSNC	\$93.984	
Utility Proxy Group Median	\$1,692.873	18.0x

The Company's estimated market capitalization was at \$93.984 million as of April 16, 2021, compared with the median market capitalization of the Utility Proxy Group of \$1.7 billion as of April 16, 2021. The Utility Proxy Group's market capitalization is 18.0 times the size of CWSNCs estimated market capitalization.

As a result, it is necessary to upwardly adjust the indicated range of common equity cost rates to reflect CWSNC's greater risk due to its smaller relative size. The determination is based on the size premiums for portfolios of New York Stock Exchange, American Stock Exchange, and NASDAQ listed companies ranked by deciles for the 1926 to 2020 period. The average size premium for the Utility Proxy Group with a market capitalization of \$1.6 billion falls in the 6th decile, while CWSNC's market capitalization of \$93.984 million places the Company in the 10th decile. The size premium spread between the 6th decile and the 10th decile is 3.64%. Even though a 3.64% upward size adjustment is indicated, I apply a size premium of 0.40% to CWSNC's indicated range of common equity cost rates.

⁵² From page 1 of Schedule DWD-8.

1 **Q. SINCE CWSNC IS A WHOLLY-OWNED SUBSIDIARY OF CRU, WHY IS**
2 **THE SIZE OF CRU NOT MORE APPROPRIATE TO USE WHEN**
3 **DETERMINING THE SIZE ADJUSTMENT?**

4 A. As discussed above, the return derived in this proceeding will not apply to
5 CRU as a whole, but only CWSNC. CRU is the sum of its constituent parts,
6 including those constituent parts' returns on common equity. Potential
7 investors in CRU are aware that it is a combination of operations in each
8 state, and that each state's operations experience the operating risks
9 specific to their jurisdiction. The market's expectation of CRU's return is
10 commensurate with the realities of its composite operations in each of the
11 states in which it operates.

12 **Q. WHAT IS THE INDICATED COST OF COMMON EQUITY AFTER**
13 **ADJUSTMENTS FOR SIZE?**

14 A. After applying the 0.40% upward adjustment for CWSNC's smaller size to
15 the indicated ranges of equity cost rates applicable to the Utility Proxy
16 Group, the adjusted ranges of common equity cost rates are between
17 10.53% to 10.82% (using projected interest rates) and 10.21% to 10.45%
18 (using current interest rates.)

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X. ECONOMIC CONDITIONS IN NORTH CAROLINA

Q. DID YOU CONSIDER THE ECONOMIC CONDITIONS IN NORTH CAROLINA IN ARRIVING AT YOUR ROE RECOMMENDATION?

A. Yes, I did. As a preliminary matter, I understand and appreciate that the Commission must balance the interests of investors and customers in setting the return on common equity. As the Commission has stated, it "...is and must always be mindful of the North Carolina Supreme Court's command that the Commission's task is to set rates as low as possible consistent with the dictates of the United States and North Carolina Constitutions."⁵³ In that regard, the return should be neither excessive nor confiscatory; it should be the minimum amount needed to meet the *Hope* and *Bluefield* Comparable Risk, Capital Attraction, and Financial Integrity standards.

The Commission also has found the role of cost of capital experts is to determine the investor-required return, not to estimate increments or decrements of return in connection with consumers' economic environment:

... adjusting investors' required costs based on factors upon which investors do not base their willingness to invest is an unsupportable theory or concept. The proper way to take into account customer ability to pay is in the Commission's exercise of fixing rates as low as reasonably possible without violating constitutional proscriptions against confiscation of

⁵³ State of North Carolina Utilities Commission, Docket No. E-7, Sub 1026, Order Granting General Rate Increase, Sept. 24, 2013 at 25; see also, North Carolina Utilities Commission, Docket No. E-7, Sub 989, Order on Remand, at 31 ("the Commission in every case seeks to comply with the N.C. Supreme Court mandate that the Commission establish rates as low as reasonably possible within Constitutional limits.").

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*property. This is in accord with the “end result” test of Hope. This the Commission has done.*⁵⁴

The North Carolina Supreme Court agreed, and upheld the Commission’s Order on Remand.⁵⁵ The North Carolina Supreme Court has also, however, made clear that the Commission “must make findings of fact regarding the impact of changing economic conditions on customers when determining the proper ROE for a public utility.”⁵⁶ In *Cooper II*, the North Carolina Supreme Court directed the Commission on remand to “make additional findings of fact concerning the impact of changing economic conditions on customers”,⁵⁷ which the Commission made in its Order on Remand.⁵⁸ In light of the *Cooper II* decision and the North Carolina Supreme Court precedent that preceded it,⁵⁹ I appreciate the Commission’s need to consider economic conditions in the State. As such, I have undertaken several analyses to provide such a review.

Q. PLEASE SUMMARIZE YOUR ANALYSES AND CONCLUSIONS.

A. In its Order on Remand in Docket No. E-22, Sub 479, the Commission observed that economic conditions in North Carolina were highly correlated

⁵⁴ State of North Carolina Utilities Commission, Docket No. E-7, Sub 989, Order on Remand, October 23, 2013, at 34 - 35; *see also*, Dominion Remand Order, Docket No. E-22, Sub 479 at 26 (stating that the Commission is not required to “isolate and quantify the effect of changing economic conditions on consumers in order to determine the appropriate rate of return on equity”).

⁵⁵ *State ex rel. Utils. Comm’n v. Cooper*, 366 N.C. 484, 739 S.E.2d 541 (2013) (“Cooper I”).
⁵⁶ *State of North Carolina ex rel. Utilities Commission v. Cooper*, 758 S.E.2d 635, 642 (2014) (“Cooper II”).

⁵⁷ *Cooper II*, 758 S.E.2d at 643.

⁵⁸ DNCP Remand Order, at 4-10.

⁵⁹ *Cooper I*, 366 N.C. 484, 739 S.E.2d 541 (2013).

1 with national conditions, such that they were reflected in the analyses used
2 to determine the cost of common equity.⁶⁰ As discussed below, those
3 relationships still hold:

- 4 • Although economic conditions in North Carolina declined
5 significantly in the second quarter of 2020 as a result of the COVID-
6 19 pandemic, by measures of unemployment and GDP, they
7 improved in the third and fourth quarters. Notably, economic
8 conditions in North Carolina continued to be strongly correlated to
9 the U.S. economy;
- 10 • Unemployment at both the state and county level remains highly
11 correlated with national rates of unemployment;
- 12 • Real Gross Domestic Product (“GDP”) in North Carolina also
13 remains highly correlated with U.S. real GDP growth; and
- 14 • Median household income in North Carolina has grown at a rate
15 consistent with the rest of the U.S. and remains strongly correlated
16 with national levels.

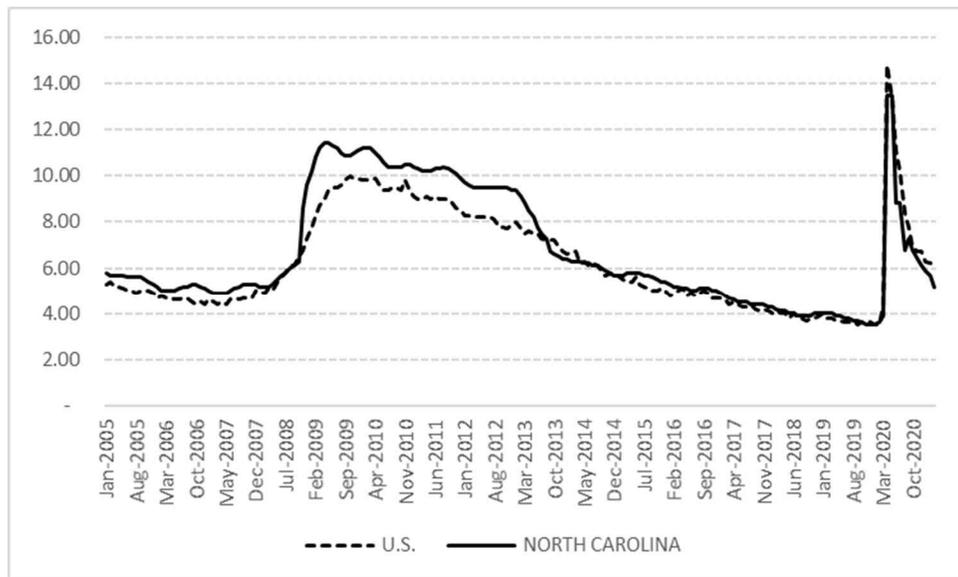
17 **Q. PLEASE NOW DESCRIBE THE SPECIFIC MEASURES OF ECONOMIC**
18 **CONDITIONS THAT YOU REVIEWED.**

19 A. Turning first to the seasonally adjusted unemployment rate, prior to April
20 2020, the unemployment rate had fallen substantially in North Carolina and
21 the U.S. since the 2008/2009 financial crisis. Although the unemployment

⁶⁰ See, State of North Carolina Utilities Commission, Docket No. E-22, Sub 479, Order on Remand, July 23, 2015, at 39.

1 rate in North Carolina exceeded the national rate during and after the
 2 2008/2009 financial crisis, by the latter portion of 2013, the two were largely
 3 consistent. As the COVID-19 pandemic hit the U.S., unemployment in
 4 North Carolina and across the U.S. spiked in April/May 2020 as many
 5 communities closed non-essential businesses to contain the spread of the
 6 COVID-19 virus. Notably, North Carolina's unemployment rate has fared
 7 better than the overall U.S., even as both fell considerably by the beginning
 8 of 2021 (see Chart 1, below).

Chart 1: Unemployment Rate (Seasonally Adjusted)⁶¹

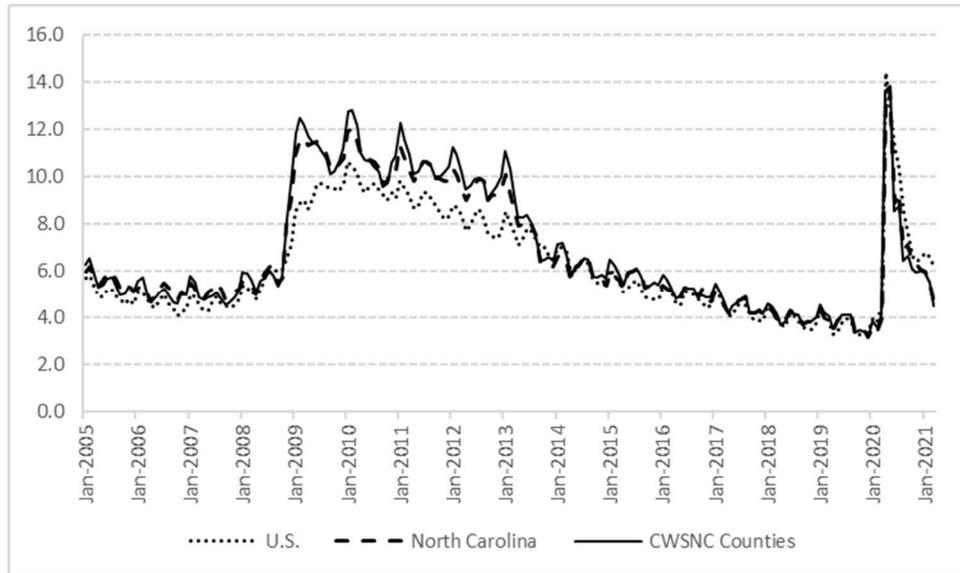


10 Between 2005 and March of 2021, the correlation between North
 11 Carolina's unemployment rate and the national rate was 96.45%, indicating
 12 the two are highly correlated.

⁶¹ Source: Bureau of Labor Statistics.

1 Second, I reviewed (seasonally unadjusted) unemployment rates in
 2 the counties served by CWSNC. As with the seasonally adjusted statistics
 3 described above, the unemployment rate in those counties spiked in May
 4 2020 at 13.84% (0.14% above the state-wide average), but by March 2021
 5 it had fallen substantially to 4.51%, below the rate statewide in North
 6 Carolina (4.60%) and below the overall rate in the U.S. (6.20%). From 2005
 7 through March 2021, the correlations in unemployment rates between the
 8 counties served by CWSNC and the U.S., as well as North Carolina, were
 9 approximately 95.07% and 99.46%, respectively. In summary, county-level
 10 unemployment has fallen considerably since it recently spiked in May 2020,
 11 is similar to the U.S. and statewide unemployment rates, and is highly
 12 correlated to state and national unemployment rates.

Chart 2: Seasonally Unadjusted Unemployment Rates⁶²

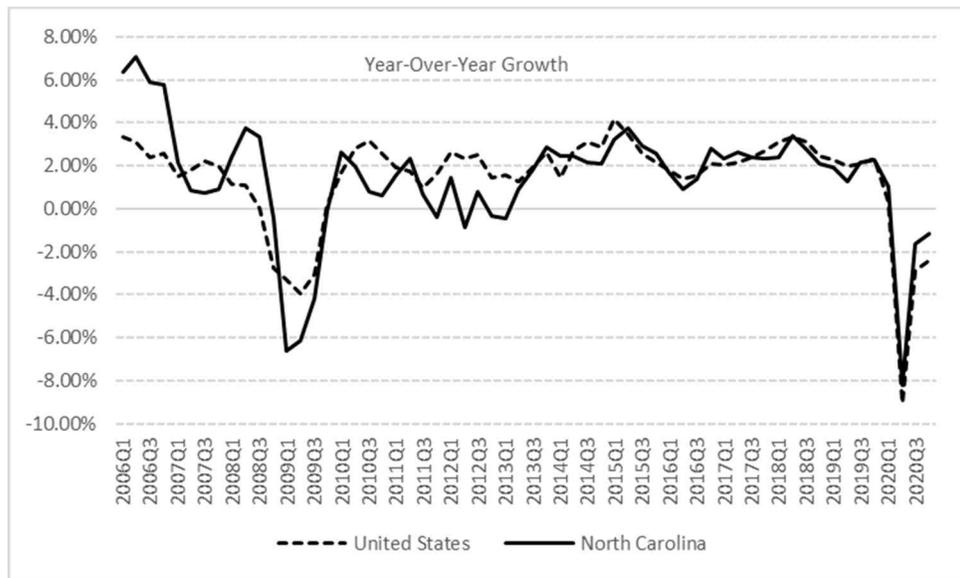


⁶² Source: Bureau of Labor Statistics, St. Louis Federal Reserve.

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1 Looking to real Gross Domestic Product growth, there also has been
 2 a relatively strong correlation between North Carolina and the national
 3 economy (approximately 81.61%). While the national rate of growth at
 4 times outpaced North Carolina between 2010 and 2014, since the first
 5 quarter of 2015, North Carolina's economic growth has been relatively
 6 consistent with U.S. economic growth. Moreover, North Carolina's real
 7 GDP growth fared better than the overall U.S. in 2020; North Carolina's real
 8 GDP grew faster than the overall U.S. in the first quarter, and did not decline
 9 as much as the U.S. economy declined in the second, third and fourth
 10 quarters.

11 **Chart 3: Real Gross Domestic Product Growth Rate**
 12 **(Year over Year)⁶³**

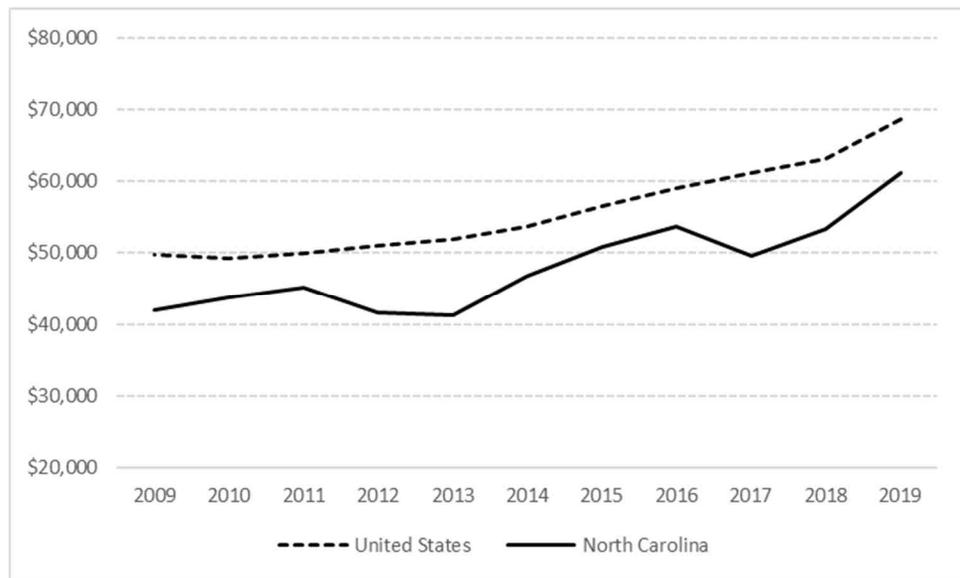


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⁶³ Source: Bureau of Economic Analysis.

1 As to median household income, the correlation between North
 2 Carolina and the U.S. is relatively strong (93.86% from 2005 through 2019).
 3 Since 2009 (that is, the years subsequent to the financial crisis), nominal
 4 median household income in North Carolina has grown at a slightly faster
 5 pace than the national median income (3.85% vs. 3.27%, respectively; see
 6 Chart 4, below). To put household income in perspective, the Missouri
 7 Economic Research and Information Center reports that in the first quarter
 8 of 2021, North Carolina had the 23rd lowest cost of living index among the
 9 50 states, the District of Columbia, and Puerto Rico.⁶⁴

10 **Chart 4: Median Household Income⁶⁵**

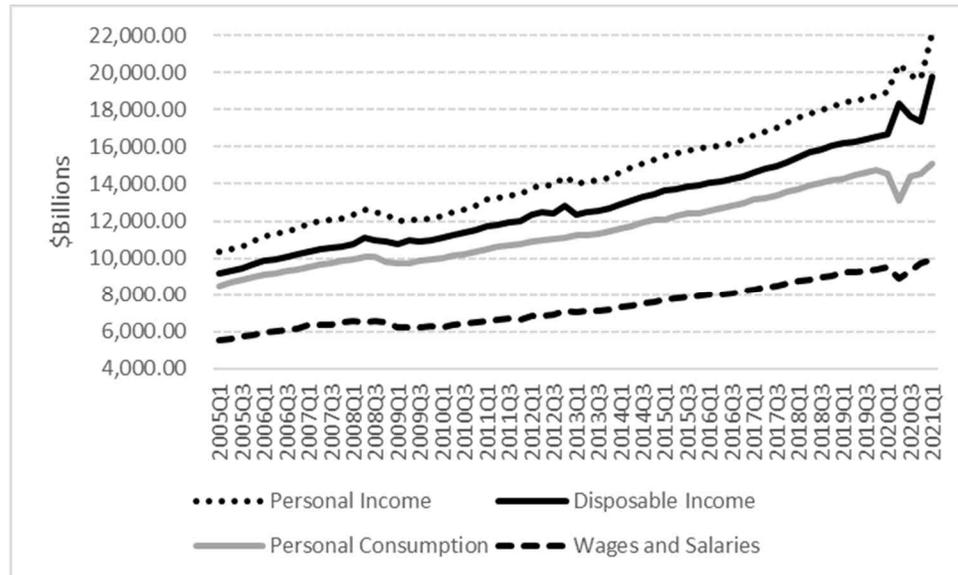


11 Similarly, as shown in Chart 5, below, since 2009 total personal
 12 income, disposable income, personal consumption, and wages and salaries

⁶⁴ Source: meric.mo.gov/data/cost-living-data-series accessed June 16, 2021.
⁶⁵ Source: U.S. Census Bureau, Current Population Survey.

1 have generally been on an increasing trend at the national level. Although
 2 each of these measures were a bit volatile in 2020, they rebounded in the
 3 first quarter of 2021 ending higher than in the first and fourth quarters of
 4 2020.

5 **Chart 5: United States Income and Consumption⁶⁶**



6
 7 **Q. HOW WOULD YOU SUMMARIZE THE ECONOMIC INDICATORS THAT**
 8 **YOU HAVE ANALYZED AND DISCUSSED IN YOUR TESTIMONY?**

9 **A.** Based on the data presented above, I observe the following:

- 10 • Unemployment at both the state and county level remains highly
 11 correlated with national rates of unemployment. North Carolina's
 12 unemployment rate and the rate in the counties served by
 13 CWSNC have fallen significantly since spiking in May 2020.

⁶⁶ Source: Bureau of Economic Analysis.

- 1 • The state's real Gross Domestic Product remains highly
2 correlated with national GDP.
- 3 • Similarly, since 2005, median household income has grown in
4 North Carolina and has grown at a rate slightly faster than the
5 national average. Additionally, the overall cost of living in North
6 Carolina also is below the national average. Furthermore, at the
7 national level, income has generally been increasing since the
8 financial crisis.

9 The U.S. and North Carolina economies both experienced an
10 historically difficult and challenging year as a result of the COVID-19
11 pandemic; yet the data show that economic conditions have improved
12 significantly. Moreover, although economic conditions remain uncertain,
13 North Carolina and the counties contained within CWSNC's service area
14 have fared better than the rest of the U.S. during the COVID-19 pandemic.

15 **Q. IN YOUR OPINION, IS AN ROE OF 10.50% FAIR AND REASONABLE**
16 **TO CWSNC, ITS SHAREHOLDERS, AND ITS CUSTOMERS, AND NOT**
17 **UNDULY BURDENSOME TO CWSNC'S CUSTOMERS CONSIDERING**
18 **THE CHANGING ECONOMIC CONDITIONS?**

19 A. Yes. Based on the factors I have discussed here, I believe that an ROE of
20 10.50% is fair and reasonable to CWSNC, its shareholders, and its
21 customers in light of the uncertainty surrounding the COVID-19 recovery.

