PT-8
Middlesex Water Company
Docket No. ____________

BEFORE THE

NEW JERSEY BOARD OF PUBLIC UTILITIES

PREPARED DIRECT TESTIMONY

OF

DYLAN W. D’ASCENDIS, CRRA, CVA
PARTNER
SCOTTMADDEN, INC.

ON BEHALF OF

MIDDLESEX WATER COMPANY

MAY 2023

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I. INTRODUCTION

A. WITNESS IDENTIFICATION

Q. Please state your name and business address.

A. My name is Dylan W. D'Ascendis. My business address is 3000 Atrium Way, Suite 200, Mount Laurel, NJ 08054.

Q. By whom are you employed and in what capacity?

A. I am a Partner at ScottMadden, Inc.

B. BACKGROUND AND QUALIFICATIONS

Q. Please summarize your professional experience and educational background.

A. I have offered expert testimony on behalf of investor-owned utilities in over 35 state regulatory commissions in the United States, the Federal Energy Regulatory Commission, the Alberta Utility Commission, and one American Arbitration Association panel on issues including, but not limited to, common equity cost rate, rate of return, valuation, capital structure, class cost of service, and rate design.

On behalf of the American Gas Association ("AGA"), I have been calculating the AGA Gas Index for 15 years, 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.

II. <u>PURPOSE OF TESTIMONY</u>

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

A. The purpose of my Direct Testimony is to present evidence on behalf of Middlesex Water Company ("Middlesex" or the "Company") about the appropriate capital structure and corresponding cost rates the Company should be provided on the various components of its capital structure, and therefore given the opportunity to earn a reasonable return on its jurisdictional rate base.

Q. Have you prepared an Exhibit in support of your recommendation?

A. Yes. I have prepared Exhibit No. P-7, which consists of Schedules DWD-1 through DWD-12.

Q. What is your recommended cost of capital for Middlesex Water Company?

A. I recommend the New Jersey Board of Public Utilities ("NJ BPU" or the "Board") authorize the Company the opportunity to earn an overall rate of return of 7.09%.

The ratemaking capital structure consists of 46.12% long-term debt at an embedded cost rate of 3.20%, 0.28% preferred equity at a 5.01% cost rate, and 53.60% common equity at my recommended return on common equity ("ROE") of 10.45%. The overall rate of return is summarized on page 1 of Schedule DWD-1 and in Table 1 below:

Table 1: Summary of Overall Rate of Return

Type of Capital	Ratios	Cost rate	Weighted Cost Rate
Long-Term Debt	46.12%	3.20%	1.48%
Preferred Equity	0.28%	5.01%	0.01%
Common Equity	53.60%	10.45%	5.60%
Total	100.00%		7.09%

III. SUMMARY

Q. Please summarize your recommended common equity cost rate.

A. My recommended common equity cost rate of 10.45% is summarized on page 2 of Schedule DWD-1. I have assessed the market-based common equity cost rates of companies of relatively similar, but clearly not identical, risk to Middlesex. 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. No proxy group can be identical in risk to any single company, so there must be an evaluation of relative risk between the company and the proxy group to see if it is appropriate to make adjustments to the proxy group's indicated rate of return. My recommendation does not contemplate the potential operational and financial risks

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

which could result if the Company does not receive an award in this proceeding commensurate with the timing and amount of this request.

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 a proxy group of six water companies ("Utility Proxy Group") whose selection criteria will be discussed below. In addition, I also applied the DCF, RPM, and CAPM to a proxy group of domestic, non-price regulated companies comparable in total risk to the Utility Proxy Group ("Non-Price Regulated Proxy Group").

The results derived from each are as follows:

Table 2: Summary of Common Equity Cost Rate

Discounted Cash Flow Model	8.98%
Risk Premium Model	11.64%
Capital Asset Pricing Model	11.47%
Market Models Applied to Comparable Risk, Non-Price Regulated Companies	11.67%
Indicated Range of Common Equity Cost Rates Before Adjustments for Company-Specific Risk	9.83% - 10.83%
Business Risk Adjustment	0.10%
Flotation Cost Adjustment	0.03%
Indicated Range of Common Equity Cost Rates after Adjustment	9.95% – 10.95%
Recommended Cost of Common Equity	10.45%

After analyzing the indicated common equity cost rates derived through these models, the indicated range of common equity cost rates produced by the models are between 9.83% and 10.83%, which are applicable to the Utility Proxy Group. In view of these model results, it is clear that the DCF model is a low side outlier when compared to the results of the other models.

