STATE OF NORTH CAROLINA
UTILITIES COMMISSION
RALEIGH

DOCKET NO. W-354, SUB 400

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 of North Carolina and Approval of a Three-Year Water and Sewer Investment Plan	))))))	DIRECT TESTIMONY OF DYLAN W. D'ASCENDIS, CRRA, CVA, PARTNER, SCOTTMADDEN, INC., ON BEHALF OF CAROLINA WATER SERVICE, INC. OF NORTH CAROLINA

July 1, 2022

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I. INTRODUCTION AND PURPOSE

Q. PLEASE STATE YOUR NAME, AFFILIATION, AND BUSINESS ADDRESS.

A. My name is Dylan W. D'Ascendis. I am employed by ScottMadden, Inc. as a Partner. My business address is 3000 Atrium Way, Suite 200, Mount Laurel, NJ 08054.

Q. ON WHOSE BEHALF ARE YOU SUBMITTING THIS TESTIMONY?

A. I am submitting this direct testimony (referred to throughout as my "Direct Testimony") before the North Carolina Utilities Commission ("NCUC" or the "Commission") on behalf of the Carolina Water Service of North Carolina ("CWSNC" or the "Company").

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, an American Arbitration Association panel, and the Superior Court of Rhode Island 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.

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.

Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY?

A. The purpose of my Direct Testimony is to present evidence on behalf of CWSNC and recommend a weighted average cost of capital ("WACC") to

be used in setting rates in this proceeding. My testimony first provides a summary of financial theory and regulatory principles pertinent to the development of the recommended cost of capital. I then present evidence and analysis on: (1) the appropriate capital structure, (2) the appropriate cost of long-term debt, and (3) the appropriate return on common equity ("ROE") the Company should be given the opportunity to earn on its jurisdictional rate base, which will be applied for the duration of its Water and Sewer Investment Plan ("WSIP"). My testimony concludes with a discussion of the current capital market environment in North Carolina and how it influences cost of capital issues in this proceeding.

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

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

Q. WHAT IS YOUR RECOMMENDATION REGARDING THE WACC FOR CWSNC?

A. Since the WSIP is a four-year program consisting of the Base Year ("BY"), and three Forecasted Test Years ("FY1", "FY2" and "FY3", respectively), I have recommended four separate ranges of WACCs to be considered by the Commission in this proceeding. My recommended capital structure

consists of 50.00% long-term debt and 50.00% common equity and is based on the Company's Parent, CORIX Regulated Utilities, Inc.'s ("CRU") target capital structure for the duration of the WSIP. My recommended cost of long-term debt is 4.64%, which is the current 13-month average long-term debt cost rate of CRU at March 31, 2022, which is expected to not change over the duration of the WSIP. As for my recommended range of ROEs applicable to the Company, they vary slightly based on the changes in expected interest rates during the WSIP. The overall rate of returns for each period (the BY, FY1, FY2, and FY3) are summarized on page 1 of Schedule DWD-1 and in Tables 1a through 1d below:

Table 1a: Summary of Overall Rate of Return – Base Year

Type of Capital	Ratios	Cost Rate	Weighted Cost Rate
Long-Term Debt	50.00%	4.64%	2.32%
Common Equity	50.00%	9.95% - 10.95%	4.97% - 5.47%
Total	100.00%		7.29% - 7.79%

Table 1b: Summary of Overall Rate of Return – Projected Year 1

Type of Capital	Ratios	Cost Rate	Weighted Cost Rate
Long-Term Debt	50.00%	4.64%	2.32%
Common Equity	50.00%	10.17% - 11.17%	5.08% - 5.58%
Total	100.00%		7.40% - 7.90%

Table 1c: Summary of Overall Rate of Return – Projected Year 2

Type of Capital	Ratios	Cost Rate	Weighted Cost Rate
Long-Term Debt	50.00%	4.64%	2.32%
Common Equity	50.00%	10.13% - 11.13%	5.07% - 5.57%
Total	100.00%		7.39% - 7.89%

Table 1d: Summary of Overall Rate of Return – Projected Year 3

Type of Capital	Ratios	Cost Rate	Weighted Cost Rate
Long-Term Debt	50.00%	4.64%	2.32%
Common Equity	50.00%	10.24% - 11.24%	5.12% - 5.62%
Total	100.00%		7.44% - 7.94%

Given the ranges of ROEs presented in my analyses, the Company is requesting an ROE of 10.45% for the base period and an ROE of 10.70% for FYs 1 through 3.

II. SUMMARY

Q. PLEASE SUMMARIZE YOUR RECOMMENDED RANGES OF COMMON EQUITY COST RATES.

A. My recommended ranges of common equity cost rates are summarized on page 2 of Schedule DWD-1. In determining my recommended ranges, I have assessed the market-based common equity cost rates of companies of relatively similar, but not necessarily identical, risk to CWSNC. Using companies of relatively comparable risk as proxies is consistent with the principles of fair rate of return established in the *Hope*[1] and *Bluefield*[2] cases. Of course, no proxy group can be identical in risk to any single company. Consequently, there must be an evaluation of relative risk between the Company and the proxy group to determine if it is appropriate to adjust the proxy group's indicated rate of return.

1 *Federal Power Commission v. Hope Natural Gas Co*., 320 U.S. 591 (1944) ("Hope").
2 *Bluefield Water Works Improvement Co. v. Public Service Commission*, 262 U.S. 679 (1922) ("Bluefield")

My recommendation results from the application of several cost of common equity models, specifically the Discounted Cash Flow ("DCF") model, the Risk Premium Model ("RPM"), and the Capital Asset Pricing Model ("CAPM"), to the market data of the Utility Proxy Group whose selection criteria will be discussed below. In addition, I also applied these same models to a Non-Price Regulated Proxy Group.

The results derived from these analyses are as follows:

Table 2: Summary of Common Equity Cost Rates

	Using Current Interest Rates	Using Projected 2023 Interest Rates	Using Projected 2024 Interest Rates	Using Projected 2025 Interest Rates
Discounted Cash Flow Model	9.37%	9.37%	9.37%	9.37%
Risk Premium Model	11.12%	11.76%	11.69%	11.90%
Capital Asset Pricing Model	11.32%	11.68%	11.66%	11.79%
Market Models Applied to Comparable Risk, Non-Price Regulated Companies	11.20%	11.54%	11.49%	11.49%
Indicated Range of Common Equity Cost Rates Before Adjustments for Company-Specific Risk	9.85% - 10.85%	10.07% - 11.07%	10.03% - 11.03%	10.14% - 11.14%
Size Adjustment	0.10%	0.10%	0.10%	0.10%
Indicated Range of Common Equity Cost Rates after Adjustment	9.95% - 10.95%	10.17% - 11.17%	10.13% - 11.13%	10.24% - 11.24%

The indicated ranges for each year are equal to 50-basis points above and below the midpoint of my four model results. Because, as

mentioned previously, no individual company can be identical in risk to a proxy group, I conducted a relative risk analysis between the Company and the Utility Proxy Group. As a result of that analysis, the indicated range of common equity cost rates applicable to the Utility Proxy Group was adjusted upward by 0.10% to reflect CWSNC's smaller size relative to the Utility Proxy Group. This adjustment to the Utility Proxy Group-specific ROE ranges result in Company-specific ranges of common equity cost rates as shown on Table 2 above, which I recommend the Commission consider in its determination of the ROE for the Company in this proceeding. As noted above, the Company is requesting an ROE of 10.45% for the base period and an ROE of 10.70% for FYs 1 through 3 for WSIP purposes.

Q. PLEASE SUMMARIZE YOUR RECOMMENDATION WITH RESPECT TO THE COMPANY'S CAPITAL STRUCTURE.

A. As briefly mentioned above, I recommend a capital structure including 50.00% long-term debt and 50.00% common equity. This represents the Company's target capital structure throughout the duration of the WSIP.

Q. PLEASE SUMMARIZE YOUR RECOMMENDATION WITH RESPECT TO THE COMPANY'S COST OF LONG-TERM DEBT.

A. I recommend a cost of long-term debt of 4.64% for the duration of the WSIP. The Company's proposed cost of long-term debt is its current 13-month average long-term debt cost rate ending March 31, 2022.

Q. HOW IS THE REMAINDER OF YOUR DIRECT TESTIMONY ORGANIZED?

- Section III – Provides a summary of financial theory and regulatory principles pertinent to the development of the cost of capital;
- Section IV – Explains my selection of the Utility Proxy Group used to develop my ROE analytical results;
- Section V – Explains the proposed capital structure;
- Section VI – Describes the analyses on which my ROE recommendation is based;
- Section VII – Summarizes the ranges of ROEs applicable to the Utility Proxy Group before adjustments to reflect the Company-specific factors;
- Section VIII – Explains my adjustment to the ranges of ROEs applicable to the Utility Proxy Group to reflect the Company's smaller relative size;
- Section IX – Discusses the economic conditions in North Carolina; and
- Section X – Presents my conclusions.

III. GENERAL PRINCIPLES

Q. WHAT GENERAL PRINCIPLES HAVE YOU CONSIDERED IN ARRIVING AT YOUR RECOMMENDED RANGES OF ROES?

A. In unregulated industries, marketplace competition is the principal determinant of the price of products or services. For regulated public utilities, regulation must act as a substitute for marketplace competition. Assuring that the utility can fulfill its obligations to the public, while providing safe and reliable service at all times, requires a level of earnings sufficient to maintain the integrity of presently invested capital. Sufficient earnings also permit the attraction of needed new capital at a reasonable cost, for which the utility must compete with other firms of comparable risk, consistent with the fair rate of return standards established by the U.S. Supreme Court in the previously cited *Hope* and *Bluefield* cases.

The U.S. Supreme Court affirmed the fair rate of return standards in *Hope* when it stated:

> *The rate-making process under the Act,* i.e., *the fixing of 'just and reasonable' rates, involves a balancing of the investor and the consumer interests. Thus we stated in the Natural Gas Pipeline Co. case that 'regulation does not insure that the business shall produce net revenues.' 315 U.S. at page 590, 62 S.Ct. at page 745. But such considerations aside, the investor interest has a legitimate concern with the financial integrity of the company whose rates are being regulated. From the investor or company point of view it is important that there be enough revenue not only for operating expenses but also for the capital costs of the business. These include service on the debt and dividends on the stock. Cf. Chicago & Grand Trunk R. Co. v. Wellman, 143 U.S. 339, 345, 346 12*

> *S.Ct. 400,402. By that standard the return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks. That return, moreover, should be sufficient to assure confidence in the financial integrity of the enterprise, so as to maintain its credit and to attract capital.*[3]

In summary, the U.S. Supreme Court has found a return that is adequate to attract capital at reasonable terms enables the utility to provide service while maintaining its financial integrity. As discussed above, and in keeping with established regulatory standards, that return should be commensurate with the returns expected elsewhere for investments of equivalent risk. The Commission's decision in this proceeding, therefore, should provide the Company with the opportunity to earn a return that is: (1) adequate to attract capital at reasonable cost and terms; (2) sufficient to ensure their financial integrity; and (3) commensurate with returns on investments in enterprises having corresponding risks.

Lastly, the required return for a regulated public utility is established on a stand-alone basis, i.e., for the utility operating company at issue in a rate case. Parent entities, like other investors, have capital constraints and must look at the attractiveness of the expected risk-adjusted return of each investment alternative in their capital budgeting process. That is, utility holding companies that own many utility operating companies have choices as to where they will invest their capital within the holding company family.

[3] *Hope*, 320 U.S. 591 (1944), at 603.

Therefore, the opportunity cost concept applies regardless of the source of the funding, public funding or corporate funding.

When funding is provided by a parent entity, the return still must be sufficient to provide an incentive to allocate equity capital to the subsidiary or business unit rather than other internal or external investment opportunities. That is, the regulated subsidiary must compete for capital with all the parent company's affiliates, and with other, similarly situated utility companies. In that regard, investors value corporate entities on a sum-of-the-parts basis and expect each division within the parent company to provide an appropriate risk-adjusted return.

It therefore is important that the authorized ROE reflects the risks and prospects of the utility's operations and supports the utility's financial integrity from a stand-alone perspective as measured by their combined business and financial risks. Consequently, the ROE authorized in this proceeding should be sufficient to support the operational (i.e., business risk) and financing (i.e., financial risk) of the Company's utility operations on a stand-alone basis. In unregulated industries, the competition of the marketplace is the principal determinant of the price of products or services. For regulated public utilities, regulation must act as a substitute for marketplace competition. Assuring that the utility can fulfill its obligations to the public, while providing safe and reliable service at all times, requires a

level of earnings sufficient to maintain the integrity of presently invested capital. Sufficient earnings also permit the attraction of needed new capital at a reasonable cost, for which the utility must compete with other firms of comparable risk, consistent with the fair rate of return standards established by the U.S. Supreme Court in the previously cited *Hope* and *Bluefield* decisions. Consequently, marketplace data must be relied on in assessing a common equity cost rate appropriate for ratemaking purposes. Just as the use of the market data for the proxy group adds reliability to the informed expert's judgment used in arriving at a recommended common equity cost rate, the use of multiple, generally accepted common equity cost rate models also adds reliability and accuracy when arriving at a recommended common equity cost rate.

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

A. Regulated utilities primarily use common stock and long-term debt to finance their permanent property, plant, and equipment (i.e., rate base). The fair rate of return for a regulated utility is based on its WACC, in which, as noted earlier, the costs of the individual sources of capital are weighted by their respective book values.

The cost of capital is the return investors require to make an investment in a firm. Investors will provide funds to a firm only if the return

that they *expect* is equal to, or greater than, the return that they *require* to accept the risk of providing funds to the firm.

The cost of capital (that is, the combination of the costs of debt and equity) is based on the economic principle of "opportunity costs." Investing in any asset (whether debt or equity securities) represents a forgone opportunity to invest in alternative assets. For any investment to be sensible, its expected return must be at least equal to the return expected on alternative, comparable risk investment opportunities. Because investments with like risks should offer similar returns, the opportunity cost of an investment should equal the return available on an investment of comparable risk.

Whereas the cost of debt is contractually defined and can be directly observed as the interest rate or yield on debt securities, the cost of equity must be estimated based on market data and various financial models. Because the cost of equity is premised on opportunity costs, the models used to determine it are typically applied to a group of "comparable" or "proxy" companies.

In the end, the estimated cost of capital should reflect the return that investors require in light of the subject company's business and financial risks, and the returns available on comparable investments.

A. BUSINESS RISK

Q. PLEASE DEFINE BUSINESS RISK AND EXPLAIN WHY IT IS IMPORTANT FOR DETERMINING A FAIR RATE OF RETURN.

A. The investor-required return on common equity reflects investors' assessment of the total investment risk of the subject firm. Total investment risk is often discussed in the context of business and financial risk.

Business risk reflects the uncertainty associated with owning a company's common stock without the company's use of debt and/or preferred stock financing. One way of considering the distinction between business and financial risk is to view the former as the uncertainty of the expected earned return on common equity, assuming the firm is financed with no debt.

Examples of business risks generally faced by utilities include, but are not limited to, the regulatory environment, mandatory environmental compliance requirements, customer mix and concentration of customers, service territory economic growth, market demand, risks and uncertainties of supply, operations, capital intensity, size, the degree of operating leverage, emerging technologies including distributed energy resources, the vagaries of weather, and the like, all of which have a direct bearing on earnings.

Although analysts, including rating agencies, may categorize business risks individually, as a practical matter, such risks are interrelated

and not wholly distinct from one another. When determining an appropriate return on common equity, the relevant issue is where investors see the subject company in relation to other similarly situated utility companies (i.e., the Utility Proxy Group). To the extent investors view a company as being exposed to higher risk, the required return will increase, and vice versa.

For regulated utilities, business risks are both long-term and near-term in nature. Whereas near-term business risks are reflected in year-to-year variability in earnings and cash flow brought about by economic or regulatory factors, long-term business risks reflect the prospect of an impaired ability of investors to obtain both a fair rate of return on, and return of, their capital. Moreover, because utilities accept the obligation to provide safe, adequate and reliable service at all times (in exchange for a reasonable opportunity to earn a fair return on their investment), they generally do not have the option to delay, defer, or reject capital investments. Because those investments are capital-intensive, utilities generally do not have the option to avoid raising external funds. The obligation to serve and the corresponding need to access capital is even more acute during periods of capital market distress.

Because utilities invest in long-lived assets, long-term business risks are of paramount concern to equity investors. That is, the risk of not recovering the return on their investment extends far into the future. The

timing and nature of events that may lead to losses, however, also are uncertain and, consequently, those risks and their implications for the required return on equity tend to be difficult to quantify. Regulatory commissions (like investors who commit their capital) must review a variety of quantitative and qualitative data and apply their reasoned judgment to determine how long-term risks weigh in their assessment of the market-required return on common equity.

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

A. Water and wastewater utilities have an ever-increasing responsibility to be stewards of the environment from which water supplies are drawn in order to preserve and protect essential natural resources of the United States. This increased environmental stewardship is a direct result of compliance with the Safe Water Drinking Act, as well as a response to continuous monitoring by the Environmental Protection Agency ("EPA") and state and local governments, of the water supply for potential contaminants and their resultant regulations. This, plus aging infrastructure, necessitate additional capital investment in the distribution and treatment of water, exacerbating the pressure on free cash flows arising from increased capital expenditures for infrastructure repair and replacement. The significant amount of capital

investment and, hence, high capital intensity, is a major risk factor for the water and wastewater utility industry.

Value Line Investment Survey ("*Value Line*") observes the following about the water utility industry:

> Prices of goods and services have increased significantly over the past year. While this is not good news for many entities, it is particularly bad for utilities. Indeed, these companies have been allowed to operate as a monopoly in their service areas, but in return, they have agreed to let state regulators have the final call on the prices customers are charged. For more then the past decade, this hasn't been a problem because inflation has been very tame. Since the pandemic has disrupted everything from the labor markets to the world's supply chains, (with a strong assist from easy monetary and fiscal policy), costs have spiked substantially. Thus, utilities are seeing their expenses rise without a similar increase in clients bills.
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> * * *
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> Each state has its own authority that deals with requests for rate relief. In the recent past, regulators and water utilities have had a relatively good working relationship. With the nation's water infrastructure in poor condition, members of this group have been investing heavily in replacing pipelines that have been, over 70 years old, in many instances. Recall that this cooperation was achieved during an era of stable prices. So, the authorities have not met with much resistance from the general public, even though customer bills have been increased at levels well ahead of the inflation rate. This has been accepted without much blowback because there has been general agreement: For decades water rates were artificially kept too low, which meant that insufficient

investment was made to modernize water infrastructure.[4]

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

Substantial capital expenditures, as noted by *Value Line,* will require significant financing. The three sources of financing typically used are debt, equity (common and preferred), and cash flow. All three are intricately linked to the opportunity to earn a sufficient rate of return as well as the ability to achieve that return. Consistent with *Hope* and *Bluefield*, the return must be sufficient to maintain credit quality as well as enable the attraction of necessary new capital, be it debt or equity capital. If unable to raise debt or equity capital, the utility must turn to either retained earnings or free cash flow,[5] both of which are directly linked to earning a sufficient rate of return. The level of free cash flow represents a utility's ability to meet the needs of

4 *Value Line Investment Survey*, (Apr. 8, 2022).

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

its debt and equity holders. If either retained earnings or free cash flow is inadequate, it will be nearly impossible for the utility to attract the needed capital for new infrastructure investment necessary to ensure quality service to its customers. An insufficient rate of return can be financially devastating for utilities as well as a public safety issue for their customers.

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

B. FINANCIAL RISK

Q. PLEASE DEFINE FINANCIAL RISK AND EXPLAIN WHY IT IS IMPORTANT IN DETERMINING A FAIR RATE OF RETURN.

A. Financial risk is the additional risk created by the introduction of debt and preferred stock into the capital structure. The higher the proportion of debt and preferred stock in the capital structure, the higher the financial risk to common equity owners (i.e., failure to receive dividends due to default or other covenants). Therefore, consistent with the basic financial principle of risk and return, common equity investors require higher returns as compensation for bearing higher financial risk.

Q. CAN BOND AND CREDIT RATINGS BE A PROXY FOR A FIRM'S COMBINED BUSINESS AND FINANCIAL RISKS TO EQUITY OWNERS (I.E., INVESTMENT RISK)?

A. Yes, similar bond ratings/issuer credit ratings reflect, and are representative of, similar combined business and financial risks (i.e., total risk) faced by bond investors.[6] Although specific business or financial risks may differ between companies, the same bond/credit rating indicates that the combined risks are roughly similar from a debtholder perspective. The caveat is that these debtholder risk measures do not translate directly to risks for common equity.

IV. CWSNC AND THE UTILITY PROXY GROUP

Q. WHY IS IT NECESSARY TO DEVELOP A PROXY GROUP WHEN ESTIMATING THE ROE FOR THE COMPANY?

A. Because the Company is not publicly traded and does not have publicly traded equity securities, it is necessary to develop groups of publicly traded, comparable companies to serve as "proxies" for the Company. In addition to the analytical necessity of doing so, the use of proxy companies is consistent with the *Hope* and *Bluefield* comparable risk standards, as discussed above. I have selected two proxy groups that, in my view, are

6 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.

fundamentally risk-comparable to the Company: A Utility Proxy Group and a Non-Price Regulated Proxy Group, which is comparable in total risk to the Utility Proxy Group.[7]

Even when proxy groups are carefully selected, it is common for analytical results to vary from company to company. Despite the care taken to ensure comparability, because no two companies are identical, market expectations regarding future risks and prospects will vary within the proxy group. It therefore is common for analytical results to reflect a seemingly wide range, even for a group of similarly situated companies. At issue is how to estimate the ROE from within that range. That determination will be best informed by employing a variety of sound analyses and necessarily must consider the sort of quantitative and qualitative information discussed throughout my Direct Testimony. Additionally, a relative risk analysis between the Company and the Utility Proxy Group must be made to determine whether or not explicit Company-specific adjustments need to be made to the Utility Proxy Group's indicated results.

My analyses are based on the Utility Proxy Group, containing U.S. water utilities. As discussed earlier, utilities must compete for capital with other companies with commensurate risk (including non-utilities) and, to do so, must be provided the opportunity to earn a fair and reasonable return.

[7] The development of the Non-Price Regulated Proxy Group is explained in more detail in Section VII.

Consequently, it is appropriate to consider the Utility Proxy Group's market data in determining the Company's ROE.

Q. ARE YOU FAMILIAR WITH THE OPERATIONS OF CWSNC?

A. Yes. CWSNC is an operating subsidiary of CRU. The Company provides water and wastewater service to approximately 56,000 residential and commercial customers in North Carolina.[8] CWSNC's common stock is not publicly traded.

Q. PLEASE EXPLAIN HOW YOU CHOSE THE COMPANIES IN THE UTILITY PROXY GROUP.

A. Because the cost of equity is a comparative exercise, my objective in developing a proxy group was to select companies that are comparable to the Company. Because the Company is a 100% rate-regulated water utility, I applied the following criteria to select my Utility Proxy Group:

(i) They were included in the Water Utility Group of *Value Line's* Standard Edition (April 8, 2022);

(ii) They have 60% or greater of fiscal year 2021 total operating income derived from, or 60% or greater of fiscal year 2021 total assets attributable to, regulated water utility operations;

(iii) At the time of preparation of this testimony, they had not publicly announced that they were involved in any major merger or

[8] Company provided.

acquisition activity (i.e., one publicly-traded utility merging with or acquiring another) or any other major development;

(iv) They have not cut or omitted their common dividends during the five years ended 2021 or through the time of preparation of this testimony;

(v) They have *Value Line* and Bloomberg Professional Services ("Bloomberg") adjusted Beta coefficients ("beta");

(vi) They have positive *Value Line* five-year dividends per share ("DPS") growth rate projections; and

(vii) They have *Value Line*, Zacks, or Yahoo! Finance consensus five-year earnings per share ("EPS") growth rate projections.

The following seven companies met these criteria: American States Water Co., American Water Works Co., Inc., California Water Service Group, Essential Utilities, Inc., Middlesex Water Co., SJW Corp., and The York Water Co.

Q. PLEASE SUMMARIZE THE UTILITY PROXY GROUP'S HISTORICAL CAPITALIZATION AND FINANCIAL STATISTICS.

A. Page 1 of Schedule DWD-2 contains comparative capitalization and financial statistics for the Utility Proxy Group identified above for the years 2017 to 2021.

During the five-year period ending 2021, the historically achieved average earnings rate on book common equity for the group averaged 10.53%. The average common equity ratio based on total permanent capital (excluding short-term debt) was 52.31%, and the average dividend payout ratio was 59.66%.

Total debt to earnings before interest, taxes, depreciation, and amortization for the years 2017 to 2021 ranges between 3.42 and 5.57 times, with an average of 4.70 times. Funds from operations to total debt range from 11.66% to 22.87%, with an average of 16.51%.

V. CAPITAL STRUCTURE

Q. HOW DOES THE CAPITAL STRUCTURE AFFECT THE RATE OF RETURN?

A. As discussed above, there are two general categories of risk: business risk and financial risk. The capital structure relates to a company's financial risk, which represents the risk that a company may not have adequate cash flows to meet its financial obligations, and is a function of the percentage of debt (or financial leverage) in its capital structure. In that regard, as the percentage of debt in the capital structure increases, so do the fixed obligations for the repayment of that debt. Consequently, as the degree of financial leverage increases, the risk of financial distress (i.e., financial risk)

also increases.[9] In essence, even if two firms face the same business risks, a company with meaningfully higher levels of debt in its capital structure is likely to have a higher cost of both debt and equity. Since the capital structure can affect the subject company's overall level of risk, it is an important consideration in establishing a just and reasonable rate of return.

Q. IS THERE SUPPORT FOR THE PROPOSITION THAT THE CAPITAL STRUCTURE IS A KEY CONSIDERATION IN ESTABLISHING AN APPROPRIATE RATE OF RETURN?

A. Yes. The Supreme Court and various utility commissions have long recognized the role of capital structure in the development of a just and reasonable rate of return for a regulated utility. In particular, a utility's leverage, or debt ratio, has been explicitly recognized as an important element in determining a just and reasonable rate of return:

> *Although the determination of whether bonds or stocks should be issued is for management, the matter of debt ratio is not exclusively within its province. Debt ratio substantially affects the manner and cost of obtaining new capital. It is therefore an important factor in the rate of return and must necessarily be considered by and come within the authority of the body charged by law with the duty of fixing a just and reasonable rate of return.*[10]

[9] Roger A. Morin, Modern Regulatory Finance, Public Utility Reports, Inc., 2020, at 51-52. ("Morin")

[10] *New England Telephone & Telegraph Co. v. State*, 98 N.H. 211, 97 A.2d 213, (1953), citing *New England Tel. & Tel. Co. v. Department of Pub. Util*., (Mass.) 327 Mass. 81, 97 N.E. 2d 509, 514; *Petitions of New England Tel. & Tel. Co*. 116 Vt. 480, 80 A2d 671, at 6.

Perhaps ultimate authority for balancing the issues of cost and financial integrity is found in the Supreme Court's statement in *Hope*:

> *The rate-making process under the Act, i.e., the fixing of "just and reasonable' rates, involves a balancing of the investor and the consumer interests.*[11]

And as the U.S. Court of Appeals, District of Columbia Circuit found in *Communications Satellite Corp. et. al. v. FCC*:

> *The equity investor's stake is made less secure as the company's debt rises, but the consumer rate-payer's burden is alleviated.*[12]

That is, the U.S. Court of Appeals, District of Columbia Circuit found that because there is a relationship between the capital structure and the cost of equity, investor and consumer interests must be balanced. Consequently, the principles of fairness and reasonableness with respect to the allowed rate of return and capital structure are considered at both the federal and state levels.

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

A. I recommend the use of CRU's target capital structure, which consists of 50.00% long-term debt and 50.00% common equity as shown on page 1 of

[11] *Federal Power Commission v. Hope Natural Gas Co.,* 320 U.S., at 603 (1944).

[12] *Communications Satellite Corp. et. al. v. FCC*, 198 U.S. App. D.C. 60, 63-64, 611 F.2d 883.

Schedule DWD-1 to be used as CWSNC's ratemaking capital structure in this proceeding.

Q. HOW DOES CWSNC'S TARGET RATEMAKING COMMON EQUITY RATIO OF 50.00% COMPARE WITH THE EQUITY RATIOS MAINTAINED BY THE COMPANIES IN YOUR UTILITY PROXY GROUP?

A. CWSNC's ratemaking common equity ratio of 50.00% is reasonable and consistent with the range of common equity ratios maintained, on average, by the companies in the Utility Proxy Group on which I base my recommended common equity cost rate. As shown on page 2 of Schedule DWD-2, the common equity ratios of the Utility Proxy Group range from 40.31% to 62.44% in 2021. In my opinion, CWSNC's ratemaking equity ratio of 50.00% falls within a reasonable range.

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

A. CRU's 13-month average long-term debt cost rate of 4.64% is reasonable and appropriate as CWSNC's cost of long-term debt in this proceeding.

VI. COMMON EQUITY COST RATE MODELS

Q. IS IT IMPORTANT THAT COST OF COMMON EQUITY MODELS BE MARKET BASED?

A. Yes. As discussed previously, regulated public utilities, like the Company, must compete for equity in capital markets along with all other companies

with commensurate risk, including non-utilities. The cost of common equity is thus determined based on equity market expectations for the returns of those companies. If an individual investor is choosing to invest their capital among companies with comparable risk, they will choose the company providing a higher return over a company providing a lower return.

Q. ARE THE COST OF COMMON EQUITY MODELS YOU USE MARKET-BASED MODELS?

A. Yes. The DCF model is market-based in that market prices are used in developing the dividend yield component of the model. The RPM and CAPM are also market-based in that the bond/issuer ratings and expected bond yields/risk-free rate used in the application of the RPM and CAPM reflect the market's assessment of bond/credit risk. In addition, the use of the beta to determine the equity risk premium also reflects the market's assessment of market/systematic risk, as betas are derived from regression analyses of market prices. Moreover, market prices are used in the development of the monthly returns and equity risk premiums used in the Predictive Risk Premium Model ("PRPM"). Selection criteria for the Non-Price Regulated Proxy Group are based on regression analyses of market prices and reflect the market's assessment of total risk.