1 **XI. CONCLUSION**

2 **Q. WHAT IS YOUR RECOMMENDED RETURN ON INVESTOR-SUPPLIED**
3 **CAPITAL FOR CWSNC?**

4 A. Given the Company's capital structure which consists of 52.03% long-term
5 debt at an embedded debt cost rate of 4.97% and 47.97% common equity
6 at my recommended ROE of 10.50%, I conclude that an appropriate return
7 on investor-supplied capital for the Company is 7.63%. A common equity
8 cost rate of 10.50% is consistent with the *Hope* and *Bluefield* standard of a
9 just and reasonable return which ensures the integrity of presently invested
10 capital and enables the attraction of needed new capital on reasonable
11 terms. It also ensures that CWSNC will be able to continue providing safe,
12 adequate, and reliable service to the benefit of customers. Thus, it balances
13 the interests of both customers and the Company.

14 **Q. IN YOUR OPINION, IS YOUR PROPOSED COMMON EQUITY COST**
15 **RATE OF 10.50% FAIR AND REASONABLE TO CWSNC, ITS**
16 **SHAREHOLDERS, AND ITS CUSTOMERS?**

17 A. Yes, it is.

18 **Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?**

19 A. Yes, it does.

Summary

Dylan is an experienced consultant and a Certified Rate of Return Analyst (CRRA) and Certified Valuation Analyst (CVA). He has served as a consultant for investor-owned and municipal utilities and authorities for 12 years. Dylan has extensive experience in rate of return analyses, class cost of service, rate design, and valuation for regulated public utilities. He has testified as an expert witness in the subjects of rate of return, cost of service, rate design, and valuation before 30 regulatory commissions in the U.S., one Canadian province, and an American Arbitration Association panel.

He also maintains the benchmark index against which the Hennessy Gas Utility Mutual Fund performance is measured.

Areas of Specialization

- Regulation and Rates
- Utilities
- Mutual Fund Benchmarking
- Capital Market Risk
- Financial Modeling
- Valuation
- Regulatory Strategy
- Rate Case Support
- Rate of Return
- Cost of Service
- Rate Design

Recent Expert Testimony Submission/Apearances

Jurisdiction	Topic
■ Massachusetts Department of Public Utilities	Rate of Return
■ New Jersey Board of Public Utilities	Rate of Return
■ Hawaii Public Utilities Commission	Cost of Service, Rate Design
■ South Carolina Public Service Commission	Return on Common Equity
■ American Arbitration Association	Valuation

Recent Assignments

- Provided expert testimony on the cost of capital for ratemaking purposes before numerous state utility regulatory agencies
- Maintains the benchmark index against which the Hennessy Gas Utility Mutual Fund performance is measured
- Sponsored valuation testimony for a large municipal water company in front of an American Arbitration Association Board to justify the reasonability of their lease payments to the City
- Co-authored a valuation report on behalf of a large investor-owned utility company in response to a new state regulation which allowed the appraised value of acquired assets into rate base

Recent Publications and Speeches

- Co-Author of: "Decoupling, Risk Impacts and the Cost of Capital", co-authored with Richard A. Michelfelder, Ph.D., Rutgers University and Pauline M. Ahern. The Electricity Journal, March, 2020.
- Co-Author of: "Decoupling Impact and Public Utility Conservation Investment", co-authored with Richard A. Michelfelder, Ph.D., Rutgers University and Pauline M. Ahern. Energy Policy Journal, 130 (2019), 311-319.
- "Establishing Alternative Proxy Groups", before the Society of Utility and Regulatory Financial Analysts: 51st Financial Forum, April 4, 2019, New Orleans, LA.
- "Past is Prologue: Future Test Year", Presentation before the National Association of Water Companies 2017 Southeast Water Infrastructure Summit, May 2, 2017, Savannah, GA.
- Co-author of: "Comparative Evaluation of the Predictive Risk Premium Model™, the Discounted Cash Flow Model and the Capital Asset Pricing Model", co-authored with Richard A. Michelfelder, Ph.D., Rutgers University, Pauline M. Ahern, and Frank J. Hanley, The Electricity Journal, May, 2013.
- "Decoupling: Impact on the Risk and Cost of Common Equity of Public Utility Stocks", before the Society of Utility and Regulatory Financial Analysts: 45th Financial Forum, April 17-18, 2013, Indianapolis, IN.

SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
Regulatory Commission of Alaska				
Alaska Power Company	09/20	Alaska Power Company; Goat Lake Hydro, Inc.; BBL Hydro, Inc.	Tariff Nos. TA886-2; TA6-521; TA4-573	Capital Structure
Alaska Power Company	07/16	Alaska Power Company	Docket No. TA857-2	Rate of Return
Alberta Utilities Commission				
AltaLink, L.P., and EPCOR Distribution & Transmission, Inc.	01/20	AltaLink, L.P., and EPCOR Distribution & Transmission, Inc.	2021 Generic Cost of Capital, Proceeding ID. 24110	Rate of Return
Arizona Corporation Commission				
EPCOR Water Arizona, Inc.	06/20	EPCOR Water Arizona, Inc.	Docket No. WS-01303A-20-0177	Rate of Return
Arizona Water Company	12/19	Arizona Water Company – Western Group	Docket No. W-01445A-19-0278	Rate of Return
Arizona Water Company	08/18	Arizona Water Company – Northern Group	Docket No. W-01445A-18-0164	Rate of Return
Arkansas Public Service Commission				
CenterPoint Energy Resources Corp.	05/21	CenterPoint Arkansas Gas	Docket No. 21-004-U	Return on Equity
Colorado Public Utilities Commission				
Summit Utilities, Inc.	04/18	Colorado Natural Gas Company	Docket No. 18AL-0305G	Rate of Return
Atmos Energy Corporation	06/17	Atmos Energy Corporation	Docket No. 17AL-0429G	Rate of Return
Delaware Public Service Commission				
Delmarva Power & Light Co.	11/20	Delmarva Power & Light Co.	Docket No. 20-0149 (Electric)	Return on Equity
Delmarva Power & Light Co.	10/20	Delmarva Power & Light Co.	Docket No. 20-0150 (Gas)	Return on Equity
Tidewater Utilities, Inc.	11/13	Tidewater Utilities, Inc.	Docket No. 13-466	Capital Structure
Public Service Commission of the District of Columbia				
Washington Gas Light Company	09/20	Washington Gas Light Company	Formal Case No. 1162	Rate of Return
Federal Energy Regulatory Commission				
LS Power Grid California, LLC	10/20	LS Power Grid California, LLC	Docket No. ER21-195-000	Rate of Return
Florida Public Service Commission				
Tampa Electric Company	04/21	Tampa Electric Company	Docket No. 20210034-EI	Return on Equity
Peoples Gas System	09/20	Peoples Gas System	Docket No. 20200051-GU	Rate of Return
Utilities, Inc. of Florida	06/20	Utilities, Inc. of Florida	Docket No. 20200139-WS	Rate of Return
Hawaii Public Utilities Commission				
Launiupoko Irrigation Company, Inc.	12/20	Launiupoko Irrigation Company, Inc.	Docket No. 2020-0217 / Transferred to 2020-0089	Capital Structure
Lanai Water Company, Inc.	12/19	Lanai Water Company, Inc.	Docket No. 2019-0386	Cost of Service / Rate Design
Manele Water Resources, LLC	08/19	Manele Water Resources, LLC	Docket No. 2019-0311	Cost of Service / Rate Design

SPONSOR	DATE	CASE/APPLICANT	DOCKET No.	SUBJECT
Kaupulehu Water Company	02/18	Kaupulehu Water Company	Docket No. 2016-0363	Rate of Return
Aqua Engineers, LLC	05/17	Puhi Sewer & Water Company	Docket No. 2017-0118	Cost of Service / Rate Design
Hawaii Resources, Inc.	09/16	Laie Water Company	Docket No. 2016-0229	Cost of Service / Rate Design
Illinois Commerce Commission				
Utility Services of Illinois, Inc.	02/21	Utility Services of Illinois, Inc.	Docket No. 21-0198	Rate of Return
Ameren Illinois Company d/b/a Ameren Illinois	07/20	Ameren Illinois Company d/b/a Ameren Illinois	Docket No. 20-0308	Return on Equity
Utility Services of Illinois, Inc.	11/17	Utility Services of Illinois, Inc.	Docket No. 17-1106	Cost of Service / Rate Design
Aqua Illinois, Inc.	04/17	Aqua Illinois, Inc.	Docket No. 17-0259	Rate of Return
Utility Services of Illinois, Inc.	04/15	Utility Services of Illinois, Inc.	Docket No. 14-0741	Rate of Return
Indiana Utility Regulatory Commission				
Aqua Indiana, Inc.	03/16	Aqua Indiana, Inc. Aboite Wastewater Division	Docket No. 44752	Rate of Return
Twin Lakes, Utilities, Inc.	08/13	Twin Lakes, Utilities, Inc.	Docket No. 44388	Rate of Return
Kansas Corporation Commission				
Atmos Energy	07/19	Atmos Energy	19-ATMG-525-RTS	Rate of Return
Kentucky Public Service Commission				
Duke Energy Kentucky, Inc.	06/21	Duke Energy Kentucky, Inc.	2021-00190	Return on Equity
Bluegrass Water Utility Operating Company	10/20	Bluegrass Water Utility Operating Company	2020-00290	Return on Equity
Louisiana Public Service Commission				
Southwestern Electric Power Company	12/20	Southwestern Electric Power Company	Docket No. U-35441	Return on Equity
Atmos Energy	04/20	Atmos Energy	Docket No. U-35535	Rate of Return
Louisiana Water Service, Inc.	06/13	Louisiana Water Service, Inc.	Docket No. U-32848	Rate of Return
Maryland Public Service Commission				
Washington Gas Light Company	08/20	Washington Gas Light Company	Case No. 9651	Rate of Return
FirstEnergy, Inc.	08/18	Potomac Edison Company	Case No. 9490	Rate of Return
Massachusetts Department of Public Utilities				
Unitil Corporation	12/19	Fitchburg Gas & Electric Co. (Elec.)	D.P.U. 19-130	Rate of Return
Unitil Corporation	12/19	Fitchburg Gas & Electric Co. (Gas)	D.P.U. 19-131	Rate of Return
Liberty Utilities	07/15	Liberty Utilities d/b/a New England Natural Gas Company	Docket No. 15-75	Rate of Return
Minnesota Public Utilities Commission				
Northern States Power Company	11/20	Northern States Power Company	Docket No. E002/GR-20-723	Rate of Return
Mississippi Public Service Commission				

SPONSOR	DATE	CASE/APPLICANT	DOCKET No.	SUBJECT
Atmos Energy	03/19	Atmos Energy	Docket No. 2015-UN-049	Capital Structure
Atmos Energy	07/18	Atmos Energy	Docket No. 2015-UN-049	Capital Structure
Missouri Public Service Commission				
Spire Missouri, Inc.	12/20	Spire Missouri, Inc.	Case No. GR-2021-0108	Return on Equity
Indian Hills Utility Operating Company, Inc.	10/17	Indian Hills Utility Operating Company, Inc.	Case No. SR-2017-0259	Rate of Return
Raccoon Creek Utility Operating Company, Inc.	09/16	Raccoon Creek Utility Operating Company, Inc.	Docket No. SR-2016-0202	Rate of Return
Public Utilities Commission of Nevada				
Southwest Gas Corporation	08/20	Southwest Gas Corporation	Docket No. 20-02023	Return on Equity
New Hampshire Public Utilities Commission				
Aquarion Water Company of New Hampshire, Inc.	12/20	Aquarion Water Company of New Hampshire, Inc.	Docket No. DW 20-184	Rate of Return
New Jersey Board of Public Utilities				
Middlesex Water Company	05/21	Middlesex Water Company	Docket No. WR21050813	Rate of Return
Atlantic City Electric Company	12/20	Atlantic City Electric Company	Docket No. ER20120746	Return on Equity
FirstEnergy	02/20	Jersey Central Power & Light Co.	Docket No. ER20020146	Rate of Return
Aqua New Jersey, Inc.	12/18	Aqua New Jersey, Inc.	Docket No. WR18121351	Rate of Return
Middlesex Water Company	10/17	Middlesex Water Company	Docket No. WR17101049	Rate of Return
Middlesex Water Company	03/15	Middlesex Water Company	Docket No. WR15030391	Rate of Return
The Atlantic City Sewerage Company	10/14	The Atlantic City Sewerage Company	Docket No. WR14101263	Cost of Service / Rate Design
Middlesex Water Company	11/13	Middlesex Water Company	Docket No. WR1311059	Capital Structure
New Mexico Public Regulation Commission				
Southwestern Public Service Company	01/21	Southwestern Public Service Company	Case No. 20-00238-UT	Return on Equity
North Carolina Utilities Commission				
Piedmont Natural Gas Co.Inc.	03/21	Piedmont Natural Gas Co., Inc.	Docket No. G-9, Sub 781	Return on Equity
Duke Energy Carolinas, LLC	07/20	Duke Energy Carolinas, LLC	Docket No. E-7, Sub 1214	Return on Equity
Duke Energy Progress, LLC	07/20	Duke Energy Progress, LLC	Docket No. E-2, Sub 1219	Return on Equity
Aqua North Carolina, Inc.	12/19	Aqua North Carolina, Inc.	Docket No. W-218 Sub 526	Rate of Return
Carolina Water Service, Inc.	06/19	Carolina Water Service, Inc.	Docket No. W-354 Sub 364	Rate of Return
Carolina Water Service, Inc.	09/18	Carolina Water Service, Inc.	Docket No. W-354 Sub 360	Rate of Return
Aqua North Carolina, Inc.	07/18	Aqua North Carolina, Inc.	Docket No. W-218 Sub 497	Rate of Return
North Dakota Public Service Commission				
Northern States Power Company	11/20	Northern States Power Company	Case No. PU-20-441	Rate of Return
Public Utilities Commission of Ohio				
Aqua Ohio, Inc.	05/16	Aqua Ohio, Inc.	Docket No. 16-0907-WW-AIR	Rate of Return

SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
Pennsylvania Public Utility Commission				
Vicinity Energy Philadelphia, Inc.	04/21	Vicinity Energy Philadelphia, Inc.	Docket No. R-2021-3024060	Rate of Return
Delaware County Regional Water Control Authority	02/20	Delaware County Regional Water Control Authority	Docket No. A-2019-3015173	Valuation
Valley Energy, Inc.	07/19	C&T Enterprises	Docket No. R-2019-3008209	Rate of Return
Wellsboro Electric Company	07/19	C&T Enterprises	Docket No. R-2019-3008208	Rate of Return
Citizens' Electric Company of Lewisburg	07/19	C&T Enterprises	Docket No. R-2019-3008212	Rate of Return
Steelton Borough Authority	01/19	Steelton Borough Authority	Docket No. A-2019-3006880	Valuation
Mahoning Township, PA	08/18	Mahoning Township, PA	Docket No. A-2018-3003519	Valuation
SUEZ Water Pennsylvania Inc.	04/18	SUEZ Water Pennsylvania Inc.	Docket No. R-2018-000834	Rate of Return
Columbia Water Company	09/17	Columbia Water Company	Docket No. R-2017-2598203	Rate of Return
Veolia Energy Philadelphia, Inc.	06/17	Veolia Energy Philadelphia, Inc.	Docket No. R-2017-2593142	Rate of Return
Emporium Water Company	07/14	Emporium Water Company	Docket No. R-2014-2402324	Rate of Return
Columbia Water Company	07/13	Columbia Water Company	Docket No. R-2013-2360798	Rate of Return
Penn Estates Utilities, Inc.	12/11	Penn Estates, Utilities, Inc.	Docket No. R-2011-2255159	Capital Structure / Long-Term Debt Cost Rate
South Carolina Public Service Commission				
Blue Granite Water Co.	12/19	Blue Granite Water Company	Docket No. 2019-292-WS	Rate of Return
Carolina Water Service, Inc.	02/18	Carolina Water Service, Inc.	Docket No. 2017-292-WS	Rate of Return
Carolina Water Service, Inc.	06/15	Carolina Water Service, Inc.	Docket No. 2015-199-WS	Rate of Return
Carolina Water Service, Inc.	11/13	Carolina Water Service, Inc.	Docket No. 2013-275-WS	Rate of Return
United Utility Companies, Inc.	09/13	United Utility Companies, Inc.	Docket No. 2013-199-WS	Rate of Return
Utility Services of South Carolina, Inc.	09/13	Utility Services of South Carolina, Inc.	Docket No. 2013-201-WS	Rate of Return
Tega Cay Water Services, Inc.	11/12	Tega Cay Water Services, Inc.	Docket No. 2012-177-WS	Capital Structure
Tennessee Public Utility Commission				
Piedmont Natural Gas Company	07/20	Piedmont Natural Gas Company	Docket No. 20-00086	Return on Equity
Public Utility Commission of Texas				
Southwestern Public Service Company	02/21	Southwestern Public Service Company	Docket No. 51802	Return on Equity

SPONSOR	DATE	CASE/APPLICANT	DOCKET No.	SUBJECT
Southwestern Electric Power Company	10/20	Southwestern Electric Power Company	Docket No. 51415	Rate of Return
Virginia State Corporation Commission				
Virginia Natural Gas, Inc.	04/21	Virginia Natural Gas, Inc.	PUR-2020-00095	Return on Equity
Massanutten Public Service Corporation	12/20	Massanutten Public Service Corporation	PUE-2020-00039	Return on Equity
Aqua Virginia, Inc.	07/20	Aqua Virginia, Inc.	PUR-2020-00106	Rate of Return
WGL Holdings, Inc.	07/18	Washington Gas Light Company	PUR-2018-00080	Rate of Return
Atmos Energy Corporation	05/18	Atmos Energy Corporation	PUR-2018-00014	Rate of Return
Aqua Virginia, Inc.	07/17	Aqua Virginia, Inc.	PUR-2017-00082	Rate of Return
Massanutten Public Service Corp.	08/14	Massanutten Public Service Corp.	PUE-2014-00035	Rate of Return / Rate Design

Carolina Water Services Inc of North Carolina
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Dylan W. D'Ascendis, CRRRA, CVA

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Carolina Water Service Inc of North Carolina
Recommended Capital Structure and Cost Rates
for Ratemaking Purposes
at April 16, 2021

<u>Type Of Capital</u>	<u>Ratios (1)</u>	<u>Cost Rate</u>		<u>Weighted Cost Rate</u>
Long-Term Debt	52.03%	4.97%	(1)	2.59%
Common Equity	<u>47.97%</u>	10.50%	(2)	<u>5.04%</u>
Total	<u>100.00%</u>			<u>7.63%</u>

Notes:

- (1) Company-provided.
- (2) From page 2 of this Schedule.

Carolina Water Service Inc of North Carolina
Brief Summary of Common Equity Cost Rate

<u>Line No.</u>	<u>Principal Methods</u>	<u>Proxy Group of Eight Water Companies</u>	<u>Using Current Interest Rates</u>
1.	Discounted Cash Flow Model (DCF) (1)	8.63%	8.63%
2.	Risk Premium Model (RPM) (2)	11.03%	10.53%
3.	Capital Asset Pricing Model (CAPM) (3)	10.16%	9.85%
4.	Market Models Applied to Comparable Risk, Non-Price Regulated Companies (4)	<u>10.68%</u>	<u>10.24%</u>
5.	Indicated Common Equity Cost Rate before Adjustment for Unique Risk	10.13% - 10.42%	9.81% - 10.05%
6.	Business Risk Adjustment (5)	0.40%	0.40%
7.	Indicated Common Equity Cost Rate after Adjustment	<u>10.53% - 10.82%</u>	<u>10.21% - 10.45%</u>
8.	Recommended Common Equity Cost Rate	<u><u>10.50%</u></u>	

- Notes: (1) From Schedule DWD-3.
(2) From page 1 of Schedule DWD-4.
(3) From page 1 of Schedule DWD-5.
(4) From page 1 of Schedule DWD-7.
(5) Business risk adjustment to reflect Carolina Water Services' unique risk compared to the Utility Proxy Group as detailed in the accompanying direct testimony.
(6) From page 1 of Schedule DWD-9.

Proxy Group of Eight Water Companies
 CAPITALIZATION AND FINANCIAL STATISTICS (1)
 2016 - 2020, Inclusive

	2020	2019	2018	2017	2016	
	(MILLIONS OF DOLLARS)					
Capitalization Statistics						
Amount of Capital Employed						
Total Permanent Capital	\$2,817.868	\$2,585.327	\$2,287.586	\$2,018.207	\$1,921.453	
Short-Term Debt	\$248.763	\$163.226	\$161.255	\$162.839	\$133.679	
Total Capital Employed	<u>\$3,066.631</u>	<u>\$2,748.553</u>	<u>\$2,448.841</u>	<u>\$2,181.046</u>	<u>\$2,055.132</u>	
Indicated Average Capital Cost Rates (2)						
Total Debt	4.01 %	4.42 %	4.83 %	4.92 %	5.81 %	
Preferred Stock	5.76 %	5.84 %	5.92 %	5.91 %	5.91 %	
Capital Structure Ratios						
5 YEAR AVERAGE						
Based on Total Permanent Capital:						
Long-Term Debt	52.68 %	51.94 %	47.98 %	49.69 %	50.39 %	50.54 %
Preferred Stock	0.04	0.05	0.08	0.09	0.10	0.07
Common Equity	47.28	48.01	51.94	50.22	49.51	49.39
Total	<u>100.00 %</u>	<u>100.00 %</u>	<u>100.00 %</u>	<u>100.00 %</u>	<u>100.00 %</u>	<u>100.00 %</u>
Based on Total Capital:						
Total Debt, Including Short-Term Debt	55.98 %	55.05 %	51.17 %	52.87 %	52.59 %	53.53 %
Preferred Stock	0.04	0.05	0.07	0.08	0.09	0.07
Common Equity	43.97	44.90	48.75	47.04	47.32	46.40
Total	<u>100.00 %</u>	<u>100.00 %</u>	<u>100.00 %</u>	<u>100.00 %</u>	<u>100.00 %</u>	<u>100.00 %</u>
Financial Statistics						
Financial Ratios - Market Based						
Earnings / Price Ratio	3.16 %	2.66 %	3.24 %	3.54 %	3.30 %	3.18 %
Market / Average Book Ratio	323.29	331.95	295.35	298.06	263.80	302.49
Dividend Yield	1.95	1.92	2.12	2.16	2.38	2.11
Dividend Payout Ratio	53.11	69.08	57.69	56.10	57.06	58.61
Rate of Return on Average Book Common Equity	10.11 %	9.60 %	10.10 %	10.91 %	10.42 %	10.23 %
Total Debt / EBITDA (3)	5.06 x	5.32 x	4.21 x	3.73 x	3.88 x	4.44 x
Funds from Operations / Total Debt (4)	12.38 %	13.75 %	21.05 %	23.06 %	21.42 %	18.33 %
Total Debt / Total Capital	55.98 %	55.05 %	51.17 %	52.87 %	52.59 %	53.53 %

Notes:

- (1) All capitalization and financial statistics for the group are the arithmetic average of the achieved results for each individual company in the group, and are based upon financial statements as originally reported in each year.
- (2) Computed by relating actual total debt interest or preferred stock dividends booked to average of beginning and ending total debt or preferred stock reported to be outstanding.
- (3) Total debt relative to EBITDA (Earnings before Interest, Income Taxes, Depreciation and Amortization).
- (4) Funds from operations (sum of net income, depreciation, amortization, net deferred income tax and investment tax credits, less total AFUDC) plus interest charges as a percentage of total debt.