In order to obtain a fair comparison, the indicated range of common equity cost rates needed to be adjusted upward by 0.10% to reflect Middlesex's greater business risk relative to the Utility Proxy Group, and upward by 0.03% to reflect Middlesex's flotation costs.[3] This adjustment results in a Company-specific range of common equity cost rates between 9.95% and 10.95%. From this range of results, I recommend the Commission consider an authorized common equity cost rate of 10.45% for use in setting rates for the Company.

IV. GENERAL PRINCIPLES

Q. What general principles have you considered in arriving at your recommended common equity cost rate of 10.45%?

A. In unregulated industries, the competition within 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 provide safe and reliable service at all times to their customers requires a level of earnings sufficient to maintain the integrity of presently invested capital. Sufficient earnings also permit the attraction of needed new debt and equity capital at a reasonable cost under all or most market conditions for continued upgrade and replacement of utility infrastructure. The utility must compete with other firms of comparable risk for such capital, consistent with the fair rate of return standards

[3] Adjustments to the Utility Proxy Group's indicated ROE for Company-specific factors will be discussed in Section XI, below.

established by the U.S. Supreme Court in the previously cited *Hope* and *Bluefield* decisions. 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 [sic] 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. [4]

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 corresponding 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 its financial integrity; and 3) commensurate with returns on investments in enterprises having corresponding risks.

[4] *Hope*, 320 U.S. at 603.

In addition, 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 various 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 limited capital within the holding company family. Therefore, the opportunity cost concept applies regardless of whether the funding source is public or corporate. Even in Middlesex's case, where it is effectively the parent, this opportunity cost principle applies.

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 similar risk companies, which may include non-utilities. 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 for the utility reflects the risks and prospects of its operations and supports its financial integrity from a stand-alone perspective.

Q. Within that broad framework, how is the cost of capital estimated in regulatory proceedings?

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 weighted average cost of capital, in which 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 that firm.

The overall cost of capital (that is, the combination of the costs of debt and equity) is based on the economic principle of "opportunity costs." The principle of opportunity costs recognizes that 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 investment opportunities with comparable risks. 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.

The cost of debt is contractually defined and can be directly observed as the interest rate or yield on debt securities. However, 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. <u>BUSINESS RISK</u>

Q. Please define business risk and explain why it is important to the determination of a fair rate of return.

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

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

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 federal Safe Drinking Water Act, New Jersey's Water Quality Accountability Act, New Jersey's recent lead service line replacement legislation, regulations promulgated by the New Jersey Department of Environmental Protection (NJDEP), as well as additional responses to continuous monitoring by the U.S.

Environmental Protection Agency and state and local governments, of the water supply for potential contaminants. An example pertaining to Middlesex would be the completion of the Park Ave. treatment facility to achieve required compliance with NJDEP's regulation to remediate the per-flouroalkyl and poly-flouroalkyl (i.e. PFAS) chemicals which have been broadly and consistently in the national and international news.

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 financial investment to support required regulatory compliance and related infrastructure 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:

> Can the "Era of Good Feelings" continue between the Water Utility Industry and its regulators? In this century, the parties have worked together to solve a problem in which they both bore blame. For years, water bills were kept artificially low. This resulted in underinvestment in the maintenance of the nations' water infrastructure. Currently, many may be surprised to find out that the average age of pipelines here can be between 50 and 75 years.
>
> To make up for lost time, utilities began spending heavily to remedy the problem. The key point is that the replacement of the older assets would not have happened if state regulators did not allow these companies to recoup their investment. Rate increases on the average customer's bill have had to exceed the rate of inflation for some time. Because the country has been in a low inflationary environment from the financial crisis of 2007-2009 until 2020, the higher water bills did not draw much attention. However, with prices rising since 2021, there is a chance that resistance to rate hikes may begin to develop. When the costs needed to recover the modernization programs are combined with the rate of inflation, the

> typical rate hike would have to average in the double digits to make utilities whole. [5]

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 infrastructure. Water/wastewater utility assets generally tend to have long lives relative to other industries, and therefore, tend to 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. Simply, capital that is retiring in a higher inflationary and interest rate environment will likely need to be replaced with capital which is significantly more expensive.