Q. WHAT ANALYTICAL APPROACHES DID YOU USE TO DETERMINE THE COMPANY'S ROE?

A. As discussed earlier, I have relied on the DCF model, the RPM, and the CAPM, which I applied to the Utility Proxy Group described above. I also applied these same models to a Non-Price Regulated Proxy Group described later in this section.

I rely on these models because reasonable investors use a variety of tools and do not rely exclusively on a single source of information or single model. Moreover, the models on which I rely focus on different aspects of return requirements, and provide different insights to investors' views of risk and return. The DCF model, for example, estimates the investor-required return assuming a constant expected dividend yield and growth rate in perpetuity, while Risk Premium-based methods (i.e., the RPM and CAPM approaches) provide the ability to reflect investors' views of risk, future market returns, and the relationship between interest rates and the cost of equity. Just as the use of market data for the Utility Proxy Group adds the reliability necessary to inform expert judgment in arriving at a recommended common equity cost rate, the use of multiple generally accepted common equity cost rate models also adds reliability and accuracy when arriving at a recommended common equity cost rate.

A. DISCOUNTED CASH FLOW MODEL

Q. PLEASE GIVE A GENERAL DESCRIPTION OF THE DCF MODEL.

A. The theory underlying the DCF model is that the present value of an expected future stream of net cash flows during the investment holding period can be determined by discounting those cash flows at the cost of capital, or the investors' capitalization rate. DCF theory indicates that an investor buys a stock for an expected total return rate, which is derived from the cash flows received from dividends and market price appreciation. Mathematically, the expected dividend yield on market price plus a growth rate equals the capitalization rate; i.e., the total common equity return rate expected by investors, as shown in Equation [1] below:

$$K_e = (D_0 (1+g))/P + g$$

where:

K_e = the required Return on Equity;
D_0 = the annualized Dividend Per Share;
P = the current stock price; and
g = the growth rate.

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

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

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

A. The unadjusted dividend yields are based on the proxy companies' dividends as of May 13, 2022 divided by the average of closing market prices for the 60 trading days ending May 13, 2022.[13]

Q. PLEASE EXPLAIN YOUR ADJUSTMENT TO THE DIVIDEND YIELD.

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

DCF theory calls for the use of the full growth rate, or D_1, in calculating the dividend yield component of the model. Since the various companies in the Utility Proxy Group increase their quarterly dividend at various times during the year, a reasonable assumption is to reflect one-half the annual dividend growth rate in the dividend yield component, or $D_{1/2}$. Because the dividend should be representative of the next 12-month period, my adjustment is a conservative approach that does not overstate the dividend yield. Therefore, the actual average dividend yields in Column 1 on page 1 of Schedule DWD-3 have been adjusted upward to reflect one-half the average projected growth rate shown in Column 5.

13 *See*, Schedule DWD-3, page 1, Column 1.

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

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

Over the long run, there can be no growth in DPS without growth in EPS. Security analysts' earnings expectations have a more significant influence on market prices than dividend expectations. Thus, using projected earnings growth rates in a DCF analysis provides a better match between investors' market price appreciation expectations and the growth rate component of the DCF.

Q. PLEASE SUMMARIZE THE CONSTANT GROWTH DCF MODEL RESULTS.

A. As shown on page 1 of Schedule DWD-3, the mean result of the application of the single-stage DCF model is 9.03%, the median result is 9.71%, and the average of the two is 9.37% for the Utility Proxy Group. In arriving at a

conclusion for the DCF-indicated common equity cost rate for the Utility Proxy Group, I relied on an average of the mean and the median results (i.e., 9.37%) of the DCF. By doing so, I have considered the DCF results for each company without giving undue weight to outliers on either the high or low side.

B. THE RISK PREMIUM MODEL

Q. PLEASE DESCRIBE THE THEORETICAL BASIS OF THE RPM.

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

While it is possible to directly observe bond returns and yields, investors' required common equity return cannot be directly determined or observed. According to RPM theory, one can estimate a common equity risk premium over bonds (either historically or prospectively), and use that premium to derive a cost rate of common equity. The cost of common equity equals the expected cost rate for long-term debt capital, plus a risk premium over that cost rate, to compensate common shareholders for the added risk

of being unsecured and last-in-line for any claim on the corporation's assets and earnings upon liquidation.

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

A. To derive my indicated cost of common equity under the RPM, I used two risk premium methods. The first method was the PRPM and the second method was a risk premium model using a total market approach. The PRPM estimates the risk-return relationship directly, while the total market approach indirectly derives a risk premium by using known metrics as a proxy for risk.

1. Predictive Risk Premium Model

Q. PLEASE EXPLAIN THE PRPM.

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

14 Autoregressive conditional heteroscedasticity. *See* Pauline M. Ahern, Frank J. Hanley and Richard A. Michelfelder, Ph.D., *A New Approach for Estimating the Equity Risk Premium for Public Utilities*, The Journal of Regulatory Economics (Dec. 2011), at 40:261-78 and Richard A. Michelfelder, Ph.D, Pauline M. Ahern, Dylan W. D'Ascendis, and Frank J. Hanley, *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*, , The Electricity Journal (May 2013), at 84-89.

15 www.nobelprize.org.

especially in financial markets. Engle discovered that the volatility in prices and returns clusters over time and is therefore highly predictable and can be used to predict future levels of risk and risk premiums. That is, historical volatility can be used to predict future volatility, which then can be translated to a predicted equity risk premium.

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

The inputs to the model are the historical returns on the common shares of each company in the Utility Proxy Group minus the historical monthly yield on long-term U.S. Treasury securities through April 2022. Using a generalized form of ARCH, known as GARCH, I calculated each Utility Proxy Group company's projected equity risk premium using Eviews© statistical software. When the GARCH Model is applied to the historical return data, it produces a predicted GARCH variance series[16] and a GARCH coefficient[17]. Multiplying the predicted monthly variance by the GARCH coefficient, then annualizing it[18], produces the predicted annual

16 Illustrated on Columns 1 and 2 of pages 2, 3, 4, and 5 of Schedule DWD-4.
17 Illustrated on Column 4 of pages 2, 3, 4, and 5 of Schedule DWD-4.
18 Annualized Return = (1+Monthly Return)^12 – 1.

equity risk premium for each company. I then added the representative risk-free rate[19] to each company's PRPM-derived equity risk premium to arrive at indicated costs of common equity.

Q. PLEASE DESCRIBE YOUR SELECTION OF RISK-FREE RATES OF RETURN.

A. In order to reflect the time periods contemplated by the WSIP (i.e., BY, FY1, FY2, and FY3), I selected four risk-free rates consistent with projected risk-free rates during those years as shown in Table 3, below:

Table 3: Representative Risk-Free Rates During WSIP

Test Year	Time Frame	Source	Value
Base Year	YE 3/31/2022	Bloomberg	2.49%
Forecasted Year 1	YE 3/31/2023	*Blue Chip*	3.33%
Forecasted Year 2	YE 3/31/2024	*Blue Chip*	3.30%
Forecasted Year 3	YE 3/31/2025	*Blue Chip*	3.60%

For the BY, I used the three-month average[20] 30-year Treasury bond yield as reported by Bloomberg. For the prospective risk-free rates for FYs1 through 3, I used the consensus forecast of 30-year Treasury bonds for each year (2023, 2024, and 2025) from *Blue Chip Financial Forecasts* ("*Blue Chip*").

19 See Column 6 of pages 2, 3, 4, and 5 of Schedule DWD-4.
20 February – April 2022.

Q. WHY DID YOU USE THE 30-YEAR TREASURY BOND YIELD AS YOUR RISK-FREE RATE?

A. I used the 30-year Treasury bond yield as my proxy for the risk-free rate because the yield on long-term U.S. Treasury bonds is almost risk-free and its term is consistent with the long-term cost of capital to public utilities measured by the yields on Moody's Investor Service's ("Moody's") A2-rated public utility bonds; the long-term investment horizon inherent in utilities' common stocks; and the long-term life of the jurisdictional rate base to which the allowed fair rate of return (i.e., cost of capital) will be applied. In contrast, short-term U.S. Treasury yields are more volatile and largely a function of Federal Reserve monetary policy.

More specifically, the term of the risk-free rate used for cost of capital purposes should match the life (or duration) of the underlying investment (i.e., perpetuity). As noted by Morningstar:

> The traditional thinking regarding the time horizon of the chosen Treasury security is that it should match the time horizon of whatever is being valued. When valuing a business that is being treated as a going concern, the appropriate Treasury yield should be that of a long-term Treasury bond. Note that the horizon is a function of the investment, not the investor. If an investor plans to hold stock in a company for only five years, the yield on a five-year Treasury note would not be appropriate since the company will continue to exist beyond those five years.[21]

[21] Morningstar, Inc., 2013 Ibbotson Stocks, Bonds, Bills and Inflation Valuation Yearbook, at 44.

Morin also confirms this when he states:

> [b]ecause common stock is a long-term investment and because the cash flows to investors in the form of dividends last indefinitely, the yield on very long-term government bonds, namely, the yield on 30-year Treasury bonds, is the best measure of the risk-free rate for use in the CAPM (footnote omitted)… The expected common stock return is based on long-term cash flows, regardless of an individual's holding time period.[22]

Pratt and Grabowski recommend a similar approach to selecting the risk-free rate: "[i]n theory, when determining the risk-free rate and the matching ERP you should be matching the risk-free security and the ERP with the period in which the investment cash flows are expected."[23]

2. Total Market Approach Risk Premium Model

Q. PLEASE EXPLAIN THE TOTAL MARKET APPROACH RPM.

A. The total market approach RPM adds a representative public utility bond yield to an average of: (1) an equity risk premium that is derived from a beta-adjusted total market equity risk premium, and (2) an equity risk premium based on the S&P Utilities Index.

[22] Morin, at 169.

[23] Shannon Pratt and Roger Grabowski, Cost of Capital: Applications and Examples, 3rd Ed. (Hoboken, NJ: John Wiley & Sons, Inc., 2008), at 92. "ERP" is the Equity Risk Premium.

Q. PLEASE EXPLAIN HOW YOU DETERMINED THE REPRESENTATIVE BOND YIELDS USED IN YOUR ANALYSIS.

A. The first step in the total market approach RPM analysis is to determine the representative bond yield. Consistent with the selection of my risk-free rate, I relied on four different bond yields which reflect the four years the WSIP will be in effect. For the BY, I started with the three-month average yield on A2-rated public utility bonds.[24] Since the Utility Proxy Group's average Moody's long-term issuer rating is A3, another adjustment to the A2-rated public utility bond yield is needed to reflect the difference in bond ratings. An upward adjustment of 0.10%, which represents one-third of a recent spread between A2- and Baa2-rated public utility bond yields, is necessary to make the A2-rated prospective bond yield applicable to an A3-rated public utility bond.[25]

For the prospective utility bond yields for FY1, FY2, and FY3, I used the consensus forecast of Aaa-rated corporate bonds for each year (i.e., 2023, 2024, and 2025) from *Blue Chip.* I then adjusted that yield by the recent spread between Aaa-rated corporate bond yields and A2-rated public utility yields, or 0.51%, as shown on Schedule DWD-4, page 7, and

[24] From February – April 2022.

25 As shown on line 5 and explained in note 4, page 6 of Schedule DWD-4. Moody's does not provide public utility bond yields for A3-rated bonds. As such, it was necessary to estimate the difference between A2-rated and A3-rated public utility bonds. Because there are two steps between Baa2 and A3 (Baa2 to Baa1 and Baa1 to A3) I assumed an adjustment of one-third of the difference between the A2-rated and Baa2-rated public utility bond yield was appropriate.

by one-third of the recent spread between A2-rated and Baa2-rated public utility bonds, to reflect the average long-term bond rating of the Utility Proxy Group, as discussed previously. Representative bond yields for the Utility Proxy Group for the years encompassed by the WSIP are presented on page 6 of Schedule DWD-4 and Table 4, below:

Table 4: Representative Utility Proxy Group Bond Yields During WSIP[26]

Test Year	Time Frame	Source	Value
Base Year	YE 3/31/2022	Bloomberg	4.09%
Forecasted Year 1	YE 3/31/2023	*Blue Chip*	5.06%
Forecasted Year 2	YE 3/31/2024	*Blue Chip*	4.81%
Forecasted Year 3	YE 3/31/2025	*Blue Chip*	5.11%

To develop the total market approach RPM estimate of the appropriate return on equity, these prospective bond yields are then added to the average of two different equity risk premiums, which I discuss in turn.

a. Beta-Derived Equity Risk Premium

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

A. The components of the beta-derived risk premium model are: (1) an expected market equity risk premium over corporate bonds, and (2) the beta. The derivation of the beta-derived equity risk premium that I applied to the Utility Proxy Group is shown on lines 1 through 9 of page 11 of

[26] From page 6 of Schedule DWD-4.

Schedule DWD-4. The total beta-derived equity risk premium I applied was based on an average of three historical market data-based equity risk premiums, two *Value Line*-based equity risk premiums, and a Bloomberg-based equity risk premium. Each of these is described below.

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

A. To derive a historical market equity risk premium, I used the most recent holding period returns for the large company common stocks from the Stocks, Bonds, Bills, and Inflation ("SBBI") 2022 Yearbook ("SBBI – 2022")[27] less the average historical yield on Moody's Aaa/Aa-rated corporate bonds for the period 1928 to 2021. Using holding period returns over a very long period of time is appropriate because it is consistent with the long-term investment horizon presumed by investing in a going concern, i.e., a company expected to operate in perpetuity.

SBBI's long-term arithmetic mean monthly total return rate on large company common stocks was 12.11% and the long-term arithmetic mean monthly yield on Moody's Aaa/Aa-rated corporate bonds was 5.98% from 1928 to 2021.[28] As shown on line 1 of page 11 of Schedule DWD-4, subtracting the mean monthly bond yield from the total return on large

27 *See* SBBI – 2022, at Appendix A Tables: Morningstar Stocks, Bonds, Bills, & Inflation 1926-2021.

28 As explained in note 1 on page 11 of Schedule DWD-4.

company stocks results in a long-term historical equity risk premium of 6.13%.

I used the arithmetic mean monthly total return rates for the large company stocks, and yields (income returns) for the Moody's Aaa/Aa-rated corporate bonds, because they are appropriate for the purpose of estimating the cost of capital as noted in SBBI – 2022.[29] Using the arithmetic mean return rates and yields is appropriate because historical total returns and equity risk premiums provide insight into the variance and standard deviation of returns needed by investors in estimating future risk when making a current investment. If investors relied on the geometric mean of historical equity risk premiums, they would have no insight into the potential variance of future returns because the geometric mean relates the change over many periods to a constant rate of change, thereby obviating the year-to-year fluctuations, or variance, which is critical to risk analysis.

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

A. To derive the regression analysis-derived market equity risk premium shown on line 2 of page 11 of Schedule DWD-4, I used the same monthly annualized total returns on large company common stocks relative to the monthly annualized yields on Moody's Aaa/Aa-rated corporate bonds as

29 SBBI – 2022, at 201.

mentioned above. The relationship between interest rates and the market equity risk premium was modeled using the observed monthly market equity risk premium as the dependent variable, and the monthly yield on Moody's Aaa/Aa-rated corporate bonds as the independent variable. I used a linear Ordinary Least Squares ("OLS") regression, in which the market equity risk premium is expressed as a function of the Moody's Aaa/Aa-rated corporate bond yields:

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

Using the representative Aaa/Aa-rated corporate bond for each year produced the applicable market equity risk premium as shown on line 2 of page 11 of Schedule DWD-4.

Q. HOW DID YOU CALCULATE THE REPRESENTATIVE AAA/AA-RATED CORPORATE BOND YIELDS FOR YOUR ANALYSES?

A. Similar to my determination for my risk-free rate and bond yields applicable to the Utility Proxy Group, I used four separate bond yields, which reflect the four years the WSIP will be in effect. For the BY, I started with the three-month average yield on Aaa- and Aa2-rated corporate bonds from Bloomberg.[30] For FY1, FY2, and FY3, I used the forecasted Aaa-rated corporate bond yields from *Blue Chip* for 2023, 2024, and 2025,

[30] From February – April 2022.

respectively. The representative Aaa/Aa-rated corporate bond yields are presented in Table 5, below:

Table 5: Representative Aaa- and Aa-Rated Average Bond Yields During WSIP

Test Year	Time Frame	Source	Value
Base Year	YE 3/31/2022	Bloomberg	3.56%
Forecasted Year 1	YE 3/31/2023	*Blue Chip*	4.45%
Forecasted Year 2	YE 3/31/2024	*Blue Chip*	4.20%
Forecasted Year 3	YE 3/31/2025	*Blue Chip*	4.50%

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

A. I used the same PRPM approach described previously to develop another equity risk premium estimate. The inputs to the model are the historical monthly returns on large company common stocks minus the monthly yields on Aaa/Aa-rated corporate bonds during the period from January 1928 through April 2022.[31] Using the previously discussed generalized form of ARCH, known as GARCH, the projected equity risk premium is determined using Eviews© statistical software. The resulting PRPM-predicted market equity risk premium is 8.35%.[32]

[31] Data from January 1926 – December 2021 is from SBBI – 2022. Data from January 2022 – April 2022 is from Bloomberg Professional Services.

32 Shown on Line No. 3 on page 11 of Schedule DWD-4.

Q. PLEASE EXPLAIN THE DERIVATION OF A PROJECTED EQUITY RISK PREMIUM BASED ON *VALUE LINE* SUMMARY & INDEX.

A. The derivation of the *Value Line* Summary & Index market equity risk premium can be found in note 4 on page 12 of Schedule DWD-4. Consistent with the concept of total returns being broken down into income returns and capital appreciation returns, the prospective market equity risk premiums are derived from an average of the three- to five-year median market price appreciation potential by *Value Line* for the 13 weeks ending May 13, 2022, plus an average of the median estimated dividend yield for the common stocks of the 1,700 firms covered in *Value Line*'s Standard Edition.[33]

The average median expected price appreciation is 53%, which translates to an 11.22% annual appreciation, and when added to the average of *Value Line's* median expected dividend yields of 1.94%, equates to a forecasted annual total return rate on the market of 13.16%. Subtracting the relevant bond yield (Table 5) for each year results in an indicated market equity risk premium, as shown on page 11, line 4 of Schedule DWD-4.

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

Q. PLEASE EXPLAIN THE DERIVATION OF AN EQUITY RISK PREMIUM BASED ON THE *VALUE LINE* DATA FOR S&P 500 COMPANIES.

A. Using data from *Value Line*, I calculated an expected total return on the S&P 500 using expected dividend yields as a proxy for income returns and long-term growth estimates as a proxy for capital appreciation. The expected total return for the S&P 500 is 16.42%. Subtracting the representative yield on Aaa-rated corporate bonds as described above results in equity risk premiums as shown on line 5 of page 11 of Schedule DWD-4.

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

A. Using data from Bloomberg, I calculated an expected total return on the S&P 500 using expected dividend yields as a proxy for income returns, and long-term growth estimates as a proxy for capital appreciation, identical to the method described above. The expected total return for the S&P 500 is 13.93%. Subtracting the representative yields on Aaa-rated corporate bonds as described above from the prospective market return results in a market equity risk premium as shown on line 6 of page 11 of Schedule DWD-4.

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

A. I gave equal weight to the six equity risk premiums for each year in arriving at my indicated market equity risk premiums as shown on line 7 of page 11 of Schedule DWD-4.

After calculating the average market equity risk premiums, I adjusted them by beta to account for the risk of the Utility Proxy Group. As discussed below, beta is a meaningful measure of prospective relative risk to the market as a whole and a logical way to allocate a company's, or proxy group's, share of the market's total equity risk premium relative to corporate bond yields. As shown on page 1 of Schedule DWD-5, the average of the mean and median beta for the Utility Proxy Group is 0.82. Multiplying the beta of the Utility Proxy Group of 0.82 by the market equity risk premiums shown on line 7 of page 11 of Schedule DWD-4 result in beta-adjusted equity risk premiums for the Utility Proxy Group on line 9 of page 11 of Schedule DWD-4 and in Table 6, below:

Table 6: Utility Proxy Group Equity Risk Premiums (Beta-Adjusted Approach)[34]

Test Year	Value
Base Year	7.72%
Forecasted Year 1	7.20%
Forecasted Year 2	7.35%

[34] From page 11 of Schedule DWD-4.

Forecasted Year 3	7.17%

b. S&P Utility Index-Derived Equity Risk Premium

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

A. I estimated three equity risk premiums based on S&P Utility Index holding returns, and two equity risk premiums based on the expected returns of the S&P Utilities Index, using *Value Line* and Bloomberg data, respectively. Turning first to the S&P Utility Index holding period returns, I derived a long-term monthly arithmetic mean equity risk premium between the S&P Utility Index total returns of 10.74% and monthly Moody's A-rated public utility bond yields of 6.46% from 1928 to 2021, to arrive at an equity risk premium of 4.28%.[35] I then used the same historical data and the representative yields on A-rated utility bonds[36] to derive equity risk premiums shown on line 2 of page 15 of Schedule DWD-4 based on a regression of the monthly equity risk premiums. The final S&P Utility Index holding period equity risk premium involved applying the PRPM using the historical monthly equity risk premiums from January 1928 to April 2022 to arrive at a PRPM-derived equity risk premium of 5.89% for the S&P Utility Index.

35 As shown on Line No. 1 on page 15 of Schedule DWD-4.

36 *See* lines 3 and 4 of page 6 of Schedule DWD-4 for applicable A2-rated public utility bond yields.

I then derived expected total returns on the S&P Utilities Index of 10.66% and 9.92% using data from *Value Line* and Bloomberg, respectively, and subtracted the representative A2-rated public utility bond yields[37] to determine two additional equity risk premiums as shown on lines 4 and 5 of page 15 of Schedule DWD-4.

Q. WHAT IS YOUR CONCLUSION FOR THE UTILITY-SPECIFIC EQUITY RISK PREMIUM?

A. As with the market equity risk premiums, I averaged each risk premium to calculate the indicated utility-specific equity risk premiums as shown on line 6 of page 15 of Schedule DWD-4 and Table 7, below:

Table 7: Utility Proxy Group Equity Risk Premiums (S&P Utility Approach)[38]

Test Year	Value
Base Year	5.83%
Forecasted Year 1	5.28%
Forecasted Year 2	5.42%
Forecasted Year 3	5.25%

[37] *See* lines 3 and 4 of page 6 of Schedule DWD-4 for applicable A2-rated public utility bond yields.

[38] From page 11 of Schedule DWD-4.

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

A. The equity risk premiums I applied to the Utility Proxy Group were 6.78% (BY), 6.24% (FY1), 6.39% (FY2), and 6.21% (FY3) which represent the average of the beta-derived and the S&P utility equity risk premiums.[39]

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

A. As shown on line 8 of Schedule DWD-4, page 6, I calculated common equity cost rates for the Utility Proxy Group of 10.87%, 11.30%, 11.20%, and 11.32% applicable to the BY, FY1, FY2, and FY3, respectively, based on the total market approach of the RPM.

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

A. As shown on page 1 of Schedule DWD-4, the indicated RPM-derived common equity cost rates are 11.12% (BY), 11.76% (FY1), 11.69% (FY2), and 11.90% (FY3); each of which gives equal weight to the PRPM and the adjusted market approach results.

39 As shown on page 10 of Schedule DWD-4.

C. THE CAPITAL ASSET PRICING MODEL

Q. PLEASE EXPLAIN THE THEORETICAL BASIS OF THE CAPM.

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

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

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

Where:

R_s = Return rate on the common stock;

R_f = Risk-free rate of return;

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

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

Numerous tests of the CAPM have measured the extent to which security returns and betas are related as predicted by the CAPM, confirming its validity. The empirical CAPM ("ECAPM") reflects the reality that while the results of these tests support the notion that beta is related to security returns, the empirical Security Market Line ("SML") described by the CAPM formula is not as steeply sloped as the predicted SML.[40] The ECAPM reflects this empirical reality.

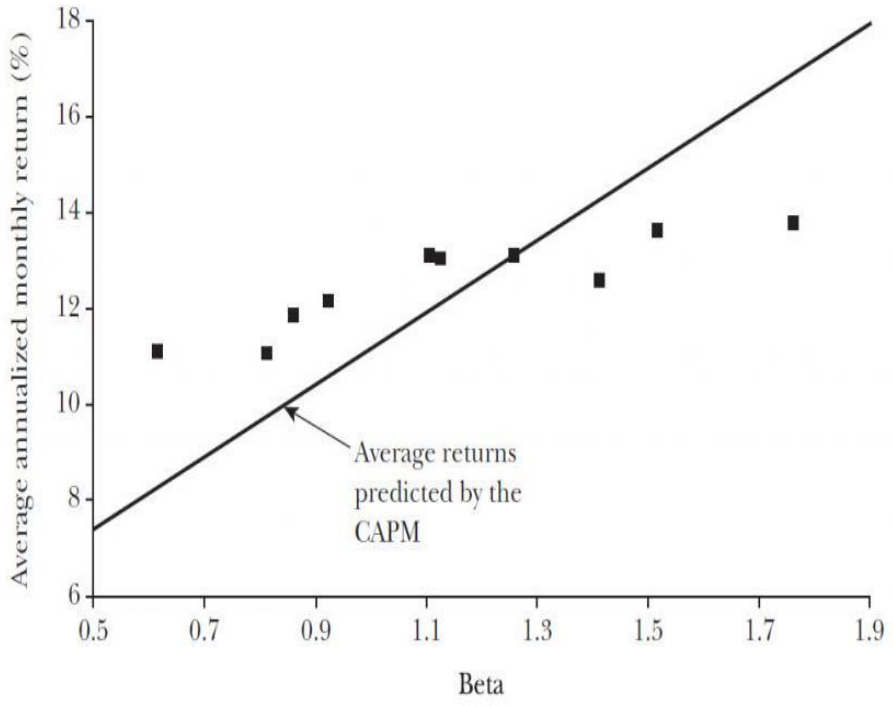
In their work on the CAPM, Fama and French clearly state regarding Figure 2, below, that "[t]he returns on the low beta portfolios are too high, and the returns on the high beta portfolios are too low."[41]

40 Morin at 205-209.

41 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.

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



In addition, Morin observes that while the results of these tests support the notion that beta is related to security returns, the empirical SML described by the CAPM formula is not as steeply sloped as the predicted SML. Morin states:

> With few exceptions, the empirical studies agree that … low-beta securities earn returns somewhat higher than the CAPM would predict, and high-beta securities earn less than predicted.[42]

* * *

[42] Morin, at 207.

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

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

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

$$K = R_F + 0.25(R_M - R_F) + 0.75 \beta(R_M - R_F)$$[43]

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

> The early tests firmly reject the Sharpe-Lintner version of the CAPM. There is a positive relation between beta and average return, but it is too 'flat.'… The regressions consistently find that the intercept is greater than the average risk-free rate… and the coefficient on beta is less than the average excess market return… This is true in the early tests… as well as in more recent cross-section regressions tests, like Fama and French (1992).[44]

Finally, Fama and French further note:

> Confirming earlier evidence, the relation between beta and average return for the ten portfolios is much flatter than the Sharpe-Linter CAPM predicts. The returns on low beta portfolios are too high, and the returns on the high beta portfolios are too low. For example, the predicted return on the portfolio with the lowest beta is 8.3 percent per year; the actual return as 11.1 percent. The predicted return on the portfolio with the highest beta is 16.8 percent per year; the actual is 13.7 percent.[45]

[43] Morin, at 221.
[44] Fama & French, at 32.
[45] Fama & French., at 33.

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

Q. WHAT BETAS DID YOU USE IN YOUR CAPM ANALYSIS?

A. For the beta in my CAPM analysis, I considered two sources: *Value Line* and Bloomberg. While both of those services adjust their calculated (or "raw") betas to reflect the tendency of beta to regress to the market mean of 1.00, *Value Line* calculates beta over a five-year period, while Bloomberg calculates it over a two-year period.

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

A. As discussed previously, I present my CAPM analyses using four risk-free rates reflecting the four years the WSIP will be in effect.

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

A. The basis of the market risk premium is explained in detail in note 1 on page 5 of Schedule DWD-5. As discussed previously, the market risk premium is derived from an average of three historical data-based market risk

premiums, two *Value Line* data-based market risk premiums, and one Bloomberg data-based market risk premium.

The long-term income return on U.S. Government Securities of 5.02% was deducted from the SBBI - 2022 monthly historical total market return of 12.37%, which results in an historical market equity risk premium of 7.35%.[46] I applied a linear OLS regression to the monthly annualized historical returns on the S&P 500 relative to historical yields on long-term U.S. Government Securities from SBBI - 2022. That regression analysis yielded market equity risk premiums of 10.27% (BY), 9.34% (FY1), 9.38% (FY2), and 9.05% (FY3). The PRPM market equity risk premium is 9.35% and is derived using the PRPM relative to the yields on long-term U.S. Treasury securities from January 1926 through April 2022.

The *Value Line* Summary & Index-derived forecasted total market equity risk premiums are derived by subtracting the representative risk-free rates, discussed above, from the *Value Line* Summary & Index projected total annual market return of 13.16%, resulting in forecasted total market equity risk premiums of 10.67% (BY), 9.83% (FY1), 9.86% (FY2), and 9.56% (FY3). The S&P 500 projected market equity risk premium using *Value Line* data is derived by subtracting the representative risk-free rates from the projected total return of the S&P 500 of 16.42%. The resulting

[46] 56-258, 274-276.

market equity risk premiums are 13.93% (BY), 13.09% (FY1), 13.12% (FY2), and 12.82% (FY3).

The S&P 500 projected market equity risk premium using Bloomberg data is derived by subtracting the current and projected risk-free rates from the projected total return of the S&P 500 of 13.93%. The resulting market equity risk premiums are 11.44% (BY), 10.60% (FY1), 10.63% (FY2), and 10.33% (FY3).

These six market equity risk premiums, when averaged, result in an average total market equity risk premiums of 10.50% (BY), 9.93% (FY1), 9.95% (FY2), and 9.74% (FY3).

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

A. As shown on pages 1 through 4 of Schedule DWD-5, the average of the mean and median results of my CAPM/ECAPM analyses are as follows:

Table 8: Indicated CAPM/ECAPM Cost Rates[47]

Test Year	CAPM/ECAPM ROE
Base Year	11.32%
Forecasted Year 1	11.68%
Forecasted Year 2	11.66%
Forecasted Year 3	11.79%

[47] From pages 1 through 5 of Schedule DWD-5.