Source of Information: Company Annual Forms 10-K

Capital Structure Based upon Total Permanent Capital for the
 Proxy Group of Eight Water Companies
 2016 - 2020, Inclusive

	2020	2019	2018	2017	2016	5 YEAR AVERAGE
<u>American States Water Company</u>						
Long-Term Debt	40.72 %	31.87 %	36.54 %	37.75 %	39.40 %	37.26 %
Preferred Stock	0.00	0.00	0.00	0.00	0.00	0.00
Common Equity	59.28	68.13	63.46	62.25	60.60	62.74
Total Capital	<u>100.00 %</u>					
<u>American Water Works Company, Inc.</u>						
Long-Term Debt	59.93 %	58.59 %	56.55 %	55.81 %	54.74 %	57.12 %
Preferred Stock	0.02	0.03	0.05	0.07	0.09	0.05
Common Equity	40.05	41.38	43.40	44.12	45.17	42.83
Total Capital	<u>100.00 %</u>					
<u>Artesian Resources Corporation</u>						
Long-Term Debt	45.96 %	47.65 %	43.42 %	42.17 %	42.71 %	44.38 %
Preferred Stock	0.00	0.00	0.00	0.00	0.00	0.00
Common Equity	54.04	52.35	56.58	57.83	57.29	55.62
Total Capital	<u>100.00 %</u>					
<u>California Water Service Group</u>						
Long-Term Debt	46.04 %	50.90 %	52.74 %	43.40 %	45.83 %	47.78 %
Preferred Stock	0.00	0.00	0.00	0.00	0.00	0.00
Common Equity	53.96	49.10	47.26	56.60	54.17	52.22
Total Capital	<u>100.00 %</u>					
<u>Global Water Resources, Inc.</u>						
Long-Term Debt	78.09 %	82.31 %	80.43 %	88.50 %	88.27 %	83.52 %
Preferred Stock	0.00	0.00	0.00	0.00	0.00	0.00
Common Equity	21.91	17.69	19.57	11.50	11.73	16.48
Total Capital	<u>100.00 %</u>					
<u>Middlesex Water Company</u>						
Long-Term Debt	44.61 %	42.20 %	38.94 %	38.65 %	38.91 %	40.66 %
Preferred Stock	0.33	0.37	0.59	0.64	0.68	0.52
Common Equity	55.06	57.43	60.47	60.71	60.41	58.82
Total Capital	<u>100.00 %</u>					
<u>SIW Group</u>						
Long-Term Debt	59.79 %	59.05 %	32.67 %	48.20 %	50.69 %	50.08 %
Preferred Stock	0.00	0.00	0.00	0.00	0.00	0.00
Common Equity	40.21	40.95	67.33	51.80	49.31	49.92
Total Capital	<u>100.00 %</u>					
<u>The York Water Company</u>						
Long-Term Debt	46.31 %	42.95 %	42.52 %	43.02 %	42.60 %	43.48 %
Preferred Stock	0.00	0.00	0.00	0.00	0.00	0.00
Common Equity	53.69	57.05	57.48	56.98	57.40	56.52
Total Capital	<u>100.00 %</u>					
<u>Proxy Group of Eight Water Companies</u>						
Long-Term Debt	52.68 %	51.94 %	47.98 %	49.69 %	50.39 %	50.54 %
Preferred Stock	0.04	0.05	0.08	0.09	0.10	0.07
Common Equity	47.28	48.01	51.94	50.22	49.51	49.39
Total Capital	<u>100.00 %</u>					

Source of Information
 Annual Forms 10-K

Carolina Water Service Inc of North Carolina
 Indicated Common Equity Cost Rate Using the Discounted Cash Flow Model for the
Proxy Group of Eight Water Companies

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Proxy Group of Eight Water Companies	Average Dividend Yield (1)	Value Line Projected Five Year Growth in EPS (2)	Zack's Five Year Projected Growth Rate in EPS	Yahoo! Finance Projected Five Year Growth in EPS	Bloomberg Projected Five Year Growth in EPS	Average Projected Five Year Growth in EPS (3)	Adjusted Dividend Yield (4)	Indicated Common Equity Cost Rate (5)
American States Water Company	1.75 %	6.50 %	NA %	4.60 %	6.00 %	5.70 %	1.80 %	7.50 %
American Water Works Company, Inc.	1.46	8.50	8.10	8.60	8.54	8.44	1.52	9.96
Artesian Resources Corporation	2.64	NA	NA	4.00	NA	4.00	2.69	6.69
California Water Service Group	1.64	6.50	NA	10.75	4.00	7.08	1.70	8.78
Global Water Resources, Inc.	1.72	15.00	15.00	15.00	NA	15.00	1.85	16.85
Middlesex Water Company	1.41	4.50	NA	2.70	NA	3.60	1.44	5.04
SIW Group	2.11	13.00	NA	5.50	7.00	8.50	2.20	10.70
The York Water Company	1.62	6.50	NA	4.90	NA	5.70	1.67	7.37
							Average	9.11 %
							Median	8.14 %
							Average of Mean and Median	8.63 %

NA= Not Available

Notes:

- (1) Indicated dividend at 04/16/2021 divided by the average closing price of the last 60 trading days ending 04/16/2021 for each company.
- (2) From pages 2 through 9 of this Schedule.
- (3) Average of columns 2 through 5 excluding negative growth rates.
- (4) This reflects a growth rate component equal to one-half the conclusion of growth rate (from column 6) x column 1 to reflect the periodic payment of dividends (Gordon Model) as opposed to the continuous payment. Thus, for American States Water Company, $1.75\% \times (1 + 1/2 \times 5.70\%) = 1.80\%$.
- (5) Column 6 + column 7.

Source of Information:

Value Line Investment Survey
 www.zacks.com Downloaded on 04/16/2021
 www.yahoo.com Downloaded on 04/16/2021
 Bloomberg Professional Services

AMER. STATES WATER NYSE-AWR										RECENT PRICE	75.91		P/E RATIO	31.5 (Trailing: 32.6 Median: 24.0)		RELATIVE P/E RATIO	1.44		DIV'D YLD	1.9%		VALUE LINE
TIMELINESS 3 Raised 3/5/21	High: 19.8	18.2	24.1	33.1	38.7	44.1	47.2	58.4	69.6	96.0	96.6	83.1				Target Price	Range					
SAFETY 2 Raised 7/20/12	Low: 15.6	15.3	17.0	24.0	27.0	35.8	37.3	41.1	50.1	63.3	65.1	70.1				2024	2025	2026				
TECHNICAL 4 Lowered 4/9/21	LEGENDS 1.35 x Dividends p sh divided by Interest Rate Relative Price Strength 2-for-1 split 9/13 Options: Yes Shaded area indicates recession																					
BETA .65 (1.00 = Market)																						
18-Month Target Price Range	Low-High Midpoint (% to Mid) \$62-\$108 \$85 (10%)																					
2024-26 PROJECTIONS	Price	Gain	Ann'l Total															% TOT. RETURN 2/21				
High	85	(+10%)	5%															1 yr.	-3.0	50.1		
Low	60	(-20%)	-3%															3 yr.	43.9	45.4		
																		5 yr.	88.1	108.8		
Institutional Decisions	2020	3Q20	4Q20	Percent	24															VL ARITH. INDEX		
to Buy	135	121	121	shares	16															1 yr.	-3.0	50.1
to Sell	129	135	142	traded	8															3 yr.	43.9	45.4
Hld's(000)	25635	25731	25483																	5 yr.	88.1	108.8
2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	© VALUE LINE PUB. LLC	24-26			
7.03	7.88	8.75	9.21	9.74	10.71	11.12	12.12	12.19	12.17	12.56	11.92	12.01	11.88	12.86	13.24	13.55	13.75	Revenues per sh	17.20			
1.32	1.45	1.65	1.69	1.70	2.11	2.13	2.48	2.65	2.67	2.81	2.70	2.96	2.84	3.26	3.34	3.50	3.65	"Cash Flow" per sh	4.80			
.66	.67	.81	.78	.81	1.11	1.12	1.41	1.61	1.57	1.61	1.62	1.88	1.72	2.28	2.33	2.40	2.55	Earnings per sh ^A	3.05			
.45	.46	.48	.50	.51	.52	.55	.64	.76	.83	.87	.91	.99	1.06	1.16	1.28	1.40	1.52	Div'd Decl'd per sh ^B	2.00			
2.12	1.95	1.45	2.23	2.09	2.12	2.13	1.77	2.52	1.89	2.39	3.55	3.08	3.44	4.12	3.54	4.05	4.00	Cap'l Spending per sh	4.25			
7.86	8.32	8.77	8.97	9.70	10.13	10.84	11.80	12.72	13.24	12.77	13.52	14.45	15.19	16.33	17.39	18.95	20.00	Book Value per sh ^D	23.20			
33.60	34.10	34.46	34.60	37.06	37.26	37.70	38.53	38.72	38.29	36.50	36.57	36.68	36.76	36.85	36.89	37.25	37.50	Common Shs Outst'g ^C	37.50			
21.9	27.7	24.0	22.6	21.2	15.7	15.4	14.3	17.2	20.1	24.6	25.6	25.7	34.0	34.4	34.3	34.0	34.3	Avg Ann'l P/E Ratio	24.0			
1.17	1.50	1.27	1.36	1.41	1.00	.97	.91	.97	1.06	1.24	1.34	1.29	1.84	1.83	1.78	1.83	1.78	Relative P/E Ratio	1.35			
3.1%	2.5%	2.5%	2.9%	2.9%	3.0%	3.2%	3.1%	2.7%	2.6%	2.2%	2.2%	2.0%	1.8%	1.5%	1.6%	1.5%	1.6%	Avg Ann'l Div'd Yield	2.8%			
CAPITAL STRUCTURE as of 12/31/20						419.3	466.9	472.1	465.8	458.6	436.1	440.6	436.8	473.9	488.2	505	515	Revenues (\$mill)	645			
TOTAL DEBT \$575.0 mill. Due in 5 Yrs \$136.0 mill.						42.0	54.1	62.7	61.1	60.5	59.7	69.4	63.9	84.3	86.4	90.0	95.0	Net Profit (\$mill)	115			
LT Debt \$574.6 mill. LT Interest \$22.5 mill. (47% of Cap'l)						41.7%	39.9%	36.3%	38.4%	38.4%	36.8%	36.0%	22.0%	22.6%	24.6%	23.0%	24.0%	Income Tax Rate	23.0%			
Leases, Uncapitalized: Annual rentals \$2.6 mill. Pension Assets-12/19 \$213.1 mill. Oblig. \$272.8 mill.						2.0%	2.5%	--	--	--	--	--	--	2.5%	--	1.0%	1.0%	1.0%	AFUDC % to Net Profit	1.0%		
Pfd Stock None						45.4%	42.2%	39.8%	39.1%	41.1%	39.4%	38.0%	40.5%	44.4%	47.2%	45.0%	45.5%	Long-Term Debt Ratio	53.5%			
Common Stock 36,898,213 shs. as of 2/19/20						54.6%	57.8%	60.2%	60.9%	58.9%	60.6%	62.0%	59.5%	55.6%	52.8%	55.0%	54.5%	Common Equity Ratio	46.5%			
MARKET CAP: \$2.8 billion (Mid Cap)						749.1	787.0	818.4	832.6	791.5	815.3	854.9	938.4	1082.5	1216.2	1280	1380	Total Capital (\$mill)	1620			
CURRENT POSITION 2018 2019 12/31/20 (\$MILL.)						896.5	917.8	981.5	1003.5	1060.8	1150.9	1205.0	1296.3	1415.7	1512.0	1600	1700	Net Plant (\$mill)	1925			
Cash Assets						7.1%	8.3%	8.9%	8.6%	9.0%	8.6%	9.3%	7.9%	8.9%	8.0%	8.0%	8.0%	Return on Total Cap'l	8.5%			
Accts Receivable						10.3%	11.9%	12.7%	12.0%	13.0%	12.1%	13.1%	11.4%	14.0%	13.5%	13.0%	12.5%	Return on Shr. Equity	13.0%			
Other						10.3%	11.9%	12.7%	12.0%	13.0%	12.1%	13.1%	11.4%	14.0%	13.5%	13.0%	12.5%	Return on Com Equity	13.0%			
Current Assets						5.3%	6.6%	6.8%	5.7%	6.0%	5.3%	6.2%	4.5%	6.9%	6.1%	6.0%	5.0%	Retained to Com Eq	4.5%			
Accts Payable						49%	45%	47%	53%	54%	56%	52%	61%	51%	55%	58%	60%	All Div's to Net Prof	66%			
Debt Due						BUSINESS: American States Water Co. operates as a holding company. Through its principal subsidiary, Golden State Water Co., it supplies water to 261,976 customers in 10 California counties. Service areas include the metropolitan areas of Los Angeles and Orange Counties. The company also provides electricity to 24,545 customers in Big Bear Lake and San Bernardino Cnty. Provides water & wastewater services to U.S. military bases through its ASUS subsidiary. Sold Chaparral City Wtr. of AZ. (6/11). Employs 841. BlackRock, Inc. owns 15.9% of out. shares; Vanguard, 11.9%; off. & dir. 1.0%. (4/20 Proxy). Chairman: Lloyd Ross. Pres. & CEO: Robert Sprowls. Inc. CA. Address: 630 East Foothill Blvd., San Dimas, CA 91773. Tel: 909-394-3600. Internet: www.aswater.com.																
Other						Shares of American States Water have not performed well lately. Over the past three-month period, the price of the stock has declined about 2%. By comparison, the S&P 500 Index has increased 7%, a difference of nearly 900 basis points. Meanwhile, a major rate case is pending. California is a state where water utilities file a petition to raise prices once every three years. Last summer, the Golden States Water Company (GSWC) submitted the papers for rate hikes that would cover the years 2022 to 2024. The final decision on the case is not expected until late this year, at the earliest. Our earnings assumptions are based upon a reasonable ruling, as relations with the regulators has been mostly positive. An unexpectedly harsh decision would have a negative impact on the bottom line. Earnings should advance at a decent clip both this year and next. The company's year-over-year share net will likely only increase 3% in 2021. (Utilities often see earnings growth slow in the year before new rates are determined.) In 2022, with the assistance of higher rates, we are estimating that earnings per share will climb 6%. Dividend growth prospects seem to be somewhat brighter. At the company's August board meeting, we think the distribution per share will be raised \$0.03, a 9% increase. This is near the very high end of the range for water utilities. The company's nonregulated operations offer some potential upside. Through its ASUS business, the company operates water systems at U.S. Army installations. ASUS has been reasonably successful in winning its share of the many contracts the military has put out for bid. With more privatizations of these facilities planned, this segment could provide higher-margined revenues. That's because returns here are not capped, so there isn't a limit on profitability. These neutrally ranked shares do not have appeal, at this time. Despite lagging the market, AWR is only ranked to perform in line with the major indexes in the year ahead. Moreover, over the pull to 2024-2026, total return potential is well below the Value Line median, as the equity is already in its Target Price Range.																
Current Liab.						James A. Flood April 9, 2021																
ANNUAL RATES of change (per sh)						Past 10 Yrs.	Past 5 Yrs.	Est'd '18-'20 to 24-'26														
Revenues						2.5%	5%	5.0%														
"Cash Flow"						5.5%	3.0%	7.0%														
Earnings						9.0%	5.5%	6.5%														
Dividends						8.5%	7.5%	9.5%														
Book Value						5.5%	5.0%	5.5%														
Cal-endar	QUARTERLY REVENUES (\$ mill.)				Full Year																	
	Mar.31	Jun.30	Sep.30	Dec.31																		
2018	94.7	106.9	124.2	111.0	436.8																	
2019	101.7	124.7	134.5	113.0	473.9																	
2020	109.1	121.3	133.6	124.2	488.2																	
2021	115	125	145	120	505																	
2022	118	127	148	122	515																	
Cal-endar	EARNINGS PER SHARE ^A				Full Year																	
	Mar.31	Jun.30	Sep.30	Dec.31																		
2018	.29	.44	.62	.37	1.72																	
2019	.35	.72	.76	.45	2.28																	
2020	.38	.69	.72	.54	2.33																	
2021	.45	.67	.75	.53	2.40																	
2022	.48	.72	.78	.57	2.55																	
Cal-endar	QUARTERLY DIVIDENDS PAID ^B				Full Year																	
	Mar.31	Jun.30	Sep.30	Dec.31																		
2017	.242	.242	.255	.255	.99																	
2018	.255	.255	.275	.275	1.06																	
2019	.275	.275	.305	.305	1.16																	
2020	.305	.305	.335	.335	1.28																	
2021	.335																					

(A) Primary earnings. Excludes nonrecurring gains/(losses): '05, 13c; '06, 3c; '08, 14c; '10, 23c; '11, 10c. Next earnings report due mid-May.
 (B) Dividends historically paid in early March, June, September, and December. ■ Div'd reinvestment plan available.
 (C) In millions, adjusted for split.
 (D) Includes intangibles. As of 12/31/20; \$1.1 million/\$0.03 a share.

Company's Financial Strength A
 Stock's Price Stability 100
 Price Growth Persistence 95
 Earnings Predictability 85