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 reasonable 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,[6] 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 its debt and equity holders. If either retained earnings or free cash flow is inadequate, it will be very difficult for

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5 *Value Line Investment Survey*, April 7, 2023.

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

any 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 creating 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 to the determination of 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 (i.e., likelihood of default). Therefore, consistent with the basic financial principle of risk and return, investors demand a higher common equity return as compensation for bearing higher default risk.

Q. Can bond and credit ratings be a proxy for the combined business and financial risk (i.e., investment risk of an enterprise)?

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.[7] Although specific business or financial risks may differ between companies, the same bond/credit rating indicates that the combined risks are roughly similar, albeit not necessarily equal. This is because the purpose of the bond/credit rating process is to assess credit quality or credit risk (i.e., the risk of the company not paying its outstanding debt), and not to assess common equity risk (i.e., the risk of the company not paying its outstanding debt, nor compensating its equity investors).

Q. That being said, do rating agencies reflect 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 needs to be conducted for companies with similar bond ratings.

V. CAPITAL STRUCTURE

Q. What capital structure ratios do you recommend be employed in developing an overall fair rate of return appropriate for the Company?

A. I recommend the use of a ratemaking capital structure consisting of 46.12% long-term debt, and 53.88% total equity, consisting of 0.28% preferred equity, and 53.60% common equity, as shown on page 1 of Schedule DWD-2. This is Middlesex's actual consolidated capital structure at March 31, 2023.

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[7] 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 or A3.

Q. How does your proposed total equity ratio of 53.88% for Middlesex compare with the total equity ratios maintained by the companies in your Utility Proxy Group?

A. My proposed ratemaking total equity ratio of 53.88% for Middlesex is reasonable to use and is generally consistent with the range of total equity ratios maintained, on average, by the companies in the Utility Proxy Group on which I base my recommended common equity cost rate. Based on the data shown on page 2 of Schedule DWD-2, the 2022 total equity ratio for the Utility Proxy Group ranged from 40.70% to 61.35%.

In my opinion, Middlesex's consolidated capital structure consisting of 46.12% long-term debt and 53.88% total equity is appropriate for ratemaking purposes for Middlesex in the current proceeding. It is appropriate because it is generally consistent with the capital structure ratios (based on total permanent capital) maintained by the Utility Proxy Group on whose market data I base my recommended common equity cost rate.

VI. LONG-TERM DEBT COST RATE

Q. What cost rate for long-term debt is most appropriate for use in a cost of capital determination for Middlesex?

A. A long-term debt cost rate of 3.20%, estimated at test-year end September 30, 2023, is the most appropriate and is derived from Middlesex's long-term debt, estimated to be outstanding at September 30, 2023. On page 1 of Schedule DWD-3, I calculate the actual embedded cost rate at January 31, 2023 to be 2.68% for Middlesex. The long-term debt cost rate is determined by employing a cost rate to maturity method, i.e., yield to maturity, using as inputs the stated coupon rate and net proceeds ratio, which reflects the necessary costs of issuance, early redemption premiums, as well as any interest earned on the proceeds of applicable series held in trust, but not fully expended, and term in years. If such costs are not permitted to be recovered in the effective long-term debt cost rate, recovery would be at the expense of common shareholders and the cost rate for common equity capital would be higher than otherwise. Once the cost rate to maturity, i.e*.,* effective cost rate, is determined for each issue, a composite cost rate can be calculated based on the total annualized long-term debt cost and total long-term debt outstanding. Thus, Middlesex's embedded long-term debt cost rate at September 30, 2023 is expected to be 3.20%, as shown on the bottom of page 1 of Schedule DWD-3. This method of calculating the embedded cost rate has not been challenged by any party in the last several Middlesex base rate cases.