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. Although I am not an attorney, my interpretation of the *Hope* and *Bluefield* cases is that they 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 excellent proxy if they are comparable in total risk to the Utility Proxy Group being used to estimate the cost of common equity. The selection of such domestic, non-price regulated competitive firms theoretically and empirically results in a proxy group which is comparable in total risk to the Utility Proxy Group, since all of these companies compete for capital in the exact same markets.

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

A. In order to select a proxy group of domestic, non-price regulated companies similar in total risk to the Utility Proxy Group, I relied on the betas and related statistics derived from *Value Line* regression analyses of weekly market prices over the most recent 260 weeks (i.e., five years). Using these selection criteria resulted in a proxy group of 24 domestic, non-price regulated firms comparable in total risk to the Utility Proxy Group. Total risk

is the sum of non-diversifiable market risk and diversifiable company-specific risks. The criteria used in the selection of the domestic, non-price regulated firms was:

(i) They must be covered by *Value Line* (Standard Edition);

(ii) They must be domestic, non-price regulated companies, i.e., not utilities;

(iii) Their betas must lie within plus or minus two standard deviations of the average unadjusted beta of the Utility Proxy Group; and

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

Betas measure market, or systematic risk, which is not diversifiable. The residual standard errors of the regressions were used to measure each firm's company-specific, diversifiable risk. Companies that have similar betas and similar residual standard errors resulting from the same regression analyses have similar total investment risk.

Q. HAVE YOU PREPARED A SCHEDULE WHICH SHOWS THE DATA FROM WHICH YOU SELECTED THE 24 DOMESTIC, NON-PRICE

REGULATED COMPANIES THAT ARE COMPARABLE IN TOTAL RISK TO THE UTILITY PROXY GROUP?

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

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

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

Page 2 of Schedule DWD-7 contains the derivation of the DCF cost rates. As shown, the indicated common equity cost rate using the DCF for the Non-Price Regulated Proxy Group comparable in total risk to the Utility Proxy Group, is 10.68%.

Pages 3 through 5 of DWD-7 contain the data and calculations that support the indicated RPM cost rates shown in Table 9, below:

Table 9: Indicated ROEs Using the RPM for the Non-Price Regulated Proxy Group Similar in Total Risk to the Utility Proxy Group [48]

Test Year	Value

[48] From page 3 of Schedule DWD-7.

Base Year	11.79%
Forecasted Year 1	12.33%
Forecasted Year 2	12.13%
Forecasted Year 3	12.25%

Pages 6 through 9 of Schedule DWD-7 contain the inputs and calculations that support my indicated CAPM/ECAPM cost rates as shown on Table 10, below:

Table 10: Indicated ROEs Using the CAPM for the Non-Price Regulated Proxy Group Similar in Total Risk to the Utility Proxy Group [49]

Test Year	Value
Base Year	11.18%
Forecasted Year 1	11.55%
Forecasted Year 2	11.53%
Forecasted Year 3	11.66%

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

A. 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 shown on page 1 of Schedule DWD-7. The average of the mean and median of these models are 11.20% (BY), 11.54% (FY1), 11.49% (FY2), and 11.60% (FY3).

[49] From page 11 of Schedule DWD-4.

VII. CONCLUSION OF COMMON EQUITY COST RATE BEFORE ADJUSTMENT

Q. BASED ON YOUR ANALYSES WHAT IS THE RANGE OF INDICATED COMMON EQUITY COST RATES FOR THE UTILITY PROXY GROUP BEFORE ADJUSTMENTS?

A. By applying multiple cost of common equity models to the Utility Proxy Group and the Non-Price Regulated Proxy Group, the indicated range of common equity cost rates attributable to the Utility Proxy Group before any relative risk adjustments are as follows:

Table 11: Indicated Ranges of Common Equity Cost Rates Before Adjustment

Test Year	Value
Base Year	9.85% - 10.85%
Forecasted Year 1	10.07% - 11.07%
Forecasted Year 2	10.03% - 11.03%
Forecasted Year 3	10.14% - 11.14%

The indicated ranges of ROEs shown on Table 11 are 50 basis points above and below the midpoint of my four model results for each time period as shown on page 2 of Schedule DWD-1.

I used multiple cost of common equity models as primary tools in arriving at my recommended common equity cost rate because each of these models is theoretically sound and available to investors, and because no single model is so inherently precise that it can be relied on to the exclusion of other theoretically sound models. As discussed previously,

using multiple models adds reliability to the estimated common equity cost rate, with the prudence of using multiple cost of common equity models supported in both the financial literature and regulatory precedent.

VIII. ADJUSTMENTS TO THE COMMON EQUITY COST RATE

A. SIZE ADJUSTMENT

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

A. Yes. As a preliminary matter, because I have developed my cost of common equity recommendation for the Company's operations based on market data applied to the Utility Proxy Group of risk-comparable companies, in order to assess the Company's risk associated with its relative small size of its operations, it is necessary to compare the Company's jurisdictional size relative to the Utility Proxy Group. The Company's smaller size relative to the Utility Proxy Group companies indicates greater relative business risk for the Company because, all else being equal, size has a material bearing on risk.

Size affects business risk because smaller companies generally are less able to cope with significant events that affect sales, revenues and earnings. For example, smaller companies face more risk exposure to business cycles and economic conditions, both nationally and locally. Additionally, the loss of revenues from a few larger customers would have

a greater effect on a small company than on a bigger company with a larger, more diverse, customer base. This is true for utilities, as well as for non-regulated companies.

As further evidence that smaller firms are riskier, investors generally demand greater returns from smaller firms to compensate for less marketability and liquidity of their securities. Kroll's Cost of Capital Navigator: U.S. Cost of Capital Module ("Kroll") discusses the nature of the small-size phenomenon, providing an indication of the magnitude of the size premium based on several measures of size. In discussing "Size as a Predictor of Equity Returns," Kroll states:

> The size effect is based on the empirical observation that companies of smaller size are associated with greater risk and, therefore, have greater cost of capital [sic]. The "size" of a company is one of the most important risk elements to consider when developing cost of equity capital estimates for use in valuing a business simply because size has been shown to be a *predictor* of equity returns. In other words, there is a significant (negative) relationship between size and historical equity returns - as size *decreases*, returns tend to *increase*, and vice versa. (footnote omitted) (emphasis in original)[50]

Furthermore, in "The Capital Asset Pricing Model: Theory and Evidence," Fama and French note size is indeed a risk factor which must be reflected when estimating the cost of common equity. On page 14, they note:

[50] Kroll, Cost of Capital Navigator: U.S. Cost of Capital Module, Size as a Predictor of Equity Returns, at 1.

> . . . the higher average returns on small stocks and high book-to-market stocks reflect unidentified state variables that produce undiversifiable risks (covariances) in returns not captured in the market return and are priced separately from market betas.[51]

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

Also, it is a basic financial principle that the use of funds invested, and not the source of funds, is what gives rise to the risk of any investment.[52] Eugene Brigham, a well-known authority, states:

> A number of researchers have observed that portfolios of small-firms (sic) have earned consistently higher average returns than those of large-firm stocks; this is called the "small-firm effect." On the surface, it would seem to be advantageous to the small firms to provide average returns in a stock market that are higher than those of larger firms. In reality, it is bad news for the small firm; **what the small-firm effect means is that the capital market demands higher returns on stocks of small firms than on otherwise similar stocks of the large firms**. (emphasis added)[53]

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

[51] Fama & French, at 25-43.

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

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

authorization of a cost rate of common equity in this proceeding must appropriately reflect the unique risks of the Company, including its small relative size to the Utility Proxy Group, which is justified and supported above by evidence in the financial literature.

Q. EARLIER YOU EXPLAINED THAT CREDIT RATINGS CAN ACT AS A PROXY FOR A FIRM'S COMBINED BUSINESS AND FINANCIAL RISKS TO EQUITY OWNERS. DO RATINGS AGENCIES ACCOUNT FOR COMPANY SIZE IN THEIR BOND RATINGS?

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

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

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

Table 12: Size as Measured by Market Capitalization for the Company and the Utility Proxy Group[54]

	Market Capitalization* ($ Millions)	Times Greater Than the Company
CWSNC	$330.292	
Utility Proxy Group Median	$2,849.097	8.6x

The Company's estimated market capitalization was at $330.292 million as of May 13, 2022, compared with the median market capitalization of the Utility Proxy Group of $2.8 billion as of May 13, 2022. The Utility Proxy Group's market capitalization is 8.6 times the size of CWSNC's 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 2021 period.[55] The average size premium for the Utility Proxy Group with a market capitalization of $2.8 billion falls in the 6th decile, while CWSNC's market capitalization of $330.292 million places the Company in the 9th decile. The size premium spread between the 6th decile and the 9th decile is 0.92%. Even though a 0.92% upward size adjustment is indicated, I applied a size

[54] From page 1 of Schedule DWD-8.
[55] Source: Kroll, Cost of Capital Navigator.

premium of 0.10% to CWSNC's indicated range of common equity cost rates.

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

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

B. <u>OTHER CONSIDERATIONS</u>

Q. DID YOU CONSIDER THE WSIP IN YOUR DETERMINATION OF THE COMPANY'S ROE?

A. Yes, I did. In reviewing Commission Rule R1-17A, which establishes the WSIP, I did not find that the mechanism lowered the Company's risk.

Q. PLEASE EXPLAIN YOUR FINDINGS.

A. Risk can be defined as volatility in revenues and earnings. The WSIP, as far as I can gather from current documents, has the effect of generating fully forecasted test years and associated revenue requirements, it better

matches future revenues to future expenses, and does not affect the volatility of those revenues or resultant earnings.

Q. DOES THE WSIP PROTECT THE CUSTOMER INTEREST OVER THE COMPANY INTEREST?

A. Yes, it does. Commission Rule R1-17A, subsection g(3) a and b state that if a company earns a return in excess of 100 basis points over its authorized return, the company must refund those earnings to their customers. If the company earns less than 100 basis points under its authorized ROE, it does not have the ability to collect a surcharge from its customers but can file a base rate case. This section of the Commission Rule places a ceiling on company earnings, but no floor, which would create an imbalance.

Q. WHAT ARE YOUR CONCLUSIONS REGARDING WSIP'S EFFECT ON THE COMPANY'S RISK PROFILE?

A. While WSIP allows the Company to better match revenues and expenses, the WSIP does not mitigate the volatility of those revenues or earnings, which is a direct measure of risk. This, in addition to the WSIP introducing an earnings ceiling without a corresponding earnings floor, leads me to the conclusion that the WSIP does not reduce the Company's risk profile.

IX. 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."[56] 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*

[56] 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.").

violating constitutional proscriptions against confiscation of property. This is in accord with the "end result" test of Hope. This the Commission has done.[57]

The North Carolina Supreme Court agreed, and upheld the Commission's Order on Remand.[58] 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."[59] 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",[60] which the Commission made in its Order on Remand.[61] In light of the *Cooper II* decision and the North Carolina Supreme Court precedent that preceded it,[62] 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.

[57] 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").

[58] *State ex rel. Utils. Comm'n v. Cooper*, 366 N.C. 484,739 S.E.2d 541 (2013) ("Cooper I").

[59] State of North Carolina ex rel. Utilities Commission v. Cooper, 758 S.E.2d 635, 642 (2014) ("Cooper II").

[60] Cooper II, 758 S.E.2d at 643.

[61] DNCP Remand Order, at 4-10.

[62] Cooper I, 366 N.C. 484, 739 S.E.2d 541 (2013).

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 with national conditions, such that they were reflected in the analyses used to determine the cost of common equity.[63] As discussed below, those relationships still hold:

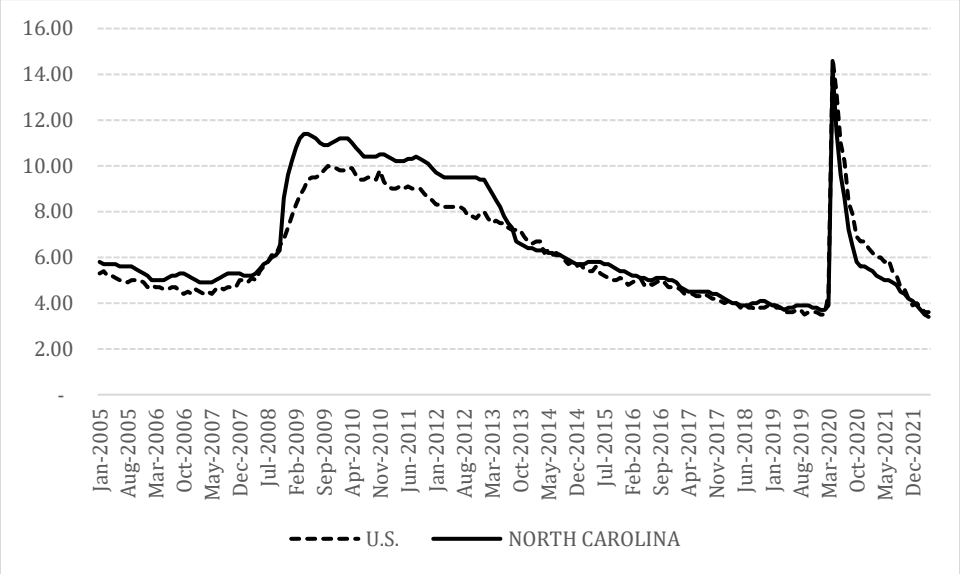
- Although economic conditions in North Carolina declined significantly in the second quarter of 2020 as a result of the COVID-19 pandemic, they have improved considerably since. Notably, economic conditions in North Carolina continue to be strongly correlated to the U.S. economy;
- Unemployment at both the state and county level remains highly correlated with national rates of unemployment;
- Real Gross Domestic Product ("GDP") in North Carolina also remains highly correlated with U.S. real GDP growth; and
- Median household income in North Carolina has grown at a rate consistent with the rest of the U.S. and remains strongly correlated with national levels.

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

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

A. Turning first to the seasonally adjusted unemployment rate, prior to April 2020, the unemployment rate had fallen substantially in North Carolina and the U.S. since the 2008/2009 financial crisis. Although the unemployment rate in North Carolina exceeded the national rate during and after the 2008/2009 financial crisis, by the latter portion of 2013, the two were largely consistent. As the COVID-19 pandemic hit the U.S., unemployment in North Carolina and across the U.S. spiked in April/May 2020 as many communities closed non-essential businesses to contain the spread of the COVID-19 virus. Notably, North Carolina's unemployment rate has fared better than the overall U.S., even as both fell considerably by the beginning of 2021 (*see* Chart 1, below).

Chart 1: Unemployment Rate (Seasonally Adjusted)[64]



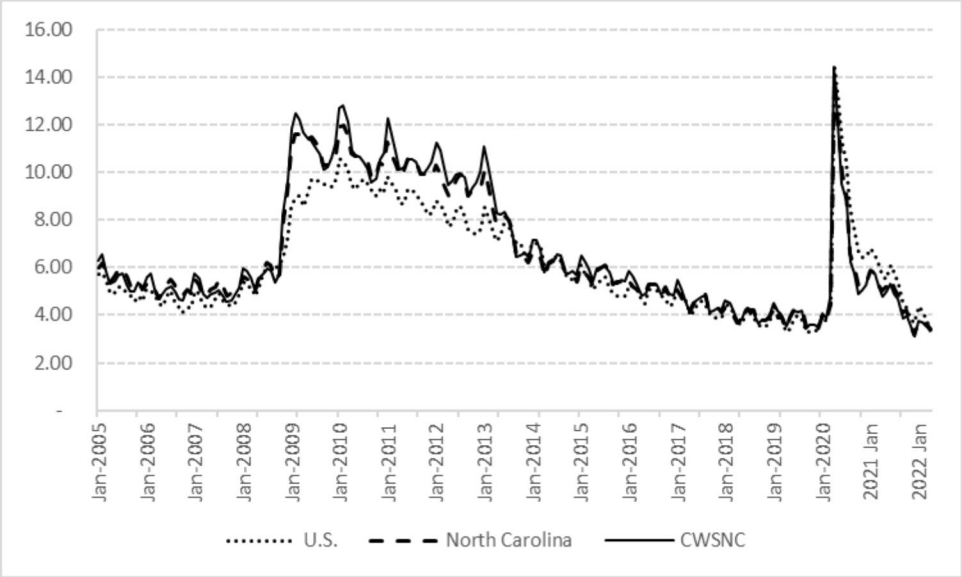
Between 2005 and March 2022, the correlation between North Carolina's unemployment rate and the national rate was 95.96%, indicating the two are highly correlated.

Second, I reviewed (seasonally unadjusted) unemployment rates in the counties served by CWSNC. As with the seasonally adjusted statistics described above, the unemployment rate in those counties spiked in April 2020 at 14.43% (0.53% above the state-wide average), but by February 2022 it had fallen substantially to 3.69%, slightly below the rate statewide in North Carolina (3.70%) and below the overall rate in the U.S. (4.10%). From 2005 through February 2022, the correlations in unemployment rates between the counties served by CWSNC and the U.S., as well as North

[64] Source: Bureau of Labor Statistics.

Carolina, were approximately 95.87% and 99.49%, respectively. In summary, county-level unemployment has fallen considerably since it recently spiked in April 2020, is similar to the U.S. and statewide unemployment rates, and is highly correlated to state and national unemployment rates.

Chart 2: Seasonally Unadjusted Unemployment Rates[65]

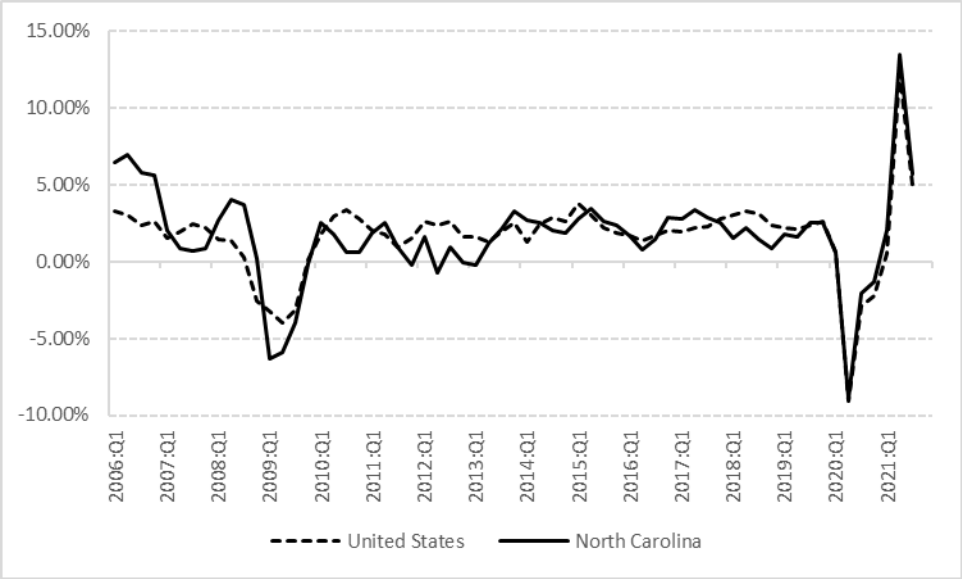


Looking to real GDP growth, there also has been a relatively strong correlation between North Carolina and the national economy (approximately 86.29%). While the national rate of growth at times outpaced North Carolina between 2010 and 2014, since the first quarter of 2015, North Carolina's economic growth has been relatively consistent with

[65] Source: Bureau of Labor Statistics, St. Louis Federal Reserve.

U.S. economic growth. Moreover, North Carolina's real GDP grew faster than the overall U.S. in the first three quarters of 2021.

Chart 3: Real GDP Growth Rate (Year over Year)[66]

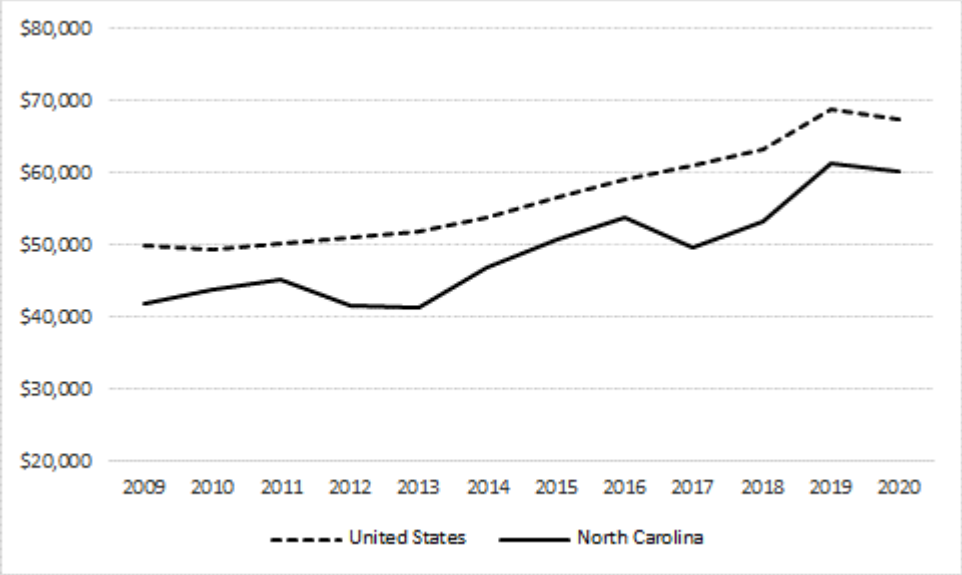


As to median household income, the correlation between North Carolina and the U.S. is relatively strong (95.32% from 2005 through 2020). Since 2009 (that is, the years subsequent to the financial crisis), nominal median household income in North Carolina has grown at a slightly faster pace than the national median income (3.36% vs. 2.81%, respectively; *see* Chart 4, below). To put household income in perspective, the Missouri Economic Research and Information Center reports that in the first quarter

[66] Source: Bureau of Economic Analysis.

of 2021, North Carolina had the 22nd lowest cost of living index among the 50 states, the District of Columbia, and Puerto Rico.[67]

Chart 4: Median Household Income[68]



Similarly, as shown in Chart 5, below, since 2009 total personal income, disposable income, personal consumption, and wages and salaries have generally been on an increasing trend at the national level. Although wages and salaries dipped in the second quarter of 2020, they rebounded in late 2020 and continued through the first quarter of 2022.

[67] Source: meric.mo.gov/data/cost-living-data-series accessed February 26, 2022.
[68] Source: U.S. Census Bureau, Current Population Survey.

Chart 5: United States Income and Consumption[69]

Q. HOW WOULD YOU SUMMARIZE THE ECONOMIC INDICATORS THAT YOU HAVE ANALYZED AND DISCUSSED IN YOUR DIRECT TESTIMONY?

A. Based on the data presented above, I observed the following:

- Unemployment at both the state and county level remains highly correlated with national rates of unemployment. North Carolina's unemployment rate and the rate in the counties served by CWSNC have fallen significantly since spiking in April 2020;
- The state's real GDP remains highly correlated with national GDP;

[69] Source: Bureau of Economic Analysis.

- Similarly, since 2005, median household income has grown in North Carolina and has grown at a rate slightly faster than the national average.
- The overall cost of living in North Carolina also is below the national average; and
- At the national level, income has generally been increasing since the financial crisis.

The U.S. and North Carolina economies both experienced an historically difficult and challenging 2020 as a result of the COVID-19 pandemic; yet the data show that economic conditions have improved significantly since then. Moreover, although economic conditions remain uncertain, North Carolina and the counties contained within CWSNC's service area have fared better than the rest of the U.S. during the COVID-19 pandemic.

Q. IN YOUR OPINION, ARE YOUR RECOMMENDED RANGES OF ROE AND REQUESTED ROES OF 10.45% AND 10.70% FAIR AND REASONABLE TO CWSNC, ITS SHAREHOLDERS, AND ITS CUSTOMERS, AND NOT UNDULY BURDENSOME TO CWSNC'S

CUSTOMERS CONSIDERING THE CHANGING ECONOMIC CONDITIONS IN THE STATE?

A. Yes. Based on the factors I have discussed here, I believe that my recommended ranges of ROE are fair and reasonable to CWSNC, its shareholders, and its customers in light of the uncertainty surrounding current market conditions.

X. CONCLUSION

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

A. My recommended returns on invested capital for the Company are 7.55% and 7.67% for the base year and FYs 1 through 3, respectively, as presented in Tables 13a through 13b, below:

Table 13a: Summary of Overall Rate of Return – Base Year

Type of Capital	Ratios	Cost Rate	Weighted Cost Rate
Long-Term Debt	50.00%	4.64%	2.32%
Common Equity	50.00%	10.45%	5.23%
Total	100.00%		7.55%

Table 13b: Summary of Overall Rate of Return – Projected Years 1 through 3

Type of Capital	Ratios	Cost Rate	Weighted Cost Rate
Long-Term Debt	50.00%	4.64%	2.32%
Common Equity	50.00%	10.70%	5.35%
Total	100.00%		7.67%

Returns on invested capital as recommended above are consistent with the *Hope* and *Bluefield* standard of a just and reasonable return, which ensures the integrity of presently invested capital, and enables the attraction of needed new capital on reasonable terms. It also ensures that CWSNC will be able to continue providing safe, adequate, and reliable service to the benefit of customers. Thus, it balances the interests of both customers and the Company.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes, it does.

Carolina Water Service Inc. of North Carolina
Table of Contents
to Exhibit No. 1
of Dylan W. D'Ascendis, CRRA, CVA

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Carolina Water Service Inc. of North Carolina
Recommended Capital Structure and Cost Rates

Base Year

Type Of Capital	Ratios (1)	Cost Rate		Weighted Cost Rate
Long-Term Debt	50.00%	4.64%	(1)	2.32%
Common Equity	50.00%	9.95% - 10.95%	(2)	4.97% - 5.47%
Total	100.00%			7.29% - 7.79%

Projected Rate Year 1 (2023 Projected Interest Rates)

Type Of Capital	Ratios (1)	Cost Rate		Weighted Cost Rate
Long-Term Debt	50.00%	4.64%	(1)	2.32%
Common Equity	50.00%	10.17% - 11.17%	(2)	5.08% - 5.58%
Total	100.00%			7.40% - 7.90%

Projected Rate Year 2 (2024 Projected Interest Rates)

Type Of Capital	Ratios (1)	Cost Rate		Weighted Cost Rate
Long-Term Debt	50.00%	4.64%	(1)	2.32%
Common Equity	50.00%	10.13% - 11.13%	(2)	5.07% - 5.57%
Total	100.00%			7.39% - 7.89%

Projected Rate Year 3 (2025 Projected Interest Rates)

Type Of Capital	Ratios (1)	Cost Rate		Weighted Cost Rate
Long-Term Debt	50.00%	4.64%	(1)	2.32%
Common Equity	50.00%	10.24% - 11.24%	(2)	5.12% - 5.62%
Total	100.00%			7.44% - 7.94%

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

Line No.	Principal Methods	Base Year (Current Interest Rates)	Projected Year 1 (2023 Projected Int. Rates)	Projected Year 2 (2024 Projected Int. Rates)	Projected Year 3 (2025 Projected Int. Rates)
1.	Discounted Cash Flow Model (DCF) (1)	9.37%	9.37%	9.37%	9.37%
2.	Risk Premium Model (RPM) (2)	11.12%	11.76%	11.69%	11.90%
3.	Capital Asset Pricing Model (CAPM) (3)	11.32%	11.68%	11.66%	11.79%
4.	Market Models Applied to Comparable Risk, Non-Price Regulated Companies (4)	11.20%	11.54%	11.49%	11.49%
5.	Indicated Common Equity Cost Rate before Adjustment for Unique Risk	9.85% - 10.85%	10.07% - 11.07%	10.03% - 11.03%	10.14% - 11.14%
6.	Business Risk Adjustment (5)		0.10%		
8.	Indicated Common Equity Cost Rate after Adjustment	9.95% - 10.95%	10.17% - 11.17%	10.13% - 11.13%	10.24% - 11.24%

Notes:
(1) From page 1 of Schedule DWD-3.
(2) From page 1 of Schedule DWD-4.
(3) From pages 1-4 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, as shown on Schedule DWD-8.
(6) From page 1 of Schedule DWD-9.