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AMERICAN WATER NYSE-AWK										RECENT PRICE	P/E RATIO					RELATIVE P/E RATIO	DIV'D YLD	VALUE LINE							
										147.91	35.4 (Trailing: 37.8 Median: 24.0)					1.62	1.6%								
TIMELINESS 2 Lowered 11/13/20 SAFETY 3 New 7/25/08 TECHNICAL 3 Lowered 4/9/21 BETA .85 (1.00 = Market)										High: 25.8 32.8 39.4 45.1 56.2 61.2 85.2 92.4 98.2 Low: 19.4 25.2 31.3 37.0 41.1 48.4 58.9 70.0 76.0										129.9	172.6	166.1	88.0	92.0	131.0
18-Month Target Price Range Low-High Midpoint (% to Mid) \$114-\$247 \$181 (20%)										LEGENDS 1.10 x Dividends p sh divided by Interest Rate Relative Price Strength Options: Yes Shaded area indicates recession										Target Price Range 2024 2025 2026					
2024-26 PROJECTIONS Price Gain Ann'l Total High Low 155 105 (+5%) (-30%) 3% -6%										Percent shares traded 21 14 7										% TOT. RETURN 2/21 THIS STOCK VL ARITH. INDEX 1 yr. 16.5 50.1 3 yr. 87.7 45.4 5 yr. 139.3 108.8					
Institutional Decisions 2Q2020 3Q2020 4Q2020 to Buy 363 401 449 to Sell 371 337 344 Hld's(000) 151102 150689 148917										2005 2006E 2007E 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022										© VALUE LINE PUB. LLC 24-26					
CAPITAL STRUCTURE as of 12/31/20 Total Debt \$10691 mil. Due in 5 Yrs \$2500 mil. LT Debt \$9329 mil. LT Interest \$354 mil. (59% of Cap'l)										2666.2 2876.9 2901.9 3011.3 3159.0 3302.0 3357.0 3440.0 3610.0 3777.0 4010 4240 304.9 374.3 369.3 429.8 476.0 468.0 426.0 567.0 621.0 709.0 770 835										Revenues per sh 25.80 "Cash Flow" per sh 9.70 Earnings per sh A 5.50 Div'd Decl'd per sh B 3.10 Cap'l Spending per sh 11.75 Book Value per sh D 50.00 Common Shs Outst'g C 190.00 Avg Ann'l P/E Ratio 23.5 Relative P/E Ratio 1.30 Avg Ann'l Div'd Yield 2.4%					
Leases, Uncapitalized: Annual rentals \$14.0 mill. Pension Assets/219 \$1747.0 mill. Oblig. \$2161.0 mill. Pfd Stock \$4.0 mill. Pfd Div'd \$3.3 mill										39.5% 40.7% 39.1% 39.4% 39.1% 39.2% 53.3% 28.2% 25.5% 23.3% 23.5% 23.5% -- 6.2% 5.1% -- -- -- -- -- 5.1% 4.0% 5.0% 5.0%										Income Tax Rate 24.0% AFUDC % to Net Profit 5.0% Long-Term Debt Ratio 61.0% Common Equity Ratio 39.0% Total Capital (\$mill) 20000 Net Plant (\$mill) 24500 Return on Total Cap'l 6.0% Return on Shr. Equity 11.0% Return on Com Equity 11.0%					
Common Stock 181,439,255 shares as of 2/19/21 MARKET CAP: \$26.8 billion (Large Cap)										55.7% 53.9% 52.4% 52.4% 53.7% 52.4% 54.7% 56.3% 58.5% 59.1% 59.5% 61.5% 44.2% 46.1% 47.6% 47.4% 46.2% 47.5% 45.3% 43.6% 41.4% 40.9% 40.5% 39.5%										AFUDC % to Net Profit 5.0% Long-Term Debt Ratio 61.0% Common Equity Ratio 39.0% Total Capital (\$mill) 20000 Net Plant (\$mill) 24500 Return on Total Cap'l 6.0% Return on Shr. Equity 11.0% Return on Com Equity 11.0%					
CURRENT POSITION 2018 2019 12/31/20 (SMILL.) Cash Assets 158 91 576 Accts Receivable 301 294 321 Other 322 900 1009 Current Assets 781 1285 1906 Accts Payable 175 203 189 Debt Due 1035 814 1611 Other 884 1028 1081 Current Liab. 2094 2045 2881										7.2% 8.4% 7.8% 8.7% 9.4% 9.0% 7.9% 9.7% 10.1% 11.0% 11.5% 11.5% 7.2% 8.4% 7.8% 8.7% 9.4% 9.0% 7.9% 9.7% 10.1% 11.0% 11.5% 11.5%										Retained to Com Eq 4.5% All Div'ds to Net Prof 56%					
ANNUAL RATES Past 10 Yrs. Past 5 Yrs. Est'd '18-'20 of change (per sh) 10 Yrs. 5 Yrs. to '24-'26 Revenues 3.0% 3.5% 4.5% "Cash Flow" 8.0% 7.0% 6.5% Earnings 10.5% 8.0% 8.5% Dividends 11.0% 11.5% 8.5% Book Value 3.5% 4.5% 5.0%										3.5% 3.6% 4.7% 4.3% 4.7% 4.0% 2.5% 4.2% 4.4% 5.0% 5.0% 5.0% 52% 57% 40% 50% 50% 50% 68% 56%										All Div'ds to Net Prof 56%					
QUARTERLY REVENUES (\$ mill.) Cal-endar Mar.31 Jun.30 Sep.30 Dec.31 Full Year 2018 761 853 976 850 3440 2019 813 882 1013 902 3610 2020 844 931 1079 923 3777 2021 880 995 1140 995 4010 2022 935 1055 1200 1050 4240										AMERICAN WATER WORKS COMPLETED ANOTHER VERY SUCCESSFUL YEAR IN 2020. Due in part to a strong fourth quarter, the water utility managed to post an impressive 14% share-earnings increase over 2019. One of the most attractive qualities about this industry is that the demand for water is relatively inelastic. Hence, the pandemic has had no real impact on the company.										literally thousands of these undersized water entities that are run by local municipalities. Often they are inefficient and undercapitalized. American Water can merge these operations into its existing business and attain significant economies of scale. As a result, the utility's margins should continue to widen annually as long as this policy is in place.					
QUARTERLY EARNINGS PER SHARE A Cal-endar Mar.31 Jun.30 Sep.30 Dec.31 Full Year 2018 .59 .91 1.03 .62 3.15 2019 .62 .94 1.33 .54 3.43 2020 .68 .97 1.46 .80 3.91 2021 .73 1.05 1.60 .87 4.25 2022 .80 1.15 1.70 .95 4.60										THE EARNINGS PICTURE REMAINS BRIGHT. American Water has an aggressive acquisition policy (more below). This, plus solid cost controls, an expanding rate base, and the stable need for water, should ensure solid yearly earnings per share increases for the foreseeable future. We think the company's share net will rise 8% both this year and in 2022. Through 2024 to 2026, we estimate growth here should be in the 7%-10% range, a much higher rate than the typical utility.										Capital expenditures are large, but manageable. Like others in the group, the company is spending heavily to upgrade its pipelines and other assets. Also, most of the acquisitions require investment to ensure that they are in compliance with federal mandates. Over the past 10 years, capital outlays have totaled \$28 billion. Out to mid-decade, annual outlays may average \$2.2 billion to \$2.5 billion. The balance sheet will likely handle this without deteriorating much.					
QUARTERLY DIVIDENDS PAID B Cal-endar Mar.31 Jun.30 Sep.30 Dec.31 Full Year 2017 .375 .415 .415 .415 1.62 2018 .415 .455 .455 .455 1.78 2019 .455 .50 .50 .50 1.96 2020 .50 .55 .55 .55 2.15 2021 .55										THE COMPANY OUGHT TO CONTINUE TO FOLLOWING WHAT HAS BEEN A SUCCESSFUL STRATEGY. Management has been acquiring small, independent water districts for many years. Indeed, in 2020, 23 such purchases were made. Domestically, there are										These shares are timely. Since our January report, the equity has underperformed the market indexes by about 750 basis points. Thus, the premium investors usually have to pay for this industry standard has declined to some degree.					
Business: American Water Works Company, Inc. is the largest investor-owned water and wastewater utility in the U.S., providing services to approximately 15 million people in 46 states. Nonregulated business assists municipalities and military bases with the maintenance and upkeep as well. Regulated operations made up 86% of 2020 revenues. New Jersey is its largest market accounting										12/31/20: \$1.559 billion, \$8.59/share. (E) Pro forma numbers for '06 & '07.										Company's Financial Strength B++ Stock's Price Stability 85 Price Growth Persistence 80 Earnings Predictability 85					

(A) Diluted earnings. Excludes nonrecr. losses: '06, \$4.62; '09, \$2.63; '11, \$0.07. Disc. oper.: '06, (\$0.04); '11, \$0.03; '12, (\$0.10); '13, (\$0.01). GAAP used as of 2014. Next earnings report due mid-May.
 (B) Dividends paid in March, June, September, and December. * Div. reinvestment available.
 (C) In millions. (D) Includes intangibles. On
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ARTESIAN RES. CORP. NDQ--ARTNA		RECENT PRICE	39.71	TRAILING P/E RATIO	22.1	RELATIVE P/E RATIO	1.02	DIV'D YLD	2.6%	VALUE LINE		
RANKS		24.43 18.20	24.27 21.52	23.82 19.85	29.16 20.00	35.00 25.17	43.22 29.37	41.92 32.00	40.97 33.14	40.26 30.00	42.70 36.70	High Low
PERFORMANCE	3 Average											
Technical	3 Average											
SAFETY	3 Average											
BETA	.75 (1.00 = Market)											
Financial Strength	B+											
Price Stability	85											
Price Growth Persistence	60											
Earnings Predictability	95											
© VALUE LINE PUBLISHING LLC		2012	2013	2014	2015	2016	2017	2018	2019	2020	2021/2022	
SALES PER SH		8.10	7.82	8.13	8.50	8.67	8.92	8.69	9.00	9.42		
"CASH FLOW" PER SH		2.04	1.87	2.04	2.22	2.43	2.55	2.66	2.77	2.99		
EARNINGS PER SH		1.13	.94	1.07	1.26	1.41	1.51	1.54	1.60	1.79	NA/NA	
DIV'DS DECL'D PER SH		.79	.82	.85	.87	.90	.93	.96	.98	1.01		
CAP'L SPENDING PER SH		2.36	2.40	2.66	2.28	3.10	4.46	5.30	4.38	3.66		
BOOK VALUE PER SH		13.57	13.80	14.09	14.61	15.23	15.91	16.57	17.25	18.11		
COMMON SHS OUTST'G (MILL)		8.71	8.83	8.91	9.06	9.13	9.22	9.25	9.29	9.36		
AVG ANN'L P/E RATIO		18.3	23.9	20.5	18.0	20.9	24.2	23.9	22.8	20.2	NA/NA	
RELATIVE P/E RATIO		1.17	1.34	1.08	.93	1.14	1.21	1.35	1.32	1.19		
AVG ANN'L DIV'D YIELD		3.8%	3.7%	3.9%	3.8%	3.1%	2.5%	2.6%	2.7%	2.8%		
SALES (\$MILL)		70.6	69.1	72.5	77.0	79.1	82.2	80.4	83.6	88.1	Bold figures are consensus earnings estimates and, using the recent prices, P/E ratios.	
OPERATING MARGIN		48.7%	47.0%	48.8%	43.0%	44.4%	44.6%	46.1%	43.0%	47.8%		
DEPRECIATION (\$MILL)		7.9	8.3	8.7	8.8	9.2	9.6	10.3	10.8	11.1		
NET PROFIT (\$MILL)		9.8	8.3	9.5	11.3	13.0	14.0	14.3	14.9	16.8		
INCOME TAX RATE		40.2%	40.2%	40.1%	--	--	--	--	--	--		
NET PROFIT MARGIN		14.0%	12.0%	13.1%	14.7%	16.4%	17.0%	17.8%	17.9%	19.1%		
WORKING CAP'L (\$MILL)		d11.4	d12.3	d13.5	d8.8	d4.7	d9.5	d21.6	d11.4	d26.1		
LONG-TERM DEBT (\$MILL)		106.3	105.5	105.0	103.6	102.3	105.6	115.9	144.2	142.3		
SHR. EQUITY (\$MILL)		118.2	121.8	125.6	132.3	139.0	146.6	153.3	160.3	169.4		
RETURN ON TOTAL CAP'L		5.9%	5.1%	5.5%	6.3%	6.7%	6.8%	6.5%	6.1%	6.6%		
RETURN ON SHR. EQUITY		8.3%	6.8%	7.6%	8.5%	9.3%	9.5%	9.3%	9.3%	9.9%		
RETAINED TO COM EQ		2.5%	.9%	1.6%	2.6%	3.4%	3.7%	3.6%	3.6%	4.4%		
ALL DIV'DS TO NET PROF		70%	87%	79%	69%	63%	61%	62%	61%	56%		

Note: No analyst estimates available.

ANNUAL RATES						ASSETS (\$mill.)			INDUSTRY: Water Utility						
of change (per share)	5 Yrs.	1 Yr.				2018	2019	12/31/20	<p>BUSINESS: Artesian Resources Corp. operates as the parent holding company of five regulated public utilities: Artesian Water Company, Inc., Artesian Water Pennsylvania, Inc., Artesian Water Maryland, Inc., Artesian Wastewater Management, Inc., and Artesian Wastewater Maryland, Inc.; and three non-regulated subsidiaries: Artesian Utility Development, Inc., Artesian Development Corp., and Artesian Storm Water Services, Inc. Its principal subsidiary, Artesian Water Company, Inc., distributes and sells water, including water for public and private fire protection, to residential, commercial, industrial, municipal, and utility customers in Delaware, Maryland, and Pennsylvania. It provides wastewater services to customers in Delaware. In addition, it provides contract water and wastewater operations, and water, sewer and internal Service Line Protection Plans. Artesian Water produced approximately 86% of 2020 consolidated operating revenues. Has 235 employees. Chairman, C.E.O. & President: Dian C. Taylor Address: 664 Churchmans Rd., Newark, DE 19702. Tel.: (302) 453-6900. Internet: www.artesianresources.com.</p> <p style="text-align: right;">E.B.</p> <p style="text-align: center;">April 9, 2021</p>						
Sales	2.0%	4.5%	Cash Assets	.3 .6		.3	.6	.0							
"Cash Flow"	6.5%	8.0%	Receivables	8.2 6.9		8.2	6.9	10.2							
Earnings	8.5%	12.0%	Inventory	1.5 1.3		1.5	1.3	1.5							
Dividends	3.0%	2.5%	Other	6.1 5.4		6.1	5.4	5.9							
Book Value	4.0%	5.0%	Current Assets	16.1 14.2		16.1	14.2	17.6							
Fiscal Year	QUARTERLY SALES (\$mill.)				Full Year	Property, Plant & Equip, at cost									
	1Q	2Q	3Q	4Q		629.4	671.9	711.7							
12/31/18	18.9	20.2	21.9	19.4	80.4	126.9	137.4	148.3							
12/31/19	19.4	20.7	22.5	21.0	83.6	502.5	534.5	563.4							
12/31/20	19.9	21.8	24.7	21.7	88.1	11.2	11.7	12.2							
12/31/21						Total Assets	529.8	560.4	593.2						
Fiscal Year	EARNINGS PER SHARE				Full Year	LIABILITIES (\$mill.)									
	1Q	2Q	3Q	4Q		Accts Payable	8.3	8.2	6.4						
12/31/17	.34	.35	.42	.40	1.51	Debt Due	17.7	9.2	28.6						
12/31/18	.38	.42	.42	.32	1.54	Other	11.7	8.2	8.7						
12/31/19	.38	.41	.48	.33	1.60	Current Liab	37.7	25.6	43.7						
12/31/20	.44	.49	.54	.32	1.79	LONG-TERM DEBT AND EQUITY as of 12/31/20									
12/31/21						Total Debt	\$170.9 mill.	Due in 5 Yrs.	\$34.7 mill.						
Cal-endar	QUARTERLY DIVIDENDS PAID				Full Year	LT Debt			\$142.3 mill.						
	1Q	2Q	3Q	4Q		Including Cap. Leases			None						
2018	.235	.239	.239	.242	.96	Leases, Uncapitalized			Annual rentals \$0 mill.						
2019	.242	.246	.246	.25	.98				(46% of Cap'l)						
2020	.25	.25	.25	.26	1.01										
2021	.257														
INSTITUTIONAL DECISIONS						Pension Liability			None in '20 vs. None in '19						
		2Q'20	3Q'20	4Q'20				Pfd Stock			None				
to Buy		42	31	39				Pfd Div'd Paid			None				
to Sell		29	41	30				Common Stock			9,357,000 shares				
Hld's(000)		4382	4328	4472							(54% of Cap'l)				
						TOTAL SHAREHOLDER RETURN			Dividends plus appreciation as of 2/28/2021						
									3 Mos.			6 Mos.	1 Yr.	3 Yrs.	5 Yrs.
									0.73%			6.58%	10.82%	20.40%	49.21%

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CALIFORNIA WATER NYSE-CWT										RECENT PRICE	P/E RATIO 31.4 (Trailing: 29.0 Median: 24.0)					RELATIVE P/E RATIO 1.43	DIV'D YLD 1.6%	VALUE LINE	
TIMELINESS 1 Raised 3/19/21	High: 19.8	19.4	19.3	23.4	26.4	26.0	36.8	46.2	49.1	57.5	57.4	60.5							
SAFETY 3 Lowered 7/27/07	Low: 16.9	16.7	16.8	18.4	20.3	19.5	22.5	32.4	35.3	44.6	39.7	51.8							
TECHNICAL 2 Lowered 4/9/21	LEGENDS 1.33 x Dividends p sh divided by Interest Rate Relative Price Strength 2-for-1 split 6/11 Options: Yes Shaded area indicates recession																		
BETA .65 (1.00 = Market)	18-Month Target Price Range Low-High Midpoint (% to Mid) \$43-\$81 \$62 (10%)																		
2024-26 PROJECTIONS Price Ann'l Total High 65 Gain (+15%) Return 6% Low 45 (-20%) -3%																			
Institutional Decisions 2Q2020 3Q2020 4Q2020 to Buy 109 101 122 to Sell 107 106 91 Hld's(000) 35580 36492 37534 Percent shares traded 18 12 6																			
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 © VALUE LINE PUB. LLC 24-26																			
8.72	8.10	8.88	9.90	10.82	11.05	12.00	13.34	12.23	12.50	12.29	12.70	13.89	14.53	14.72	15.78	16.00	15.95	Revenues per sh	16.30
1.52	1.36	1.56	1.86	1.93	1.93	2.07	2.32	2.21	2.47	2.22	2.34	3.00	3.11	3.14	3.88	3.45	3.55	"Cash Flow" per sh	3.75
.74	.67	.75	.95	.98	.98	.86	1.02	1.02	1.19	.94	1.01	1.40	1.36	1.31	1.97	1.90	2.00	Earnings per sh A	2.25
.57	.58	.58	.59	.59	.60	.62	.63	.64	.65	.67	.69	.72	.75	.79	.85	.92	.98	Div'd Decl'd per sh B	1.15
2.01	2.14	1.84	2.41	2.66	2.97	2.83	3.04	2.58	2.76	3.69	4.77	5.40	5.65	5.64	5.93	5.25	5.50	Cap'l Spending per sh	5.85
7.90	9.07	9.25	9.72	10.13	10.45	10.76	11.28	12.54	13.11	13.41	13.75	14.44	15.19	16.07	18.30	18.35	18.25	Book Value per sh C	19.80
36.78	41.31	41.33	41.45	41.53	41.67	41.82	41.98	47.74	47.81	47.88	47.97	48.01	48.07	48.53	50.33	51.00	52.00	Common Shs Outst'g D	53.00
24.9	29.2	26.1	19.8	19.7	20.3	21.3	17.9	20.1	19.7	24.8	29.6	26.9	30.3	39.3	24.9	Bold figures are Value Line estimates		Avg Ann'l P/E Ratio	24.0
1.33	1.58	1.39	1.19	1.31	1.29	1.34	1.14	1.13	1.04	1.25	1.55	1.35	1.64	2.09	1.29			Relative P/E Ratio	1.30
3.1%	2.9%	3.0%	3.1%	3.1%	3.2%	3.4%	3.5%	3.1%	2.8%	2.9%	2.3%	1.9%	1.8%	1.5%	1.7%			Avg Ann'l Div'd Yield	2.1%
CAPITAL STRUCTURE as of 12/31/20 Total Debt \$1156.2 mill. Due in 5 Yrs \$357.0 mill. LT Debt \$781.1 mill. LT Interest \$40.0 mill. (Total interest coverage: 5.2x) (46% of Cap'l)																			
Pension Assets-12/20 \$716.8 mill. Oblig. \$833.9 mill.																			
Pfd Stock None																			
Common Stock 50,330,000 shs.																			
MARKET CAP: \$2.8 billion (Mid Cap)																			
CURRENT POSITION 2018 2019 12/31/20 (SMILL.)																			
Cash Assets 47.2 42.7 44.6 Other 141.5 142.0 221.4 Current Assets 188.7 184.7 266.0 Accts Payable 95.6 108.5 131.7 Debt Due 170.0 197.0 375.1 Other 55.6 53.2 81.9 Current Liab. 321.2 358.7 588.7																			
ANNUAL RATES Past 10 Yrs. Past 5 Yrs. Est'd '18-'20 of change (per sh) to '24-'26																			
Revenues 3.5% 4.0% 1.5% "Cash Flow" 6.0% 8.0% 2.0% Earnings 5.0% 8.0% 6.5% Dividends 3.0% 4.0% 6.5% Book Value 5.0% 5.0% 4.0%																			
QUARTERLY REVENUES (\$ mill.)^E Full Year																			
Cal-ender	Mar.31	Jun.30	Sep.30	Dec.31	Full Year														
2018	134.6	174.9	221.3	167.4	698.2														
2019	126.1	179.0	232.6	176.9	714.6														
2020	125.6	175.5	304.1	189.1	794.3														
2021	155	205	255	200	815														
2022	160	205	260	205	830														
EARNINGS PER SHARE A Full Year																			
Cal-ender	Mar.31	Jun.30	Sep.30	Dec.31	Full Year														
2018	d.02	.31	.75	.32	1.36														
2019	d.16	.35	.88	.24	1.31														
2020	d.42	.11	1.94	.31	1.97														
2021	.08	.45	.95	.42	1.90														
2022	.10	.45	1.00	.45	2.00														
QUARTERLY DIVIDENDS PAID B Full Year																			
Cal-ender	Mar.31	Jun.30	Sep.30	Dec.31	Full Year														
2017	.18	.18	.18	.18	.72														
2018	.1875	.1875	.1875	.1875	.75														
2019	.1975	.1975	.1975	.1975	.79														
2020	.2125	.2125	.2125	.2125	.85														
2021	.230																		

(A) Basic EPS. Excl. nonrecurring gain (loss): \$11.4c. Next earnings report due early May.
 (B) Dividends historically paid in late Feb., May, Aug., and Nov. ■ Div'd reinvestment plan
 (C) Incl. intangible assets. In '20 : \$27.6 mill., \$0.55/sh.
 (D) In millions, adjusted for split.
 (E) Excludes non-regulated revenues
 Company's Financial Strength B++
 Stock's Price Stability 95
 Price Growth Persistence 70
 Earnings Predictability 65
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 Nicholas P. Patrikis April 9, 2021