Q. Please describe your projection of the debt cost rate attributable to the Potential September 2023 Private Placement Loan.

A. Regarding the Potential Private Placement Loan, I assume that the expected interest rate for this loan will be the average A2-rated utility bond yield for March 2023, or 5.39%. Once the terms for these series are confirmed, I will update my recommended long-term debt cost rate using the actual data when it becomes available.

VII. PREFERRED EQUITY COST RATE

Q. What cost rate for preferred stock is most appropriate for use in a cost of capital determination?

A. A preferred stock cost rate of 5.01% expected at test-year end September 30, 2023 on an estimated basis is the most appropriate, for reasons previously explained. I also calculate the actual embedded cost rate at January 31, 2023 to be 5.01% for Middlesex. These cost rates are summarized on page 1 of Schedule DWD-4. In developing the embedded cost rates to maturity by issue, I have taken into account the impact of the necessary original costs of issuance. As discussed previously relative to debt cost, if such costs are not permitted to be recovered, recovery would be at the expense of the common shareholders and the cost rate for common equity capital would then be higher than otherwise. Historically, there has been little issue with including these costs in the effective preferred stock cost rate. The details of the cost rates to maturity by issue are shown on page 2.

Q. What is your conclusion regarding capital structure and the embedded cost rates of long-term debt and preferred equity?

A. It is my recommendation that the Board adopt Middlesex's actual consolidated capital structure at March 31, 2023 for ratemaking purposes which consists of 46.12% long-term debt, 0.28% preferred equity, and 53.60% common equity. My recommended embedded long-term debt cost rate is 3.20%, and my recommended embedded preferred equity cost rate is 5.01%.

VIII. <u>MIDDLESEX WATER COMPANY AND THE UTILITY PROXY GROUP</u>

Q. Are you familiar with the operations of Middlesex?

A. Yes, generally. Middlesex's operations serve approximately 61,000 customers primarily in eastern Middlesex County, as well as wholesale water to the City of Rahway, Townships of Edison and Marlboro, the Borough of Highland Park, and the Old Bridge Municipal Utilities Authority.[8] Middlesex's New Jersey operations

[8] Middlesex Water Company, SEC Form 10-K for the fiscal year ended December 31, 2022, at 2.

are not a separate publicly-traded entity. Middlesex's New Jersey operations are not independently rated by either Moody's or S&P.

Q. Please explain how you chose your Utility Proxy Group.

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

(i) They are included in the Water Utility Group of *Value Line's Standard Edition* (April 7, 2023);

(ii) They have 60% or greater of 2022 total operating income or 60% or greater of 2022 total assets attributable to regulated water operations;

(iii) At the time of preparation of this testimony, they had not publicly announced that they were involved in any major merger or acquisition activity (i.e., one publicly-traded utility merging with or acquiring another);

(iv) They have not cut or omitted their common dividends during the five years ending 2022 or through the time of the preparation of this testimony;

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

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

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

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

Q. Please describe Schedule DWD-5, page 1.

A. Page 1 of Schedule DWD-5 contains comparative capitalization and financial statistics for the Utility Proxy Group identified above for the years 2018 to 2022. During the five-year period ending 2022, the historically achieved average earnings rate on book common equity for the group averaged 10.02%. The average common equity ratio based on total capital (excluding short-term debt) was 51.05%, and the average dividend payout ratio was 60.40%.

Total debt to earnings before interest, taxes, depreciation, and amortization ("EBITDA") for the years 2018 to 2022 ranges between 4.37 and 5.91, with an average of 5.21. Funds from operations to total debt range from 11.39% to 22.17%, with an average of 14.79%.

Q. Have you reviewed financial data for Middlesex?

A. Yes. As shown on page 2 of Schedule DWD-5, during the five years ending 2022, Middlesex's achieved average earnings rate on book common equity was 6.56%, ranging from 5.88% to 7.96%. Total debt to EBITDA has averaged 7.25x for the five years ended 2022, ranging from 5.22x to 9.24x.