Exhibit No. 1
Schedule DWD-1
Page 2 of 2

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Proxy Group of Seven Water Companies
CAPITALIZATION AND FINANCIAL STATISTICS (1)
2017 - 2021, Inclusive

	2021	2020	2019	2018	2017	
			(MILLIONS OF DOLLARS)			
Capitalization Statistics						
Amount of Capital Employed						
Total Permanent Capital	$5,096.955	$4,622.646	$3,885.041	$3,208.636	$2,837.657	
Short-Term Debt	$133.499	$291.642	$189.148	$184.221	$185.250	
Total Capital Employed	$5,230.454	$4,914.288	$4,074.189	$3,392.857	$3,022.907	
Indicated Average Capital Cost Rates (2)						
Total Debt	3.55 %	3.84 %	4.18 %	4.75 %	4.83 %	
Preferred Stock	5.76 %	5.76 %	5.84 %	5.92 %	5.91 %	
Capital Structure Ratios						5 YEAR AVERAGE
Based on Total Permanent Capital:						
Long-Term Debt	50.00 %	50.26 %	47.11 %	45.15 %	45.58 %	47.62 %
Preferred Stock	0.05	0.05	0.06	0.09	0.10	0.07
Common Equity	49.95	49.69	52.83	54.76	54.32	52.31
Total	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
Based on Total Capital:						
Total Debt, Including Short-Term Debt	51.86 %	53.47 %	50.52 %	48.37 %	48.93 %	50.63 %
Preferred Stock	0.05	0.05	0.06	0.08	0.09	0.07
Common Equity	48.10	46.48	49.43	51.54	50.98	49.30
Total	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
Financial Statistics						
Financial Ratios - Market Based						
Earnings / Price Ratio	3.14 %	3.20 %	2.67 %	3.33 %	3.65 %	3.20 %
Market / Average Book Ratio	361.91	328.25	340.26	308.46	310.75	329.93
Dividend Yield	1.66	1.81	1.77	2.00	1.99	1.85
Dividend Payout Ratio	53.26	56.81	72.34	60.08	55.80	59.66
Rate of Return on Average Book Common Equity	11.26 %	10.49 %	9.48 %	10.12 %	11.31 %	10.53 %
Total Debt / EBITDA (3)	4.95 x	5.33 x	5.57 x	4.22 x	3.42 x	4.70 x
Funds from Operations / Total Debt (4)	11.66 %	12.11 %	14.55 %	21.37 %	22.87 %	16.51 %
Total Debt / Total Capital	51.86 %	53.47 %	50.52 %	48.37 %	48.93 %	50.63 %

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

W-354, Sub 400

Capital Structure Based upon Total Permanent Capital for the
Proxy Group of Seven Water Companies
2017 - 2021, Inclusive

	2021	2020	2019	2018	2017	5 YEAR AVERAGE
American States Water Company						
Long-Term Debt	37.56 %	40.72 %	31.87 %	36.54 %	37.75 %	36.89 %
Preferred Stock	0.00	0.00	0.00	0.00	0.00	0.00
Common Equity	62.44	59.28	68.13	63.46	62.25	63.11
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
American Water Works Company, Inc.						
Long-Term Debt	58.75 %	59.93 %	58.59 %	56.55 %	55.81 %	57.93 %
Preferred Stock	0.02	0.02	0.03	0.05	0.07	0.04
Common Equity	41.23	40.05	41.38	43.40	44.12	42.03
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
California Water Service Group						
Long-Term Debt	47.28 %	46.04 %	50.90 %	52.74 %	43.40 %	48.07 %
Preferred Stock	0.00	0.00	0.00	0.00	0.00	0.00
Common Equity	52.72	53.96	49.10	47.26	56.60	51.93
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
Essential Utilities Inc.						
Long-Term Debt	53.28 %	54.42 %	44.23 %	56.06 %	52.26 %	52.05 %
Preferred Stock	0.00	0.00	0.00	0.00	0.00	0.00
Common Equity	46.72	45.58	55.77	43.94	47.74	47.95
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
Middlesex Water Company						
Long-Term Debt	45.84 %	44.61 %	42.20 %	38.94 %	38.65 %	42.05 %
Preferred Stock	0.31	0.33	0.37	0.59	0.64	0.45
Common Equity	53.85	55.06	57.43	60.47	60.71	57.50
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
SJW Group						
Long-Term Debt	59.69 %	59.79 %	59.05 %	32.67 %	48.20 %	51.88 %
Preferred Stock	0.00	0.00	0.00	0.00	0.00	0.00
Common Equity	40.31	40.21	40.95	67.33	51.80	48.12
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
The York Water Company						
Long-Term Debt	47.64 %	46.31 %	42.95 %	42.52 %	43.02 %	44.49 %
Preferred Stock	0.00	0.00	0.00	0.00	0.00	0.00
Common Equity	52.36	53.69	57.05	57.48	56.98	55.51
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
Proxy Group of Seven Water Companies						
Long-Term Debt	50.01 %	50.26 %	47.11 %	45.15 %	45.59 %	47.62 %
Preferred Stock	0.05	0.05	0.06	0.09	0.10	0.07
Common Equity	49.94	49.69	52.83	54.76	54.31	52.31
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %

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 Seven Water Companies

Proxy Group of Seven Water Companies	[1] Average Dividend Yield (1)	[2] Value Line Projected Five Year Growth in EPS (2)	[3] Zack's Five Year Projected Growth Rate in EPS	[4] Yahoo! Finance Projected Five Year Growth in EPS	[5] Average Projected Five Year Growth in EPS (3)	[6] Adjusted Dividend Yield (4)	[7] Indicated Common Equity Cost Rate (5)
American States Water Company	1.73 %	5.50 %	NA %	4.40 %	4.95 %	1.77 %	6.72 %
American Water Works Company, Inc.	1.67	7.50	8.10	8.30	7.97	1.74	9.71
California Water Service Group	1.77	6.50	NA	11.70	9.10	1.85	10.95
Essential Utilities Inc.	2.25	10.00	6.10	6.80	7.63	2.34	9.97
Middlesex Water Company	1.19	4.50	NA	2.70	3.60	1.21	4.81
SJW Group	2.22	14.00	NA	9.80	11.90	2.35	14.25
The York Water Company	1.83	5.00	NA	4.90	4.95	1.88	6.83
						Average	9.03 %
						Median	9.71 %
						Average of Mean and Median	9.37 %

NA= Not Available

Notes:

(1) Indicated dividend at 05/13/2022 divided by the average closing price of the last 60 trading days ending 05/13/2022 for each company.
(2) From pages 2 through 8 of this Schedule.
(3) Average of columns 2 through 4 excluding negative growth rates.
(4) This reflects a growth rate component equal to one-half the conclusion of growth rate (from column 5) x column 1 to reflect the periodic payment of dividends (Gordon Model) as opposed to the continuous payment. Thus, for American States Water Company, 1.73% x (1+(1/2 x 4.95%)) = 1.77%.
(5) Column 5 + column 6.

Source of Information:
Value Line Investment Survey
www.zacks.com Downloaded on 05/13/2022
www.yahoo.com Downloaded on 05/13/2022

AMERICAN WATER NYSE-AWK

RECENT PRICE 161.42 | P/E RATIO 22.6 (Trailing: 38.0 Median: 24.0) | RELATIVE P/E RATIO 1.26 | DIV'D YLD 1.6% | VALUE LINE

TIMELINESS 3 Lowered 6/25/21
SAFETY 3 New 7/25/08
TECHNICAL 4 Lowered 4/8/22
BETA .85 (1.00 = Market)

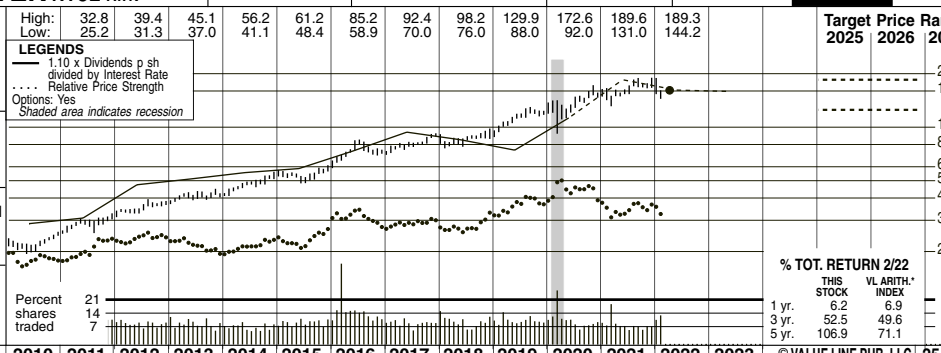
18-Month Target Price Range
Low-High: $139-$227 | Midpoint (% to Mid): $183 (15%)

2025-27 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	185	(+15%)	5%
Low	125	(-25%)	-4%

Institutional Decisions

	2Q2021	3Q2021	4Q2021
to Buy	444	465	526
to Sell	377	362	369
Hld's(000)	150291	155734	156569



2006E	2007E	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	© VALUE LINE PUB. LLC	25-27
13.08	13.84	14.61	13.98	15.49	15.18	16.25	16.28	16.78	17.72	18.54	18.81	19.04	19.97	20.83	21.58	*22.00*	*23.00*	Revenues per sh	*27.10*
.65	d.47	2.87	2.89	3.56	3.73	4.27	4.36	4.75	5.13	5.26	5.14	6.15	6.65	7.24	*10.45*	*8.15*	*8.70*	"Cash Flow" per sh	*10.10*
d.97	d2.14	1.10	1.25	1.53	1.72	2.11	2.06	2.39	2.64	2.62	2.38	3.15	3.43	3.91	6.95	*4.50*	*4.85*	Earnings per sh A	*5.75*
- -	- -	.40	.82	.86	.90	1.21	.84	1.21	1.33	1.47	1.62	1.78	1.96	2.15	2.36	*2.58*	*2.80*	Div'd Decl'd per sh B■	*3.55*
4.31	4.74	6.31	4.50	4.38	5.27	5.25	5.50	5.33	6.51	7.36	8.04	8.78	9.15	10.05	*9.70*	*9.90*	*9.85*	Cap'l Spending per sh	*11.50*
23.86	28.39	25.64	22.91	23.59	24.11	25.11	26.52	27.39	28.25	29.24	30.13	32.42	33.83	35.58	40.19	*42.05*	*44.40*	Book Value per sh D	*57.80*
160.00	160.00	160.00	174.63	175.00	175.66	176.99	178.25	179.46	178.28	178.10	178.44	180.68	180.81	181.30	181.61	*182.00*	*182.50*	Common Shs Outst'g C	*190.00*
- -	- -	18.9	15.6	14.6	16.8	16.7	19.9	20.0	20.5	27.7	33.8	27.3	32.9	35.3	23.6	*Bold figures are Value Line estimates*		Avg Ann'l P/E Ratio	*27.0*
- -	- -	1.14	1.04	.93	1.05	1.06	1.12	1.05	1.03	1.45	1.70	1.47	1.75	1.81	1.32			Relative P/E Ratio	*1.50*
- -	- -	1.9%	4.2%	3.8%	3.1%	3.4%	2.0%	2.5%	2.5%	2.0%	2.0%	2.1%	1.7%	1.6%	1.4%			Avg Ann'l Div'd Yield	*2.3%*
2876.9	2901.9	3011.3	3159.0	3302.0	3357.0	3440.0	3610.0	3777.0	3920.0	*4000*	*4200*	Revenues ($mill)	*5150*
374.3	369.3	429.8	476.0	468.0	426.0	567.0	621.0	709.0	1263.0	*820*	*885*	Net Profit ($mill)	*1095*
40.7%	39.1%	39.4%	39.1%	39.2%	53.3%	28.2%	25.5%	23.3%	23.0%	*22.5%*	*23.0%*	Income Tax Rate	*24.0%*
6.2%	5.1%	- -	- -	- -	- -	- -	- -	5.1%	*2.9%*	*5.0%*	*5.0%*	AFUDC % to Net Profit	*5.0%*
53.9%	52.4%	52.4%	53.7%	52.4%	54.7%	56.3%	58.5%	59.1%	58.6%	*59.5%*	*60.0%*	Long-Term Debt Ratio	*60.0%*
46.1%	47.6%	47.4%	46.2%	47.5%	45.3%	43.6%	41.4%	40.9%	41.4%	*40.5%*	*40.0%*	Common Equity Ratio	*40.0%*
9635.5	9940.7	10364	10911	10967	11875	13433	14760	15787	17642	*19000*	*20200*	Total Capital ($mill)	*22000*
11739	12391	12900	13933	14992	16246	17409	18232	19710	21084	*21950*	*23000*	Net Plant ($mill)	*26000*
5.4%	5.1%	5.5%	5.7%	5.6%	4.9%	5.4%	5.4%	5.7%	8.3%	*5.5%*	*5.0%*	Return on Total Cap'l	*6.0%*
8.4%	7.8%	8.7%	9.4%	9.0%	7.9%	9.7%	10.1%	11.0%	17.3%	*10.5%*	*11.0%*	Return on Shr. Equity	*10.5%*
8.4%	7.8%	8.7%	9.4%	9.0%	7.9%	9.7%	10.1%	11.0%	17.3%	*10.5%*	*11.0%*	Return on Com Equity	*10.5%*
3.6%	4.7%	4.3%	4.7%	4.0%	2.5%	4.2%	4.4%	5.0%	*11.5%*	*4.5%*	*4.5%*	Retained to Com Eq	*4.0%*
57%	40%	50%	50%	56%	68%	56%	57%	55%	34%	*57%*	*58%*	All Div'ds to Net Prof	*62%*

CAPITAL STRUCTURE as of 12/31/21
Total Debt $10982 mil. **Due in 5 Yrs** $2867 mil.
LT Debt $10341 mil. **LT Interest** $384 mil. (59% of Cap'l)

Leases, Uncapitalized: Annual rentals $13.0 mill.
Pension Assets 12/21 $2294.0 mill
Oblig. $1991.0 mill.
Pfd Stock $3.0 mill. **Pfd Div'd** $.2 mill

Common Stock 181,724,991 shares as of 2/10/22

MARKET CAP: $29.3 billion (Large Cap)

CURRENT POSITION ($MILL.)	2019	2020	12/31/21
Cash Assets	91	576	136
Accts Receivable	294	321	271
Other	900	1009	1147
Current Assets	1285	1906	1554
Accts Payable	203	189	235
Debt Due	814	1611	641
Other	1028	1081	1265
Current Liab.	2045	2881	2141

BUSINESS: American Water Works Company, Inc. is the largest investor-owned water and wastewater utility in the U.S., providing services to approximately 14 million people in 24 states. Nonregulated business assists municipalities and military bases with the maintenance and upkeep as well. Regulated operations made up 86% of 2021 revenues. Pennsylvania is its largest market accounting for 21.5% of regulated revenues; New Jersey, 20.3%; Missouri, 13.9%. Has 6,400 employees. The Vanguard Grp, owns 11.7% of outstanding shares; BlackRock, Inc., 8.1%; officers & directors, less than 1.0% (4/21 Proxy). President & CEO: Susan N. Story. Chairman: George MacKenzie. Address: 1 Water Street, Camden, NJ 08102. Tel.: 856-346-8200. Internet: www.amwater.com.

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '18-'20 to '25-'27
Revenues	3.0%	3.5%	*4.5%*
"Cash Flow"	8.0%	7.0%	*6.0%*
Earnings	10.5%	8.0%	*7.5%*
Dividends	11.0%	11.5%	*9.0%*
Book Value	3.5%	4.5%	*8.0%*

Calendar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2019	813	882	1013	902	3610
2020	844	931	1079	923	3777
2021	888	999	1082	951	3920
2022	*895*	*1010*	*1110*	*985*	*4000*
2023	*925*	*1060*	*1190*	*1025*	*4200*

Calendar	EARNINGS PER SHARE A Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2019	.62	.94	1.33	.54	3.43
2020	.68	.97	1.46	.80	3.91
2021	.73	1.14	1.53	3.55	6.95
2022	*.77*	*1.18*	*1.65*	*.90*	*4.50*
2023	*.85*	*1.25*	*1.80*	*.95*	*4.85*

Calendar	QUARTERLY DIVIDENDS PAID B■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2018	.415	.455	.455	.455	1.78
2019	.455	.50	.50	.50	1.96
2020	.50	.55	.55	.55	2.15
2021	.55	.6025	.6025	.6025	2.36
2022	.6025				

American Water Works finished up another successful year. In the fourth quarter, the company posted adjusted share earnings of $0.85, a solid 6% increase over 2020's strong results. For the full year, the water utility posted an impressive 9% rise in the bottom line, on an operational basis. It should be noted that a one-time $2.70-a-share gain was registered for the profit made on the sale of its Homeowners Insurance Service Group in a transaction valued at $1.275 billion. Since we have been using GAAP in our presentation, the total for 2021 is shown as $6.95.

Short- and long-term earnings prospects remain bright. In 2022, adjusted share net will likely increase only 6% to $4.50. (Total net income could prove higher as American Water sold a New York-based subsidiary for $608 million in January.) In 2023, the utility's earnings per share could well climb 7%, which is in line with management's guidance of 7%-10% growth annually over the next five-year period.

The company's strategy of growth through acquisition ought to remain the mainstay behind its success. American Water has been buying up small water districts for years. With its economies of scale, it is able to squeeze significantly more profits out of the same assets. This trend could even accelerate, as smaller utilities could be hit hard by the current inflationary environment.

There is a new caveat added to the mixture here. In general, utilities have done well over the past decade because inflation has remained very tame. This makes it more palatable for state regulators to pass along costs to customers. However, with the large jump in prices, it may be more difficult to do so. What's more, there is the possibility of regulatory lag, or a delay in when American Water makes outlays and when it is reimbursed. On the plus side, water utilities have enjoyed constructive relationships with their regulators in the past.

These shares do not have much to offer at this time. Even though the price of the stock has declined about 850 basis points more than the S&P 500 Index since our January report, total return potential to 2025-2027 is not attractive.

James A. Flood *April 8, 2022*

(A) Diluted earnings. Excludes nonrecur. losses: '08, $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. Includes $2.70 sh. gain from sale of HOS sub.in Q4,'21. Next earnings report due early May.
(B) Dividends paid in March, June, September, and December. ■ Div. reinvestment available.
(C) In millions. (D) Includes intangibles. On 12/31/21: $1.231 billion, $6.67/share.
(E) Pro forma numbers for '06 & '07.

Company's Financial Strength	B++
Stock's Price Stability	85
Price Growth Persistence	75
Earnings Predictability	95

AMER. STATES WATER NYSE-AWR

RECENT PRICE 87.33 | P/E RATIO 33.6 (Trailing: 34.2 Median: 27.0) | RELATIVE P/E RATIO 1.88 | DIV'D YLD 1.8% | VALUE LINE

TIMELINESS 3 Raised 3/5/21
SAFETY 2 Raised 7/20/12
TECHNICAL 3 Lowered 3/25/22
BETA .65 (1.00 = Market)

18-Month Target Price Range

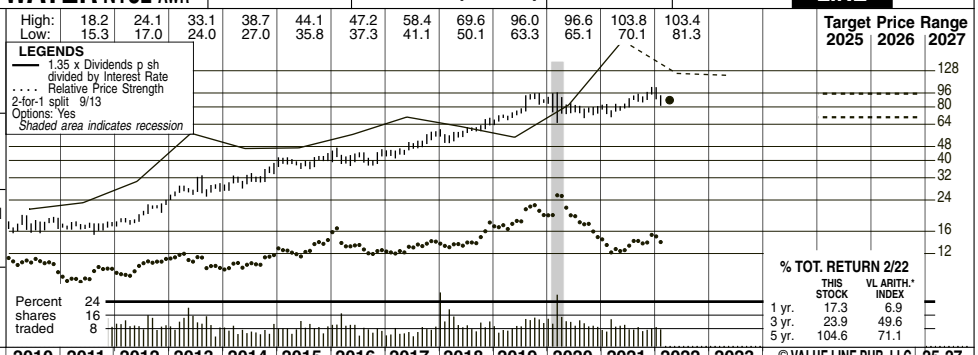
Low-High	Midpoint (% to Mid)
$77-$132	$105 (20%)

2025-27 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	95	(+10%)	4%
Low	70	(-20%)	-3%

Institutional Decisions

	2Q2021	3Q2021	4Q2021
to Buy	126	146	157
to Sell	117	101	117
Hld's(000)	25636	26958	27394



% TOT. RETURN 2/22

	THIS STOCK	VL ARITH.* INDEX
1 yr.	17.3	6.9
3 yr.	23.9	49.6
5 yr.	104.6	71.1

2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	© VALUE LINE PUB. LLC	25-27
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	13.51	*13.95*	*14.25*	Revenues per sh	*18.15*
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	3.64	*3.75*	*4.15*	"Cash Flow" per sh	*4.75*
.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	2.55	*2.60*	*2.75*	Earnings per sh A	*3.25*
.46	.48	.50	.51	.52	.55	.64	.76	.83	.87	.91	.99	1.06	1.16	1.28	1.40	*1.52*	*1.65*	Div'd Decl'd per sh B■	*2.15*
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	3.91	*4.00*	*4.00*	Cap'l Spending per sh	*4.25*
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	18.57	*19.45*	*20.65*	Book Value per sh D	*23.75*
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	36.94	*37.25*	*37.50*	Common Shs Outst'g C	*37.50*
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	33.2	*Bold figures are Value Line estimates*		Avg Ann'l P/E Ratio	*25.0*
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	1.76	1.82			Relative P/E Ratio	*1.40*
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%	1.7%			Avg Ann'l Div'd Yield	*2.6%*
						466.9	472.1	465.8	458.6	436.1	440.6	436.8	473.9	488.2	498.9	*520*	*535*	Revenues ($mill)	*680*
						54.1	62.7	61.1	60.5	59.7	69.4	63.9	84.3	86.4	94.3	*95.0*	*105*	Net Profit ($mill)	*120*
						39.9%	36.3%	38.4%	38.4%	36.8%	36.0%	22.0%	22.6%	24.6%	24.4%	*24.0%*	*24.0%*	Income Tax Rate	*24.0%*
						2.5%	--	--	--	--	--	--	--	2.5%	--	*1.0%*	*1.5%*	AFUDC % to Net Profit	*1.5%*
						42.2%	39.8%	39.1%	41.1%	39.4%	38.0%	40.5%	44.4%	47.2%	46.1%	*48.5%*	*48.5%*	Long-Term Debt Ratio	*52.0%*
						57.8%	60.2%	60.9%	58.9%	60.6%	62.0%	59.5%	55.6%	52.8%	53.9%	*51.5%*	*51.5%*	Common Equity Ratio	*48.0%*
						787.0	818.4	832.6	791.5	815.3	854.9	938.4	1082.5	1216.2	1272.6	*1410*	*1500*	Total Capital ($mill)	*1710*
						917.8	981.5	1003.5	1060.8	1150.9	1205.0	1296.3	1415.7	1512.0	1626.0	*1720*	*1800*	Net Plant ($mill)	*2025*
						8.3%	8.9%	8.6%	9.0%	8.6%	9.3%	7.9%	8.9%	8.0%	8.3%	*8.0%*	*8.0%*	Return on Total Cap'l	*8.0%*
						11.9%	12.7%	12.0%	13.0%	12.1%	13.1%	11.4%	14.0%	13.5%	13.8%	*13.0%*	*13.5%*	Return on Shr. Equity	*13.5%*
						11.9%	12.7%	12.0%	13.0%	12.1%	13.1%	11.4%	14.0%	13.5%	13.8%	*13.0%*	*13.5%*	Return on Com Equity	*13.5%*
						6.6%	6.8%	5.7%	6.0%	5.3%	6.2%	4.5%	6.9%	6.1%	6.2%	*5.5%*	*5.5%*	Retained to Com Eq	*4.5%*
						45%	47%	53%	54%	56%	52%	61%	51%	55%	55%	*58%*	*60%*	All Div'ds to Net Prof	*66%*

CAPITAL STRUCTURE as of 12/31/21
Total Debt $443.6 mill. **Due in 5 Yrs** $33.5 mill.
LT Debt $412.2 mill. **LT Interest** $22.8 mill. (38% of Cap'l)

Leases, Uncapitalized: Annual rentals $2.6 mill.
Pension Assets-12/21 $233.5 mill. **Oblig.** $259.8 mill.
Pfd Stock None

Common Stock 36,945,434 shs. **as of 2/18/22**

MARKET CAP: $3.2 billion (Mid Cap)

CURRENT POSITION ($MILL.)	2019	2020	12/31/21
Cash Assets	1.3	36.7	5.0
Accts Receivable	20.9	29.2	34.4
Other	100.3	91.2	98.7
Current Assets	122.5	157.1	138.1
Accts Payable	55.6	63.8	65.9
Debt Due	5.3	.4	31.4
Other	55.1	54.4	58.3
Current Liab.	116.0	118.6	155.6

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '19-'21 to '25-'27
Revenues	2.5%	1.5%	*5.5%*
"Cash Flow"	5.5%	4.5%	*5.5%*
Earnings	9.0%	8.5%	*5.5%*
Dividends	9.5%	8.0%	*9.0%*
Book Value	5.5%	6.0%	*5.5%*

Calendar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2019	101.7	124.7	134.5	113.0	473.9
2020	109.1	121.3	133.6	124.2	488.2
2021	117.1	128.4	136.8	116.6	498.9
2022	*120*	*130*	*140*	*130*	*520*
2023	*120*	*135*	*145*	*135*	*535*

Calendar	EARNINGS PER SHARE A Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2019	.35	.72	.76	.45	2.28
2020	.38	.69	.72	.54	2.33
2021	.52	.72	.76	.55	2.55
2022	*.52*	*.75*	*.78*	*.55*	*2.60*
2023	*.55*	*.79*	*.82*	*.59*	*2.75*

Calendar	QUARTERLY DIVIDENDS PAID B■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2018	.255	.255	.275	.275	1.06
2019	.275	.275	.305	.305	1.16
2020	.305	.305	.335	.335	1.28
2021	.335	.335	.365	.365	1.40
2022	.365				

BUSINESS: American States Water Co. operates as a holding company. Through its principal subsidiary, Golden State Water Co., it supplies water to 262,770 customers in 10 California counties. Service areas include the metropolitan areas of Los Angeles and Orange Counties. The company also provides electricity to 24,656 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 808. BlackRock, Inc. owns 16.4% of out. shares; Vanguard, 12.0%; off. & dir., 1.0% (4/21 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.

American States Water is still awaiting a decision on a major rate case. As we mentioned in our January report, the company's Golden States Water subsidiary agreed to a deal with the state's Public Advocate Office. The California Public Utility Commission (CPUC) must still approve the settlement, but a few issues remain unresolved. As part of the deal, the utility has agreed to invest over $400 million over the next three-year period on upgrading its existing pipelines and other assets.

Dividend growth prospects are bright. The company has an excellent track record of hiking the annual payout, as the distributions have increased by 8.0% and 9.0% annually, over the past five- and 10-year periods. We think that this pace can be sustained to 2025-2027.

The company's private water business offers the chance to boost profitability. Through its ASUS subsidiary, it provides water services to domestic military bases. The government has determined that privatizing this service will be cheaper than doing it in house. ASUS has already won a number of 50-year contracts and should continue to do so as the program is rolled out. In this segment, returns on equity are not capped by regulatory authorities.

Inflation could present a problem for the utility industry. Soaring prices are increasing the cost of doing business. And while interim rate relief can be granted, utilities file petitions for rate increases every three years in California. The pending one is for the years 2022 to 2024 and may have underestimated the pace of rising expenses. In any case, much of the company's future will be determined by how it is treated by the CPUC.

Shares of American States Water have underperformed of late. Since our January report, the value of the stock has declined 13%. This provides evidence that the stock might be more volatile than investors believe, despite a low Beta coefficient (.65), 2 Safety rank, and a high score for Earnings Predictability. We attribute the move downward to the spike in long-term interest. Indeed, the yield on the 10-year Treasury bond has risen almost 95 basis points from 1.51% at year-end 2021, to about 2.45% recently.

James A. Flood *April 8, 2022*

(A) Primary earnings. Excludes nonrecurring gains/(losses):; '06, 3¢; '08, (14¢); '10, (23¢); '11, 10¢. Next earnings report due early 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 12/31/21; $1.1 million/$0.03 a share.

Company's Financial Strength	A
Stock's Price Stability	100
Price Growth Persistence	90
Earnings Predictability	95

CALIFORNIA WATER NYSE-CWT

RECENT PRICE **58.80** | P/E RATIO **31.4** (Trailing: 30.0, Median: 27.0) | RELATIVE P/E RATIO **1.75** | DIV'D YLD **1.7%** | **VALUE LINE**

TIMELINESS 3 Lowered 10/29/21
SAFETY 3 Lowered 7/27/07
TECHNICAL 3 Lowered 3/25/22
BETA .65 (1.00 = Market)

18-Month Target Price Range

Low-High	Midpoint (% to Mid)
$50-$91	$71 (20%)

2025-27 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	75	(+30%)	*8%*
Low	50	(-15%)	*-2%*

Institutional Decisions

	2Q2021	3Q2021	4Q2021
to Buy	113	133	155
to Sell	99	93	109
Hld's(000)	39103	41511	42143

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	© VALUE LINE PUB. LLC	25-27
High:	19.4	19.3	23.4	26.4	26.0	36.8	46.2	49.1	57.5	57.4	72.1	72.0								
Low:	16.7	16.8	18.4	20.3	19.5	22.5	32.4	35.3	44.6	39.7	51.0	52.8								
	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	14.72	*15.40*	*15.80*	Revenues per sh	*16.40*
	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	3.91	*3.55*	*3.80*	"Cash Flow" per sh	*4.05*
	.67	.75	.95	.98	.91	.86	1.02	1.02	1.19	.94	1.01	1.40	1.36	1.31	1.97	1.96	*2.05*	*2.30*	Earnings per sh [A]	*2.55*
	.58	.58	.59	.59	.60	.62	.63	.64	.65	.67	.69	.72	.75	.79	.85	.92	*1.00*	*1.08*	Div'd Decl'd per sh [B] ■	*1.25*
	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	5.46	*5.85*	*6.00*	Cap'l Spending per sh	*6.45*
	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	21.92	*22.45*	*22.90*	Book Value per sh [C]	*23.60*
	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	53.72	*53.50*	*53.50*	Common Shs Outst'g [D]	*54.00*
	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	30.5	*Bold figures are Value Line estimates*		Avg Ann'l P/E Ratio	*24.0*
	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	1.28	1.67			Relative P/E Ratio	*1.30*
	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%	1.5%			Avg Ann'l Div'd Yield	*2.0%*
							560.0	584.1	597.5	588.4	609.4	666.9	698.2	714.6	794.3	790.9	*825*	*845*	Revenues ($mill) [E]	*885*
							42.6	47.3	56.7	45.0	48.7	67.2	65.6	63.1	96.8	101.1	*110*	*125*	Net Profit ($mill)	*138*
							37.5%	30.3%	33.0%	36.0%	35.5%	30.1%	24.5%	19.1%	11.1%	20.1%	*21.0%*	*21.0%*	Income Tax Rate	*21.0%*
							8.0%	4.3%	2.7%	4.3%	6.1%	3.5%	3.1%	5.8%	3.3%	1.7%	*4.0%*	*5.0%*	AFUDC % to Net Profit	*5.0%*
							47.8%	41.6%	40.1%	44.4%	44.6%	42.7%	49.3%	50.2%	45.9%	47.3%	*44.0%*	*42.5%*	Long-Term Debt Ratio	*39.5%*
							52.2%	58.4%	59.9%	55.6%	55.4%	57.3%	50.7%	49.8%	54.1%	52.7%	*56.0%*	*57.5%*	Common Equity Ratio	*60.5%*
							908.2	1024.9	1045.9	1154.4	1191.2	1209.3	1440.2	1566.7	1702.4	2233.4	*2150*	*2125*	Total Capital ($mill)	*2100*
							1457.1	1515.8	1590.4	1701.8	1859.3	2048.0	2232.7	2406.4	2650.6	2846.9	*2900*	*2925*	Net Plant ($mill)	*2975*
							6.3%	6.0%	6.3%	5.2%	5.5%	7.1%	5.9%	5.5%	7.0%	5.5%	*5.5%*	*6.5%*	Return on Total Cap'l	*7.0%*
							9.0%	7.9%	9.1%	7.0%	7.4%	9.7%	9.0%	8.1%	10.5%	8.6%	*9.0%*	*10.0%*	Return on Shr. Equity	*11.0%*
							9.0%	7.9%	9.1%	7.0%	7.4%	9.7%	9.0%	8.1%	10.5%	8.6%	*9.0%*	*10.0%*	Return on Com Equity	*11.0%*
							3.4%	3.4%	4.1%	2.0%	2.4%	4.7%	4.0%	3.2%	6.0%	4.6%	*4.5%*	*5.5%*	Retained to Com Eq	*5.5%*
							62%	56%	55%	71%	68%	51%	55%	60%	43%	47%	*49%*	*47%*	All Div'ds to Net Prof	*49%*

% TOT. RETURN 2/22

	THIS STOCK	VL ARITH.* INDEX
1 yr.	6.7	6.9
3 yr.	16.0	49.6
5 yr.	70.4	71.1

CAPITAL STRUCTURE as of 12/31/21
Total Debt $1096.0 mill. **Due in 5 Yrs** $357.0 mill.
LT Debt $1055.8 mill. **LT Interest** $40.0 mill.
(Total interest coverage: 6.4x) (47% of Cap'l)

Pension Assets-12/21 $810.5 mill.
Oblig. $887.5 mill.