GLOBAL WATER RES. NDQ-GWRS		RECENT PRICE	16.28	TRAILING P/E RATIO	NMF	RELATIVE P/E RATIO	NMF	DIV'D YLD	1.8%	VALUE LINE	
RANKS				9.29	10.00	11.61	14.99	16.20	18.13	High	
PERFORMANCE 2 Above Average				6.23	7.90	8.40	9.00	8.50	14.40	Low	
Technical 2 Above Average		LEGENDS									
SAFETY 3 Average											
BETA .75 (1.00 = Market)											
Financial Strength B											
Price Stability 80											
Price Growth Persistence NMF											
Earnings Predictability NMF											
© VALUE LINE PUBLISHING LLC		2012	2013	2014	2015	2016	2017	2018	2019	2020	2021/2022
REVENUES PER SH	--	--	--	--	1.52	1.59	1.65	1.65	1.71		
"CASH FLOW" PER SH	--	--	--	--	.18	.58	.49	.49	.45		
EARNINGS PER SH	--	--	--	--	d.15	.23	.15	.10	.05		.11 A,B/.18 C
DIV'DS DECL'D PER SH	--	--	--	--	.17	.28	.28	.29	.29		
CAP'L SPENDING PER SH	--	--	--	--	.44	1.06	.22	.52	.40		
BOOK VALUE PER SH	--	--	--	--	.78	.76	1.30	1.15	1.43		
COMMON SHS OUTST'G (MILL)	--	--	--	--	19.58	19.63	21.47	21.54	22.59		
AVG ANN'L P/E RATIO	--	--	--	--	--	40.1	63.9	NMF	NMF		NMF/90.4
RELATIVE P/E RATIO	--	--	--	--	--	2.01	3.61	NMF	NMF		
AVG ANN'L DIV'D YIELD	--	--	--	--	2.2%	3.0%	3.0%	2.6%	2.5%		
REVENUES (\$MILL)	--	--	--	32.0	29.8	31.2	35.5	35.5	38.6		Bold figures are consensus earnings estimates and, using the recent prices, P/E ratios.
OPERATING MARGIN	--	--	--	75.1%	38.8%	45.7%	47.1%	43.2%	42.4%		
DEPRECIATION (\$MILL)	--	--	--	8.2	6.3	6.9	7.5	8.4	9.0		
NET PROFIT (\$MILL)	--	--	--	21.4	d2.9	4.6	3.1	2.2	1.1		
INCOME TAX RATE	--	--	--	49.1%	--	--	36.5%	34.3%	41.1%		
NET PROFIT MARGIN	--	--	--	66.9%	NMF	14.6%	8.7%	6.3%	2.9%		
WORKING CAP'L (\$MILL)	--	--	--	8.0	13.8	.7	7.7	2.2	11.1		
LONG-TERM DEBT (\$MILL)	--	--	--	104.7	114.3	114.4	114.5	114.7	112.7		
SHR. EQUITY (\$MILL)	--	--	--	20.1	15.2	14.9	27.9	24.7	32.2		
RETURN ON TOTAL CAP'L	--	--	--	20.5%	2.4%	5.5%	4.0%	3.5%	2.6%		
RETURN ON SHR. EQUITY	--	--	--	106.5%	NMF	30.6%	11.1%	9.0%	3.4%		
RETAINED TO COM EQ	--	--	--	106.5%	NMF	NMF	11.1%	NMF	NMF		
ALL DIV'DS TO NET PROF	--	--	--	--	NMF	119%	--	NMF	NMF		
<p>^ANo. of analysts changing earn. est. in last 29 days: 0 up, 0 down, consensus 5-year earnings growth 15.0% per year. ^BBased upon one analyst's estimate. ^CBased upon one analyst's estimate.</p>											
ANNUAL RATES				ASSETS (\$mill.)			INDUSTRY: Water Utility				
of change (per share) 5 Yrs. 1 Yr.				2018 2019 12/31/20			<p>BUSINESS: Global Water Resources, Inc. is a water resource management company that owns, operates, and manages 16 water, wastewater, and recycled water utilities in strategically located communities, principally in metropolitan Phoenix, Arizona. It seeks to deploy its integrated approach, Total Water Management, a term used to mean managing the entire water cycle by owning and operating the water, wastewater, and recycled water utilities within the same geographic areas in order to both conserve water and maximize its total economic and social value. The company uses Total Water Management to promote sustainable communities in areas where growth outpaces the existing potable water supply. Global Water recycles nearly one billion gallons of water annually. In February 2021, Global Water agreed to acquire two small water utility companies, Twin Hawks Utility, Inc. and Rincon Water Company. The acquisitions will add approximately 93 water connections. Has 79 employees. Chairman, C.E.O. & President: Ron L. Fleming Address: 21410 N. 19th Avenue #220, Phoenix, AZ 85027. Tel.: (480) 360-7775. Internet: www.gwresources.com. E.B.</p> <p style="text-align: right;">April 9, 2021</p>				
Sales -- 4.0%				Cash Assets 12.8 7.5 18.0							
"Cash Flow" -- -8.5%				Receivables 1.5 1.6 2.1							
Earnings -- -50.0%				Inventory .0 .0 .0							
Dividends -- 1.0%				Other 3.0 3.2 3.4							
Book Value -- 24.5%				Current Assets 17.3 12.3 23.5							
Fiscal Year				Property, Plant & Equip, at cost							
QUARTERLY SALES (\$mill.)				Accum Depreciation							
1Q 2Q 3Q 4Q				2018 2019 12/31/20							
12/31/18 7.4 10.8 9.0 8.3 35.5				312.1 326.3 340.2							
12/31/19 7.7 9.2 9.9 8.7 35.5				85.0 92.7 101.3							
12/31/20 8.2 9.9 10.8 9.7 38.6				227.1 233.6 238.9							
12/31/21				18.1 20.2 21.0							
				262.5 266.1 283.4							
Fiscal Year				LIABILITIES (\$mill.)							
EARNINGS PER SHARE				Accts Payable .6 1.0 .5							
1Q 2Q 3Q 4Q				Debt Due .0 .1 2.0							
12/31/17 -- .02 .06 .15 .23				Other 9.0 9.0 9.9							
12/31/18 .02 .10 .03 -- .15				Current Liab 9.6 10.1 12.4							
12/31/19 .02 .04 .05 d.01 .10											
12/31/20 .02 d.01 .05 d.01 .05											
12/31/21 d.01 .04 .06											
Cal-endar				LONG-TERM DEBT AND EQUITY as of 12/31/20							
QUARTERLY DIVIDENDS PAID				Total Debt \$114.7 mill. Due in 5 Yrs. \$17.4 mill.							
1Q 2Q 3Q 4Q				LT Debt \$112.7 mill.							
2018 .071 .071 .071 .071 .28				Including Cap. Leases \$.1 mill. (78% of Cap'l)							
2019 .072 .072 .072 .072 .29				Leases, Uncapitalized Annual rentals None							
2020 .073 .072 .073 .072 .29											
2021 .073											
INSTITUTIONAL DECISIONS				Pension Liability None in '20 vs. None in '19							
2Q'20 3Q'20 4Q'20				Pfd Stock None Pfd Div'd Paid None							
to Buy 33 18 26				Common Stock 22,588,000 shares (22% of Cap'l)							
to Sell 22 33 21											
Hld's(000) 8849 7844 7595											
TOTAL SHAREHOLDER RETURN						3 Mos. 6 Mos. 1 Yr. 3 Yrs. 5 Yrs.					
Dividends plus appreciation as of 2/28/2021						35.15% 58.52% 48.56% 118.55% --					

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MIDDLESEX WATER NDAQ-MSEX										RECENT PRICE	P/E RATIO		RELATIVE P/E RATIO		DIV'D YLD		VALUE LINE							
										80.66	36.7 (Trailing: 37.0 Median: 23.0)		1.68		1.4%									
TIMELINESS 1	Raised 11/13/20									High: 19.3	19.4	19.6	22.5	23.7	28.0	44.5	46.7	60.3	67.7	76.1	85.9			
SAFETY 2	New 10/21/11									Low: 14.7	16.5	17.5	18.6	19.1	21.2	25.0	32.2	34.0	51.0	48.8	67.1			
TECHNICAL 4	Lowered 4/9/21									LEADS 1.20 x Dividends p sh divided by Interest Rate Relative Price Strength Options: Yes Shaded area indicates recession														
BETA .70	(1.00 = Market)									18-Month Target Price Range Low-High Midpoint (% to Mid) \$58-\$106 \$82 (0%)														
2024-26 PROJECTIONS										2024-26 PROJECTIONS High Price 75 Gain (-5%) 55 Ann'l Total Return -7% Low Price 55 Return -7%														
Institutional Decisions										202020 3Q2020 4Q2020 to Buy 68 52 67 to Sell 55 69 49 Hld's(000) 10359 10357 10675 Percent shares traded 12 8 4														
										% TOT. RETURN 2/21 THIS STOCK VL ARITH. INDEX 1 yr. 17.2 50.1 3 yr. 103.1 45.4 5 yr. 168.7 108.8														
										© VALUE LINE PUB. LLC 24-26														
2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022			24-26				
6.44	6.16	6.50	6.79	6.75	6.60	6.50	6.98	7.19	7.26	7.77	8.16	8.00	8.42	7.72	8.10	8.45	8.70	Revenues per sh		9.15				
1.33	1.33	1.49	1.53	1.40	1.55	1.46	1.56	1.72	1.84	1.97	2.17	2.24	2.89	2.90	3.25	3.15	3.25	"Cash Flow" per sh		3.70				
.71	.82	.87	.89	.72	.96	.84	.90	1.03	1.13	1.22	1.38	1.38	1.96	2.01	2.18	2.25	2.35	Earnings per sh ^A		2.70				
.67	.68	.69	.70	.71	.72	.73	.74	.75	.76	.78	.81	.86	.91	.98	1.04	1.10	1.15	Div'd Decl'd per sh ^B		1.35				
2.18	2.31	1.66	2.12	1.49	1.90	1.50	1.36	1.26	1.40	1.59	2.91	3.08	4.40	5.11	6.04	5.50	5.50	Cap'l Spending per sh		6.25				
8.26	9.52	10.05	10.03	10.33	11.13	11.27	11.48	11.82	12.24	12.74	13.40	14.02	15.17	18.57	19.81	19.45	19.60	Book Value per sh		20.85				
11.58	13.17	13.25	13.40	13.52	15.57	15.70	15.82	15.96	16.12	16.23	16.30	16.35	16.40	17.43	17.47	17.75	17.85	Common Shs Outs'tg ^C		18.00				
27.4	22.7	21.6	19.8	21.0	17.8	21.7	20.8	19.7	18.5	19.1	25.6	28.4	22.2	29.7	30.1	Bold figures are Value Line estimates		Avg Ann'l P/E Ratio		24.0				
1.46	1.23	1.15	1.19	1.40	1.13	1.36	1.32	1.11	.97	.96	1.34	1.43	1.20	1.58	1.56			Relative P/E Ratio		1.30				
3.5%	3.7%	4.0%	4.0%	4.7%	4.2%	4.0%	4.0%	3.7%	3.7%	3.3%	2.3%	2.2%	2.1%	1.6%	1.6%			Avg Ann'l Div'd Yield		2.1%				
CAPITAL STRUCTURE as of 12/31/20										102.1	110.4	114.8	117.1	126.0	132.9	130.8	138.1	134.6	141.6	150	155	Revenues (\$mill)		165
Total Debt \$282.5 mill. Due in 5 Yrs \$43.7 mill.										13.4	14.4	16.6	18.4	20.0	22.7	22.8	32.5	33.9	38.4	40.0	42.0	Net Profit (\$mill)		49.0
LT Debt \$273.2 mill. LT Interest \$7.5 mill. (Total interest coverage: 7.3x) (44% of Cap'l)										32.7%	33.9%	34.1%	35.0%	34.5%	34.0%	32.7%	2.8%	2.8%	21.0%	21.0%	21.0%	Income Tax Rate		21.0%
Pension Assets-12/20 \$88.9 mill. Oblig. \$115.9 mill.										6.1%	3.4%	1.9%	1.7%	1.9%	2.7%	3.1%	1.4%	3.4%	3.9%	2.5%	2.5%	AFUDC % to Net Profit		2.5%
Pfd Stock \$2.4 mill. Pfd Div'd: \$.1 mill.										42.3%	41.5%	40.4%	40.5%	39.4%	37.9%	37.5%	37.8%	41.5%	44.0%	42.5%	41.5%	Long-Term Debt Ratio		40.0%
Common Stock 17,473,000 shs.										56.6%	57.4%	58.7%	58.8%	59.8%	61.5%	61.8%	61.6%	58.2%	55.7%	57.0%	58.0%	Common Equity Ratio		60.0%
										312.5	316.5	321.4	335.8	345.4	355.4	370.7	404.1	556.7	621.5	610	600	Total Capital (\$mill)		630
										422.2	435.2	446.5	465.4	481.9	517.8	557.2	618.5	705.7	796.6	800	815	Net Plant (\$mill)		835
										5.2%	5.4%	5.9%	6.3%	6.6%	7.1%	6.9%	8.9%	6.7%	6.8%	7.0%	7.5%	Return on Total Cap'l		8.0%
										7.5%	7.8%	8.7%	9.2%	9.6%	10.3%	9.8%	12.9%	10.4%	11.0%	11.5%	12.0%	Return on Shr. Equity		13.0%
										7.5%	7.8%	8.7%	9.3%	9.6%	10.3%	9.9%	13.0%	10.4%	11.1%	11.5%	12.0%	Return on Com Equity		13.0%
										1.0%	1.4%	2.4%	3.1%	3.5%	4.3%	3.8%	7.0%	5.4%	5.8%	6.0%	6.0%	Retained to Com Eq		6.5%
										87%	83%	73%	67%	63%	58%	62%	46%	48%	48%	49%	49%	All Div'ds to Net Prof		50%
MARKET CAP: \$1.4 billion (Mid-Cap)																								
CURRENT POSITION (\$MILL.)																								
Cash Assets										3.7	2.2	4.5												
Other										27.1	26.9	29.6												
Current Assets										30.8	29.1	34.1												
Accts Payable										19.3	23.3	30.4												
Debt Due										55.8	27.2	9.3												
Other										19.3	14.5	17.1												
Current Liab.										94.4	65.0	56.8												
ANNUAL RATES of change (per sh)																								
Past 10 Yrs.										Past 5 Yrs. to '24-'26														
Revenues										2.0%	2.0%	2.0%												
"Cash Flow"										7.5%	10.5%	3.5%												
Earnings										9.0%	12.5%	4.5%												
Dividends										3.0%	5.0%	5.5%												
Book Value										5.5%	8.0%	2.5%												
QUARTERLY REVENUES (\$ mill.)																								
Cal-endar	Mar.31	Jun.30	Sep.30	Dec.31	Full Year																			
2018	31.2	34.9	38.7	33.3	138.1																			
2019	30.7	33.4	37.8	32.7	134.6																			
2020	31.8	35.3	39.9	34.6	141.6																			
2021	33.0	37.0	44.0	36.0	150																			
2022	34.0	38.0	45.0	38.0	155																			
EARNINGS PER SHARE^A																								
Cal-endar	Mar.31	Jun.30	Sep.30	Dec.31	Full Year																			
2018	.27	.52	.74	.43	1.96																			
2019	.39	.49	.66	.46	2.01																			
2020	.44	.55	.72	.47	2.18																			
2021	.45	.55	.73	.52	2.25																			
2022	.47	.57	.76	.55	2.35																			
QUARTERLY DIVIDENDS PAID^B																								
Cal-endar	Mar.31	Jun.30	Sep.30	Dec.31	Full Year																			
2017	.21125	.21125	.21125	.22375	.86																			
2018	.22375	.22375	.22375	.24	.91																			
2019	.24	.24	.24	.2562	.98																			
2020	.2562	.2562	.2562	.2725	1.04																			
2021	.2725																							

(A) Diluted earnings. Next earnings report due early May.

(B) Dividends historically paid in mid-Feb., May, Aug., and November. Div'd reinvestment plan available.

(C) In millions.

2020, the Middlesex System accounted for 59% of operating revenues. At 12/31/20, the company had 348 employees. Incorporated: NJ. President, CEO, and Chairman: Dennis W. Doll. Officers & directors own 3.1% of the com. stock; BlackRock Inst. Trust Co., 7.7% (4/20 proxy). Add: 485 C Route 1 South, Suite 400, Iselin, NJ 08830. Tel.: 732-634-1500. Int.: www.middlesexwater.com.

Shares of Middlesex Water continue to march higher. The equity established yet another all-time high in early February, but has since retracted modestly to slightly above \$80 per share. Still, the stock is up about 10% in price since our early-January review, keeping intact its enviable multiyear price ascent. Based on our Timeliness ranking scale, MSEX shares are slated to outperform (1: Highest) the broader market over the coming six to 12 months. Thus, they may pique the interest of near-term accounts.

The stage is set for respectable top- and bottom-line growth this year. Favorable operating trends, which were evident in the fourth quarter, are likely to persist over the near- to intermediate-terms. These include increased residential and wholesale water consumption owing to more people staying at home and greater handwashing frequency, as well as an expanding customer base in its Delaware water system. A recently inked contract with Highland Park in its New Jersey system is a positive, too. Adding it all up, revenues are poised to expand 6%, to \$150 million, and will likely be accompanied by a 3% earnings advance, to \$2.25 per share.

From a financial perspective, the company ought to be a stable performer over the pull to mid-decade. Modest revenue and earnings growth is likely on tap for 2022. Meanwhile, significant infrastructure spending may well overflow into the 3- to 5-year time frame. Management has laid out a budget of nearly \$300 million through its Water For Tomorrow program, which aims to upgrade watermain, piping, and wastewater treatment facilities. Most recently, the company announced a \$10 million investment to improve its drinking water infrastructure in New Jersey. Overall, aggressive spending ought to eventually curb unnecessary operating costs, and may well facilitate additional rate hikes going forward.

Shares of Middlesex Water are currently trading beyond the upper end of our 3- to 5-year Target Price parameters. This is so even after modestly lifting our P/E multiple to 24x. All in all, subscribers with an investment horizon of 18 months or longer can find more-attractive options elsewhere, at this juncture.

Nicholas P. Patrikis April 9, 2021

Company's Financial Strength	B++
Stock's Price Stability	85
Price Growth Persistence	65
Earnings Predictability	85

SJW GROUP NYSE-SJW										RECENT PRICE	P/E RATIO		RELATIVE P/E RATIO	DIV'D YLD	VALUE LINE																																		
RECENT PRICE 63.42 P/E RATIO 26.9 (Trailing: 29.6 Median: 21.0) RELATIVE P/E RATIO 1.23 DIV'D YLD 2.1% VALUE LINE										High: 28.2	26.8	26.9	30.1	33.7	35.7	56.9	69.3	68.4	74.5	75.0	71.7	Target Price Range	2024	2025	2026																								
TIMELINESS — E High: 28.2 26.8 26.9 30.1 33.7 35.7 56.9 69.3 68.4 74.5 75.0 71.7 Low: 21.6 20.9 22.6 24.5 25.5 27.5 28.6 45.4 51.3 53.9 45.6 58.0										LEGENDS 1.50 x Dividends p sh divided by Interest Rate Relative Price Strength Options: Yes Shaded area indicates recession										120	100	80	64	48	32	24	20	16	8																				
SAFETY 3 New 4/22/11 TECHNICAL — E BETA .85 (1.00 = Market)										18-Month Target Price Range Low-High Midpoint (% to Mid) \$53-\$123 \$88 (40%)										2024-26 PROJECTIONS Price Gain Ann'l Total High Low 100 65 (+60%) (Nil) 14% 3%										Institutional Decisions 2Q2020 3Q2020 4Q2020 to Buy 78 62 80 to Sell 75 77 68 Hld's(000) 19939 19827 19850 Percent shares traded 15 10 5										% TOT. RETURN 2/21 THIS STOCK VL ARITH. INDEX 1 yr. 4.5 50.1 3 yr. 24.8 45.4 5 yr. 89.0 108.8									
2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022										© VALUE LINE PUB. LLC 24-26																																							
9.86 10.35 11.25 12.12 11.68 11.62 12.85 14.01 13.73 15.76 14.97 16.61 18.97 14.00 14.78 19.77 20.00 20.65 Revenues per sh 22.15 2.21 2.38 2.30 2.44 2.21 2.38 2.80 2.97 2.90 4.42 3.86 4.76 5.24 3.29 3.67 5.28 4.25 4.40 "Cash Flow" per sh 5.30 1.12 1.19 1.04 1.08 .81 1.11 1.18 1.12 2.54 1.85 2.57 2.86 1.82 1.35 2.14 2.55 2.70 Earnings per sh A 3.65 .53 .57 .61 .65 .66 .68 .69 .71 .73 .75 .78 .81 1.04 1.12 1.20 1.28 1.36 1.44 Div'd Decl'd per sh B 1.72 2.83 3.87 6.62 3.79 3.17 5.65 3.75 5.67 4.68 5.02 5.24 6.95 7.26 5.08 6.25 7.44 6.75 7.00 Cap'l Spending per sh 7.50 10.72 12.48 12.90 13.99 13.66 13.75 14.20 14.71 15.92 17.75 18.83 20.61 22.57 31.31 31.27 32.12 35.60 36.95 Book Value per sh 40.85 18.27 18.28 18.36 18.18 18.50 18.55 18.59 18.67 20.17 20.29 20.38 20.46 20.52 28.40 28.46 28.56 29.50 29.75 Common Shs Outst'g C 30.00 19.7 23.5 33.4 26.2 28.7 29.1 21.2 20.4 24.3 11.2 16.6 15.7 18.8 32.7 47.8 30.0 Bold figures are 1.05 1.27 1.77 1.58 1.91 1.85 1.33 1.30 1.37 .59 .84 .82 .95 1.77 2.55 1.56 1.77 Relative P/E Ratio 1.30 2.4% 2.0% 1.7% 2.3% 2.8% 2.8% 2.9% 3.0% 2.7% 2.6% 2.5% 2.0% 1.9% 1.9% 1.9% 1.9% 2.0% Avg Ann'l Div'd Yield 2.1%										CAPITAL STRUCTURE as of 12/31/20 Total Debt \$1363.8 mill. Due in 5 Yrs \$22.4 mill. LT Debt \$1287.6 mill. LT Interest \$50.0 mill. (LT Interest Coverage: 3.8x)										239.0 261.5 276.9 319.7 305.1 339.7 389.2 397.7 420.5 564.5 590 615 Revenues (\$mill) 665 20.9 22.3 23.5 51.8 37.9 52.8 59.2 38.8 38.7 61.5 75.0 80.0 Net Profit (\$mill) 110 41.1% 41.1% 38.7% 32.5% 38.1% 38.8% 36.7% 20.6% 25.3% 12.0% 21.0% 21.5% Income Tax Rate 21.0% -- -- -- -- -- -- -- -- -- 2.0% 1.5% 1.5% AFUDC % to Net Profit 1.5% 56.6% 55.0% 51.1% 51.6% 49.8% 50.7% 48.2% 32.7% 59.1% 58.4% 53.5% 51.0% Long-Term Debt Ratio 38.0% 43.4% 45.0% 48.9% 48.4% 50.2% 49.3% 51.8% 67.3% 40.9% 41.6% 46.5% 49.0% Common Equity Ratio 62.0% 607.9 610.2 656.2 744.5 764.6 855.0 894.3 1320.7 2173.6 2204.7 2250 2250 Total Capital (\$mill) 1975 756.2 831.6 898.7 963.0 1036.8 1146.4 1239.3 1328.8 2206.5 2334.9 2450 2565 Net Plant (\$mill) 2775 4.9% 5.0% 5.0% 8.3% 6.3% 7.4% 7.9% 3.9% 2.5% 4.0% 4.0% 4.0% Return on Total Cap'l 6.0% 7.9% 8.1% 7.3% 14.4% 9.9% 12.5% 12.8% 4.4% 4.3% 6.7% 7.0% 7.5% Return on Shr. Equity 9.0% 7.9% 8.1% 7.3% 14.4% 9.9% 12.5% 12.8% 4.4% 4.3% 6.7% 7.0% 7.5% Return on Com Equity 9.0% 3.1% 3.3% 2.8% 10.2% 5.7% 8.6% 8.2% 1.8% .5% 2.7% 3.5% 3.5% Retained to Com Eq 4.5% 61% 59% 62% 29% 42% 31% 36% 60% 88% 59% 53% 53% All Div'ds to Net Prof 47%										Pension Assets-12/20 \$278.1 mill. Oblig. \$386.1 mill. Pfd Stock None. Common Stock 28,560,000 shs.										MARKET CAP: \$1.8 billion (Mid Cap)									
CURRENT POSITION 2018 2019 12/31/20 (\$MILL.) Cash Assets 420.7 17.9 9.3 Accts Receivable 19.2 36.3 58.1 Other 62.8 67.8 59.9 Current Assets 502.7 122.0 127.3 Accts Payable 24.9 34.9 34.2 Debt Due -- 22.3 76.2 Other 139.1 177.4 240.4 Current Liab. 164.0 234.6 350.8										BUSINESS: SJW Group engages in the production, purchase, storage, purification, distribution, and retail sale of water. It provides water service to approximately 231,000 connections with a total population of roughly one million people in the San Jose area and 16,000 connections that reach about 49,000 residents in the region between San Antonio and Austin, Texas. The company merged with Connecticut Water (10/19) which provides service to approx. 138,000 connections with a total population of 450,000 people. Has 361 employees. Officers and directors own 8.3% of outstanding shares (3/21 proxy). Chairman & CEO: Eric Thornburg, Incorporated: California. Address: 110 West Taylor Street, San Jose, CA 95110. Telephone: (408) 279-7800. Internet: www.sjwater.com.																																							
ANNUAL RATES Past Past Est'd '18-'20 of change (per sh) 10 Yrs. 5 Yrs. to '24-'26 Revenues 3.0% 2.0% 5.5% "Cash Flow" 5.5% 2.0% 4.5% Earnings 7.0% -5% 13.0% Dividends 6.0% 10.0% 6.0% Book Value 8.5% 12.5% 4.5%										SJW Group posted better-than-expected top- and bottom-line results to close 2020. December-period revenues of \$136 million came in about \$5 million above our call, while earnings of \$0.46 a share exceeded our \$0.42 expectation. The overall outperformance was driven primarily by greater customer usage, cumulative water rate increases, slimmer operating expenses due to lower merger-related costs, and a decline in general & administrative expenses.																																							
QUARTERLY REVENUES (\$ mill.) Cal-ender Mar.31 Jun.30 Sep.30 Dec.31 Full Year 2018 75.0 99.1 124.9 98.7 397.7 2019 77.7 103.0 114.0 126.0 420.5 2020 115.8 147.2 165.9 135.6 564.5 2021 120 150 175 145 590 2022 125 155 185 150 615										Noteworthy share-profit expansion is likely in the cards this year and next. Water production costs are apt to rise in conjunction with increased water consumption and a widening customer base, but operating expenses may well trend lower. Not to mention, we think significant merger synergies are likely to develop. All told, we think SJW will earn \$2.55 a share this year, and \$2.70 a share in 2022.																																							
EARNINGS PER SHARE A Cal-ender Mar.31 Jun.30 Sep.30 Dec.31 Full Year 2018 .06 .62 .76 .38 1.82 2019 .21 .47 .33 .34 1.35 2020 .08 .69 .91 .46 2.14 2021 .20 .75 .95 .65 2.55 2022 .23 .77 1.00 .70 2.70										Unranked SJW shares are a bit more appealing for patient accounts following their recent step back in price. At recent levels, capital appreciation potential out to mid-decade is slightly above average, thus presenting a decent entry point for interested subscribers to start building a position. What's more, the dividend yield is now comfortably above the Value Line median, and ranks among the top payers in the Water Utilities Industry.																																							
QUARTERLY DIVIDENDS PAID B D Cal-ender Mar.31 Jun.30 Sep.30 Dec.31 Full Year 2017 .2175 .2175 .2175 .3875 1.04 2018 .28 .28 .28 .28 1.12 2019 .30 .30 .30 .30 1.20 2020 .32 .32 .32 .32 1.28 2021 .34										The coast-to-coast regulated water utility has tapped the equity markets. Specifically, the company recently closed a public offering of over one million shares, netting proceeds of almost \$61 million. Management's plan for the raised funds include paying down outstanding obligations, various capital expenditures, and general corporate purposes.																																							
(A) Diluted earnings. Excludes nonrecurring losses: '05, \$1.09; '06, \$16.36; '08, \$1.22; '10, \$0.46. GAAP accounting as of 2013. Next earnings report due early May. Quarterly egs. may not add due to rounding.										(B) Dividends historically paid in early March, June, September, and December. ■ Div'd reinvestment plan available.																																							
(C) In millions.										(D) Paid special dividend of \$0.17 per share on 11/17.																																							
(E) Suspended due to recent CTWS merger.										Company's Financial Strength B+ Stock's Price Stability 75 Price Growth Persistence 70 Earnings Predictability 45																																							