IX. COMMON EQUITY COST RATE MODELS

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

A. Yes. A public utility must compete for equity in capital markets along with all other companies of comparable risk, which includes non-utilities. The cost of common equity is thus determined based on equity market expectations for the returns of those comparable risk companies. If an individual investor is choosing to invest their capital among companies of comparable risk, they will invest in a company providing a higher return over a company providing a lower return.

Q. Are your cost of common equity models market-based models?

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

A. <u>DISCOUNTED CASH FLOW MODEL</u>

Q. What is the theoretical basis 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 cash flows received in the form of dividends plus appreciation in market price (the expected growth rate).

Mathematically, the dividend yield on market price plus a growth rate equals the capitalization rate, i.e., the total common equity return rate expected by investors.

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 April 14, 2023, divided by the average of closing market prices for the 60 trading days ending April 14, 2023.[9]

Q. Please explain your adjustment to the dividend yield.

A. Because dividends are paid periodically (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-6 have been adjusted upward to reflect one-half the average projected growth rate shown in Column 6.

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9 *See,* Schedule DWD-6, 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 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, the use of 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 DCF model results.

A. As shown on page 1 of Schedule DWD-6, the application of the DCF model to the Utility Proxy Group results in a wide range of indicated ROEs from 5.43% to 10.94%. The mean result of the application of the single-stage DCF model is 8.54%, the median result is 8.84%, and the average of the two is 8.69% for the Utility Proxy Group.

Q. Do you have any comments regarding your DCF model results?

A. Because Middlesex indicated DCF result of 5.43% is indistinguishable from that of the marginal yield on A-rated utility debt (5.39%),[10] it violates the basic financial

[10] Average A-rated utility bond yield for March 2023 as shown on page 4 of Schedule DWD-7.

principle of risk and return, namely that investors require greater returns for bearing greater risk. It is generally accepted that common equity capital has greater investment risk than debt capital, as common equity shareholders sit behind debt holders in any claim on a company's assets and earnings. Because of this, any investor required return on equity at or below the marginal yield on long-term debt related to that particular stock is non-sensical and should not be considered. Given that Middlesex's long-term credit rating from S&P is A, and the current (i.e., marginal) yield on A-rated utility bonds of 5.39%,[11] Middlesex's indicated DCF of 5.43% result violates the principle of risk and return stated above and should be eliminated.

Q. Considering the above, what is your recommended indicated ROE applicable to the DCF model?

A. Eliminating Middlesex's indicated DCF cost rate of 5.43% for the above reasons results in mean, median, and average of mean and median ROEs of 9.16%, 9.38%, and 9.27%, respectively. In arriving at a reasonable way of including a DCF-indicated common equity cost rate for the Utility Proxy Group of 8.98%, I have relied on an average of the mean and the median results of the DCF both including and excluding Middlesex's DCF result, which takes into consideration all the proxy companies' results, while mitigating the theoretically inconsistent nature of Middlesex's DCF results, but does not mitigate the mathematical flaws in the model at this time. Because my recommended DCF cost rate considers Middlesex's illogical DCF result, the 8.98% DCF-indicated common equity cost rate should be viewed as extremely conservative.

[11] Average A-rated utility bond yield for March 2023 as shown on page 4 of Schedule DWD-7.

Q. As shown on Table 2, above, the DCF results appear to be a low-side outlier compared to the rest of your model results even after mitigating the illogical Middlesex DCF result. Are there any specific weaknesses of the DCF model where it would mis-specify investors return on common equity necessitating the use of multiple common equity cost rate models?

A. Yes. The DCF model presumes that market-to-book ("M/B") ratios are at unity or 1.00. However, that is rarely the case. Morin[12] states:

> The third and perhaps most important reason for caution and skepticism is that application of the DCF model produces estimates of common equity cost that are consistent with investors' expected return <u>only</u> when stock price and book value are reasonably similar, that is, when the market-to-book ratio M/B is close to unity. As shown below, application of the standard DCF model to utility stocks <u>understates</u> the investor's expected return when the M/B ratio of a given stock exceeds unity. This is particularly relevant in the capital market environment of the early 2020s when utility stocks are trading at M/B ratios well above unity and have been for nearly several decades. The converse is also true, that is, the DCF model overstates the investor's return when the stock's M/B ratio is less than unity. The reason for the distortion is that the DCF market return is applied to a book value rate base by the regulator, that is, a utility's earnings are limited to earnings on a book value rate base. (emphasis supplied)