Pfd Stock None

Common Stock 53,716,000 shs.

MARKET CAP: $3.2 billion (Mid Cap)

CURRENT POSITION ($MILL.)	2019	2020	12/31/21
Cash Assets	42.7	44.6	78.4
Other	142.0	221.4	222.1
Current Assets	184.7	266.0	300.5
Accts Payable	108.5	131.7	144.4
Debt Due	197.0	375.1	40.2
Other	53.2	81.9	72.0
Current Liab.	358.7	588.7	256.6

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '19-'21 to '25-'27
Revenues	3.0%	4.0%	*1.5%*
"Cash Flow"	6.5%	9.0%	*2.0%*
Earnings	6.5%	11.0%	*6.5%*
Dividends	3.5%	5.0%	*6.5%*
Book Value	6.0%	7.0%	*4.0%*

Calendar	QUARTERLY REVENUES ($ mill.) [E] Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2019	126.1	179.0	232.6	176.9	714.6
2020	125.6	175.5	304.1	189.1	794.3
2021	147.7	213.1	256.7	173.4	790.9
2022	*155*	*215*	*260*	*195*	*825*
2023	*160*	*220*	*265*	*200*	*845*

Calendar	EARNINGS PER SHARE [A] Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2019	d.16	.35	.88	.24	1.31
2020	d.42	.11	1.94	.31	1.97
2021	d.06	.75	1.20	.07	1.96
2022	*.10*	*.55*	*1.15*	*.25*	*2.05*
2023	*.15*	*.60*	*1.20*	*.35*	*2.30*

Calendar	QUARTERLY DIVIDENDS PAID [B] ■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2018	.1875	.1875	.1875	.1875	.75
2019	.1975	.1975	.1975	.1975	.79
2020	.2125	.2125	.2125	.2125	.85
2021	.230	.230	.230	.230	.92
2022	.250				

BUSINESS: California Water Service Group provides regulated and nonregulated water service to 494,500 customers in 100 communities in the state of California. Accounts for about 94% of total customers. Also operates in Washington, New Mexico, and Hawaii. Main service areas: San Francisco Bay area, Sacramento Valley, Salinas Valley, San Joaquin Valley & parts of Los Angeles. Acquired Rio Grande Corp; West Hawaii Utilities (9/08). Revenue breakdown, '21: residential, 69%; business, 19%; industrial, 3%; public authorities, 5%; other 4%. Off. and dir. own 1% of common stock (4/21 proxy). Has 1,184 employees. Pres. and CEO: Martin A. Kropelnicki. Inc.: DE. Addr.: 1720 North First St., San Jose, CA 95112-4598. Tel.: 408-367-8200. Internet: www.calwatergroup.com.

California Water Service stock has not performed well year to date. Subsequent to etching a fresh all-time high of about $72 per share in early January, the equity has slipped nearly 20% in value. A mix of broader market turbulence and relatively lackluster fourth-quarter financial results were likely behind the selloff. In regard to the latter, December-period revenues and earnings of $173 million and $0.07 per share both contracted on an annual and sequential basis, respectively. The underperformance can be largely attributed to a decrease in regulatory cost mechanisms, higher deferred revenues, and an uptick in general and administrative expenses.

Modest top- and bottom-line expansion is likely on tap this year. Water consumption ought to slowly improve as the West Coast economy continues to reopen from pandemic-related shutdowns. Moreover, the potential for improved weather conditions and some relief on the transportation cost front is also encouraging. On balance, we are trimming $10 million from our 2022 revenue call, to $825 million, and are lowering our share-profit forecast by $0.30, to $2.05.

The company's wholly-owned subsidiary, New Mexico Water, recently inked a deal to acquire the assets of Monterey Water Company. Subject to the state's closing conditions, California Water's customer roster will get a marginal boost in the New Mexico area. Going forward, we think small-scale bolt-on asset purchases are likely, especially given the company's decent cash position ($78 million at the end of 2021).

Shares of California Water are ranked to mirror the broader market averages over the coming six to 12 months (Timeliness: 3). Investors with a short-term horizon should approach with caution here in an effort to avoid trying to call a bottom. Longer term, the water utility's business prospects are solid, in our view, and ought to be supported by sustainable, yet periodic, rate hikes. That said, buy-and-hold subscribers would do well to remain on the sidelines, as total return potential three to five years hence is nothing to write home about, even after the recent price slide.

Nicholas P. Patrikis *April 8, 2022*

(A) Basic EPS. Excl. nonrecurring gain (loss): '11, 4¢. Next earnings report due early May.
(B) Dividends historically paid in late Feb., May, Aug., and Nov. ■ Div'd reinvestment plan available.
(C) Incl. intangible assets. In '21 : $36.8 mill., $0.69/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	75
Earnings Predictability	55

MIDDLESEX WATER NDQ-MSEX

RECENT PRICE 102.71 | P/E RATIO 48.7 (Trailing: 49.6 Median: 24.0) | RELATIVE P/E RATIO 2.72 | DIV'D YLD 1.1% | VALUE LINE

TIMELINESS 3 Lowered 6/4/21
SAFETY 2 New 10/21/11
TECHNICAL 3 Raised 4/8/22
BETA .70 (1.00 = Market)

18-Month Target Price Range

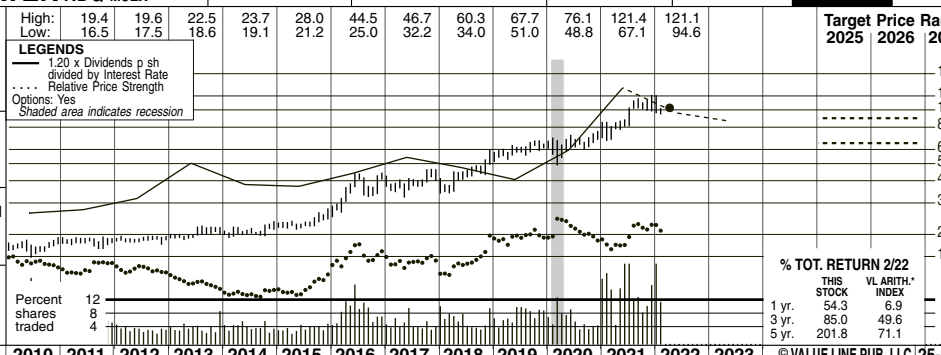
Low-High	Midpoint (% to Mid)
$63-$117	$90 (-10%)

2025-27 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	90	(-10%)	-2%
Low	65	(-35%)	-9%

Institutional Decisions

	2Q2021	3Q2021	4Q2021
to Buy	71	101	93
to Sell	65	66	84
Hld's(000)	10852	12996	12685



Target Price Range 2025 | 2026 | 2027

% TOT. RETURN 2/22

	THIS STOCK	VL ARITH.* INDEX
1 yr.	54.3	6.9
3 yr.	85.0	49.6
5 yr.	201.8	71.1

2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	© VALUE LINE PUB. LLC	25-27
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	8.17	*8.45*	*8.70*	Revenues per sh	*9.15*
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	3.28	*3.20*	*3.45*	"Cash Flow" per sh	*3.85*
.82	.87	.89	.72	.96	.84	.90	1.03	1.13	1.22	1.38	1.38	1.96	2.01	2.18	2.07	*2.25*	*2.45*	Earnings per sh [A]	*2.75*
.68	.69	.70	.71	.72	.73	.74	.75	.76	.78	.81	.86	.91	.98	1.04	1.11	*1.18*	*1.25*	Div'd Decl'd per sh [B]■	*1.40*
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	4.53	*5.00*	*5.25*	Cap'l Spending per sh	*6.00*
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	20.99	*21.15*	*21.55*	Book Value per sh	*22.20*
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	17.52	*17.75*	*17.85*	Common Shs Outst'g [C]	*18.00*
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	44.3	*Bold figures are Value Line estimates*		Avg Ann'l P/E Ratio	*28.0*
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	1.55	2.43			Relative P/E Ratio	*1.30*
3.7%	3.7%	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%	1.2%			Avg Ann'l Div'd Yield	*1.8%*
110.4	114.8	117.1	126.0	132.9	130.8	138.1	134.6	141.6	143.1	*150*	*155*	Revenues ($mill)	*165*
14.4	16.6	18.4	20.0	22.7	22.8	32.5	33.9	38.4	36.5	*42.0*	*44.0*	Net Profit ($mill)	*49.5*
33.9%	34.1%	35.0%	34.5%	34.0%	32.7%	2.8%	- -	2.8%	2.8%	*21.0%*	*21.0%*	Income Tax Rate	*21.0%*
3.4%	1.9%	1.7%	1.9%	2.7%	3.1%	1.4%	3.4%	3.9%	3.9%	*2.5%*	*2.5%*	AFUDC % to Net Profit	*2.5%*
41.5%	40.4%	40.5%	39.4%	37.9%	37.5%	37.8%	41.5%	44.0%	45.3%	*40.5%*	*39.0%*	Long-Term Debt Ratio	*38.5%*
57.4%	58.7%	58.8%	59.8%	61.5%	61.8%	61.6%	58.2%	55.7%	54.4%	*59.5%*	*60.5%*	Common Equity Ratio	*61.5%*
316.5	321.4	335.8	345.4	355.4	370.7	404.1	556.7	621.5	676.3	*630*	*640*	Total Capital ($mill)	*655*
435.2	446.5	465.4	481.9	517.8	557.2	618.5	705.7	796.6	865.4	*875*	*885*	Net Plant ($mill)	*915*
5.4%	5.9%	6.3%	6.6%	7.1%	6.9%	8.9%	6.7%	6.8%	6.0%	*6.5%*	*7.5%*	Return on Total Cap'l	*8.0%*
7.8%	8.7%	9.2%	9.6%	10.3%	9.8%	12.9%	10.4%	11.0%	9.9%	*10.5%*	*11.5%*	Return on Shr. Equity	*12.5%*
7.8%	8.7%	9.3%	9.6%	10.3%	9.9%	13.0%	10.4%	11.1%	9.9%	*10.5%*	*11.5%*	Return on Com Equity	*12.5%*
1.4%	2.4%	3.1%	3.5%	4.3%	3.8%	7.0%	5.4%	5.8%	4.6%	*5.0%*	*5.5%*	Retained to Com Eq	*6.0%*
83%	73%	67%	63%	58%	62%	46%	48%	48%	53%	*52%*	*51%*	All Div'ds to Net Prof	*51%*

CAPITAL STRUCTURE as of 12/31/21
Total Debt $313.2 mill. **Due in 5 Yrs** $43.7 mill.
LT Debt $306.5 mill. **LT Interest** $7.5 mill.
(Total interest coverage: 6.0x)
(45% of Cap'l)

Pension Assets-12/21 $100.8 mill.
Oblig. $113.7 mill.
Pfd Stock $2.4 mill. **Pfd Div'd:** $.1 mill.

Common Stock 17,520,000 shs.

MARKET CAP: $1.8 billion (Mid Cap)

CURRENT POSITION ($MILL.)	2019	2020	12/31/21
Cash Assets	2.2	4.5	3.5
Other	26.9	29.6	30.9
Current Assets	29.1	34.1	34.4
Accts Payable	23.3	30.4	21.1
Debt Due	27.2	9.3	6.7
Other	14.5	17.1	28.8
Current Liab.	65.0	56.8	56.6

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '19-'21 to '25-'27
Revenues	2.0%	.5%	*2.5%*
"Cash Flow"	8.0%	9.5%	*3.5%*
Earnings	9.5%	11.0%	*4.5%*
Dividends	3.5%	6.0%	*5.0%*
Book Value	6.0%	9.0%	*2.0%*

Calendar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2019	30.7	33.4	37.8	32.7	134.6
2020	31.8	35.3	39.9	34.6	141.6
2021	32.5	36.7	39.9	34.0	143.1
2022	*34.0*	*38.0*	*41.0*	*37.0*	*150*
2023	*36.0*	*39.0*	*42.0*	*38.0*	*155*

Calendar	EARNINGS PER SHARE [A] Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2019	.39	.49	.66	.46	2.01
2020	.44	.55	.72	.47	2.18
2021	.39	.62	.65	.41	2.07
2022	*.39*	*.56*	*.75*	*.55*	*2.25*
2023	*.50*	*.60*	*.77*	*.58*	*2.45*

Calendar	QUARTERLY DIVIDENDS PAID [B]■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2018	.22375	.22375	.22375	.24	.91
2019	.24	.24	.24	.2562	.98
2020	.2562	.2562	.2562	.2725	1.04
2021	.2725	.2725	.2725	.29	1.11
2022	.29				

BUSINESS: Middlesex Water Company engages in the ownership and operation of regulated water utility systems in New Jersey, Delaware, and Pennsylvania. It also operates water and wastewater systems under contract on behalf of municipal and private clients in NJ and DE. Its Middlesex System provides water services to 61,000 retail customers, primarily in Middlesex County, New Jersey. In 2021, the Middlesex System accounted for 59% of operating revenues. At 12/31/21, the company had 347 employees. Incorporated: NJ. President, CEO, and Chairman: Dennis W. Doll. Officers & directors own 2.0% of the com. stock; BlackRock Inst. Trust Co., 7.8% (4/21 proxy). Add.: 485 C Route 1 South, Suite 400, Iselin, NJ 08830. Tel.: 732-634-1500. Int.: www.middlesexwater.com.

Middlesex Water reported lackluster share earnings in the December period. The New Jersey-based regulated water utility delivered fourth-quarter earnings of $0.41 per share, down 13% from the previous-year figure. Despite decent water consumption and customer base growth in its Delaware water system, headwinds, such as higher labor and transportation fuel costs, along with an uptick in operation and maintenance expense, were a drag on the bottom line.

But a recently effected rate hike (January) should provide some relief amidst a relatively challenging operating backdrop. While burdensome fuel inputs are not likely to abate in the near term, higher revenues from the abovementioned rate increase ought to largely offset rising expenses. A notable recovery in economic activity levels post-pandemic augurs well, too. All things considered, based on our model, 2022 revenues and earnings are poised to expand 5% and 9% this year, to $150 million and $2.25 per share, respectively.

The company ought to continue to execute on its capital investment strategy. On top of completing an ozone treatment facility late last year, several projects are on tap, including upgrades at its Wellfield treatment facility, water infrastructure improvements in Woodbridge Township, and a recently announced lead service line replacement program to extricate any lead-related materials from New Jersey service lines. On balance, we think periodic rate hikes are in the cards over the pull to mid-decade, as the majority of these project costs can be passed along to the consumer pending approval from state regulators.

Middlesex stock has taken a breather since the start of the year. In our view, a combination of broader market turbulence and profit taking (MSEX shares etched an all-time high of $120 in late December) likely weighed on share-price performance over the past three months. Even so, we are not recommending the stock at present. The equity, which is merely an Average (Timeliness: 3) selection for the year ahead, is currently trading beyond the upper end of our 3- to 5-year Target Price Range.

Nicholas P. Patrikis *April 8, 2022*

(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.

Company's Financial Strength	B++
Stock's Price Stability	85
Price Growth Persistence	80
Earnings Predictability	90

SJW GROUP NYSE-SJW

RECENT PRICE **67.83** | P/E RATIO **27.7** (Trailing: 33.6 / Median: 23.0) | RELATIVE P/E RATIO **1.55** | DIV'D YLD **2.1%** | **VALUE LINE**

TIMELINESS 3 Raised 3/4/22
SAFETY 3 New 4/22/11
TECHNICAL 3 Raised 4/8/22
BETA .80 (1.00 = Market)

18-Month Target Price Range

Low-High	Midpoint (% to Mid)
$59-$100	$80 (15%)

2025-27 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	100	(+45%)	*12%*
Low	65	(-5%)	*1%*

Institutional Decisions

	2Q2021	3Q2021	4Q2021
to Buy	81	81	98
to Sell	64	53	68
Hld's(000)	21472	22567	21890

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	© VALUE LINE PUB. LLC	25-27
High:	26.8	26.9	30.1	33.7	35.7	56.9	69.3	68.4	74.5	75.0	73.7	73.4								
Low:	20.9	22.6	24.5	25.5	27.5	28.6	45.4	51.3	53.9	45.6	58.0	61.3								
	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	19.01	*20.15*	*20.85*	Revenues per sh	*22.15*
	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	3.13	5.28	5.13	*4.15*	*4.40*	"Cash Flow" per sh	*5.30*
	1.19	1.04	1.08	.81	.84	1.11	1.18	1.12	2.54	1.85	2.57	2.86	1.82	.82	2.14	2.03	*2.50*	*2.75*	Earnings per sh [A]	*3.65*
	.57	.61	.65	.66	.68	.69	.71	.73	.75	.78	.81	1.04	1.12	1.20	1.28	1.36	*1.44*	*1.52*	Div'd Decl'd per sh [B]■	*1.76*
	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	8.32	*7.50*	*8.00*	Cap'l Spending per sh	*7.75*
	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	34.28	*36.65*	*39.15*	Book Value per sh	*40.85*
	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	30.18	*30.00*	*30.00*	Common Shs Outst'g [C]	*30.00*
	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	NMF	30.0	32.9	*Bold figures are Value Line estimates*		Avg Ann'l P/E Ratio	*23.0*
	1.27	1.77	1.58	1.91	1.85	1.33	1.30	1.37	.59	.84	.82	.95	1.77	NMF	1.54	1.80			Relative P/E Ratio	*1.30*
	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%	2.0%	2.0%			Avg Ann'l Div'd Yield	*2.1%*
	261.5	276.9	319.7	305.1	339.7	389.2	397.7	420.5	564.5	573.7	*605*	*625*	Revenues ($mill)	*665*
	22.3	23.5	51.8	37.9	52.8	59.2	38.8	23.4	61.5	60.5	*75.0*	*83.0*	Net Profit ($mill)	*110*
	41.1%	38.7%	32.5%	38.1%	38.8%	36.7%	20.6%	26.4%	12.0%	12.2%	*21.5%*	*21.0%*	Income Tax Rate	*21.0%*
	--	--	--	--	--	--	--	--	2.0%	1.5%	*1.5%*	*1.5%*	AFUDC % to Net Profit	*1.5%*
	55.0%	51.1%	51.6%	49.8%	50.7%	48.2%	32.7%	59.1%	58.4%	59.1%	*57.5%*	*54.0%*	Long-Term Debt Ratio	*45.0%*
	45.0%	48.9%	48.4%	50.2%	49.3%	51.8%	67.3%	40.9%	41.6%	40.9%	*42.5%*	*46.0%*	Common Equity Ratio	*55.0%*
	610.2	656.2	744.5	764.6	855.0	894.3	1320.7	2173.6	2204.7	2527.5	*2575*	*2550*	Total Capital ($mill)	*2225*
	831.6	898.7	963.0	1036.8	1146.4	1239.3	1328.8	2206.5	2334.9	2497.5	*2565*	*2650*	Net Plant ($mill)	*2825*
	5.0%	5.0%	8.3%	6.3%	7.4%	7.9%	3.9%	1.8%	4.0%	3.5%	*3.5%*	*3.5%*	Return on Total Cap'l	*5.5%*
	8.1%	7.3%	14.4%	9.9%	12.5%	12.8%	4.4%	2.6%	6.7%	5.8%	*7.0%*	*7.0%*	Return on Shr. Equity	*9.0%*
	8.1%	7.3%	14.4%	9.9%	12.5%	12.8%	4.4%	2.6%	6.7%	5.8%	*7.0%*	*7.0%*	Return on Com Equity	*9.0%*
	3.3%	2.8%	10.2%	5.7%	8.6%	8.2%	1.8%	NMF	2.7%	2.0%	*3.0%*	*3.0%*	Retained to Com Eq	*4.5%*
	59%	62%	29%	42%	31%	36%	60%	NMF	59%	66%	*58%*	*55%*	All Div'ds to Net Prof	*48%*

CAPITAL STRUCTURE as of 12/31/21
Total Debt $1532.0 mill. **Due in 5 Yrs** $39.1 mill.
LT Debt $1492.9 mill. **LT Interest** $50.0 mill.
(LT Interest Coverage: 4.2x)
(59% of Cap'l)

Pension Assets-12/21 $310.2 mill.
Oblig. $383.8 mill.
Pfd Stock None.
Common Stock 30,181,000 shs.

MARKET CAP: $2.0 billion (Mid Cap)

CURRENT POSITION ($MILL.)	2019	2020	12/31/21
Cash Assets	17.9	9.3	10.9
Accts Receivable	36.3	58.1	53.7
Other	67.8	59.9	69.5
Current Assets	122.0	127.3	134.1
Accts Payable	34.9	34.2	30.4
Debt Due	22.3	76.2	39.1
Other	177.4	240.4	133.8
Current Liab.	234.6	350.8	203.3

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '19-'21 to '25-'27
Revenues	4.0%	2.5%	*3.5%*
"Cash Flow"	6.0%	.5%	*2.5%*
Earnings	6.0%	-6.5%	*14.0%*
Dividends	6.5%	10.5%	*5.5%*
Book Value	9.0%	11.5%	*4.0%*

Calendar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2019	77.7	103.0	114.0	126.0	420.5
2020	115.8	147.2	165.9	135.6	564.5
2021	114.8	152.2	166.9	139.8	573.7
2022	*125*	*155*	*175*	*150*	*605*
2023	*130*	*160*	*180*	*155*	*625*

Calendar	EARNINGS PER SHARE [A] Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2019	.21	.47	.33	d.19	.82
2020	.08	.69	.91	.46	2.14
2021	.09	.69	.64	.60	2.03
2022	*.18*	*.77*	*.90*	*.65*	*2.50*
2023	*.23*	*.82*	*.95*	*.75*	*2.75*

Calendar	QUARTERLY DIVIDENDS PAID [B]■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2018	.28	.28	.28	.28	1.12
2019	.30	.30	.30	.30	1.20
2020	.32	.32	.32	.32	1.28
2021	.34	.34	.34	.34	1.36
2022	.36				

% TOT. RETURN 2/22

	THIS STOCK	VL ARITH.* INDEX
1 yr.	6.8	6.9
3 yr.	13.2	49.6
5 yr.	47.9	71.1

Target Price Range 2025 | 2026 | 2027

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 751 employees. Officers and directors own about 8.0% of outstanding shares (3/22 proxy). Chairman & CEO: Eric Thornburg. Incorporated: California. Address: 110 West Taylor Street, San Jose, CA 95110. Telephone: (408) 279-7800. Internet: www.sjwater.com.

SJW Group ended 2021 on a decent note. Fourth-quarter revenues clocked in at nearly $140 million, registering a modest year-over-year improvement. Water rate increases helped offset a reduction in consumer consumption during the period. Meanwhile, December-period share profits of $0.60 came in above consensus estimates. Slimmer operating expenses and a one-time gain on the sale of a nonutility property were largely behind the outperformance.

We expect SJW to return to growth mode this year. Our fairly upbeat revenue forecast stems from a projected uptick in consumer water consumption, particularly in California, as economic conditions still have room to recover from pandemic-related shutdowns. Elsewhere, profitability ought to benefit from further operating efficiencies.

The company and its subsidiaries have been active on the regulatory front. First, San Jose Water Company has an application pending with the California Public Utilities Commission for higher rates for the 2022-2024 window. On the East Coast, Connecticut Water Company recently received approval to recoup nearly $2.0 million in excess deferred income taxes via increased rates. In addition, Connecticut regulators gave the nod for a 2.5% rate increase (went in to effect on January 1, 2022) which is linked to infrastructure-related projects. Lastly, Maine Water Company is now allowed to gradually lift rates, as state regulators recently approved a rate-hike request associated with a $60 million treatment facility project.

Amidst recent broader market turbulence, SJW's stock price has held up well relative to industry peers. The equity is roughly flat compared to where it was trading three months ago, versus an approximate 10% decline among other regulated water utilities. That said, investment appeal is limited at recent levels. Shares of SJW are ranked to move in line with the year-ahead broader market averages (Timeliness: 3). Moreover, total return potential three to five years hence is lackluster. All told, investors would be wise to wait for a more attractive entry point before starting a position here, in our view.

Nicholas P. Patrikis *April 8, 2022*

(A) Diluted earnings. Excludes nonrecurring losses: '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.

Company's Financial Strength	B+
Stock's Price Stability	85
Price Growth Persistence	65
Earnings Predictability	45

ESSENTIAL UTIL. NYSE-WTRG

RECENT PRICE **50.04** | P/E RATIO **28.0** (Trailing: 30.0 / Median: 25.0) | RELATIVE P/E RATIO **1.56** | DIV'D YLD **2.2%** | **VALUE LINE**

TIMELINESS **4** Lowered 3/18/22
SAFETY **3** Lowered 1/8/21
TECHNICAL **4** Lowered 4/8/22
BETA .95 (1.00 = Market)

18-Month Target Price Range

Low-High	Midpoint (% to Mid)
$42-$72	$57 (15%)

2025-27 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	70	(+40%)	*11%*
Low	45	(-10%)	*Nil*

Institutional Decisions

	2Q2021	3Q2021	4Q2021
to Buy	244	245	313
to Sell	231	223	208
Hld's(000)	171680	174820	178560

High:	19.0	21.5	28.1	28.2	31.1	35.8	39.6	39.4	47.3	54.5	53.9	53.7
Low:	15.4	16.8	20.6	22.4	24.4	28.0	29.4	32.1	32.7	30.4	41.1	44.7

LEGENDS
1.60 x Dividends p sh divided by Interest Rate
. . . . Relative Price Strength
5-for-4 split 9/13
Options: Yes
Shaded area indicates recession

Target Price Range 2025 | 2026 | 2027
128 96 80 64 48 40 32 24 16 12

Percent shares traded 15 10 5

% TOT. RETURN 2/22

	THIS STOCK	VL ARITH.* INDEX
1 yr.	14.6	6.9
3 yr.	39.4	49.6
5 yr.	65.7	71.1

2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	© VALUE LINE PUB. LLC	25-27
3.23	3.61	3.71	3.93	4.21	4.10	4.32	4.32	4.37	4.61	4.62	4.56	4.71	4.03	5.96	7.43	*7.85*	*8.25*	Revenues per sh	*8.95*
1.01	1.10	1.14	1.29	1.42	1.45	1.51	1.82	1.89	1.87	2.07	2.12	1.90	1.73	2.21	2.89	*3.00*	*3.20*	"Cash Flow" per sh	*4.00*
.56	.57	.58	.62	.72	.83	.87	1.16	1.20	1.14	1.32	1.35	1.08	1.04	1.12	1.67	*1.80*	*1.95*	Earnings per sh	*2.25*
.35	.38	.41	.44	.47	.50	.54	.58	.63	.69	.74	.79	.85	.91	.97	1.04	*1.14*	*1.25*	Div'd Decl'd per sh	*1.55*
1.64	1.43	1.58	1.66	1.89	1.90	1.98	1.73	1.84	2.07	2.16	2.69	2.78	2.49	3.41	4.04	*3.90*	*3.85*	Cap'l Spending per sh	*3.80*
5.57	5.85	6.26	6.50	6.81	7.21	7.90	8.63	9.27	9.78	10.43	11.02	11.28	17.58	19.09	20.50	*21.45*	*22.30*	Book Value per sh	*26.90*
165.41	166.75	169.21	170.61	172.46	173.60	175.43	177.93	178.59	176.54	177.39	177.71	178.09	220.76	245.39	252.87	*255.00*	*260.00*	Common Shs Outst'g	*280.00*
34.7	32.0	24.9	23.1	21.1	21.3	21.9	21.2	20.8	23.5	23.9	24.7	32.6	39.1	39.6	28.3	*Bold figures are Value Line estimates*		Avg Ann'l P/E Ratio	*26.0*
1.87	1.70	1.50	1.54	1.34	1.34	1.39	1.19	1.09	1.18	1.25	1.24	1.76	2.08	2.03	1.55			Relative P/E Ratio	*1.45*
1.8%	2.1%	2.8%	3.1%	3.1%	2.8%	2.8%	2.4%	2.5%	2.6%	2.3%	2.4%	2.4%	2.2%	2.2%	2.2%			Avg Ann'l Div'd Yield	*2.7%*
						757.8	768.6	779.9	814.2	819.9	809.5	838.1	889.7	1462.7	1878.1	*2000*	*2150*	Revenues ($mill)	*2500*
						153.1	205.0	213.9	201.8	234.2	239.7	192.0	224.5	284.8	431.6	*460*	*505*	Net Profit ($mill)	*630*
						39.0%	10.0%	10.5%	6.9%	8.2%	6.6%	- -	- -	- -	- -	*5.0%*	*10.0%*	Income Tax Rate	*15.0%*
						- -	1.1%	2.4%	3.1%	3.8%	6.3%	6.8%	7.2%	4.5%	4.8%	*5.0%*	*5.0%*	AFUDC % to Net Profit	*6.0%*
						52.7%	48.9%	48.5%	50.3%	48.4%	50.6%	54.4%	43.1%	54.0%	52.7%	*54.0%*	*54.5%*	Long-Term Debt Ratio	*53.0%*
						47.3%	51.1%	51.5%	49.7%	51.6%	49.4%	45.6%	56.9%	46.0%	47.3%	*46.0%*	*45.5%*	Common Equity Ratio	*47.0%*
						2929.7	3003.6	3216.0	3469.5	3587.7	3965.4	4407.8	6824.2	10192	10964	*11975*	*12800*	Total Capital ($mill)	*16000*
						3936.2	4167.3	4402.0	4688.9	5001.6	5399.9	5930.3	6345.8	9512.9	10252	*10900*	*11600*	Net Plant ($mill)	*13500*
						6.6%	8.0%	7.8%	6.9%	7.6%	7.1%	5.5%	4.2%	3.7%	4.8%	*5.5%*	*5.5%*	Return on Total Cap'l	*5.5%*
						11.0%	13.4%	12.9%	11.7%	12.7%	12.2%	9.6%	5.8%	6.1%	8.3%	*8.5%*	*8.5%*	Return on Shr. Equity	*8.5%*
						11.0%	13.4%	12.9%	11.7%	12.7%	12.2%	9.6%	5.8%	6.1%	8.3%	*8.5%*	*8.5%*	Return on Com Equity	*8.5%*
						4.3%	6.7%	6.1%	4.7%	5.6%	5.1%	2.1%	.9%	1.1%	3.3%	*3.0%*	*3.0%*	Retained to Com Eq	*2.5%*
						61%	50%	52%	60%	56%	59%	79%	84%	82%	60%	*63%*	*64%*	All Div'ds to Net Prof	*69%*

CAPITAL STRUCTURE as of 12/31/21
Total Debt $5976.9 mill. **Due in 5 Yrs** $882.1 mill.
LT Debt $5779.5 mill. **LT Interest** $200.0 mill. (53% of Cap'l)

Pension Assets-12/21 $433.1 mill.
Oblig. $452.9 mill.