Carolina Water Service Inc of North Carolina
Summary of Risk Premium Models for the
Proxy Group of Eight Water Companies

	<u>Proxy Group of Eight Water Companies</u>	<u>Using Current Interest Rates</u>
Predictive Risk Premium Model (PRPM) (1)	12.13 %	11.47 %
Risk Premium Using an Adjusted Total Market Approach (2)	<u>9.92</u>	<u>9.58</u>
Average	<u><u>11.03 %</u></u>	<u><u>10.53 %</u></u>

Notes:

- (1) From page 2 of this Schedule.
- (2) From page 3 of this Schedule.

Carolina Water Service Inc of North Carolina
Indicated ROE
Derived by the Predictive Risk Premium Model (1)

	[1]	[2]	[3]	[4]	[5]	[6]	[7]
Proxy Group of Eight Water Companies	LT Average Predicted Variance	Spot Predicted Variance	Recommended Variance	GARCH Coefficient	Predicted Risk Premium (2)	Risk-Free Rate (3)	Indicated ROE (4)
American States Water Company	0.38%	0.35%	0.36%	1.8535	8.37%	2.73%	11.10%
American Water Works Company, Inc.	0.23%	0.17%	0.20%	5.8359	15.13%	2.73%	NMF
Artesian Resources Corporation	0.32%	0.35%	0.34%	2.0979	8.80%	2.73%	11.53%
California Water Service Group	0.32%	0.31%	0.31%	2.0227	7.85%	2.73%	10.58%
Global Water Resources, Inc.	0.57%	0.53%	0.55%	1.9704	13.80%	2.73%	16.53%
Middlesex Water Company	0.31%	0.58%	0.45%	2.1701	12.25%	2.73%	14.98%
SJW Group	0.41%	0.37%	0.39%	1.5296	7.40%	2.73%	10.13%
The York Water Company	0.45%	0.37%	0.41%	2.2144	11.49%	2.73%	14.22%
						Average	<u>12.72%</u>
						Median	<u>11.53%</u>
						Average of Mean and Median	<u>12.13%</u>

Using Current Interest Rates

Proxy Group of Eight Water Companies	LT Average Predicted Variance	Spot Predicted Variance	Recommended Variance	GARCH Coefficient	Predicted Risk Premium (2)	Risk-Free Rate (5)	Indicated ROE (4)
American States Water Company	0.38%	0.35%	0.36%	1.8535	8.37%	2.07%	10.44%
American Water Works Company, Inc.	0.23%	0.17%	0.20%	5.8359	15.13%	2.07%	NMF
Artesian Resources Corporation	0.32%	0.35%	0.34%	2.0979	8.80%	2.07%	10.87%
California Water Service Group	0.32%	0.31%	0.31%	2.0227	7.85%	2.07%	9.92%
Global Water Resources, Inc.	0.57%	0.53%	0.55%	1.9704	13.80%	2.07%	15.87%
Middlesex Water Company	0.31%	0.58%	0.45%	2.1701	12.25%	2.07%	14.32%
SJW Group	0.41%	0.37%	0.39%	1.5296	7.40%	2.07%	9.47%
The York Water Company	0.45%	0.37%	0.41%	2.2144	11.49%	2.07%	13.56%
						Average	<u>12.06%</u>
						Median	<u>10.87%</u>
						Average of Mean and Median	<u>11.47%</u>

NMF = Not Meaningful Figure

Notes:

- (1) The Predictive Risk Premium Model uses historical data to generate a predicted variance and a GARCH coefficient. The historical data used are the equity risk premiums for the first available trading month as reported by Bloomberg Professional Service.
- (2) $[1 + (\text{Column [3]} * \text{Column [4]})^{1/2}] - 1$.
- (3) From note 2 on page 2 of Schedule DWD-5.
- (4) Column [5] + Column [6].
- (5) Three-month average 30-year Treasury bond yield ending March 2021.

Carolina Water Service Inc of North Carolina
 Indicated Common Equity Cost Rate
 Through Use of a Risk Premium Model
Using an Adjusted Total Market Approach

<u>Line No.</u>		<u>Proxy Group of Eight Water Companies</u>	<u>Using Current Interest Rates</u>
1.	Prospective Yield on Aaa Rated Corporate Bonds (1)	3.44 %	
2.	Adjustment to Reflect Yield Spread Between Aaa Rated Corporate Bonds and A2 Rated Public Utility Bonds	<u>0.42</u> (2)	
3.	Adjusted Prospective Yield on A2 Rated Public Utility Bonds	3.86 %	
4.	Current Yield on A2 Rated Public Utility Bond Yields (3)		3.15 %
4.	Adjustment to Reflect Bond Rating Difference of Proxy Group	<u>0.05</u> (4)	<u>0.05</u> (4)
5.	Adjusted Prospective Bond Yield	3.91 %	3.20 %
6.	Equity Risk Premium (5)	<u>6.01</u>	<u>6.38</u>
7.	Risk Premium Derived Common Equity Cost Rate	<u>9.92</u> %	<u>9.58</u> %

- Notes: (1) Consensus forecast of Moody's Aaa Rated Corporate bonds from Blue Chip Financial Forecasts (see pages 10 and 11 of this Schedule).
- (2) The average yield spread of A2 rated public utility bonds over Aaa rated corporate bonds of 0.42% from page 4 of this Schedule.
- (3) Three-month average yield on A2 rated utility bonds ending March 2021.
- (3) Adjustment to reflect the A2/A3 Moody's LT issuer rating of the Utility Proxy Group as shown on page 5 of this Schedule. The 0.05% upward adjustment is derived by taking 1/6 of the spread between A2/A3 and Baa2 Public Utility Bonds ($1/6 * 0.27\% = 0.05\%$) as derived from page 4 of this Schedule.
- (4) From page 7 of this Schedule.

Carolina Water Service Inc of North Carolina
Interest Rates and Bond Spreads for
Moody's Corporate and Public Utility Bonds

Selected Bond Yields

	[1]	[2]	[3]
	<u>Aaa Rated Corporate Bond</u>	<u>A2 Rated Public Utility Bond</u>	<u>Baa2 Rated Public Utility Bond</u>
Mar-2021	3.04 %	3.44 %	3.72 %
Feb-2021	2.70	3.09	3.37
Jan-2021	<u>2.45</u>	<u>2.91</u>	<u>3.18</u>
Average	<u>2.73 %</u>	<u>3.15 %</u>	<u>3.42 %</u>

Selected Bond Spreads

A2 Rated Public Utility Bonds Over Aaa Rated Corporate Bonds:

0.42 % (1)

Baa2 Rated Public Utility Bonds Over A2 Rated Public Utility Bonds:

0.27 % (2)

Notes:

(1) Column [2] - Column [1].

(2) Column [3] - Column [2].

Source of Information:

Bloomberg Professional Service

Carolina Water Service Inc of North Carolina
 Comparison of Long-Term Issuer Ratings for
Proxy Group of Eight Water Companies

	<u>Moody's</u>		<u>Standard & Poor's</u>	
	<u>Long-Term Issuer Rating</u>		<u>Long-Term Issuer Rating</u>	
	<u>April 2021</u>		<u>April 2021</u>	
<u>Proxy Group of Eight Water Companies</u>	<u>Long-Term Issuer Rating</u>	<u>Numerical Weighting (1)</u>	<u>Long-Term Issuer Rating</u>	<u>Numerical Weighting (1)</u>
American States Water Company (2)	A2	6.0	A+	5.0
American Water Works Company, Inc. (3)	A3	7.0	A	6.0
Artesian Resources Corporation	NR	--	NR	--
California Water Service Group	NR	--	A+	5.0
Global Water Resources, Inc.	NR	--	NR	--
Middlesex Water Company	NR	--	A	6.0
SJW Group (4)	NR	--	A/A-	6.5
The York Water Company	NR	--	A-	7.0
Average	<u>A2/A3</u>	<u>6.5</u>	<u>A</u>	<u>5.9</u>

Notes:

- (1) From page 6 of this Schedule.
- (2) Ratings that of Golden State Water Company.
- (3) Ratings that of New Jersey and Pennsylvania American Water Co
- (4) Ratings that of San Jose Water Company and The Connecticut W:

Source Information: Moody's Investors Service
 Standard & Poor's Global Utilities Rating Service

Numerical Assignment for
Moody's and Standard & Poor's Bond Ratings

<u>Moody's Bond Rating</u>	<u>Numerical Bond Weighting</u>	<u>Standard & Poor's Bond Rating</u>
Aaa	1	AAA
Aa1	2	AA+
Aa2	3	AA
Aa3	4	AA-
A1	5	A+
A2	6	A
A3	7	A-
Baa1	8	BBB+
Baa2	9	BBB
Baa3	10	BBB-
Ba1	11	BB+
Ba2	12	BB
Ba3	13	BB-
B1	14	B+
B2	15	B
B3	16	B-

Carolina Water Service Inc of North Carolina
Judgment of Equity Risk Premium for the
Proxy Group of Eight Water Companies

<u>Line No.</u>		<u>Proxy Group of Eight Water Companies</u>	<u>Using Current Interest Rates</u>
1.	Calculated equity risk premium based on the total market using the beta approach (1)	6.52 %	6.87 %
2.	Mean equity risk premium based on a study using the holding period returns of public utilities with A2 rated bonds (2)	<u>5.49</u>	<u>5.89</u>
3.	Average equity risk premium	<u><u>6.01</u></u> %	<u><u>6.38</u></u> %

Notes: (1) From page 8 of this Schedule.
 (2) From page 12 of this Schedule.

Carolina Water Service Inc of North Carolina
 Derivation of Equity Risk Premium Based on the Total Market Approach
 Using the Beta for the
Proxy Group of Eight Water Companies

<u>Line No.</u>	<u>Equity Risk Premium Measure</u>	<u>Proxy Group of Eight Water Companies</u>	<u>Using Current Interest Rates</u>
<u>Ibbotson-Based Equity Risk Premiums:</u>			
1.	Ibbotson Equity Risk Premium (1)	5.92 %	5.92 %
2.	Regression on Ibbotson Risk Premium Data (2)	8.83	9.59
3.	Ibbotson Equity Risk Premium based on PRPM (3)	9.40	9.40
4.	Equity Risk Premium Based on Value Line Summary and Index (4)	4.80	5.44
5.	Equity Risk Premium Based on Value Line S&P 500 Companies (5)	10.66	11.30
6.	Equity Risk Premium Based on Bloomberg S&P 500 Companies (6)	<u>10.57</u>	<u>11.21</u>
7.	Conclusion of Equity Risk Premium	8.36 %	8.81 %
8.	Adjusted Beta (7)	<u>0.78</u>	<u>0.78</u>
9.	Forecasted Equity Risk Premium	<u><u>6.52 %</u></u>	<u><u>6.87 %</u></u>

Notes provided on page 9 of this Schedule.

Carolina Water Service Inc of North Carolina
Derivation of Equity Risk Premium Based on the Total Market Approach
Using the Beta for the
Proxy Group of Eight Water Companies

Notes:

- (1) Based on the arithmetic mean historical monthly returns on large company common stocks from Ibbotson® S&P 500 2020 Market Report minus the arithmetic mean monthly yield of Moody's average Aaa and Aa2 corporate bonds from 1928-2020.
- (2) This equity risk premium is based on a regression of the monthly equity risk premiums of large company common stocks relative to Moody's average Aaa and Aa2 rated corporate bond yields from 1928-2020 referenced in Note 1 above.
- (3) The Predictive Risk Premium Model (PRPM) is discussed in the accompanying direct testimony. The Ibbotson equity risk premium based on the PRPM is derived by applying the PRPM to the monthly risk premiums between Ibbotson large company common stock monthly returns and average Aaa and Aa2 corporate monthly bond yields, from January 1928 through March 2021.
- (4) The equity risk premium based on the Value Line Summary and Index is derived by subtracting the average consensus forecast of Aaa corporate bonds of 3.44% (from page 3 of this Schedule) from the projected 3-5 year total annual market return of 8.24% (described fully in note 1 on page 2 of Schedule DWD-5).
- (5) Using data from Value Line for the S&P 500, an expected total return of 14.10% was derived based upon expected dividend yields and long-term earnings growth estimates as a proxy for capital appreciation. Subtracting the average consensus forecast of Aaa corporate bonds of 3.44% results in an expected equity risk premium of 10.66%.
- (6) Using data from the Bloomberg Professional Service for the S&P 500, an expected total return of 17.50% was derived based upon expected dividend yields and long-term earnings growth estimates as a proxy for capital appreciation. Subtracting the average consensus forecast of Aaa corporate bonds of 3.44% results in an expected equity risk premium of 10.57%.
- (7) Average of mean and median beta from Schedule DWD-5.

Sources of Information:

Stocks, Bonds, Bills, and Inflation - 2020 S&P 500 Yearbook, John Wiley & Sons, Inc.
Industrial Manual and Mergent Bond Record Monthly Update.
Value Line Summary and Index
Blue Chip Financial Forecasts, April 1, 2021 and December 1, 2020
Bloomberg Professional Service

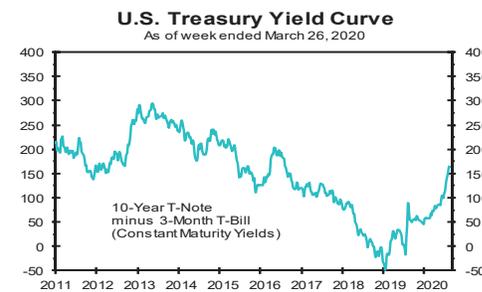
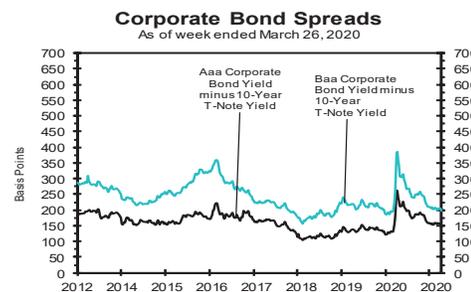
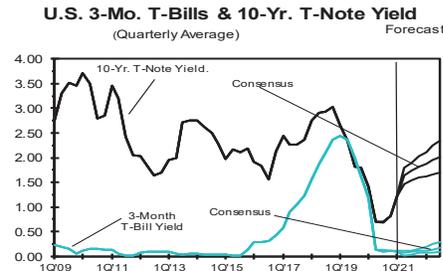
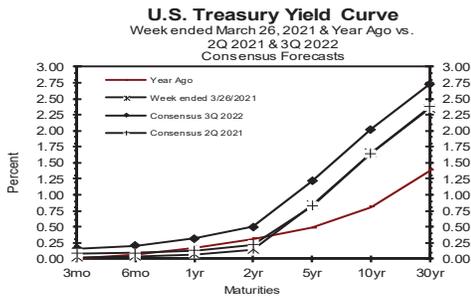
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Consensus Forecasts of U.S. Interest Rates and Key Assumptions

Interest Rates	History								Consensus Forecasts-Quarterly Avg.						
	Average For Week Ending				Average For Month				Latest Qtr	2Q	3Q	4Q	1Q	2Q	3Q
	Mar 26	Mar 19	Mar 12	Mar 5	Feb	Jan	Dec	1Q 2021*	2021	2021	2021	2022	2022	2022	
Federal Funds Rate	0.07	0.07	0.07	0.07	0.08	0.09	0.09	0.08	0.1	0.1	0.1	0.1	0.1	0.1	
Prime Rate	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.3	3.3	3.3	3.3	3.3	3.3	
LIBOR, 3-mo.	0.20	0.19	0.18	0.18	0.19	0.22	0.23	0.20	0.2	0.3	0.3	0.3	0.3	0.3	
Commercial Paper, 1-mo.	0.07	0.07	0.07	0.06	0.06	0.08	0.09	0.07	0.1	0.1	0.1	0.1	0.2	0.2	
Treasury bill, 3-mo.	0.02	0.02	0.04	0.04	0.04	0.08	0.09	0.05	0.1	0.1	0.1	0.1	0.1	0.2	
Treasury bill, 6-mo.	0.04	0.05	0.06	0.07	0.06	0.09	0.09	0.07	0.1	0.1	0.1	0.1	0.2	0.2	
Treasury bill, 1 yr.	0.07	0.07	0.09	0.08	0.07	0.10	0.10	0.08	0.1	0.2	0.2	0.2	0.3	0.3	
Treasury note, 2 yr.	0.14	0.15	0.16	0.14	0.12	0.13	0.14	0.13	0.2	0.3	0.3	0.4	0.4	0.5	
Treasury note, 5 yr.	0.84	0.85	0.82	0.73	0.54	0.45	0.39	0.61	0.8	0.9	1.0	1.1	1.1	1.2	
Treasury note, 10 yr.	1.65	1.66	1.57	1.49	1.26	1.08	0.93	1.32	1.6	1.7	1.8	1.9	2.0	2.0	
Treasury note, 30 yr.	2.35	2.41	2.30	2.25	2.04	1.82	1.67	2.08	2.4	2.5	2.5	2.6	2.7	2.7	
Corporate Aaa bond	3.15	3.23	3.13	3.06	2.84	2.64	2.52	2.88	3.0	3.1	3.2	3.3	3.4	3.4	
Corporate Baa bond	3.63	3.71	3.62	3.52	3.30	3.14	3.03	3.36	3.9	4.0	4.1	4.2	4.3	4.4	
State & Local bonds	2.75	2.74	2.72	2.77	2.63	2.65	2.70	2.68	2.7	2.9	3.0	3.0	3.1	3.2	
Home mortgage rate	3.17	3.09	3.05	3.02	2.81	2.74	2.68	2.88	3.2	3.3	3.4	3.5	3.6	3.7	

Key Assumptions	History								Consensus Forecasts-Quarterly									
	2Q				3Q				4Q				1Q		2Q		3Q	
	2019	2019	2019	2020	2020	2020	2020	2020	2021**	2021	2021	2021	2022	2022	2022	2022		
Fed's AFE \$ Index	110.4	110.6	110.5	111.4	112.4	107.3	105.2	103.4	104.0	103.9	103.9	103.6	103.5	103.5	103.4			
Real GDP	1.5	2.6	2.4	-5.0	-31.4	33.4	4.3	4.3	8.1	6.9	4.8	3.5	3.0	2.7				
GDP Price Index	2.5	1.5	1.4	1.4	-1.8	3.5	2.0	2.2	2.1	2.1	2.0	1.9	2.1	2.2				
Consumer Price Index	3.5	1.3	2.6	1.0	-3.1	4.7	2.4	2.8	2.4	2.1	2.0	2.0	2.1	2.2				
PCE Price Index	2.5	1.4	1.5	1.3	-1.6	3.7	1.5	2.7	2.2	2.0	1.9	1.9	2.0	2.1				

Forecasts for interest rates and the Federal Reserve's Major Currency Index represent averages for the quarter. Forecasts for Real GDP, GDP Price Index and Consumer Price Index are seasonally-adjusted annual rates of change (saar). Individual panel members' forecasts are on pages 4 through 9. Historical data: Treasury rates from the Federal Reserve Board's H.15; AAA-AA and A-BBB corporate bond yields from Bank of America-Merrill Lynch and are 15+ years, yield to maturity; State and local bond yields from Bank of America-Merrill Lynch, A-rated, yield to maturity; Mortgage rates from Freddie Mac, 30-year, fixed; LIBOR quotes from Intercontinental Exchange. All interest rate data are sourced from Haver Analytics. Historical data for Fed's Major Currency Index are from FRSR H.10. Historical data for Real GDP and GDP Chained Price Index are from the Bureau of Economic Analysis (BEA). Consumer Price Index (CPI) history is from the Department of Labor's Bureau of Labor Statistics (BLS). *Interest rate data for 1Q 2021 based on historical data through the week ended March 26. **Data for 1Q 2021 for the Fed's AFE \$ Index based on data through the week ended March 26. Figures for 1Q 2021 Real GDP, GDP Chained Price Index and CPI and PCE Price Index are consensus forecasts from the March 2021 survey.