Since the "simplified" DCF model traditionally used in rate regulation assumes a M/B ratio of 1.00, it understates/overstates investors' required return rate when market value exceeds or is less than book value. It does so because utility investors evaluate and receive their returns on the <u>market</u> value of a utility's equity, whereas regulators authorize returns on <u>book</u> common equity. This means the market-based DCF model will produce the total annual dollar return expected

[12] Roger A. Morin, <u>Modern Regulatory Finance,</u> Public Utility Reports, Inc., 2021, at 481-482. ("Morin").

by investors only when market and book values are equal, and again, a rare and unlikely situation.

Market values can diverge from book values for a myriad of reasons including, but not limited to, EPS and DPS expectations, merger/acquisition expectations, the rising interest rate environment, etc. As noted by Phillips:

> Many question the assumption that market price should equal book value, believing that 'the earnings of utilities should be sufficiently high to achieve market-to-book ratios which are consistent with those prevailing for stocks of unregulated companies.[13]

In addition, Bonbright states:

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

Q. Can the under- or overstatement of investors' required rate of return by the DCF model be demonstrated mathematically?

A. Yes. The under- or overstatement of the investor required rate of return on the market by the DCF model is demonstrated mathematically on page 2 of Schedule DWD-6. Column [1] represents a M/B ratio of 100% (market and book value of equity is $30.00 per share). The DCF cost rate of 10.00% is comprised of a 3.00% dividend yield and 7.00% growth rate. The total return expected by investors is

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[13] Charles F. Phillips, The Regulation of Public Utilities, Public Utilities Reports, Inc., 1993, at 395.

[14] James C. Bonbright, Albert L. Danielsen and David R. Kamerschen, Principles of Public Utility Rates, Public Utilities Reports, Inc., 1988, at 334.

$3.00 ($0.90 dividends, $2.10 capital appreciation). When M/B ratios are not equal to 100%, the DCF model mis-specifies the investor expected return. As shown in Column [2], Line No. 7, using the same market value as Column [1] ($30.00) and a book value per share of $15.00 (a M/B ratio of 200%), the investor would only receive a return on book value of $1.50 ($15.00 * 10.00% investor-expected return). The $1.50 is broken down into $0.90 in dividends ($30.00 market price * 3.00% dividend yield) and $0.60 in capital appreciation. Since investor's expectations are based on market values, the capital appreciation return is 2.00% ($0.60 / $30.00), which is 5.00% less than the investor-expected return of 7.00% (the growth term in the DCF model). Conversely, as shown in Column [3], using the same market value of $30.00 and a book value per share of $37.50 (a M/B ratio of 80%), the investor would receive a return on book value of $3.75 ($37.50 * 10.00% investor-expected return) The $3.75 is broken down into $0.90 in dividends ($30.00 market price * 3.00% dividend yield) and $2.85 in capital appreciation. Since investor's expectations are based on market values, the capital appreciation return is 9.50% ($2.85 / $30.00), which is 2.50% more than the investor-expected return of 7.00% (the growth term in the DCF model).

Stated simply, the DCF model either understates or overstates investors' required cost of common equity capital when market values exceed/are less than their underlying book values. In this instance, the DCF model results for the Utility Proxy Group is a clear outlier compared to my other cost of common equity model results. Because of this, multiple cost of common equity models must be used for one to derive a more reliable estimate of the cost of common equity for a company.

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 in the event of a liquidation.

Q. Please explain how you derived your indicated cost of common equity based on the RPM.

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

1. <u>Predictive Risk Premium Model</u>

Q. Please explain the PRPM.

A. The PRPM, published in the *Journal of Regulatory Economics* and *The Electricity Journal*[15]*,* 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')".[16] Engle found that volatility changes over time and is related from one period to the next, 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.

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 <u>estimate</u> 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 March 2023. 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

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

16 www.nobelprize.org.