Pfd Stock None
Common Stock 252,875,079 shares **as of 2/15/22**

MARKET CAP: $12.7 billion (Large Cap)

CURRENT POSITION ($MILL.)	2019	2020	12/31/21
Cash Assets	1868.9	4.8	10.6
Receivables	67.1	154.8	141.0
Inventory (AvgCst)	18.4	58.4	109.6
Other	58.3	162.2	176.6
Current Assets	2012.7	380.2	437.8
Accts Payable	74.9	177.5	192.9
Debt Due	130.8	162.6	197.1
Other	113.1	263.8	285.1
Current Liab.	318.8	603.9	675.1

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '19-'21 to '25-'27
Revenues	3.5%	5.0%	*7.5%*
"Cash Flow"	5.0%	3.0%	*10.0%*
Earnings	6.0%	1.0%	*10.0%*
Dividends	7.5%	7.0%	*8.0%*
Book Value	11.0%	14.0%	*6.0%*

Calendar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2019	201.1	218.9	243.6	226.1	889.7
2020	255.6	384.5	348.6	474.0	1462.7
2021	583.5	397.0	361.9	535.7	1878.1
2022	*610*	*420*	*420*	*550*	*2000*
2023	*630*	*445*	*500*	*575*	*2150*

Calendar	EARNINGS PER SHARE A Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2019	.09	.25	.38	.28	1.04
2020	.21	.29	.22	.40	1.12
2021	.72	.32	.19	.44	1.67
2022	*.73*	*.33*	*.29*	*.45*	*1.80*
2023	*.78*	*.37*	*.33*	*.47*	*1.95*

Calendar	QUARTERLY DIVIDENDS PAID B ■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2018	.2047	.2047	.219	.219	.85
2019	.219	.219	.2343	.2343	.91
2020	.2343	.2343	.2507	.2507	.97
2021	.2507	.2507	.2682	.2682	1.04
2022	.2682				

BUSINESS: Essential Utilities, Inc. became the new name for Aqua America on Feb. 3, 2020, to reflect the acquisition of Peoples, a natural gas utility, which occurred in 3/20. In 2021, Aqua Amer. provided water and wastewater services to about 5 million people in PA, OH, TX, IL, NC, NJ, IN, VA NS WS. Employs 3,211. Acquired AquaSource, 7/13; N. Maine Util., 7/15; and others. Water respn. for 52% of revenues in 2021; residential, 30%; commercial, 8.0%; industrial, wastewater & other, 14%. Gas 46%; other, 2.0%. Off. & dir. own less than 1% of the common stock; BlackRock, 10.6%; Vanguard, 9.7%; Can. Pen. Plan 8.6% (3/22 proxy). Pres. & CEO: Christopher Franklin. Inc.: PA Addr.: 762 W Lancaster Ave., Bryn Mawr, PA 19010. Tel.: 610-525-1400. Int.: www.essential.co.

Essential Utilities had a strong finish in 2021. Share earnings of $0.44 represented a 10% increase over the similar year-earlier period, and $0.02 above our estimate. For the full year, the bottom line appears to have turned the corner and has easily surpassed profit levels that were posted last decade.

Earnings and dividend growth will likely remain strong. We think the utility's share earnings can increase by 8% in both 2022 and 2023. A decision on a major rate case is expected midyear, however. Our projections are based on the assumption that the ruling will be constructive. Dividends will probably rise almost 10%, over the same time frame. Cost savings from the merger that created Essential two years ago ought to contribute much to the good showing.

Future capital expenditures will remain large. The company expects to spend close to $1 billion annually upgrading its water and natural gas infrastructure over the next three years. (The company is among the nation's largest replacers of pipelines.) Last year, most of the funds were targeted toward the water segment of the business. It will remain tilted in the former's favor in the years ahead, but gas ought to start getting a larger share of the outlays.

Finances will likely stay in the average range. At 53% of total capital, long-term debt is manageable. Over the next two years, this percentage may well rise slightly before stabilizing later in the decade.

Inflation remains a question mark. While there are measures that exist to recoup higher expenses, state authorities can often delay reimbursements to utilities. Hence, should costs continue to spike at the current pace, more of Essentials' fate will be determined by regulators.

These shares have outperformed others in the Water Industry this year. The price of the equity has fallen less than 7% in 2022. While this is slightly worse that the broader markets, it is much better than the double-digits losses posted by most in this group. Our ranking system pegs AWK to lag most stocks in the year ahead. Moreover, its total return potential through 2025-2027 is below average.

James A. Flood *April 8, 2022*

(A) Diluted egs. Excl. nonrec. gains: '12, 18¢. Excl. gain from disc. operations: '12, 7¢; '13, 9¢; '14, 11¢. Quarterly EPS do not add in '19 due to a large change in the number of shares outstanding in the Dec. period. Next earnings report early May. **(B)** Dividends historically paid in early March, June, Sept., & Dec. ■ Div'd. reinvestment plan available (5% discount). **(C)** In millions, adjusted for stock split. **(D)** Includes intangibles: 12/31/21, $1.231 bill./$4.87 a share.

Company's Financial Strength	B+
Stock's Price Stability	90
Price Growth Persistence	65
Earnings Predictability	60

YORK WATER NDQ-YORW

RECENT PRICE 44.63 | P/E RATIO 34.3 (Trailing: 34.3 / Median: 31.0) | RELATIVE P/E RATIO 1.92 | DIV'D YLD 1.7% | VALUE LINE

TIMELINESS 3 Lowered 1/15/21
SAFETY 3 Lowered 7/17/15
TECHNICAL 5 Lowered 3/18/22
BETA .85 (1.00 = Market)

18-Month Target Price Range

Low-High	Midpoint (% to Mid)
$36-$66	$51 (15%)

2025-27 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	50	(+10%)	5%
Low	35	(-20%)	-4%

Institutional Decisions

	2Q2021	3Q2021	4Q2021
to Buy	51	51	52
to Sell	43	39	49
Hld's(000)	5416	5241	5272

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	© VALUE LINE PUB. LLC	25-27
High:	18.1	18.5	22.0	24.3	26.7	39.8	39.9	36.1	47.3	51.3	53.8	49.8								
Low:	15.8	16.8	17.6	18.8	19.7	23.8	31.7	27.5	30.3	34.6	40.7	42.1								
Revenues per sh	2.56	2.79	2.89	2.95	3.07	3.18	3.21	3.27	3.58	3.68	3.70	3.77	3.74	3.96	4.12	4.20	*4.40*	*4.50*		*5.10*
"Cash Flow" per sh	.77	.86	.88	.95	1.07	1.09	1.12	1.19	1.36	1.45	1.42	1.53	1.58	1.70	1.90	1.97	*2.05*	*2.15*		*2.45*
Earnings per sh A	.58	.57	.57	.64	.71	.71	.72	.75	.89	.97	.92	1.01	1.04	1.11	1.27	1.30	*1.35*	*1.45*		*1.65*
Div'd Decl'd per sh B	.45	.48	.49	.51	.52	.53	.54	.55	.57	.60	.63	.65	.67	.70	.73	.76	*.79*	*.83*		*1.00*
Cap'l Spending per sh	1.85	1.69	2.17	1.18	.83	.74	.94	.76	1.10	1.11	1.03	1.95	--	.16	.09	.91	*1.25*	*1.35*		*1.75*
Book Value per sh	5.84	5.97	6.14	6.92	7.19	7.45	7.73	7.98	8.15	8.51	8.88	9.28	9.75	10.31	10.97	11.64	*11.90*	*12.30*		*12.90*
Common Shs Outst'g C	11.20	11.27	11.37	12.56	12.69	12.79	12.92	12.98	12.83	12.81	12.85	12.87	12.94	13.02	13.06	13.11	*13.00*	*13.00*		*12.80*
Avg Ann'l P/E Ratio	31.2	30.3	24.6	21.9	20.7	23.9	24.4	26.3	23.1	23.5	32.8	34.6	30.3	33.8	35.7	36.7	*Bold figures are Value Line estimates*			*25.0*
Relative P/E Ratio	1.68	1.61	1.48	1.46	1.32	1.50	1.55	1.48	1.22	1.18	1.72	1.74	1.64	1.80	1.83	2.01				*1.40*
Avg Ann'l Div'd Yield	2.5%	2.8%	3.5%	3.6%	3.5%	3.1%	3.1%	2.8%	2.8%	2.6%	2.1%	1.9%	2.1%	1.9%	1.6%	1.6%				*2.4%*
Revenues ($mill)							41.4	42.4	45.9	47.1	47.6	48.6	48.4	51.6	53.9	55.1	*57.0*	*58.5*		*65.0*
Net Profit ($mill)							9.3	9.7	11.5	12.5	11.8	13.0	13.4	14.4	16.6	17.0	*17.6*	*18.9*		*21.0*
Income Tax Rate							37.6%	37.6%	29.8%	27.5%	31.3%	25.9%	15.7%	13.5%	10.8%	6.2%	*21.0%*	*21.0%*		*21.0%*
AFUDC % to Net Profit							1.1%	.8%	1.8%	1.6%	1.9%	6.7%	1.7%	2.5%	3.2%	7.2%	*3.5%*	*2.5%*		*1.5%*
Long-Term Debt Ratio							46.0%	45.1%	44.8%	44.4%	42.6%	43.0%	42.5%	41.3%	46.3%	47.6%	*44.5%*	*43.0%*		*37.5%*
Common Equity Ratio							54.0%	54.9%	55.2%	55.6%	57.4%	57.0%	57.5%	58.7%	53.7%	52.4%	*55.5%*	*57.0%*		*62.5%*
Total Capital ($mill)							184.8	188.4	189.4	196.3	198.7	209.5	219.5	228.7	266.8	291.5	*280*	*280*		*265*
Net Plant ($mill)							240.3	244.2	253.2	261.4	270.9	288.8	299.2	313.2	343.6	382.9	*390*	*400*		*425*
Return on Total Cap'l							6.4%	6.5%	7.4%	7.6%	7.2%	7.5%	7.3%	7.4%	7.1%	6.7%	*7.0%*	*7.5%*		*9.0%*
Return on Shr. Equity							9.3%	9.3%	11.0%	11.5%	10.4%	10.9%	10.6%	10.7%	11.6%	11.1%	*11.5%*	*12.0%*		*13.0%*
Return on Com Equity							9.3%	9.3%	11.0%	11.5%	10.4%	10.9%	10.6%	10.7%	11.6%	11.1%	*11.5%*	*12.0%*		*13.0%*
Retained to Com Eq							2.4%	2.4%	3.9%	4.4%	3.4%	4.0%	3.8%	4.0%	5.0%	4.7%	*4.5%*	*5.0%*		*5.0%*
All Div'ds to Net Prof							74%	74%	64%	62%	67%	63%	64%	62%	57%	58%	*58%*	*57%*		*61%*

Target Price Range 2025 | 2026 | 2027

% TOT. RETURN 2/22

	THIS STOCK	VL ARITH.* INDEX
1 yr.	9.2	6.9
3 yr.	28.9	49.6
5 yr.	35.9	71.1

CAPITAL STRUCTURE as of 12/31/21
Total Debt $146.4 mill. **Due in 5 Yrs** $42.5 mill.
LT Debt $138.9 mill. **LT Interest** $5.5 mill.
(48% of Cap'l)
Pension Assets12/21 $65.6 mill.
Oblig. $51.5 mill.
Pfd Stock None
Common Stock 13,113,000 shs.
MARKET CAP: $575 million (Small Cap)

CURRENT POSITION ($MILL.)

	2019	2020	12/31/21
Cash Assets	--	5.0	--
Accounts Receivable	4.4	5.2	4.6
Inventory (Avg. Cost)	1.0	1.0	1.9
Other	4.0	5.1	4.8
Current Assets	9.4	16.3	11.3
Accts Payable	3.4	6.5	6.7
Debt Due	6.5	--	7.5
Other	5.3	5.5	5.9
Current Liab.	15.2	12.0	20.1

ANNUAL RATES of change (per sh)

	Past 10 Yrs.	Past 5 Yrs.	Est'd '19-'21 to '25-'27
Revenues	3.0%	2.5%	*3.5%*
"Cash Flow"	6.0%	5.5%	*4.5%*
Earnings	6.0%	6.0%	*5.0%*
Dividends	3.5%	4.0%	*5.5%*
Book Value	4.5%	5.0%	*2.5%*

QUARTERLY REVENUES ($ mill.)

Calendar	Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2019	11.8	13.0	13.7	13.1	51.6
2020	12.9	13.3	14.3	13.4	53.9
2021	13.1	13.8	14.5	13.7	55.1
2022	*13.7*	*14.3*	*15.0*	*14.0*	*57.0*
2023	*14.0*	*14.5*	*15.3*	*14.7*	*58.5*

EARNINGS PER SHARE A

Calendar	Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2019	.22	.28	.35	.26	1.11
2020	.31	.32	.36	.28	1.27
2021	.28	.35	.36	.31	1.30
2022	*.27*	*.34*	*.38*	*.36*	*1.35*
2023	*.31*	*.37*	*.40*	*.37*	*1.45*

QUARTERLY DIVIDENDS PAID B

Calendar	Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2018	.1666	.1666	.1666	.1733	.673
2019	.1733	.1733	.1733	.1802	.70
2020	.1802	.1802	.1802	.1874	.73
2021	.1874	.1874	.1874	.1949	.76
2022	.1949				

BUSINESS: The York Water Company is the oldest investor-owned regulated water utility in the United States. It has operated continuously since 1816. As of December 31, 2021, the company's average daily availability was 39.6 million gallons and its service territory had an estimated population of 204,000. Has more than 72,600 customers. Residential customers accounted for 65% of 2021 revenues; commercial and industrial (27%); other (8%). It also provides sewer billing services. Incorporated: PA. York had 110 full-time employees at 12/31/21. President/Chief Executive Officer: J.T. Hand. Officers/directors own 1.3% of the common stock (3/21 proxy). Address: 130 East Market Street, York, Pennsylvania 17401. Telephone: (717) 845-3601. Internet: www.yorkwater.com.

York Water ended 2021 on a decent note. Fourth-quarter revenues of $13.7 million improved 2% year over year, thanks largely to recently implemented rate hikes approved by Pennsylvania regulators, as well as an expanded customer base. On point, York's acquisition of West Manheim Township wastewater collection system (completed in the second half of last year) bolstered its customer base by approximately 1,800. Meanwhile, December-period earnings of $0.31, despite falling slightly short of our call, rose three cents compared to the previous-year period. An uptick in operation and maintenance expenses of late can be linked to higher transportation (fuel related) and labor costs.

Modest top- and bottom-line growth is probable this year. The latter may remain under some pressure, as the abovementioned cost headwinds may take some time to subside. Nevertheless, we expect 2022 revenues to advance 3%, to $57.0 million, while earnings are poised to jump a nickel, to $1.35 per share.

Management has unveiled its capital investment budget for 2022 and 2023. Last year, the company spent nearly $35 million on routine infrastructure replacements and upgrades, a software system update, and an elevated water tank. For this year and next, leadership plans to invest about $44 million and $50 million, respectively, with a primary focus on pipe and service line upgrades, additional water main extensions, and water treatment plant construction, to name a few. Consequently, these improvements suggest that additional rate hike relief, which is frequently granted by state regulators to offset infrastructure-related upgrade and replacement costs, is likely to be pursued by York Water.

Investment appeal is limited at the recent quotation. Looking at the 3- to 5-year window, total return potential is uninspiring. To that end, income-seeking accounts should note that the current yield pales in comparison to the average utility payer. Moreover, the equity is ranked to mirror the broader market averages over the coming six to 12 months (Timeliness: 3), and offers lackluster appreciation potential over the 18-month horizon.

Nicholas P. Patrikis *April 8, 2022*

(A) Diluted earnings. Next earnings report due early May.
(B) Dividends historically paid in late February, June, September, and December.
(C) In millions, adjusted for split.

Company's Financial Strength	B+
Stock's Price Stability	80
Price Growth Persistence	70
Earnings Predictability	100

W-354, Sub 400

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

	Base Year (Current Interest Rates)	Projected Rate Year 1 (2023 Proj Interest Rates)	Projected Rate Year 2 (2024 Proj Interest Rates)	Projected Rate Year 3 (2025 Proj Interest Rates)
Predictive Risk Premium Model (PRPM) (1)	11.37 %	12.21 %	12.18 %	12.48 %
Risk Premium Using an Adjusted Total Market Approach (2)	10.87 %	11.30 %	11.20 %	11.32 %
Average	11.12 %	11.76 %	11.69 %	11.90 %

Notes:
(1) From pages 2 through 5 of this Schedule.
(2) From page 6 of this Schedule.

Carolina Water Service Inc. of North Carolina
Indicated ROE
Derived by the Predictive Risk Premium Model (1)
Using Current Interest Rates

Proxy Group of Seven Water Companies	[1] LT Average Predicted Variance	[2] Spot Predicted Variance	[3] Recommended Variance (2)	[4] GARCH Coefficient	[5] Predicted Risk Premium (3)	[6] Risk-Free Rate (4)	[7] Indicated ROE (5)
American States Water Company	0.38%	0.42%	0.38%	1.8324	8.73%	2.49%	11.22%
American Water Works Company, Inc.	0.27%	0.38%	0.27%	4.7663	16.74%	2.49%	NMF
California Water Service Group	0.33%	0.53%	0.33%	1.8760	7.58%	2.49%	10.07%
Essential Utilities Inc.	0.44%	0.47%	0.44%	2.2107	12.41%	2.49%	14.90%
Middlesex Water Company	0.33%	0.82%	0.33%	2.0161	8.24%	2.49%	10.73%
SJW Group	0.41%	0.36%	0.41%	1.4808	7.60%	2.49%	10.09%
The York Water Company	0.47%	0.43%	0.47%	1.8732	11.04%	2.49%	13.53%
						Average	11.76%
						Median	10.98%
						Average of Mean and Median	11.37%

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 Services.

(2) Based on the long-term average predicted variance.

(3) $(1+(\text{Column [3]} * \text{Column [4]})^{\wedge 12}) - 1$.

(4) From note 2 on page 5 of Schedule DWD-5.

(5) Column [5] + Column [6].

Carolina Water Service Inc. of North Carolina
Indicated ROE
Derived by the Predictive Risk Premium Model (1)
Using Projected 2023 Interest Rates

Proxy Group of Seven Water Companies	[1] LT Average Predicted Variance	[2] Spot Predicted Variance	[3] Recommended Variance (2)	[4] GARCH Coefficient	[5] Predicted Risk Premium (3)	[6] Risk-Free Rate (4)	[7] Indicated ROE (5)
American States Water Company	0.38%	0.42%	0.38%	1.8324	8.73%	3.33%	12.06%
American Water Works Company, Inc.	0.27%	0.38%	0.27%	4.7663	16.74%	3.33%	NMF
California Water Service Group	0.33%	0.53%	0.33%	1.8760	7.58%	3.33%	10.91%
Essential Utilities Inc.	0.44%	0.47%	0.44%	2.2107	12.41%	3.33%	15.74%
Middlesex Water Company	0.33%	0.82%	0.33%	2.0161	8.24%	3.33%	11.57%
SJW Group	0.41%	0.36%	0.41%	1.4808	7.60%	3.33%	10.93%
The York Water Company	0.47%	0.43%	0.47%	1.8732	11.04%	3.33%	14.37%
						Average	12.60%
						Median	11.82%
						Average of Mean and Median	12.21%

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 Services.
(2) Based on the long-term average predicted variance.
(3) $(1+(\text{Column [3]} * \text{Column [4]})^{\wedge 12}) - 1$.
(4) From note 3 on page 5 of Schedule DWD-5.
(5) Column [5] + Column [6].

Carolina Water Service Inc. of North Carolina
Indicated ROE
Derived by the Predictive Risk Premium Model (1)
Using Projected 2024 Interest Rates

Proxy Group of Seven Water Companies	[1] LT Average Predicted Variance	[2] Spot Predicted Variance	[3] Recommended Variance (2)	[4] GARCH Coefficient	[5] Predicted Risk Premium (3)	[6] Risk-Free Rate (4)	[7] Indicated ROE (5)
American States Water Company	0.38%	0.42%	0.38%	1.8324	8.73%	3.30%	12.03%
American Water Works Company, Inc.	0.27%	0.38%	0.27%	4.7663	16.74%	3.30%	NMF
California Water Service Group	0.33%	0.53%	0.33%	1.8760	7.58%	3.30%	10.88%
Essential Utilities Inc.	0.44%	0.47%	0.44%	2.2107	12.41%	3.30%	15.71%
Middlesex Water Company	0.33%	0.82%	0.33%	2.0161	8.24%	3.30%	11.54%
SJW Group	0.41%	0.36%	0.41%	1.4808	7.60%	3.30%	10.90%
The York Water Company	0.47%	0.43%	0.47%	1.8732	11.04%	3.30%	14.34%
						Average	12.57%
						Median	11.79%
						Average of Mean and Median	12.18%

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 Services.
(2) Based on the long-term average predicted variance.
(3) $(1+(\text{Column [3]} * \text{Column [4]})^{\wedge 12}) - 1$.
(4) From note 4 on page 5 of Schedule DWD-5.
(5) Column [5] + Column [6].

Carolina Water Service Inc. of North Carolina
Indicated ROE
Derived by the Predictive Risk Premium Model (1)
Using Projected 2025 Interest Rates

Proxy Group of Seven Water Companies	[1] LT Average Predicted Variance	[2] Spot Predicted Variance	[3] Recommended Variance (2)	[4] GARCH Coefficient	[5] Predicted Risk Premium (3)	[6] Risk-Free Rate (4)	[7] Indicated ROE (5)
American States Water Company	0.38%	0.42%	0.38%	1.8324	8.73%	3.60%	12.33%
American Water Works Company, Inc.	0.27%	0.38%	0.27%	4.7663	16.74%	3.60%	NMF
California Water Service Group	0.33%	0.53%	0.33%	1.8760	7.58%	3.60%	11.18%
Essential Utilities Inc.	0.44%	0.47%	0.44%	2.2107	12.41%	3.60%	16.01%
Middlesex Water Company	0.33%	0.82%	0.33%	2.0161	8.24%	3.60%	11.84%
SJW Group	0.41%	0.36%	0.41%	1.4808	7.60%	3.60%	11.20%
The York Water Company	0.47%	0.43%	0.47%	1.8732	11.04%	3.60%	14.64%
						Average	12.87%
						Median	12.09%
						Average of Mean and Median	12.48%

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 Services.

(2) Based on the long-term average predicted variance.

(3) (1+(Column [3] * Column [4])$^{\wedge 12}$) - 1.

(4) From note 5 on page 5 of Schedule DWD-5.

(5) Column [5] + Column [6].

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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

Line No.		Results using Current Interest Rates	Results using Projected 2023 Interest Rates	Results using Projected 2024 Interest Rates	Results using Projected 2025 Interest Rates
1.	Prospective Yield on Aaa Rated Corporate Bonds (1)		4.45 %	4.20	4.50
2.	Adjustment to Reflect Yield Spread Between Aaa Rated Corporate Bonds and A2 Rated Public Utility Bonds		0.51 (2)	0.51	0.51
3.	Adjusted Prospective Yield on A2 Rated Public Utility Bonds		4.96 %	4.71 %	5.01 %
4.	Current Yield on A2 Rated Public Utility Bonds (3)	3.99 %			
5.	Adjustment to Reflect Bond Rating Difference of Proxy Group (4)	0.10	0.10	0.10	0.10
6.	Adjusted Prospective Bond Yield	4.09 %	5.06 %	4.81 %	5.11 %
7.	Equity Risk Premium (5)	6.78	6.24	6.39	6.21
8.	Risk Premium Derived Common Equity Cost Rate	10.87 %	11.30 %	11.20 %	11.32 %

Notes:
(1) Consensus forecast of Moody's Aaa Rated Corporate bonds from Blue Chip Financial Forecasts (see pages 13 and 14 of this Schedule).
(2) The average yield spread of A2 rated public utility bonds over Aaa rated corporate bonds of 0.51% from page 7 of this Schedule.
(3) Three-month average A2-rated utility bond yield ending April 2022 as shown on page 7 of this Schedule.
(4) Adjustment to reflect the A3 Moody's long-term rating of the Utility Proxy Group as shown on page 8 of this Schedule. The 0.1% upward adjustment is derived by taking 1/3 of the spread between A2 and Baa2 Public Utility Bonds (1/3 * 0.29% = 0.10%) as derived from page 7 of this Schedule.
(5) From page 10 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] Aaa Rated Corporate Bond	[2] A2 Rated Public Utility Bond	[3] Baa2 Rated Public Utility Bond
Apr-2022	3.75 %	4.30 %	4.60 %
Mar-2022	3.43	3.98	4.28
Feb-2022	3.25	3.68	3.95
Average	3.48 %	3.99 %	4.28 %

Selected Bond Spreads

A2 Rated Public Utility Bonds Over Aaa Rated Corporate Bonds: 0.51 % (1)

Baa2 Rated Public Utility Bonds Over A2 Rated Public Utility Bonds: 0.29 % (2)

Notes:
(1) Column [2] - Column [1].
(2) Column [3] - Column [2].

Source of Information:
Bloomberg Professional Services

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

	Moody's		Standard & Poor's	
	Long-Term Issuer Rating May 2022		Long-Term Issuer Rating May 2022	
Proxy Group of Seven Water Companies	Long-Term Issuer Rating	Numerical Weighting (1)	Long-Term Issuer Rating	Numerical Weighting (1)
American States Water Company (2)	A2	6.0	A+	5.0
American Water Works Company, Inc. (3)	A3	7.0	A	6.0
California Water Service Group	NR	- -	A+	5.0
Essential Utilities Inc. (4)	Baa1	8.0	A	6.0
Middlesex Water Company	NR	- -	A	6.0
SJW Group (5)	NR	- -	A/A-	6.5
The York Water Company	NR	- -	A-	7.0
Average	A3	7.0	A	5.9

Notes:
(1) From page 9 of this Schedule.
(2) Ratings that of Golden State Water Company.
(3) Ratings that of New Jersey and Pennsylvania American Water Companies.
(4) Ratings that of PNG Companies and Aqua Pennsylvania, Inc.
(5) Ratings that of San Jose Water Company and Connecticut Water Inc.

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

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

Moody's Bond Rating	Numerical Bond Weighting	Standard & Poor's Bond Rating
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
Results using Current Interest Rates

Line No.		Results using Current Interest Rates	Results Using Projected 2023 Interest Rates	Results Using Projected 2024 Interest Rates	Results Using Projected 2025 Interest Rates
1.	Calculated equity risk premium based on the total market using the beta approach (1)	7.72 %	7.20 %	7.35 %	7.17 %
2.	Mean equity risk premium based on a study using the holding period returns of public utilities with A2 rated bonds (2)	5.83	5.28	5.42	5.25
3.	Average equity risk premium	6.78 %	6.24 %	6.39 %	6.21 %

Notes: (1) From page 11 of this Schedule.
(2) From page 15 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 Seven Water Companies

Line No.	Equity Risk Premium Measure	Results using Current Interest Rates	Results Using Projected 2023 Interest Rates	Results Using Projected 2024 Interest Rates	Results Using Projected 2025 Interest Rates
1.	Ibbotson Equity Risk Premium (1)	6.13 %	6.13 %	6.13 %	6.13 %
2.	Regression on Ibbotson Risk Premium Data (2)	9.16	8.02	8.34	7.96
3.	Ibbotson Equity Risk Premium based on PRPM (3)	8.35	8.35	8.35	8.35
4.	Equity Risk Premium Based on Value Line Summary and Index (4)	9.61	8.71	8.96	8.66
5.	Equity Risk Premium Based on Value Line S&P 500 Companies (5)	12.87	11.97	12.22	11.92
6.	Equity Risk Premium Based on Bloomberg S&P 500 Companies (6)	10.37	9.48	9.73	9.43
7.	Conclusion of Equity Risk Premium	9.41 %	8.78 %	8.96 %	8.74 %
8.	Adjusted Beta (7)	0.82	0.82	0.82	0.82
9.	Forecasted Equity Risk Premium	7.72 %	7.20 %	7.35 %	7.17 %

Notes provided on page 12 of this Schedule.

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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 Seven Water Companies

Notes:

(1) Based on the arithmetic mean historical monthly returns on large company common stocks from Kroll 2022 SBBI® 2022 YearbookMarket Report minus the arithmetic mean monthly yield of Moody's average Aaa and Aa2 corporate bonds from 1928-2021.

(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 1928-2021 referenced in Note 1 above. The equity risk premium is calculated using current and projected interest rates as indicated. The projected Aaa corporate bond yields for 2023 through 2025 are shown on line 1 of page 6 of this Schedule. The current interest rate is the three-month average Aaa and Aa2 corporate bond yields ending April 2022.

(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 April 2022.