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Long-Range Survey:

The table below contains the results of our twice-annual long-range CONSENSUS survey. There are also Top 10 and Bottom 10 averages for each variable. Shown are consensus estimates for the years 2022 through 2026 and averages for the five-year periods 2022-2026 and 2027-2031. Apply these projections cautiously. Few if any economic, demographic and political forces can be evaluated accurately over such long time spans.

		Average For The Year					Five-Year Averages	
		2022	2023	2024	2025	2026	2022-2026	2027-2031
1. Federal Funds Rate	CONSENSUS	0.1	0.3	0.7	1.2	1.5	0.8	1.8
	Top 10 Average	0.2	0.7	1.4	2.0	2.4	1.3	2.5
	Bottom 10 Average	0.1	0.1	0.2	0.4	0.6	0.3	1.2
2. Prime Rate	CONSENSUS	3.3	3.5	3.9	4.3	4.6	3.9	4.9
	Top 10 Average	3.4	3.7	4.4	5.0	5.4	4.4	5.4
	Bottom 10 Average	3.2	3.2	3.3	3.5	3.8	3.4	4.5
3. LIBOR, 3-Mo.	CONSENSUS	0.4	0.6	1.1	1.5	1.8	1.1	2.2
	Top 10 Average	0.5	1.0	1.7	2.2	2.6	1.6	2.7
	Bottom 10 Average	0.3	0.3	0.5	0.8	1.1	0.6	1.6
4. Commercial Paper, 1-Mo	CONSENSUS	0.3	0.7	1.2	1.6	1.9	1.1	2.1
	Top 10 Average	0.4	0.9	1.6	2.1	2.4	1.5	2.5
	Bottom 10 Average	0.2	0.4	0.8	1.2	1.5	0.8	1.7
5. Treasury Bill Yield, 3-Mo	CONSENSUS	0.2	0.4	0.8	1.2	1.5	0.8	1.9
	Top 10 Average	0.3	0.7	1.5	2.0	2.4	1.4	2.5
	Bottom 10 Average	0.1	0.1	0.2	0.5	0.7	0.3	1.3
6. Treasury Bill Yield, 6-Mo	CONSENSUS	0.2	0.5	0.9	1.3	1.6	0.9	2.0
	Top 10 Average	0.3	0.8	1.6	2.1	2.5	1.5	2.6
	Bottom 10 Average	0.1	0.2	0.3	0.5	0.8	0.4	1.4
7. Treasury Bill Yield, 1-Yr	CONSENSUS	0.3	0.6	1.0	1.4	1.8	1.0	2.1
	Top 10 Average	0.5	1.0	1.7	2.3	2.6	1.6	2.7
	Bottom 10 Average	0.2	0.3	0.4	0.7	0.9	0.5	1.6
8. Treasury Note Yield, 2-Yr	CONSENSUS	0.4	0.8	1.2	1.6	1.9	1.2	2.3
	Top 10 Average	0.7	1.2	1.9	2.4	2.8	1.8	2.9
	Bottom 10 Average	0.2	0.3	0.6	0.8	1.1	0.6	1.7
9. Treasury Note Yield, 5-Yr	CONSENSUS	0.8	1.2	1.6	2.0	2.3	1.5	2.5
	Top 10 Average	1.1	1.6	2.3	2.8	3.1	2.1	3.1
	Bottom 10 Average	0.5	0.7	1.0	1.2	1.4	1.0	1.9
10. Treasury Note Yield, 10-Yr	CONSENSUS	1.3	1.7	2.0	2.4	2.6	2.0	2.8
	Top 10 Average	1.7	2.2	2.7	3.1	3.4	2.6	3.5
	Bottom 10 Average	0.9	1.2	1.4	1.7	1.8	1.4	2.2
11. Treasury Bond Yield, 30-Yr	CONSENSUS	2.1	2.4	2.8	3.1	3.4	2.8	3.6
	Top 10 Average	2.5	3.0	3.5	4.0	4.2	3.4	4.3
	Bottom 10 Average	1.6	1.9	2.2	2.4	2.6	2.1	2.9
12. Corporate Aaa Bond Yield	CONSENSUS	2.8	3.2	3.6	4.0	4.2	3.6	4.5
	Top 10 Average	3.1	3.6	4.2	4.6	4.9	4.1	5.0
	Bottom 10 Average	2.4	2.8	3.0	3.3	3.6	3.0	3.9
13. Corporate Baa Bond Yield	CONSENSUS	3.9	4.3	4.7	5.0	5.2	4.6	5.4
	Top 10 Average	4.3	4.7	5.2	5.6	5.9	5.1	6.0
	Bottom 10 Average	3.5	3.9	4.1	4.3	4.5	4.1	4.9
14. State & Local Bonds Yield	CONSENSUS	2.8	3.1	3.4	3.6	3.8	3.3	3.9
	Top 10 Average	3.1	3.5	3.8	4.1	4.3	3.8	4.3
	Bottom 10 Average	2.5	2.8	2.9	3.2	3.4	2.9	3.6
15. Home Mortgage Rate	CONSENSUS	3.2	3.5	3.9	4.2	4.5	3.9	4.7
	Top 10 Average	3.5	3.9	4.4	4.9	5.2	4.4	5.2
	Bottom 10 Average	2.9	3.2	3.4	3.6	3.8	3.4	4.2
A. Fed's AFE Nominal \$ Index	CONSENSUS	107.2	107.0	106.5	106.4	106.6	106.7	106.7
	Top 10 Average	109.0	108.9	108.8	108.9	109.5	109.0	110.2
	Bottom 10 Average	105.4	105.2	104.4	103.8	103.7	104.5	103.0
		Year-Over-Year, % Change					Five-Year Averages	
		2022	2023	2024	2025	2026	2022-2026	2027-2031
B. Real GDP	CONSENSUS	3.2	2.5	2.3	2.2	2.1	2.4	2.1
	Top 10 Average	3.8	3.0	2.6	2.5	2.4	2.9	2.4
	Bottom 10 Average	2.6	2.1	1.9	1.9	1.8	2.1	1.8
C. GDP Chained Price Index	CONSENSUS	1.9	2.0	2.1	2.1	2.1	2.0	2.1
	Top 10 Average	2.2	2.3	2.3	2.3	2.3	2.3	2.3
	Bottom 10 Average	1.7	1.8	1.9	1.9	1.9	1.8	1.9
D. Consumer Price Index	CONSENSUS	2.1	2.2	2.2	2.1	2.2	2.1	2.2
	Top 10 Average	2.4	2.4	2.4	2.4	2.4	2.4	2.4
	Bottom 10 Average	1.8	1.9	1.9	1.9	1.9	1.9	1.9
E. PCE Price Index	CONSENSUS	1.9	2.0	2.1	2.1	2.1	2.0	2.1
	Top 10 Average	2.2	2.2	2.2	2.2	2.3	2.2	2.4
	Bottom 10 Average	1.7	1.8	1.9	1.9	1.9	1.8	1.9

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Carolina Water Service Inc of North Carolina
 Derivation of Mean Equity Risk Premium Based Studies
 Using Holding Period Returns and
Projected Market Appreciation of the S&P Utility Index

<u>Line No.</u>		<u>Implied Equity Risk Premium</u>	<u>Using Current Interest Rates</u>
	<u>Equity Risk Premium based on S&P Utility Index Holding Period Returns (1):</u>		
1.	Historical Equity Risk Premium	4.16 %	4.16 %
2.	Regression of Historical Equity Risk Premium	6.45 (2)	7.03 (3)
3.	Forecasted Equity Risk Premium Based on PRPM (4)	4.77	4.77
4.	Forecasted Equity Risk Premium based on Projected Total Return on the S&P Utilities Index (Value Line Data)	6.63 (5)	7.34 (6)
5.	Forecasted Equity Risk Premium based on Projected Total Return on the S&P Utilities Index (Bloomberg Data)	<u>5.45 (7)</u>	<u>6.16 (8)</u>
6.	Average Equity Risk Premium (9)	<u>5.49 %</u>	<u>5.89 %</u>

- Notes: (1) Based on S&P Public Utility Index monthly total returns and Moody's Public Utility Bond average monthly yields from 1928-2020. Holding period returns are calculated based upon income received (dividends and interest) plus the relative change in the market value of a security over a one-year holding period.
- (2) This equity risk premium is based on a regression of the monthly equity risk premiums of the S&P Utility Index relative to Moody's A2 rated public utility bond yields from 1928 - 2020 referenced in note 1 above.
- (3) The Predictive Risk Premium Model (PRPM) is applied to the risk premium of the monthly total returns of the S&P Utility Index and the monthly yields on Moody's A2 rated public utility bonds from January 1928 - March 2021.
- (4) Using data from Value Line for the S&P Utilities Index, an expected return of 10.49% was derived based on expected dividend yields and long-term growth estimates as a proxy for market appreciation. Subtracting the expected A2 rated public utility bond yield of 3.86%, calculated on line 3 of page 3 of this Schedule results in an equity risk premium of 6.68%. (10.49% - 3.86% = 6.63%)
- (5) Using data from Bloomberg Professional Service for the S&P Utilities Index, an expected return of 9.31% was derived based on expected dividend yields and long-term growth estimates as a proxy for market appreciation. Subtracting the expected A2 rated public utility bond yield of 3.86%, calculated on line 3 of page 3 of this Schedule results in an equity risk premium of 5.70%. (9.56% - 3.86% = 5.45%)
- (6) Average of lines 1 through 5.

Carolina Water Service, Inc. of North Carolina
 Indicated Common Equity Cost Rate Through Use
 of the Traditional Capital Asset Pricing Model (CAPM) and Empirical Capital Asset Pricing Model (ECAPM)

[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	
Using Projected Interest Rates								
Proxy Group of Eight Water Companies	Value Line Adjusted Beta	Bloomberg Adjusted Beta	Average Beta	Market Risk Premium (1)	Risk-Free Rate (2)	Traditional CAPM Cost Rate	ECAPM Cost Rate	Indicated Common Equity Cost Rate (3)
American States Water Company	0.65	0.60	0.62	9.22 %	2.73 %	8.45 %	9.32 %	8.88 %
American Water Works Company, Inc.	0.85	1.03	0.94	9.22	2.73	11.40	11.54	11.47
Artesian Resources Corporation	0.75	0.67	0.71	9.22	2.73	9.28	9.94	9.61
California Water Service Group	0.65	0.63	0.64	9.22	2.73	8.63	9.46	9.05
Global Water Resources, Inc.	0.75	0.88	0.81	9.22	2.73	10.20	10.64	10.42
Middlesex Water Company	0.70	0.79	0.74	9.22	2.73	9.55	10.15	9.85
SJW Group	0.85	0.95	0.90	9.22	2.73	11.03	11.26	11.14
The York Water Company	0.80	0.94	0.87	9.22	2.73	10.75	11.05	10.90
Mean			0.78			9.91 %	10.42 %	10.17 %
Median			0.78			9.88 %	10.39 %	10.14 %
Average of Mean and Median			0.78			9.90	10.41	10.16 %

Using Current Interest Rates

Proxy Group of Eight Water Companies	Value Line Adjusted Beta	Bloomberg Adjusted Beta	Average Beta	Market Risk Premium (1)	Risk-Free Rate (2)	Traditional CAPM Cost Rate	ECAPM Cost Rate	Indicated Common Equity Cost Rate (3)
American States Water Company	0.65	0.60	0.62	9.66 %	2.07 %	8.06 %	8.98 %	8.52 %
American Water Works Company, Inc.	0.85	1.03	0.94	9.66	2.07	11.15	11.30	11.22
Artesian Resources Corporation	0.75	0.67	0.71	9.66	2.07	8.93	9.63	9.28
California Water Service Group	0.65	0.63	0.64	9.66	2.07	8.25	9.12	8.69
Global Water Resources, Inc.	0.75	0.88	0.81	9.66	2.07	9.89	10.35	10.12
Middlesex Water Company	0.70	0.79	0.74	9.66	2.07	9.22	9.85	9.53
SJW Group	0.85	0.95	0.90	9.66	2.07	10.76	11.01	10.88
The York Water Company	0.80	0.94	0.87	9.66	2.07	10.47	10.79	10.63
Mean			0.78			9.59 %	10.13 %	9.86 %
Median			0.78			9.56 %	10.10 %	9.83 %
Average of Mean and Median			0.78			9.58	10.12	9.85 %

Notes on page 2 of this Schedule.

Carolina Water Service Inc of North Carolina
Notes to Accompany the Application of the CAPM and ECAPM

Notes:

- (1) The market risk premium (MRP) is derived by using six different measures from three sources: Ibbotson, Value Line, and Bloomberg as illustrated below:

<u>Historical Data MRP Estimates:</u>	Using Prospective Interest Rates	Using Current Interest Rates
Measure 1: Ibbotson Arithmetic Mean MRP (1926-2020)		
Arithmetic Mean Monthly Returns for Large Stocks 1926-2020:	12.20 %	12.20 %
Arithmetic Mean Income Returns on Long-Term Government Bonds:	<u>5.05</u>	<u>5.05</u>
MRP based on Ibbotson Historical Data:	<u><u>7.15</u></u> %	<u><u>7.15</u></u> %
Measure 2: Application of a Regression Analysis to Ibbotson Historical Data (1926-2020)		
	<u>9.54</u> %	<u>10.21</u> %
Measure 3: Application of the PRPM to Ibbotson Historical Data: (January 1926 - March 2021)		
	<u>10.46</u> %	<u>10.46</u> %
Value Line MRP Estimates:		
Measure 4: Value Line Projected MRP (Thirteen weeks ending April 16, 2021)		
Total projected return on the market 3-5 years hence*:	8.24 %	8.24 %
Projected Risk-Free Rate (see note 2):	<u>2.73</u>	<u>2.07</u>
MRP based on Value Line Summary & Index:	<u><u>5.51</u></u> %	<u><u>6.17</u></u> %
*Forecasted 3-5 year capital appreciation plus expected dividend yield		
Measure 5: Value Line Projected Return on the Market based on the S&P 500		
Total return on the Market based on the S&P 500:	14.10 %	14.10 %
Projected Risk-Free Rate (see note 2):	<u>2.73</u>	<u>2.07</u>
MRP based on Value Line data	<u><u>11.37</u></u> %	<u><u>12.03</u></u> %
Measure 6: Bloomberg Projected MRP		
Total return on the Market based on the S&P 500:	14.01 %	14.01 %
Projected Risk-Free Rate (see note 2):	<u>2.73</u>	<u>2.07</u>
MRP based on Bloomberg data	<u><u>11.28</u></u> %	<u><u>11.94</u></u> %
Average of Value Line, Ibbotson, and Bloomberg MRP:	<u><u>9.22</u></u> %	<u><u>9.66</u></u>

- (2) For reasons explained in the direct testimony, the appropriate risk-free rate for cost of capital purposes is the average forecast of 30 year Treasury Bonds per the consensus of nearly 50 economists reported in Blue Chip Financial Forecasts. (See pages 10-11 of Schedule DWD-4.) The projection of the risk-free rate is illustrated below:

Second Quarter 2021	2.40 %
Third Quarter 2021	2.50
Fourth Quarter 2021	2.50
First Quarter 2022	2.60
Second Quarter 2022	2.70
Third Quarter 2022	2.70
2022-2026	2.80
2027-2031	<u>3.60</u>
	<u><u>2.73</u></u> %

- (3) Three-month average yield on 30-year Treasury bonds ended March 2021 as shown below:

January 2021	1.82 %
February 2021	2.04
March 2021	<u>2.34</u>
	<u><u>2.07</u></u> %

- (4) Average of Column 6 and Column 7.

Sources of Information:

Value Line Summary and Index
 Blue Chip Financial Forecasts, April 1, 2021 and December 1, 2020
 Stocks, Bonds, Bills, and Inflation - 2020 SBBI Yearbook, John Wiley & Sons, Inc.
 Bloomberg Professional Services

Carolina Water Services Inc of North Carolina
Basis of Selection of the Group of Non-Price Regulated Companies
Comparable in Total Risk to the Utility Proxy Group

The criteria for selection of the Non-Price Regulated Proxy Group was that the non-price regulated companies be domestic and reported in Value Line Investment Survey (Standard Edition).

The Non-Price Regulated Proxy Group companies were then selected based on the unadjusted beta range of 0.43 – 0.75 and residual standard error of the regression range of 3.0062 – 3.5854 of the Utility Proxy Group.

These ranges are based upon plus or minus two standard deviations of the unadjusted beta and standard error of the regression. Plus or minus two standard deviations captures 95.50% of the distribution of unadjusted betas and residual standard errors of the regression.

The standard deviation of the Water Utility Proxy Group's residual standard error of the regression is 0.1448. The standard deviation of the standard error of the regression is calculated as follows:

$$\text{Standard Deviation of the Std. Err. of the Regr.} = \frac{\text{Standard Error of the Regression}}{\sqrt{2N}}$$

where: N = number of observations. Since Value Line betas are derived from weekly price change observations over a period of five years, N = 259

$$\text{Thus, } 0.1448 = \frac{3.2958}{\sqrt{518}} = \frac{3.2958}{22.7596}$$

Source of Information: Value Line, Inc., March 2021
Value Line Investment Survey (Standard Edition)

Carolina Water Service Inc of North Carolina
Basis of Selection of Comparable Risk
Domestic Non-Price Regulated Companies

	[1]	[2]	[3]	[4]
<u>Proxy Group of Eight Water Companies</u>	<u>Value Line Adjusted Beta</u>	<u>Unadjusted Beta</u>	<u>Residual Standard Error of the Regression</u>	<u>Standard Deviation of Beta</u>
American States Water Company	0.65	0.41	2.5967	0.0648
American Water Works Company, Inc.	0.85	0.75	3.1587	0.0788
Artesian Resources Corporation	0.75	0.57	3.3189	0.0828
California Water Service Group	0.65	0.45	3.1469	0.0785
Global Water Resources, Inc.	0.75	0.58	3.4912	0.0882
Middlesex Water Company	0.70	0.54	3.4491	0.0861
SJW Group	0.85	0.70	3.5640	0.0889
The York Water Company	0.80	0.69	3.6408	0.0908
Average	<u>0.75</u>	<u>0.59</u>	<u>3.2958</u>	<u>0.0824</u>
Beta Range (+/- 2 std. Devs. of Beta) 2 std. Devs. of Beta	0.43 0.16	0.75		
Residual Std. Err. Range (+/- 2 std. Devs. of the Residual Std. Err.)	3.0062	3.5854		
Std. dev. of the Res. Std. Err.	0.1448			
2 std. devs. of the Res. Std. Err.	0.2896			

Source of Information: Valueline Proprietary Database, March 2021

Carolina Water Service Inc of North Carolina
Proxy Group of Non-Price Regulated Companies
Comparable in Total Risk to the
Proxy Group of Eight Water Companies

	[1]	[2]	[3]	[4]
<u>Proxy Group of Twenty Non-Price Regulated Companies</u>	<u>VL Adjusted Beta</u>	<u>Unadjusted Beta</u>	<u>Residual Standard Error of the Regression</u>	<u>Standard Deviation of Beta</u>
Adobe, Inc.	0.75	0.61	3.2593	0.0813
Balchem Corporation	0.70	0.54	3.5216	0.0879
Bio-Rad Labs	0.75	0.58	3.2201	0.0804
CSG Systems Int'l	0.75	0.60	3.1995	0.0798
Citrix Sys.	0.70	0.47	3.4840	0.0869
Dollar General Corporation	0.65	0.46	3.1921	0.0797
Ennis, Inc.	0.80	0.66	3.3410	0.0834
Heartland Express	0.70	0.54	3.0069	0.0750
Intel Corp.	0.80	0.67	3.5783	0.0893
Keysight Technologies	0.85	0.73	3.5026	0.0874
Lancaster Colony Corp.	0.70	0.50	3.0103	0.0751
Lilly (Eli)	0.75	0.59	3.0669	0.0765
Smucker (J.M.)	0.65	0.45	3.0463	0.0760
Schneider National, Inc.	0.80	0.65	3.4534	0.0894
Bio-Techne Corp.	0.80	0.67	3.2475	0.0810
Tyler Technologies	0.75	0.56	3.2350	0.0807
United Parcel Serv.	0.80	0.63	3.0112	0.0751
Walgreens Boots Alliance	0.85	0.71	3.4851	0.0870
Werner Enterprises	0.75	0.58	3.3887	0.0846
West Pharmaceutical Services Inc	0.85	0.70	3.1887	0.0796
Average	<u>0.76</u>	<u>0.60</u>	<u>3.2719</u>	<u>0.0818</u>
Proxy Group of Eight Water Companies	<u>0.75</u>	<u>0.59</u>	<u>3.2958</u>	<u>0.0824</u>

Source of Information:

Valueline Proprietary Database, March 2021

Carolina Water Service Inc of North Carolina
 Summary of Cost of Equity Models Applied to
 Proxy Group of Twenty Non-Price Regulated Companies
 Comparable in Total Risk to the
Proxy Group of Eight Water Companies

<u>Principal Methods</u>	<u>Proxy Group of Twenty Non- Price Regulated Companies</u>	<u>Based on Current Interest Rates</u>
Discounted Cash Flow Model (DCF) (1)	11.75 %	11.75 %
Risk Premium Model (RPM) (2)	10.58	9.99
Capital Asset Pricing Model (CAPM) (3)	<u>10.02</u>	9.71
	Mean <u>10.78 %</u>	<u>10.48 %</u>
	Median <u>10.58 %</u>	<u>9.99 %</u>
	Average of Mean and Median <u>10.68 %</u>	<u>10.24 %</u>

Notes:

- (1) From page 2 of this Schedule.
- (2) From page 3 of this Schedule.
- (3) From page 6 of this Schedule.