GARCH variance series[17] and a GARCH coefficient[18]. Multiplying the predicted monthly variance by the GARCH coefficient, then annualizing it[19], produces the predicted annual equity risk premium. I then added the forecasted 30-year U.S. Treasury Bond yield, 3.84%[20], to each company's PRPM-derived equity risk premium to arrive at an indicated cost of common equity. The 30-year Treasury yield is a consensus forecast derived from the *Blue Chip Financial Forecasts ("Blue Chip")*[21].

Q. Please describe your selection of a risk-free rate of return.

A. As shown in Schedules DWD-7 and DWD-8, the risk-free rate adopted for applications of the RPM and CAPM is 3.84%. This risk-free rate of 3.84% is based on the average of the *Blue Chip* consensus forecast of the expected yields on 30-year U.S. Treasury bonds for the six quarters ending with the third calendar quarter of 2024, and long-term projections for the years 2024 to 2028 and 2029 to 2033.

Q. Why do you use the 30-year Treasury yield in your analyses?

A. 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 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.

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17 Illustrated on Columns 1 and 2 of page 2 of Schedule DWD-7.
18 Illustrated on Column 4 of page 2 of Schedule DWD-7.
19 Annualized Return = (1+Monthly Return)^12 – 1.
20 *See,* Column 6 of page 2 of Schedule DWD-7.
21 *Blue Chip Financial Forecasts*, December 2, 2022, at p. 14 and March 31, 2023, at p. 2.

Q. What are the results of the PRPM?

A. As shown on page 2 of Schedule DWD-7, the mean PRPM indicated common equity cost rate for the Utility Proxy Group is 12.82%, the median is 12.00%, and the average of the two is 12.41%. Consistent with my reliance on the average of the median and mean results of the DCF, I relied on the average of the mean and median results of the Utility Proxy Group PRPM to calculate a cost of common equity rate of 12.41%.

2. Total Market Approach Risk Premium Model

Q. Please explain the total market approach RPM.

A. The total market approach RPM adds a prospective 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.

Q. Please explain the basis of the expected bond yield of 5.62% applicable to the Utility Proxy Group.

A. The first step in the total market approach RPM analysis is to determine the expected bond yield. Because both ratemaking and the cost of capital, including common equity cost rate, are prospective in nature, a prospective yield on similarly-rated long-term debt is essential. I rely on a consensus forecast of about 50 economists of the expected yield on Aaa-rated corporate bonds for the six calendar quarters ending with the third calendar quarter of 2024, and the long-term projections for 2024 to 2028 and 2029 to 2033 from *Blue Chip*. As shown on line 1 of page 3 of Schedule DWD-7, the average expected yield on Moody's Aaa-rated corporate bonds is 4.76%. In order to derive an expected yield on A2-rated public utility bonds, I make an upward adjustment of 0.77%, which represents a recent spread between Aaa-rated corporate bonds and A2-rated public utility bonds, in order to adjust the expected Aaa-rated corporate bond yield to an equivalent Moody's A2-rated public utility bond.[22] Adding that recent 0.77% spread to the expected Aaa-rated corporate bond yield of 4.76% results in an expected A2-rated public utility bond of 5.53%.

Since the Utility Proxy Group's average Moody's long-term issuer rating is A3, another adjustment to the expected A2-rated public utility bond yield is needed to reflect the difference in bond ratings. An upward adjustment of 0.09%, 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 A2/A3-rated public utility bond.[23] Adding the 0.09% to the 5.53% prospective A2-rated public utility bond yield results in a 5.62% expected bond yield for the Utility Proxy Group.

Table 3: Summary of the Calculation of the Utility Proxy Group Projected Bond Yield[24]

Prospective Yield on Moody's Aaa-Rated Corporate Bonds (*Blue Chip*)	4.76%
Adjustment to Reflect Yield Spread Between Moody's Aaa-Rated Corporate Bonds and Moody's A2-Rated Utility Bonds	0.77%
Adjustment to Reflect the Utility Proxy Group's Average Moody's Bond Rating of A2/A3	0.09%
Prospective Bond Yield Applicable to the Utility Proxy Group	5.62%

22 As shown on line 2 and explained in note 2 of page 3 of Schedule DWD-7.
23 As shown on Line No. 4 and explained in Note 3 on page 3 of Schedule DWD-7.
24 As shown on page 3 of Schedule DWD-7.