(4) The equity risk premium based on the Value Line Summary and Index is derived by subtracting the relevant bond yield from the projected 3-5 year total annual market return of 13.16% (described fully in note 1 on page 5 of Exhibit DWD-5).

(5) The equity risk premium based on Value Line data for the S&P 500 companies subtracts the relevant bond yield from the expected market return of 16.42%, which was derived using expected dividend yields to represent the income return and expected earnings growth to represent the capital appreciation return.

(6) The equity risk premium based on Bloomberg data for the S&P 500 companies subtracts the relevant bond yield from the expected market return of 13.93%, which was derived using expected dividend yields to represent the income return and expected earnings growth to represent the capital appreciation return.

(7) Average of mean and median beta from Schedule DWD-5.

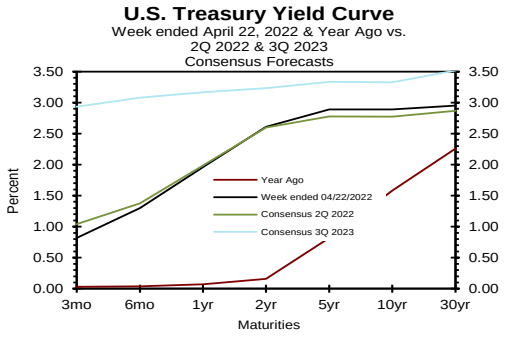
Sources of Information:

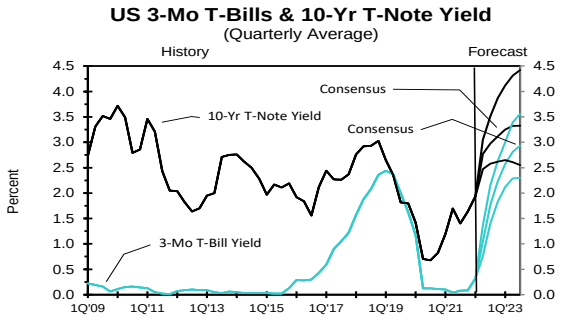
Kroll 2022 SBBI® Yearbook
Industrial Manual and Mergent Bond Record
Value Line Summary and Index
Blue Chip Financial Forecasts, December 1, 2021 and April 29, 2022
Bloomberg Professional Services

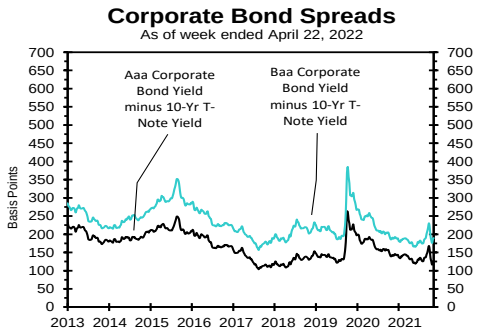
Consensus Forecasts of U.S. Interest Rates and Key Assumptions

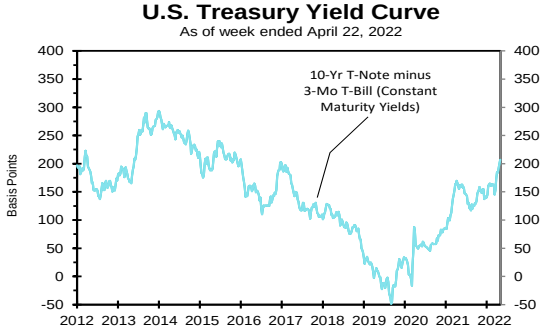
	History								Consensus Forecasts-Quarterly Avg.					
	Average For Week Ending				Average For Month			*Latest Qtr*	2Q	3Q	4Q	1Q	2Q	3Q
Interest Rates	Apr 22	Apr 15	Apr 8	Apr 1	Mar	Feb	Jan	1Q 2022	2022	2022	2022	2023	2023	2023
Federal Funds Rate	0.33	0.33	0.33	0.33	0.20	0.08	0.08	0.12	**1.0**	**1.7**	**2.2**	**2.6**	**2.9**	**3.0**
Prime Rate	3.50	3.50	3.50	3.50	3.37	3.25	3.25	3.29	**4.0**	**4.8**	**5.2**	**5.6**	**5.9**	**6.1**
SOFR	0.27	0.29	0.30	0.28	0.16	0.05	0.05	0.09	**0.8**	**1.6**	**2.1**	**2.5**	**2.7**	**2.9**
Commercial Paper, 1-mo.	0.48	0.38	0.32	0.34	0.32	0.16	0.07	0.18	**0.9**	**1.7**	**2.1**	**2.6**	**2.8**	**3.0**
Treasury bill, 3-mo.	0.82	0.76	0.67	0.55	0.45	0.31	0.15	0.30	**1.0**	**1.8**	**2.2**	**2.6**	**2.8**	**2.9**
Treasury bill, 6-mo.	1.30	1.22	1.15	1.07	0.86	0.64	0.33	0.61	**1.4**	**2.1**	**2.4**	**2.8**	**3.0**	**3.1**
Treasury bill, 1 yr.	1.96	1.81	1.77	1.67	1.34	1.00	0.55	0.96	**2.0**	**2.4**	**2.7**	**3.0**	**3.1**	**3.2**
Treasury note, 2 yr.	2.61	2.43	2.49	2.35	1.91	1.44	0.98	1.44	**2.6**	**2.9**	**3.0**	**3.2**	**3.2**	**3.2**
Treasury note, 5 yr.	2.89	2.73	2.68	2.49	2.11	1.81	1.54	1.82	**2.8**	**3.0**	**3.1**	**3.3**	**3.3**	**3.3**
Treasury note, 10 yr.	2.89	2.76	2.59	2.39	2.13	1.93	1.76	1.94	**2.8**	**3.0**	**3.1**	**3.3**	**3.3**	**3.3**
Treasury note, 30 yr.	2.95	2.85	2.63	2.49	2.41	2.25	2.10	2.25	**2.9**	**3.1**	**3.2**	**3.4**	**3.5**	**3.5**
Corporate Aaa bond	4.16	4.02	3.75	3.64	3.63	3.36	3.06	3.35	**4.0**	**4.2**	**4.4**	**4.6**	**4.7**	**4.8**
Corporate Baa bond	4.78	4.63	4.35	4.23	4.23	3.92	3.54	3.90	**4.8**	**5.1**	**5.3**	**5.5**	**5.6**	**5.7**
State & Local bonds	3.79	3.67	3.55	3.51	3.30	3.01	2.74	3.02	**3.4**	**3.7**	**3.8**	**4.0**	**4.1**	**4.1**
Home mortgage rate	5.11	5.00	4.72	4.67	4.17	3.76	3.45	3.79	**4.9**	**5.1**	**5.2**	**5.3**	**5.4**	**5.4**
	History								Consensus Forecasts-Quarterly					
	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q
Key Assumptions	2020	2020	2020	2021	2021	2021	2021	2022	2022	2022	2022	2023	2023	2023
Fed's AFE $ Index	112.4	107.2	105.1	103.4	102.9	105.0	107.0	108.4	**110.9**	**111.5**	**111.7**	**111.5**	**111.2**	**110.9**
Real GDP	-31.2	33.8	4.5	6.3	6.7	2.3	6.9	-1.4	**2.8**	**2.7**	**2.4**	**2.3**	**2.1**	**2.0**
GDP Price Index	-1.5	3.6	2.2	4.3	6.1	6.0	7.1	8.0	**5.6**	**4.0**	**3.4**	**3.0**	**2.8**	**2.6**
Consumer Price Index	-3.4	4.8	2.2	4.1	8.2	6.7	7.9	9.2	**6.9**	**4.3**	**3.4**	**3.0**	**2.7**	**2.6**
PCE Price Index	-1.6	3.7	1.5	3.8	6.5	5.3	6.4	7.0	**5.8**	**3.9**	**3.2**	**2.8**	**2.6**	**2.4**

Forecasts for interest rates and the Federal Reserve's Advanced Foreign Economies Index represent averages for the quarter. Forecasts for Real GDP, GDP Price Index, CPI and PCE 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; SOFR from the New York Fed. All interest rate data are sourced from Haver Analytics. Historical data for Fed's Advanced Foreign Economies Index are from FRSR H.10. Historical data for Real GDP, GDP Price Index and PCE Price Index are from the Bureau of Economic Analysis (BEA). Consumer Price Index history is from the Department of Labor's Bureau of Labor Statistics (BLS).









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 2023 through 2027 and averages for the five-year periods 2023-2027 and 2028-2032. 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	
		2023	2024	2025	2026	2027	2023-2027	2028-2032
1. Federal Funds Rate	**CONSENSUS**	**0.8**	**1.6**	**2.0**	**2.2**	**2.3**	**1.8**	**2.2**
	Top 10 Average	1.2	2.2	2.7	2.7	2.8	2.3	2.9
	Bottom 10 Average	0.4	1.0	1.4	1.7	1.8	1.2	1.5
2. Prime Rate	**CONSENSUS**	**4.0**	**4.7**	**5.1**	**5.3**	**5.4**	**4.9**	**5.3**
	Top 10 Average	4.3	5.3	5.8	5.8	5.9	5.4	6.0
	Bottom 10 Average	3.6	4.1	4.5	4.9	5.0	4.4	4.6
3. LIBOR, 3-Mo.	**CONSENSUS**	**1.0**	**1.7**	**2.2**	**2.4**	**2.5**	**1.9**	**2.4**
	Top 10 Average	1.3	2.1	2.7	2.9	3.0	2.4	3.1
	Bottom 10 Average	0.7	1.2	1.6	1.9	2.0	1.5	1.8
4. Commercial Paper, 1-Mo	**CONSENSUS**	**0.9**	**1.6**	**2.1**	**2.3**	**2.4**	**1.9**	**2.4**
	Top 10 Average	1.2	2.0	2.6	2.8	2.9	2.3	2.9
	Bottom 10 Average	0.6	1.2	1.6	1.9	2.0	1.5	1.8
5. Treasury Bill Yield, 3-Mo	**CONSENSUS**	**0.8**	**1.4**	**1.8**	**2.0**	**2.3**	**1.7**	**2.2**
	Top 10 Average	1.2	1.9	2.5	2.6	2.8	2.2	2.9
	Bottom 10 Average	0.4	0.8	1.2	1.5	1.8	1.1	1.6
6. Treasury Bill Yield, 6-Mo	**CONSENSUS**	**0.8**	**1.4**	**1.9**	**2.1**	**2.4**	**1.7**	**2.3**
	Top 10 Average	1.2	2.0	2.6	2.7	2.9	2.3	3.0
	Bottom 10 Average	0.4	0.9	1.2	1.6	1.9	1.2	1.7
7. Treasury Bill Yield, 1-Yr	**CONSENSUS**	**1.0**	**1.6**	**2.1**	**2.4**	**2.5**	**1.9**	**2.4**
	Top 10 Average	1.4	2.1	2.7	2.8	3.0	2.4	3.1
	Bottom 10 Average	0.6	1.2	1.5	1.9	2.0	1.4	1.8
8. Treasury Note Yield, 2-Yr	**CONSENSUS**	**1.3**	**1.9**	**2.4**	**2.6**	**2.6**	**2.2**	**2.6**
	Top 10 Average	1.7	2.5	3.0	3.1	3.2	2.7	3.4
	Bottom 10 Average	0.8	1.4	1.8	2.0	2.1	1.6	1.9
9. Treasury Note Yield, 5-Yr	**CONSENSUS**	**1.9**	**2.4**	**2.8**	**2.9**	**2.9**	**2.6**	**3.0**
	Top 10 Average	2.3	3.0	3.4	3.5	3.6	3.1	3.8
	Bottom 10 Average	1.5	1.9	2.1	2.3	2.3	2.0	2.2
10. Treasury Note Yield, 10-Yr	**CONSENSUS**	**2.4**	**2.8**	**3.1**	**3.2**	**3.2**	**2.9**	**3.3**
	Top 10 Average	2.8	3.3	3.7	3.8	3.9	3.5	4.2
	Bottom 10 Average	2.0	2.3	2.4	2.5	2.5	2.3	2.4
11. Treasury Bond Yield, 30-Yr	**CONSENSUS**	**2.9**	**3.3**	**3.6**	**3.7**	**3.7**	**3.4**	**3.8**
	Top 10 Average	3.4	3.9	4.3	4.4	4.4	4.1	4.6
	Bottom 10 Average	2.4	2.8	2.9	3.0	3.0	2.8	3.0
12. Corporate Aaa Bond Yield	**CONSENSUS**	**3.7**	**4.2**	**4.5**	**4.6**	**4.8**	**4.4**	**4.9**
	Top 10 Average	4.3	4.7	5.1	5.2	5.4	4.9	5.6
	Bottom 10 Average	3.2	3.7	3.9	4.1	4.2	3.8	4.2
13. Corporate Baa Bond Yield	**CONSENSUS**	**4.6**	**5.0**	**5.3**	**5.5**	**5.6**	**5.2**	**5.7**
	Top 10 Average	5.1	5.5	5.9	6.1	6.2	5.7	6.5
	Bottom 10 Average	4.0	4.5	4.8	4.9	5.0	4.7	5.0
14. State & Local Bonds Yield	**CONSENSUS**	**3.2**	**3.7**	**3.9**	**4.1**	**4.2**	**3.8**	**4.3**
	Top 10 Average	3.8	4.3	4.5	4.7	4.8	4.4	5.0
	Bottom 10 Average	2.7	3.2	3.4	3.5	3.6	3.3	3.6
15. Home Mortgage Rate	**CONSENSUS**	**4.0**	**4.4**	**4.7**	**4.8**	**4.8**	**4.5**	**4.9**
	Top 10 Average	4.5	5.0	5.3	5.4	5.4	5.1	5.7
	Bottom 10 Average	3.6	3.9	4.1	4.1	4.2	4.0	4.1
A. Fed's AFE Nominal $ Index	**CONSENSUS**	**106.2**	**106.0**	**106.1**	**106.2**	**106.4**	**106.2**	**106.5**
	Top 10 Average	108.1	108.4	108.9	109.0	109.2	108.7	110.1
	Bottom 10 Average	104.4	104.0	103.7	103.7	103.9	103.9	103.1
		Year-Over-Year, % Change					Five-Year Averages	
		2023	2024	2025	2026	2027	2023-2027	2028-2032
B. Real GDP	**CONSENSUS**	**2.6**	**2.2**	**2.1**	**2.0**	**2.0**	**2.2**	**2.0**
	Top 10 Average	3.1	2.6	2.5	2.4	2.3	2.6	2.4
	Bottom 10 Average	2.2	1.7	1.7	1.7	1.7	1.8	1.7
C. GDP Chained Price Index	**CONSENSUS**	**2.5**	**2.2**	**2.2**	**2.1**	**2.1**	**2.2**	**2.1**
	Top 10 Average	3.0	2.7	2.5	2.4	2.4	2.6	2.4
	Bottom 10 Average	2.0	1.9	1.9	1.9	1.9	1.9	1.8
D. Consumer Price Index	**CONSENSUS**	**2.6**	**2.3**	**2.3**	**2.2**	**2.2**	**2.3**	**2.2**
	Top 10 Average	3.2	2.8	2.6	2.5	2.5	2.7	2.5
	Bottom 10 Average	2.1	2.0	2.0	2.0	2.0	2.0	1.9
E. PCE Price Index	**CONSENSUS**	**2.5**	**2.2**	**2.1**	**2.1**	**2.1**	**2.2**	**2.1**
	Top 10 Average	3.0	2.6	2.4	2.4	2.3	2.6	2.4
	Bottom 10 Average	2.0	1.9	1.9	1.9	1.9	1.9	1.9

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

Line No.		Results using Current Interest Rates	Results using Projected 2023 Interest Rates	Results using Projected 2024 Interest Rates	Results using Projected 2025 Interest Rates
	Equity Risk Premium based on S&P Utility Index Holding Period Returns (1):				
1.	Historical Equity Risk Premium	4.28 %	4.28 %	4.28 %	4.28 %
2.	Regression of Historical Equity Risk Premium (2)	6.36	5.56	5.77	5.52
3.	Forecasted Equity Risk Premium Based on PRPM (3)	5.89	5.89	5.89	5.89
4.	Forecasted Equity Risk Premium based on Projected Total Return on the S&P Utilities Index (Value Line Data) (4)	6.67	5.70	5.95	5.65
5.	Forecasted Equity Risk Premium based on Projected Total Return on the S&P Utilities Index (Bloomberg Data) (5)	5.93	4.96	5.21	4.91
6.	Average Equity Risk Premium (6)	5.83 %	5.28 %	5.42 %	5.25 %

Notes provided on page 16 of this Schedule.

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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

Notes:

(1) Based on S&P Public Utility Index monthly total returns and Moody's Public Utility Bond average monthly yields from 1928-2021. 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 - 2021 referenced in note 1 above. Using the equation generated from the regression, an expected equity risk premium is calculated using the relevant bond yield. The current and projected A2 rated utiliy bond yields are shown on lines 4 and 3 of page 6 of this Schedule, respectively.

(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 - April 2022.

(4) The equity risk premium based on Value Line data for the S&P Utilites Index subtracts the relevant bond yield from the expected market return of 10.66%, which was derived using expected dividend yields to represent the income return and expected earnings growth to represent the capital appreciation return.

(5) The equity risk premium based on Bloomberg data for the S&P Utilites Index subtracts the relevant bond yield from the expected market return of 9.92%, which was derived using expected dividend yields to represent the income return and expected earnings growth to represent the capital appreciation return.

(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)
Using Current Interest Rates

Proxy Group of Seven Water Companies	[1] Value Line Adjusted Beta	[2] Bloomberg Adjusted Beta	[3] Average Beta	[4] Market Risk Premium (1)	[5] Risk-Free Rate (2)	[6] Traditional CAPM Cost Rate	[7] ECAPM Cost Rate	[8] Indicated Common Equity Cost Rate (6)
American States Water Company	0.65	0.80	0.73	10.50 %	2.49 %	10.16 %	10.87 %	10.51 %
American Water Works Company, Inc.	0.85	0.79	0.82	10.50	2.49	11.10	11.57	11.34
California Water Service Group	0.65	0.91	0.78	10.50	2.49	10.68	11.26	10.97
Essential Utilities Inc.	0.95	0.91	0.93	10.50	2.49	12.26	12.44	12.35
Middlesex Water Company	0.70	0.88	0.79	10.50	2.49	10.79	11.34	11.06
SJW Group	0.80	0.86	0.83	10.50	2.49	11.21	11.65	11.43
The York Water Company	0.85	0.81	0.83	10.50	2.49	11.21	11.65	11.43
Mean			0.82			11.06 %	11.54 %	11.30 %
Median			0.82			11.10 %	11.57 %	11.34 %
Average of Mean and Median			0.82			11.08 %	11.56 %	11.32 %

Notes on page 5 of this Schedule.

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)
Using Projected 2023 Interest Rates

Proxy Group of Seven Water Companies	[1] Value Line Adjusted Beta	[2] Bloomberg Adjusted Beta	[3] Average Beta	[4] Market Risk Premium (1)	[5] Risk-Free Rate (3)	[6] Traditional CAPM Cost Rate	[7] ECAPM Cost Rate	[8] Indicated Common Equity Cost Rate (6)
American States Water Company	0.65	0.80	0.73	9.93 %	3.33 %	10.58 %	11.25 %	10.91 %
American Water Works Company, Inc.	0.85	0.79	0.82	9.93	3.33	11.47	11.92	11.69
California Water Service Group	0.65	0.91	0.78	9.93	3.33	11.07	11.62	11.35
Essential Utilities Inc.	0.95	0.91	0.93	9.93	3.33	12.56	12.74	12.65
Middlesex Water Company	0.70	0.88	0.79	9.93	3.33	11.17	11.69	11.43
SJW Group	0.80	0.86	0.83	9.93	3.33	11.57	11.99	11.78
The York Water Company	0.85	0.81	0.83	9.93	3.33	11.57	11.99	11.78
Mean			0.82			11.43 %	11.89 %	11.66 %
Median			0.82			11.47 %	11.92 %	11.69 %
Average of Mean and Median			0.82			11.45 %	11.91 %	11.68 %

Notes on page 5 of this Schedule.

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)
Using Projected 2024 Interest Rates

Proxy Group of Seven Water Companies	[1] Value Line Adjusted Beta	[2] Bloomberg Adjusted Beta	[3] Average Beta	[4] Market Risk Premium (1)	[5] Risk-Free Rate (4)	[6] Traditional CAPM Cost Rate	[7] ECAPM Cost Rate	[8] Indicated Common Equity Cost Rate (6)
American States Water Company	0.65	0.80	0.73	9.95 %	3.30 %	10.56 %	11.23 %	10.90 %
American Water Works Company, Inc.	0.85	0.79	0.82	9.95	3.30	11.46	11.91	11.68
California Water Service Group	0.65	0.91	0.78	9.95	3.30	11.06	11.61	11.33
Essential Utilities Inc.	0.95	0.91	0.93	9.95	3.30	12.55	12.73	12.64
Middlesex Water Company	0.70	0.88	0.79	9.95	3.30	11.16	11.68	11.42
SJW Group	0.80	0.86	0.83	9.95	3.30	11.56	11.98	11.77
The York Water Company	0.85	0.81	0.83	9.95	3.30	11.56	11.98	11.77
Mean			0.82			11.42 %	11.87 %	11.64 %
Median			0.82			11.46 %	11.91 %	11.68 %
Average of Mean and Median			0.82			11.44 %	11.89 %	11.66 %

Notes on page 5 of this Schedule.

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)
Using Projected 2025 Interest Rates

Proxy Group of Seven Water Companies	[1] Value Line Adjusted Beta	[2] Bloomberg Adjusted Beta	[3] Average Beta	[4] Market Risk Premium (1)	[5] Risk-Free Rate (5)	[6] Traditional CAPM Cost Rate	[7] ECAPM Cost Rate	[8] Indicated Common Equity Cost Rate (6)
American States Water Company	0.65	0.80	0.73	9.74 %	3.60 %	10.71 %	11.37 %	11.04 %
American Water Works Company, Inc.	0.85	0.79	0.82	9.74	3.60	11.59	12.03	11.81
California Water Service Group	0.65	0.91	0.78	9.74	3.60	11.20	11.74	11.47
Essential Utilities Inc.	0.95	0.91	0.93	9.74	3.60	12.66	12.83	12.75
Middlesex Water Company	0.70	0.88	0.79	9.74	3.60	11.30	11.81	11.55
SJW Group	0.80	0.86	0.83	9.74	3.60	11.69	12.10	11.89
The York Water Company	0.85	0.81	0.83	9.74	3.60	11.69	12.10	11.89
Mean			0.82			11.55 %	12.00 %	11.77 %
Median			0.82			11.59 %	12.03 %	11.81 %
Average of Mean and Median			0.82			11.57 %	12.02 %	11.79 %

Notes on page 5 of this Schedule.

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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:

Historical Data MRP Estimates:	Using Current Interest Rates	Using Projected 2023 Interest Rates	Using Projected 2024 Interest Rates	Using Projected 2025 Interest Rates
Measure 1: Ibbotson Arithmetic Mean MRP (1926-2021)				
Arithmetic Mean Monthly Returns for Large Stocks 1926-2021:	12.37 %	12.37 %	12.37 %	12.37 %
Arithmetic Mean Income Returns on Long-Term Government Bonds:	5.02	5.02	5.02	5.02
MRP based on Ibbotson Historical Data:	7.35 %	7.35 %	7.35 %	7.35 %
Measure 2: Application of a Regression Analysis to Ibbotson Historical Data (1926-2021)	10.27 %	9.34 %	9.38 %	9.05 %
Measure 3: Application of the PRPM to Ibbotson Historical Data: (January 1926 - April 2022)	9.35 %	9.35 %	9.35 %	9.35 %
Value Line MRP Estimates:				
Measure 4: Value Line Projected MRP (Thirteen weeks ending May 13, 2022)				
Total projected return on the market 3-5 years hence*:	13.16 %	13.16 %	13.16 %	13.16 %
Projected Risk-Free Rate (see note 2):	2.49	3.33	3.30	3.60
MRP based on Value Line Summary & Index:	10.67 %	9.83 %	9.86 %	9.56 %
*Forcasted 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:	16.42 %	16.42 %	16.42 %	16.42 %
Projected Risk-Free Rate (see note 2):	2.49	3.33	3.30	3.60
MRP based on Value Line data	13.93 %	13.09 %	13.12 %	12.82 %
Measure 6: Bloomberg Projected MRP				
Total return on the Market based on the S&P 500:	13.93 %	13.93 %	13.93 %	13.93 %
Projected Risk-Free Rate (see note 2):	2.49	3.33	3.30	3.60
MRP based on Bloomberg data	11.44 %	10.60 %	10.63 %	10.33 %
Average of Value Line, Ibbotson, and Bloomberg MRP:	10.50 %	9.93 %	9.95 %	9.74 %

(2) Three-month average on 30-year Treasury bond yield ended February, 2022 as shown below:

Feb-22	2.25 %
Mar-22	2.41
Apr-22	2.81
	2.49 %

(3) 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 13-14 of Schedule DWD-4.) The projection of the 2023 risk-free rate is illustrated below:

First Quarter 2023	3.40 %
Second Quarter 2023	3.50
Third Quarter 2023	3.50
2023 Consensus	2.90
	3.33 %

(4) The projection of the 2024 risk-free rate is illustrated below:

2024 Consensus	3.30 %

(5) The projection of the 2025 risk-free rate is illustrated below:

2025 Consensus	3.60 %

(6) Average of Column 6 and Column 7.

Sources of Information:
Value Line Summary and Index
Blue Chip Financial Forecasts, December 1, 2021 and April 29, 2022
Kroll 2022 SBBI® Yearbook
Bloomberg Professional Services

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Carolina Water Service 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 proxy group of twenty-five non-price regulated companies was that the non-price regulated companies be domestic and reported in Value Line Investment Survey (Standard Edition).

The Non-Price Regulated Proxy Group were then selected based on the unadjusted beta range of 0.48 – 0.78 and residual standard error of the regression range of 2.8225 – 3.3665 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 Utility Proxy Group's residual standard error of the regression is 0.1360. 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

$$\text{Thus, } 0.1360 = \frac{3.0945}{\sqrt{518}} = \frac{3.0945}{22.7596}$$

Source of Information: Value Line, Inc., March 2022
Value Line Investment Survey (Standard Edition)

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

Proxy Group of Seven Water Companies	[1] Value Line Adjusted Beta	[2] Unadjusted Beta	[3] Residual Standard Error of the Regression	[4] Standard Deviation of Beta
American States Water Company	0.65	0.40	2.4309	0.0601
American Water Works Company, Inc.	0.85	0.75	3.2139	0.0795
California Water Service Group	0.65	0.46	3.0606	0.0757
Essential Utilities Inc.	0.95	0.90	2.6745	0.0662
Middlesex Water Company	0.70	0.51	3.4876	0.0863
SJW Group	0.80	0.68	3.3451	0.0827
The York Water Company	0.85	0.71	3.4491	0.0853
Average	0.78	0.63	3.0945	0.0765
Beta Range (+/- 2 std. Devs. of Beta)	0.48	0.78		
2 std. Devs. of Beta	0.15			
Residual Std. Err. Range (+/- 2 std. Devs. of the Residual Std. Err.)	2.8225	3.3665		
Std. dev. of the Res. Std. Err.	0.1360			
2 std. devs. of the Res. Std. Err.	0.2720			

Source of Information: Valueline Proprietary Database, March 2022

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

Proxy Group of Twenty-Four Non-Price Regulated Companies	[1] Value Line Adjusted Beta	[2] Unadjusted Beta	[3] Residual Standard Error of the Regression	[4] Standard Deviation of Beta
Smith (A.O.)	0.85	0.77	2.8592	0.0707
Balchem Corp.	0.70	0.51	3.3114	0.0819
Becton, Dickinson	0.75	0.60	2.8626	0.0708
Bristol-Myers Squibb	0.85	0.75	2.9154	0.0721
Chemed Corp.	0.85	0.70	2.8432	0.0703
C.H. Robinson	0.75	0.56	3.0412	0.0752
CSG Systems Int'l	0.75	0.57	3.0997	0.0767
Quest Diagnostics	0.80	0.65	3.1904	0.0789
Heartland Express	0.75	0.55	2.8513	0.0705
Henry (Jack) & Assoc	0.85	0.70	2.9159	0.0721
Lancaster Colony	0.70	0.49	2.9597	0.0732
Lilly (Eli)	0.75	0.62	3.2324	0.0800
ManTech Int'l 'A'	0.85	0.75	3.1083	0.0769
McCormick & Co.	0.80	0.65	2.8247	0.0699
Monster Beverage	0.85	0.75	2.9659	0.0734
Northrop Grumman	0.85	0.75	2.9830	0.0738
Oracle Corp.	0.75	0.61	2.8406	0.0703
Progressive Corp.	0.75	0.59	2.9344	0.0726
RLI Corp.	0.80	0.65	2.8568	0.0707
Rollins, Inc.	0.85	0.73	3.1605	0.0782
Tyler Technologies	0.75	0.59	3.2277	0.0798
United Parcel Serv.	0.80	0.65	3.3248	0.0822
Werner Enterprises	0.75	0.62	3.2786	0.0811
Western Union	0.80	0.64	2.8493	0.0705
Average	0.79	0.64	3.0182	0.0747
Proxy Group of Seven Water Companies	0.78	0.63	3.0945	0.0765

Source of Information: Valueline Proprietary Database, March 2022

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

Principal Methods	Results using Current Interest Rates	Results using Projected 2023 Interest Rates	Results using Projected 2024 Interest Rates	Results using Projected 2025 Interest Rates
Discounted Cash Flow Model (DCF) (1)	10.68 %	10.68 %	10.68 %	10.68 %
Risk Premium Model (RPM) (2)	11.79	12.33	12.13	12.25
Capital Asset Pricing Model (CAPM) (3)	11.18	11.55	11.53	11.66
Mean	11.22 %	11.52 %	11.45 %	11.53 %
Median	11.18 %	11.55 %	11.53 %	11.66 %
Average of Mean and Median	11.20 %	11.54 %	11.49 %	11.60 %

Notes:
(1) From page 2 of this Schedule.
(2) From page 3 of this Schedule.
(3) From pages 6 through 9 of this Schedule.