Carolina Water Service, Inc. of North Carolina
 DCF Results for the Proxy Group of Non-Price-Regulated Companies Comparable in Total Risk to the
 Proxy Group of Eight Water Companies

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Proxy Group of Twenty Non-Price Regulated Companies	Average Dividend Yield	Value Line Projected Five Year Growth in EPS	Zack's Five Year Projected Growth Rate in EPS	Yahoo! Finance Projected Five Year Growth in EPS	Bloomberg Projected Five Year Growth in EPS	Average Projected Five Year Growth Rate in EPS	Adjusted Dividend Yield	Indicated Common Equity Cost Rate (1)
	%	%	%	%	%	%	%	%
Adobe, Inc.	-	14.00	18.30	17.50	17.17	16.74	-	NA
Balchem Corporation	0.48	13.50	NA	24.00	7.93	15.14	0.52	15.66
Bio-Rad Labs	-	11.50	NA	17.80	28.75	19.35	-	NA
CSG Systems Int'l	2.15	10.00	NA	NMF	NA	10.00	2.26	12.26
Citrix Sys.	1.09	9.00	13.00	11.85	9.60	10.86	1.15	12.01
Dollar General Corporation	0.85	13.00	10.80	13.57	10.57	11.99	0.90	12.89
Ennis, Inc.	4.44	3.00	NA	5.00	NA	4.00	4.53	8.53
Heartland Express	0.42	10.00	NA	12.50	NA	11.25	0.44	11.69
Intel Corp.	2.25	7.00	7.50	5.43	5.48	6.35	-	8.67
Keysight Technologies	-	17.00	10.40	12.41	10.41	12.56	-	NA
Lancaster Colony Corp.	1.67	6.50	NA	3.00	NA	4.75	1.71	6.46
Lilly (Bil)	1.73	9.00	12.20	11.60	NA	10.93	1.82	12.75
Smucker (JM)	2.98	4.00	1.60	NMF	1.65	2.42	3.02	5.44
Schneider National, Inc.	1.17	2.50	14.00	15.02	14.48	11.50	1.24	12.74
Bio-Techne Corp.	0.34	12.50	15.00	15.00	19.03	15.38	0.37	15.75
Tyler Technologies	-	10.50	NA	10.00	20.15	13.55	-	NA
United Parcel Serv.	2.48	8.00	8.70	10.06	8.04	8.70	2.59	11.29
Walgreens Boots Alliance	3.66	6.00	6.80	3.63	4.74	5.29	3.76	9.05
Werner Enterprises	0.89	9.50	10.00	11.49	9.52	10.13	0.94	11.07
West Pharmaceutical Services Inc	0.24	17.00	22.60	22.60	17.21	19.85	0.26	20.11
							Mean	11.65
							Median	11.85
							Average of Mean and Median	11.75

NA= Not Available
 NMF= Not Meaningful Figure

(1) The application of the DCF model to the domestic, non-price regulated comparable risk companies is identical to the application of the DCF to the utility proxy group. The dividend yield is derived by using the 60 day average price and the spot indicated dividend as of April 16, 2021. The dividend yield is then adjusted by 1/2 the average projected growth rate in EPS, which is calculated by averaging the 5 year projected growth in EPS provided by Value Line, Bloomberg, www.zacks.com, and www.yahoo.com (excluding any negative growth rates) and then adding that growth rate to the adjusted dividend yield.

Source of Information:
 Value Line Investment Survey
 www.zacks.com Downloaded on 04/16/2021
 www.yahoo.com Downloaded on 04/16/2021
 Bloomberg Professional Services

Carolina Water Service Inc of North Carolina
Indicated Common Equity Cost Rate
Through Use of a Risk Premium Model
Using an Adjusted Total Market Approach

<u>Line No.</u>		<u>Proxy Group of Twenty Non-Price Regulated Companies</u>	<u>Using Current Interest Rates</u>
1.	Prospective Yield on Baa2 Rated Corporate Bonds (1)	4.36 %	
2.	Current Yield on Baa2 Rated Corporate Bonds (2)		3.42 %
2.	Adjustment to Reflect Proxy Group Bond Rating (3)	<u>(0.13)</u>	<u>(0.13)</u>
3.	Adjusted Bond Yield Applicable to the Non-Price Regulated Proxy Group	4.23 %	3.29 %
4.	Equity Risk Premium (3)	<u>6.35</u>	<u>6.70</u>
5.	Risk Premium Derived Common Equity Cost Rate	<u>10.58 %</u>	<u>9.99 %</u>

Notes: (1) Average forecast of Baa2 corporate bonds based upon the consensus of nearly 50 economists reported in Blue Chip Financial Forecasts dated April 1, 2021 and December 1, 2020 (see pages 10 and 11 of Schedule DWD-4). The estimates are detailed below.

Second Quarter 2021	3.90 %
Third Quarter 2021	4.00
Fourth Quarter 2021	4.10
First Quarter 2022	4.20
Second Quarter 2022	4.30
Third Quarter 2022	4.40
2022-2026	4.60
2027-2031	<u>5.40</u>
Average	<u>4.36 %</u>

(2) Three-month average yield on Baa2 rated corporate bonds ending March 2021.

(2) To reflect the Baa1 average rating of the Non-Price Regulated Proxy Group, the prospective yield on Baa2 corporate bonds must be adjusted downward by 1/3 of the spread between A2 and Baa2 corporate bond yields as shown below:

	<u>A2 Corp. Bond Yield</u>	<u>Baa2 Corp. Bond Yield</u>	<u>Spread</u>
Mar-2021	3.37 %	3.74 %	0.37 %
Feb-2021	3.03	3.42	0.39
Jan-2021	2.84	3.24	0.40
	Average yield spread		<u>0.39 %</u>
	1/3 of spread		<u>0.13 %</u>

(3) From page 5 of this Schedule.

Carolina Water Service Inc of North Carolina
Comparison of Long-Term Issuer Ratings for the
Proxy Group of Twenty Non-Price Regulated Companies of Comparable risk to the
Proxy Group of Eight Water Companies

<u>Proxy Group of Twenty Non-Price Regulated Companies</u>	Moody's Long-Term Issuer Rating April 2021		Standard & Poor's Long-Term Issuer Rating April 2021	
	Long-Term Issuer Rating	Numerical Weighting (1)	Long-Term Issuer Rating	Numerical Weighting (1)
Adobe, Inc.	A2	6.0	A	6.0
Balchem Corporation	NA	--	NA	--
Bio-Rad Labs	Baa2	9.0	BBB	9.0
CSG Systems Int'l	NA	--	BB+	11.0
Citrix Sys.	Baa3	10.0	BBB	9.0
Dollar General Corporation	Baa2	9.0	BBB	9.0
Ennis, Inc.	NA	--	NA	--
Heartland Express	NA	--	NA	--
Intel Corp.	A1	5.0	A+	5.0
Keysight Technologies	Baa2	9.0	BBB	9.0
Lancaster Colony Corp.	NA	--	NA	--
Lilly (Eli)	A2	6.0	A+	5.0
Smucker (J.M.)	Baa2	9.0	BBB	9.0
Schneider National, Inc.	NA	--	NA	--
Bio-Techne Corp.	NA	--	NA	--
Tyler Technologies	NA	--	NA	--
United Parcel Serv.	A2	6.0	A-	7.0
Walgreens Boots Alliance	Baa2	9.0	BBB	9.0
Werner Enterprises	NA	--	NA	--
West Pharmaceutical Services Inc	NA	--	NA	--
Average	Baa1	7.8	BBB+	8.0

Notes:
(1) From page 6 of Schedule DWD-4.

Source of Information:
Bloomberg Professional Services

Carolina Water Service Inc of North Carolina
Derivation of Equity Risk Premium Based on the Total Market Approach
Using the Beta for
Proxy Group of Twenty Non-Price Regulated Companies of Comparable risk to the
Proxy Group of Eight Water Companies

<u>Line No.</u>	<u>Equity Risk Premium Measure</u>	<u>Proxy Group of Twenty Non-Price Regulated Companies</u>	<u>Based on Current Interest Rates</u>
<u>Ibbotson-Based Equity Risk Premiums:</u>			
1.	Ibbotson Equity Risk Premium (1)	5.92 %	5.92 %
2.	Regression on Ibbotson Risk Premium Data (2)	8.83	9.59
3.	Ibbotson Equity Risk Premium based on PRPM (3)	9.40	9.40
4.	Equity Risk Premium Based on <u>Value Line</u> Summary and Index (4)	4.80	5.44
5.	Equity Risk Premium Based on <u>Value Line</u> S&P 500 Companies (5)	10.66	11.30
6.	Equity Risk Premium Based on Bloomberg S&P 500 Companies (6)	10.57	11.21
7.	Conclusion of Equity Risk Premium	8.36 %	8.81 %
8.	Adjusted Beta (7)	0.76	0.76
9.	Forecasted Equity Risk Premium	6.35 %	6.70 %

Notes:

- (1) From note 1 of page 9 of Schedule DWD-4.
- (2) From note 2 of page 9 of Schedule DWD-4.
- (3) From note 3 of page 9 of Schedule DWD-4.
- (4) From note 4 of page 9 of Schedule DWD-4.
- (5) From note 5 of page 9 of Schedule DWD-4.
- (6) From note 6 of page 9 of Schedule DWD-4.
- (7) Average of mean and median beta from page 6 of this Schedule.

Sources of Information:

Stocks, Bonds, Bills, and Inflation - 2020 SBBI Yearbook, John Wiley & Sons,
Value Line Summary and Index
Blue Chip Financial Forecasts, April 1, 2021 and December 1, 2020
Bloomberg Professional Services

Carolina Water Service Inc of North Carolina
 Traditional CAPM and ECAPM Results for the Proxy Group of Non-Price-Regulated Companies Comparable in Total Risk to the
 Proxy Group of Eight Water Companies.

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
	Value Line Adjusted Beta	Bloomberg Beta	Average Beta	Market Risk Premium (1)	Risk-Free Rate (2)	Traditional CAPM Cost Rate	ECAPM Cost Rate	Indicated Common Equity Cost Rate (3)
Proxy Group of Twenty Non-Price Regulated Companies								
Adobe, Inc.	0.75	0.87	0.81	9.22 %	2.73 %	10.20 %	10.64 %	10.42 %
Balchem Corporation	0.70	0.73	0.71	9.22	2.73	9.28	9.94	9.61
Bio-Rad Labs	0.75	0.70	0.72	9.22	2.73	9.37	10.01	9.69
CSC Systems Int'l	0.75	0.91	0.83	9.22	2.73	10.38	10.77	10.58
Citrix Sys.	0.70	0.61	0.66	9.22	2.73	8.82	9.60	9.21
Dollar General Corporation	0.70	0.67	0.69	9.22	2.73	9.09	9.81	9.45
Ennis, Inc.	0.80	0.82	0.81	9.22	2.73	10.20	10.64	10.42
Heartland Express	0.70	0.76	0.73	9.22	2.73	9.46	10.08	9.77
Intel Corp.	0.80	0.97	0.89	9.22	2.73	10.94	11.19	11.06
Keysight Technologies	0.85	0.79	0.82	9.22	2.73	10.29	10.71	10.50
Lancaster Colony Corp.	0.70	0.71	0.71	9.22	2.73	9.28	9.94	9.61
Lilly (Eli)	0.75	0.72	0.74	9.22	2.73	9.55	10.15	9.85
Smucker (JM)	0.65	0.51	0.58	9.22	2.73	8.08	9.05	8.56
Schneider National, Inc.	0.80	0.72	0.76	9.22	2.73	9.74	10.29	10.01
Bio-Techne Corp.	0.80	0.92	0.86	9.22	2.73	10.66	10.98	10.82
Tyler Technologies	0.75	0.75	0.75	9.22	2.73	9.65	10.22	9.93
United Parcel Serv.	0.80	0.85	0.83	9.22	2.73	10.38	10.77	10.58
Walgreens Boots Alliance	0.75	0.80	0.78	9.22	2.73	9.92	10.43	10.18
Werner Enterprises	0.75	0.78	0.76	9.22	2.73	9.74	10.29	10.01
West Pharmaceutical Services Inc	0.85	0.76	0.80	9.22	2.73	10.11	10.57	10.34
Mean			<u>0.76</u>			<u>9.76 %</u>	<u>10.30 %</u>	<u>10.03 %</u>
Median			<u>0.76</u>			<u>9.74 %</u>	<u>10.29 %</u>	<u>10.01 %</u>
Average of Mean and Median			<u>0.76</u>			<u>9.75 %</u>	<u>10.30 %</u>	<u>10.02 %</u>

Carolina Water Service Inc of North Carolina
 Traditional CAPM and ECAPM Results for the Proxy Group of Non-Price-Regulated Companies Comparable in Total Risk to the
 Proxy Group of Eight Water Companies.

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
	Value Line Adjusted Beta	Bloomberg Beta	Average Beta	Market Risk Premium (1)	Risk-Free Rate (2)	Traditional CAPM Cost Rate	ECAPM Cost Rate	Indicated Common Equity Cost Rate (3)
Proxy Group of Twenty Non-Price Regulated Companies								
Adobe, Inc.	0.75	0.87	0.81	9.66 %	2.07 %	9.89 %	10.35 %	10.12 %
Balchem Corporation	0.70	0.73	0.71	9.66	2.07	8.93	9.63	9.28
Bio-Rad Labs	0.75	0.70	0.72	9.66	2.07	9.03	9.70	9.36
CSG Systems Int'l	0.75	0.91	0.83	9.66	2.07	10.09	10.50	10.29
Citrix Sys.	0.70	0.61	0.66	9.66	2.07	8.45	9.27	8.86
Dollar General Corporation	0.70	0.67	0.69	9.66	2.07	8.74	9.48	9.11
Ennis, Inc.	0.80	0.82	0.81	9.66	2.07	9.89	10.35	10.12
Heartland Express	0.70	0.76	0.73	9.66	2.07	9.12	9.77	9.45
Intel Corp.	0.80	0.97	0.89	9.66	2.07	10.67	10.93	10.80
Keysight Technologies	0.85	0.79	0.82	9.66	2.07	9.99	10.43	10.21
Lancaster Colony Corp.	0.70	0.71	0.71	9.66	2.07	8.93	9.63	9.28
Lilly (Eli)	0.75	0.72	0.74	9.66	2.07	9.22	9.85	9.53
Smucker (J.M.)	0.65	0.51	0.58	9.66	2.07	7.67	8.69	8.18
Schneider National, Inc.	0.80	0.72	0.76	9.66	2.07	9.41	9.99	9.70
Bio-Techne Corp.	0.80	0.92	0.86	9.66	2.07	10.38	10.72	10.55
Tyler Technologies	0.75	0.75	0.75	9.66	2.07	9.32	9.92	9.62
United Parcel Serv.	0.80	0.85	0.83	9.66	2.07	10.09	10.50	10.29
Walgreens Boots Alliance	0.75	0.80	0.78	9.66	2.07	9.60	10.14	9.87
Werner Enterprises	0.75	0.78	0.76	9.66	2.07	9.41	9.99	9.70
West Pharmaceutical Services Inc	0.85	0.76	0.80	9.66	2.07	9.80	10.28	10.04
Mean			<u>0.76</u>			<u>9.43 %</u>	<u>10.01 %</u>	<u>9.72 %</u>
Median			<u>0.76</u>			<u>9.41 %</u>	<u>9.99 %</u>	<u>9.70 %</u>
Average of Mean and Median			<u>0.76</u>			<u>9.42 %</u>	<u>10.00 %</u>	<u>9.71 %</u>

Notes:
 (1) From Schedule DWD-5, note 1.
 (2) From Schedule DWD-5, note 2.
 (3) Average of CAPM and ECAPM cost rates.

Carolina Water Service Inc. of North Carolina
 Derivation of Investment Risk Adjustment Based upon
 Ibbotson Associates' Size Premia for the Decile Portfolios of the NYSE/AMEX/NASDAQ

Line No.	[1] Market Capitalization on April 16, 2021 (millions)	[2] Applicable Decile of the NYSE/AMEX/NASDAQ (2)	[3] Applicable Size Premium (3)	[4] Spread from Applicable Size Premium (4)
1.	Carolina Water Service Inc of North Carolina \$ 93,984	10	5.01%	
2.	Proxy Group of Eight Water Companies \$ 1,692,873	6	1.37%	3.64%

Decile	Market Capitalization of (millions)		Market Capitalization of Largest Company (millions)	Size Premium (Return in Excess of CAPM)*
	Smallest Company	Largest Company		
Largest	\$ 29,025,803	\$ 1,966,078,882		-0.22%
1	13,178,743	28,808,073		0.49%
2	6,743,361	13,177,828		0.71%
3	3,861,858	6,710,676		0.75%
4	2,445,693	3,836,536		1.09%
5	1,591,865	2,444,745		1.37%
6	911,586	1,591,765		1.54%
7	451,955	911,103		1.46%
8	190,019	451,800		2.29%
9	2.194	189,831		5.01%
Smallest				

*From Duff & Phelps Cost of Capital Navigator, CRSP Size Premia as of 12/31/2020

Notes:

- (1) From page 2 of this Schedule.
- (2) Gleaned From Columns [B] and [C] on the bottom of this page. The appropriate decile (Column [A]) corresponds to the market capitalization of the proxy group, which is found in Column [1].
- (3) Corresponding risk premium to the decile is provided in Column [D] on the bottom of this page.
- (4) Line No. 1 Column [3] - Line No. 2 Column [3]. For example, the 3.64% in Column [4], Line No. 2 is derived as follows 3.64% = 5.01% - 1.37%.

Carolina Water Service Inc of North Carolina
 Market Capitalization of Carolina Water Service Inc of North Carolina and the
 Proxy Group of Eight Water Companies

Company	Exchange	[1] Common Stock Shares Outstanding at Fiscal Year End 2020 (millions)	[2] Book Value per Share at Fiscal Year End 2020 (1)	[3] Total Common Equity at Fiscal Year End 2020 (millions)	[4] Closing Stock Market Price on April 16, 2021	[5] Market-to- Book Ratio on April 16, 2021 (2)	[6] Market Capitalization on April 16, 2021 (3) (millions)
Carolina Water Service Inc of North Carolina		NA	NA	22,457 (4)	NA		
Based upon Proxy Group of Eight Water Companies						418.5 (5)	\$ 93,984 (6)
Proxy Group of Eight Water Companies							
American States Water Company	NYSE	36,889	\$ 17,395	\$ 641,673	\$ 80,710	464.0 %	\$ 2,977,320
American Water Works Company, Inc.	NYSE	181,298	35,599	6,454,000	160,120	449.8	29,029,515
Artesian Resources Corporation	NASDAQ	9,357	18,107	169,426	41,440	228.9	387,754
California Water Service Group	NYSE	50,334	18,305	921,344	60,310	329.5	3,035,623
Global Water Resources, Inc.	NASDAQ	22,588	1,425	32,188	17,630	NMF	398,222
Middlesex Water Company	NASDAQ	17,473	19,814	346,208	82,930	418.5	1,449,036
SIW Group	NYSE	28,557	32,117	917,160	67,820	211.2	1,936,709
The York Water Company	NASDAQ	13,061	10,968	143,252	51,970	473.8	678,771
Median		25,572	\$ 18,206	\$ 493,941	\$ 64,065	418.5 %	\$ 1,692,873

NA= Not Available

Notes: (1) Column 3 / Column 1.

(2) Column 4 / Column 2.

(3) Column 1 * Column 4.

(4) Combined book common equity from Company 2020 annual report filed with the Commission.

(5) The market-to-book ratio of Carolina Water Service Inc of North Carolina on April 16, 2021 is assumed to be equal to the market-to-book ratio of Proxy Group of Eight Water Companies on April 16, 2021 as appropriate.

(6) Column [3] multiplied by Column [5].

Source of Information: 2020 Annual Forms 10K
 Bloomberg Financial Services