Exhibit No. 1
Schedule DWD-7
Page 1 of 9

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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 Seven Water Companies

	[1]	[2]	[3]	[4]	[6]	[7]	[8]
Proxy Group of Twenty-Four 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	Average Projected Five Year Growth Rate in EPS	Adjusted Dividend Yield	Indicated Common Equity Cost Rate (1)
Smith (A.O.)	1.72 %	11.50 %	9.00 %	8.00 %	9.50 %	1.80 %	11.30 %
Balchem Corp.	0.48	14.00	NA	24.00	19.00	0.53	19.53
Becton, Dickinson	1.34	5.50	6.30	3.20	5.00	1.37	6.37
Bristol-Myers Squibb	2.96	NMF	6.20	4.43	5.32	3.04	8.36
Chemed Corp.	0.29	7.00	8.50	7.00	7.50	0.30	7.80
C.H. Robinson	2.13	8.50	9.00	7.24	8.25	2.22	10.47
CSG Systems Int'l	1.70	12.00	NA	(5.00)	12.00	1.80	13.80
Quest Diagnostics	1.93	7.00	NA	(13.70)	7.00	2.00	9.00
Heartland Express	0.57	8.50	NA	13.30	10.90	0.60	11.50
Henry (Jack) & Assoc	1.04	9.00	9.00	14.00	10.67	1.10	11.77
Lancaster Colony	2.08	5.50	NA	3.00	4.25	2.12	6.37
Lilly (Eli)	1.40	11.50	15.30	6.66	11.15	1.48	12.63
ManTech Int'l 'A'	1.95	7.50	NA	5.38	6.44	2.01	8.45
McCormick & Co.	1.49	6.00	6.10	6.95	6.35	1.54	7.89
Monster Beverage	-	11.50	15.70	14.58	13.93	-	NA
Northrop Grumman	1.41	7.50	6.10	6.10	6.57	1.46	8.03
Oracle Corp.	1.65	9.00	8.00	10.24	9.08	1.72	10.80
Progressive Corp.	0.36	4.50	17.60	NMF	11.05	0.38	11.43
RLI Corp.	0.95	12.00	NA	9.80	10.90	1.00	11.90
Rollins, Inc.	1.19	10.50	NA	8.20	9.35	1.25	10.60
Tyler Technologies	-	12.00	NA	10.00	11.00	-	NA
United Parcel Serv.	3.05	11.50	9.00	14.10	11.53	3.23	14.76
Werner Enterprises	1.26	9.00	4.10	9.40	7.50	1.31	8.81
Western Union	5.13	8.00	NA	6.84	7.42	5.32	12.74
						Mean	10.65 %
						Median	10.70 %
						Average of Mean and Median	10.68 %

NA= Not Available
NMF= Not Meaningful Figure

Notes: (1) The application of the DCF model to the domestic, non-price regluated 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 May 13, 2022. 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, 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 05/13/2022
www.yahoo.com Downloaded on 05/13/2022

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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

Line No.		Proxy Group of Twenty-Four Non-Price Regulated Companies	Results using Projected 2023 Interest Rates	Results using Projected 2024 Interest Rates	Results using Projected 2025 Interest Rates
1.	Prospective Yield on Baa2 Rated Corporate Bonds	-	5.35 % (1)	5.00 % (2)	5.30 % (3)
2.	Current Yield on Baa2 Rated Corporate Bonds (4)	4.30 %	-	-	-
3.	Adjustment to Reflect Bond rating Difference of Non-Price Regulated Companies (5)	(0.13)	(0.13)	(0.13)	(0.13)
4.	Adjusted Prospective Bond Yield	4.17	5.22	4.87	5.17
5.	Equity Risk Premium (6)	7.62	7.11	7.26	7.08
6.	Risk Premium Derived Common Equity Cost Rate	11.79 %	12.33 %	12.13 %	12.25 %

(1) Average forecast of 2023 Baa2 corporate bonds based upon the consensus of nearly 50 economists reported in Blue Chip Financial Forecasts dated December 1, 2021 and April 29, 2022 (see pages 13 and 14 of Schedule DWD-4). The estimates are detailed below.

First Quarter 2023	5.50 %
Second Quarter 2023	5.60
Third Quarter 2023	5.70
2023 Consensus	4.60
Average	5.35 %

(2) The projection of the 2024 Baa2 coporate bond is illustrated below:

2024 Consensus	5.00 %

(3) The projection of the 2025 Baa2 coporate bond is illustrated below:

2025 Consensus	5.30 %

(4) Three-month average Baa2 corporate bond yield ended February, 2022 as reported by Bloomberg Professional Services shown below:

Feb-22	3.97 %
Mar-22	4.29
Apr-22	4.64
Average	4.30 %

(5) The average yield spread of Baa rated corporate bonds over A corporate bonds for the three months ending April 2022 . To reflect the Baa1 average rating of the non-utility proxy group, the prosepctive yield on Baa corporate bonds must be adjusted by 1/3 of the spread between A and Baa corporate bond yields as shown below:

	A Corp. Bond Yield	Baa Corp. Bond Yield	Spread
Apr-22	4.21 %	4.64 %	0.43 %
Mar-22	3.88	4.29	0.41
Feb-22	3.60	3.97	0.37
		Average yield spread	0.40
		1/3 of spread	0.13

(6) From page 5 of this Schedule.

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

	Moody's Long-Term Issuer Rating May 2022		Standard & Poor's Long-Term Issuer Rating May 2022	
Proxy Group of Twenty-Four Non-Price Regulated Companies	Long-Term Issuer Rating	Numerical Weighting (1)	Long-Term Issuer Rating	Numerical Weighting (1)
Smith (A.O.)	NA	--	NA	--
Balchem Corp.	NA	--	NA	--
Becton, Dickinson	Baa3	10.0	BBB	9.0
Bristol-Myers Squibb	A2	6.0	A+	5.0
Chemed Corp.	WR	--	NR	--
C.H. Robinson	Baa2	9.0	BBB+	8.0
CSG Systems Int'l	NA	--	BB+	11.0
Quest Diagnostics	Baa2	9.0	BBB+	8.0
Heartland Express	NA	--	NA	--
Henry (Jack) & Assoc	NA	--	NA	--
Lancaster Colony	NA	--	NA	--
Lilly (Eli)	A2	6.0	A+	5.0
ManTech Int'l 'A'	WR	--	BB+	11.0
McCormick & Co.	Baa2	9.0	BBB	9.0
Monster Beverage	NA	--	NA	--
Northrop Grumman	Baa1	8.0	BBB+	8.0
Oracle Corp.	Baa2	9.0	BBB+	8.0
Progressive Corp.	A2	6.0	A	6.0
RLI Corp.	Baa2	9.0	BBB	9.0
Rollins, Inc.	NA	--	NA	--
Tyler Technologies	NA	--	NA	--
United Parcel Serv.	A2	6.0	A	6.0
Werner Enterprises	NA	--	NA	--
Western Union	Baa2	9.0	BBB	9.0
Average	Baa1	8.0	BBB+	8.0

Notes:
(1) From page 9 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-Four Non-Price Regulated Companies of Comparable risk to the
Proxy Group of Seven Water Companies

Line No.	Equity Risk Premium Measure	Results using Current Interest Rates	Results using Projected 2023 Interest Rates	Results using Projected 2024 Interest Rates	Results using Projected 2025 Interest Rates
	Ibbotson-Based Equity Risk Premiums:				
1.	Ibbotson Equity Risk Premium (1)	6.13 %	6.13 %	6.13 %	6.13 %
2.	Regression on Ibbotson Risk Premium Data (2)	9.16	8.02	8.34	7.96
3.	Ibbotson Equity Risk Premium based on PRPM (3)	8.35	8.35	8.35	8.35
4.	Equity Risk Premium Based on Value Line Summary and Index (4)	9.61	8.71	8.96	8.66
5	Equity Risk Premium Based on Value Line S&P 500 Companies (5)	12.87	11.97	12.22	11.92
6.	Equity Risk Premium Based on Bloomberg S&P 500 Companies (6)	10.37	9.48	9.73	9.43
7.	Conclusion of Equity Risk Premium	9.41 %	8.78 %	8.96 %	8.74 %
8.	Adjusted Beta (7)	0.81	0.81	0.81	0.81
9.	Forecasted Equity Risk Premium	7.62 %	7.11 %	7.26 %	7.08 %

Notes:
(1) From note 1 of page 12 of Schedule DWD-4.
(2) From note 2 of page 12 of Schedule DWD-4.
(3) From note 3 of page 12 of Schedule DWD-4.
(4) From note 4 of page 12 of Schedule DWD-4.
(5) From note 5 of page 12 of Schedule DWD-4.
(6) From note 6 of page 12 of Schedule DWD-4.
(7) Average of mean and median beta from page 6 of this Schedule.

Sources of Information:
Kroll 2022 SBBI® Yearbook
Value Line Summary and Index
Blue Chip Financial Forecasts, December 1, 2021 and April 29, 2022
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 Seven Water Companies
Using Current Interest Rates

Proxy Group of Twenty-Four Non-Price Regulated Companies	[1] Value Line Adjusted Beta	[2] Bloomberg Beta	[3] Average Beta	[4] Market Risk Premium (1)	[5] Risk-Free Rate (2)	[6] Traditional CAPM Cost Rate	[7] ECAPM Cost Rate	[8] Indicated Common Equity Cost Rate (3)
Smith (A.O.)	0.85	1.08	0.97	10.50 %	2.49 %	12.68 %	12.76 %	12.72 %
Balchem Corp.	0.70	0.96	0.83	10.50	2.49	11.21	11.65	11.43
Becton, Dickinson	0.75	0.53	0.64	10.50	2.49	9.21	10.16	9.68
Bristol-Myers Squibb	0.85	0.60	0.73	10.50	2.49	10.16	10.87	10.51
Chemed Corp.	0.85	0.80	0.82	10.50	2.49	11.10	11.57	11.34
C.H. Robinson	0.75	0.87	0.81	10.50	2.49	11.00	11.50	11.25
CSG Systems Int'l	0.75	0.88	0.81	10.50	2.49	11.00	11.50	11.25
Quest Diagnostics	0.80	0.55	0.68	10.50	2.49	9.63	10.47	10.05
Heartland Express	0.75	0.74	0.75	10.50	2.49	10.37	11.02	10.69
Henry (Jack) & Assoc	0.85	0.68	0.77	10.50	2.49	10.58	11.18	10.88
Lancaster Colony	0.70	0.70	0.70	10.50	2.49	9.84	10.63	10.24
Lilly (Eli)	0.75	0.67	0.71	10.50	2.49	9.95	10.71	10.33
ManTech Int'l 'A'	0.85	0.78	0.82	10.50	2.49	11.10	11.57	11.34
McCormick & Co.	0.80	0.58	0.69	10.50	2.49	9.74	10.55	10.14
Monster Beverage	0.85	0.96	0.91	10.50	2.49	12.05	12.28	12.16
Northrop Grumman	0.85	0.63	0.74	10.50	2.49	10.26	10.94	10.60
Oracle Corp.	0.75	0.86	0.81	10.50	2.49	11.00	11.50	11.25
Progressive Corp.	0.75	0.73	0.74	10.50	2.49	10.26	10.94	10.60
RLI Corp.	0.80	0.95	0.88	10.50	2.49	11.73	12.05	11.89
Rollins, Inc.	0.85	0.88	0.86	10.50	2.49	11.52	11.89	11.71
Tyler Technologies	0.75	0.93	0.84	10.50	2.49	11.31	11.73	11.52
United Parcel Serv.	0.80	1.09	0.94	10.50	2.49	12.36	12.52	12.44
Werner Enterprises	0.75	0.74	0.74	10.50	2.49	10.26	10.94	10.60
Western Union	0.80	1.01	0.90	10.50	2.49	11.94	12.20	12.07
Mean			0.80			10.84 %	11.38 %	11.11 %
Median			0.81			11.00 %	11.50 %	11.25 %
Average of Mean and Median			0.81			10.92 %	11.44 %	11.18 %

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

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 Seven Water Companies
Using 2023 Projected Interest Rates

Proxy Group of Twenty-Four Non-Price Regulated Companies	[1] Value Line Adjusted Beta	[2] Bloomberg Beta	[3] Average Beta	[4] Market Risk Premium (1)	[5] Risk-Free Rate (2)	[6] Traditional CAPM Cost Rate	[7] ECAPM Cost Rate	[8] Indicated Common Equity Cost Rate (3)
Smith (A.O.)	0.85	1.08	0.97	9.93 %	3.33 %	12.96 %	13.03 %	13.00 %
Balchem Corp.	0.70	0.96	0.83	9.93	3.33	11.57	11.99	11.78
Becton, Dickinson	0.75	0.53	0.64	9.93	3.33	9.68	10.58	10.13
Bristol-Myers Squibb	0.85	0.60	0.73	9.93	3.33	10.58	11.25	10.91
Chemed Corp.	0.85	0.80	0.82	9.93	3.33	11.47	11.92	11.69
C.H. Robinson	0.75	0.87	0.81	9.93	3.33	11.37	11.84	11.61
CSG Systems Int'l	0.75	0.88	0.81	9.93	3.33	11.37	11.84	11.61
Quest Diagnostics	0.80	0.55	0.68	9.93	3.33	10.08	10.88	10.48
Heartland Express	0.75	0.74	0.75	9.93	3.33	10.78	11.40	11.09
Henry (Jack) & Assoc	0.85	0.68	0.77	9.93	3.33	10.97	11.55	11.26
Lancaster Colony	0.70	0.70	0.70	9.93	3.33	10.28	11.02	10.65
Lilly (Eli)	0.75	0.67	0.71	9.93	3.33	10.38	11.10	10.74
ManTech Int'l 'A'	0.85	0.78	0.82	9.93	3.33	11.47	11.92	11.69
McCormick & Co.	0.80	0.58	0.69	9.93	3.33	10.18	10.95	10.57
Monster Beverage	0.85	0.96	0.91	9.93	3.33	12.36	12.59	12.48
Northrop Grumman	0.85	0.63	0.74	9.93	3.33	10.68	11.32	11.00
Oracle Corp.	0.75	0.86	0.81	9.93	3.33	11.37	11.84	11.61
Progressive Corp.	0.75	0.73	0.74	9.93	3.33	10.68	11.32	11.00
RLI Corp.	0.80	0.95	0.88	9.93	3.33	12.07	12.36	12.22
Rollins, Inc.	0.85	0.88	0.86	9.93	3.33	11.87	12.22	12.04
Tyler Technologies	0.75	0.93	0.84	9.93	3.33	11.67	12.07	11.87
United Parcel Serv.	0.80	1.09	0.94	9.93	3.33	12.66	12.81	12.74
Werner Enterprises	0.75	0.74	0.74	9.93	3.33	10.68	11.32	11.00
Western Union	0.80	1.01	0.90	9.93	3.33	12.27	12.51	12.39
Mean			0.80			11.23 %	11.73 %	11.48 %
Median			0.81			11.37 %	11.84 %	11.61 %
Average of Mean and Median			0.81			11.30 %	11.79 %	11.55 %

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

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 Seven Water Companies
Using 2024 Projected Interest Rates

Proxy Group of Twenty-Four Non-Price Regulated Companies	[1] Value Line Adjusted Beta	[2] Bloomberg Beta	[3] Average Beta	[4] Market Risk Premium (1)	[5] Risk-Free Rate (2)	[6] Traditional CAPM Cost Rate	[7] ECAPM Cost Rate	[8] Indicated Common Equity Cost Rate (3)
Smith (A.O.)	0.85	1.08	0.97	9.95 %	3.30 %	12.95 %	13.02 %	12.99 %
Balchem Corp.	0.70	0.96	0.83	9.95	3.30	11.56	11.98	11.77
Becton, Dickinson	0.75	0.53	0.64	9.95	3.30	9.67	10.56	10.11
Bristol-Myers Squibb	0.85	0.60	0.73	9.95	3.30	10.56	11.23	10.90
Chemed Corp.	0.85	0.80	0.82	9.95	3.30	11.46	11.91	11.68
C.H. Robinson	0.75	0.87	0.81	9.95	3.30	11.36	11.83	11.59
CSG Systems Int'l	0.75	0.88	0.81	9.95	3.30	11.36	11.83	11.59
Quest Diagnostics	0.80	0.55	0.68	9.95	3.30	10.06	10.86	10.46
Heartland Express	0.75	0.74	0.75	9.95	3.30	10.76	11.38	11.07
Henry (Jack) & Assoc	0.85	0.68	0.77	9.95	3.30	10.96	11.53	11.25
Lancaster Colony	0.70	0.70	0.70	9.95	3.30	10.26	11.01	10.64
Lilly (Eli)	0.75	0.67	0.71	9.95	3.30	10.36	11.08	10.72
ManTech Int'l 'A'	0.85	0.78	0.82	9.95	3.30	11.46	11.91	11.68
McCormick & Co.	0.80	0.58	0.69	9.95	3.30	10.16	10.94	10.55
Monster Beverage	0.85	0.96	0.91	9.95	3.30	12.35	12.58	12.47
Northrop Grumman	0.85	0.63	0.74	9.95	3.30	10.66	11.31	10.99
Oracle Corp.	0.75	0.86	0.81	9.95	3.30	11.36	11.83	11.59
Progressive Corp.	0.75	0.73	0.74	9.95	3.30	10.66	11.31	10.99
RLI Corp.	0.80	0.95	0.88	9.95	3.30	12.05	12.35	12.20
Rollins, Inc.	0.85	0.88	0.86	9.95	3.30	11.86	12.20	12.03
Tyler Technologies	0.75	0.93	0.84	9.95	3.30	11.66	12.05	11.86
United Parcel Serv.	0.80	1.09	0.94	9.95	3.30	12.65	12.80	12.73
Werner Enterprises	0.75	0.74	0.74	9.95	3.30	10.66	11.31	10.99
Western Union	0.80	1.01	0.90	9.95	3.30	12.25	12.50	12.38
Mean			0.80			11.21 %	11.72 %	11.47 %
Median			0.81			11.36 %	11.83 %	11.59 %
Average of Mean and Median			0.81			11.29 %	11.78 %	11.53 %

Notes:
(1) From Schedule DWD-5, page 5, note 1.
(2) From Schedule DWD-5, page 5, note 4.
(3) Average of CAPM and ECAPM cost rates.

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 Seven Water Companies
Using 2025 Projected Interest Rates

Proxy Group of Twenty-Four Non-Price Regulated Companies	[1] Value Line Adjusted Beta	[2] Bloomberg Beta	[3] Average Beta	[4] Market Risk Premium (1)	[5] Risk-Free Rate (2)	[6] Traditional CAPM Cost Rate	[7] ECAPM Cost Rate	[8] Indicated Common Equity Cost Rate (3)
Smith (A.O.)	0.85	1.08	0.97	9.74 %	3.60 %	13.05 %	13.12 %	13.09 %
Balchem Corp.	0.70	0.96	0.83	9.74	3.60	11.69	12.10	11.89
Becton, Dickinson	0.75	0.53	0.64	9.74	3.60	9.84	10.71	10.27
Bristol-Myers Squibb	0.85	0.60	0.73	9.74	3.60	10.71	11.37	11.04
Chemed Corp.	0.85	0.80	0.82	9.74	3.60	11.59	12.03	11.81
C.H. Robinson	0.75	0.87	0.81	9.74	3.60	11.49	11.96	11.72
CSG Systems Int'l	0.75	0.88	0.81	9.74	3.60	11.49	11.96	11.72
Quest Diagnostics	0.80	0.55	0.68	9.74	3.60	10.23	11.01	10.62
Heartland Express	0.75	0.74	0.75	9.74	3.60	10.91	11.52	11.21
Henry (Jack) & Assoc	0.85	0.68	0.77	9.74	3.60	11.10	11.66	11.38
Lancaster Colony	0.70	0.70	0.70	9.74	3.60	10.42	11.15	10.79
Lilly (Eli)	0.75	0.67	0.71	9.74	3.60	10.52	11.22	10.87
ManTech Int'l 'A'	0.85	0.78	0.82	9.74	3.60	11.59	12.03	11.81
McCormick & Co.	0.80	0.58	0.69	9.74	3.60	10.32	11.08	10.70
Monster Beverage	0.85	0.96	0.91	9.74	3.60	12.47	12.69	12.58
Northrop Grumman	0.85	0.63	0.74	9.74	3.60	10.81	11.44	11.13
Oracle Corp.	0.75	0.86	0.81	9.74	3.60	11.49	11.96	11.72
Progressive Corp.	0.75	0.73	0.74	9.74	3.60	10.81	11.44	11.13
RLI Corp.	0.80	0.95	0.88	9.74	3.60	12.17	12.47	12.32
Rollins, Inc.	0.85	0.88	0.86	9.74	3.60	11.98	12.32	12.15
Tyler Technologies	0.75	0.93	0.84	9.74	3.60	11.78	12.17	11.98
United Parcel Serv.	0.80	1.09	0.94	9.74	3.60	12.76	12.91	12.83
Werner Enterprises	0.75	0.74	0.74	9.74	3.60	10.81	11.44	11.13
Western Union	0.80	1.01	0.90	9.74	3.60	12.37	12.61	12.49
Mean			0.80			11.35 %	11.85 %	11.60 %
Median			0.81			11.49 %	11.96 %	11.72 %
Average of Mean and Median			0.81			11.42 %	11.91 %	11.66 %

Notes:
(1) From Schedule DWD-5, page 5, note 1.
(2) From Schedule DWD-5, page 5, note 5.
(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

		[1]		[2]	[3]	[4]
Line No.		Market Capitalization on May 13, 2022 (1) (millions)	(times larger)	Applicable Decile of the NYSE/AMEX/ NASDAQ (2)	Applicable Size Premium (3)	Spread from Applicable Size Premium (4)
1.	Carolina Water Service Inc. of North Carolina	$ 330.292		9	2.10%	
2.	Proxy Group of Seven Water Companies	$ 2,849.097	8.6 x	6	1.18%	0.92%
			[A]	[B]	[C]	[D]

	Decile	Market Capitalization of Smallest Company (millions)	Market Capitalization of Largest Company (millions)	Size Premium (Return in Excess of CAPM)*
Largest	1	$ 36,160.584	$ 2,324,390.219	-0.22%
	2	16,759.390	36,099.221	0.43%
	3	8,216.356	16,738.364	0.55%
	4	5,019.883	8,212.638	0.54%
	5	3,281.009	5,003.747	0.89%
	6	2,170.315	3,276.553	1.18%
	7	1,306.402	2,164.524	1.34%
	8	629.118	1,306.038	1.21%
	9	290.002	627.803	2.10%
Smallest	10	10.588	289.007	4.80%

*From 2022 Duff & Phelps Cost of Capital Navigator

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 0.92% in Column [4], Line No. 2 is derived as follows 0.92% = 2.1% - 1.18%.

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

Company	Exchange	[1] Common Stock Shares Outstanding at Fiscal Year End 2021 (millions)	[2] Book Value per Share at Fiscal Year End 2021 (1)	[3] Total Common Equity at Fiscal Year End 2021 (millions)	[4] Closing Stock Market Price on May 13, 2022	[5] Market-to-Book Ratio on May 13, 2022 (2)	[6] Market Capitalization on May 13, 2022 (3) (millions)
Carolina Water Service Inc. of North Carolina		NA	NA	$ 96.888 (4)	NA		
Based upon Proxy Group of Seven Water Companies						340.9 (5)	$ 330.292 (6)
Proxy Group of Seven Water Companies							
American States Water Company	NYSE	36.936	$ 18.571	$ 685.947	$ 77.990	420.0 %	$ 2,880.661
American Water Works Company, Inc.	NYSE	181.611	40.185	7,298.000	146.480	364.5	26,602.392
California Water Service Group	NYSE	53.716	22.023	1,182.980	53.040	240.8	2,849.097
Essential Utilities Inc.	NYSE	252.868	20.503	5,184.450	45.350	221.2	11,467.547
Middlesex Water Company	NASDAQ	17.522	20.987	367.726	91.180	434.5	1,597.656
SJW Group	NYSE	30.181	34.277	1,034.519	60.640	176.9	1,830.197
The York Water Company	NASDAQ	13.113	11.639	152.622	39.680	340.9	520.322
Median		36.936	$ 20.987	$ 1,034.519	$ 60.640	340.9 %	$ 2,849.097

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 2021 annual report filed with the Commission.
(5) The market-to-book ratio of Carolina Water Service Inc. of North Carolina on May 13, 2022 is assumed to be equal to the market-to-book ratio of Proxy Group of Seven Water Companies on May 13, 2022 as appropriate.
(6) Column [3] multiplied by Column [5].

Source of Information: 2021 Annual Forms 10K
Bloomberg Financial Services

scottmadden
MANAGEMENT CONSULTANTS

Appendix A – Resume & Testimony Listing of:

Dylan W. D'Ascendis, CRRA, CVA
Partner

Summary

Dylan is an experienced consultant and a Certified Rate of Return Analyst (CRRA) and Certified Valuation Analyst (CVA). Dylan joined ScottMadden in 2016 and has become a leading expert witness with respect to cost of capital and capital structure. He has served as a consultant for investor-owned and municipal utilities and authorities for 13 years. Dylan has testified as an expert witness on over 100 occasions regarding rate of return, cost of service, rate design, and valuation before more than 30 regulatory jurisdictions in the United States and Canada, an American Arbitration Association panel, and the Superior Court of Rhode Island. He also maintains the benchmark index against which the Hennessy Gas Utility Mutual Fund performance is measured. Dylan holds a B.A. in economic history from the University of Pennsylvania and an M.B.A. with concentrations in finance and international business from Rutgers University.

Areas of Specialization

- Regulation and Rates
- Rate of Return
- Valuation
- Mutual Fund Benchmarking
- Capital Market Risk
- Regulatory Strategy
- Cost of Service

Recent Expert Testimony Submission/Appearance

- Regulatory Commission of Alaska – Capital Structure
- Federal Energy Regulatory Commission – Rate of Return
- Public Utility Commission of Texas – Return on Equity
- Hawaii Public Utilities Commission – Cost of Service / Rate Design
- Pennsylvania Public Utility Commission - Valuation

Recent Assignments

- Provided expert testimony on the cost of capital for ratemaking purposes before numerous state utility regulatory agencies
- 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 Articles 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				
Cook Inlet Natural Gas Storage Alaska, LLC	07/21	Cook Inlet Natural Gas Storage Alaska, LLC	Docket No. TA45-733	Capital Structure
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				
Southwestern Electric Power Co.	07/21	Southwestern Electric Power Co.	Docket No. 21-070-U	Return on Equity
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.	01/22	Delmarva Power & Light Co.	Docket No. 22-002 (Gas)	Return on Equity
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	04/22	Washington Gas Light Company	Formal Case No. 1169	Rate of Return
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

Sponsor	Date	Case/Applicant	Docket No.	Subject
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
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				
Atmos Energy Corporation	07/21	Atmos Energy Corporation	2021-00304	PRP Rider Rate
Atmos Energy Corporation	06/21	Atmos Energy Corporation	2021-00214	Rate of Return
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				
Utilities, Inc. of Louisiana	05/21	Utilities, Inc. of Louisiana	Docket No. U-36003	Rate of Return
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
Maine Public Utilities Commission				
Summit Natural Gas of Maine, Inc.	03/22	Summit Natural Gas of Maine, Inc.	Docket No. 2022-00025	Rate of Return
The Maine Water Company	09/21	The Maine Water Company	Docket No. 2021-00053	Rate of Return

Sponsor	Date	Case/Applicant	Docket No.	Subject
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	11/01	Northern States Power Company	Docket No. G002/GR-21-678	Return on Equity
Northern States Power Company	10/21	Northern States Power Company	Docket No. E002/GR-21-630	Return on Equity
Northern States Power Company	11/20	Northern States Power Company	Docket No. E002/GR-20-723	Return on Equity
Mississippi Public Service Commission				
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.	Case No. SR-2016-0202	Rate of Return
Public Utilities Commission of Nevada				
Southwest Gas Corporation	09/21	Southwest Gas Corporation	Docket No. 21-09001	Return on Equity
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

Sponsor	Date	Case/Applicant	Docket No.	Subject
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 Co.	01/21	Southwestern Public Service Co.	Case No. 20-00238-UT	Return on Equity
North Carolina Utilities Commission				
Carolina Water Service, Inc.	07/21	Carolina Water Service, Inc.	Docket No. W-354 Sub 384	Rate of Return
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	09/21	Northern States Power Company	Case No. PU-21-381	Rate of Return
Northern States Power Company	11/20	Northern States Power Company	Case No. PU-20-441	Rate of Return
Public Utilities Commission of Ohio				
Duke Energy Ohio, Inc.	10/21	Duke Energy Ohio, Inc.	Case No. 21-887-EL-AIR	Return on Equity
Aqua Ohio, Inc.	07/21	Aqua Ohio, Inc.	Case No. 21-0595-WW-AIR	Rate of Return
Aqua Ohio, Inc.	05/16	Aqua Ohio, Inc.	Case No. 16-0907-WW-AIR	Rate of Return
Pennsylvania Public Utility Commission				
Citizens' Electric Company of Lewisburg	05/22	C&T Enterprises	Docket No. R-2022-3032369	Rate of Return
Valley Energy Company	05/22	C&T Enterprises	Docket No. R-2022-3032300	Rate of Return
Community Utilities of Pennsylvania, Inc.	04/21	Community Utilities of Pennsylvania, Inc.	Docket No. R-2021-3025207	Rate of Return
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

Sponsor	Date	Case/Applicant	Docket No.	Subject
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				
Oncor Electric Delivery Co. LLC	05/22	Oncor Electric Delivery Co. LLC	Docket No. 53601	Return on Equity
Southwestern Public Service Co.	02/21	Southwestern Public Service Co.	Docket No. 51802	Return on Equity
Southwestern Electric Power Co.	10/20	Southwestern Electric Power Co.	Docket No. 51415	Rate of Return
Virginia State Corporation Commission				

Sponsor	Date	Case/Applicant	Docket No.	Subject
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
Public Service Commission of West Virginia				
Monongahela Power Company and The Potomac Edison Company	12/21	Monongahela Power Company and The Potomac Edison Company	Case No. 21-0857-E-CN (ELG)	Return on Equity
Monongahela Power Company and The Potomac Edison Company	11/21	Monongahela Power Company and The Potomac Edison Company	Case No. 21-0813-E-P (Solar)	Return on Equity