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

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) beta. The derivation of the beta-derived equity risk premium that I applied to the Utility Proxy Group is shown on lines1 through 9 of page 8 of Schedule DWD-7. The total beta-derived equity risk premium I applied was based on an average of: 1) Ibbotson-based equity risk premiums; 2) *Value Line*-based equity risk premiums; and 3) Bloomberg-based equity risk premium. Each of these is described in turn.

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") 2023 Yearbook ("SBBI – 2023")[25] less the average historical yield on Moody's Aaa/Aa-rated corporate bonds for the period 1928 to 2022. The use of 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 11.78% and the long-term arithmetic mean monthly

[25] 2023 SBBI Yearbook, at 248-250.

yield on Moody's Aaa/Aa-rated corporate bonds was 5.96%.[26] As shown on line 1 of page 8 of Schedule DWD-7, subtracting the mean monthly bond yield from the total return on large company stocks results in a long-term historical equity risk premium of 5.82%.

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 – 2023.[27] The use of 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 of 7.45%, shown on line 2 of Page 8 of Schedule DWD-7, 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 mentioned above. The relationship between interest rates and the market equity risk premium was

[26] As explained in note 1 on page 8of Schedule DWD-7.
[27] SBBI – 2023, at 193.

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 bonds yield:

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

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 March 2023.[28] 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 9.76%.[29]

Q. Please explain the derivation of a projected equity risk premium based on *Value Line Summary & Index* data for your RPM analysis.

A. As noted previously, because both ratemaking and the cost of capital are prospective, a prospective market equity risk premium is needed. The derivation of the forecasted or prospective market equity risk premium can be found in Note 4 on page 8 of Schedule DWD-7. Consistent with my calculation of the dividend yield component in my DCF analysis, this prospective market equity risk premium

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[28] Data from January 1928-December 2022 is from SBBI – 2023. Data from January – March 2023 is from Bloomberg Professional Services.

[29] Shown on Line No. 3 on page 8 of Schedule DWD-7.

is derived from an average of the three- to five-year median market price appreciation potential by *Value Line* for the 13 weeks ending April 14, 2023, 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.[30]

The average median expected price appreciation is 60%, which translates to a 12.47% annual appreciation, and when added to the average of *Value Line's* median expected dividend yields of 2.18%, equates to a forecasted annual total return rate on the market of 14.65%. The forecasted Aaa-rated bond yield of 4.76% is deducted from the total market return of 14.65%, resulting in an equity risk premium of 9.89%, shown on page 8, line 4 of Schedule DWD-7.

Q. Please explain the derivation of an equity risk premium based on the 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 and long-term growth estimates as a proxy for capital appreciation. The expected total return for the S&P 500 is 15.08%. Subtracting the prospective yield on Aaa-rated Corporate bonds of 4.76% results in a 10.32% projected equity risk premium.

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 and long-term growth estimates as a proxy for capital appreciation, identical to the method described above. The expected total

30 As explained in detail in page 2, note 1 of Schedule DWD-8.

return for the S&P 500 is 13.42%. Subtracting the prospective yield on Aaa-rated Corporate bonds of 4.76% results in an 8.66% projected equity risk premium.

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 in arriving at my conclusion of 8.65%.[31]

Table 4: Summary of the Calculation of the Equity Risk Premium Using Total Market Returns[32]

Historical Spread Between Total Returns of Large Stocks and Aaa and Aa2-Rated Corporate Bond Yields (1928 – 2022)	5.82%
Regression Analysis on Historical Data	7.45%
PRPM Analysis on Historical Data	9.76%
Prospective Equity Risk Premium using Total Market Returns from *Value Line* Summary & Index less Projected Aaa Corporate Bond Yields	9.89%
Prospective Equity Risk Premium using Measures of Capital Appreciation and Income Returns from *Value Line* for the S&P 500 less Projected Aaa Corporate Bond Yields	10.32%
Prospective Equity Risk Premium using Measures of Capital Appreciation and Income Returns from Bloomberg Professional Services for the S&P 500 less Projected Aaa Corporate Bond Yields	8.66%
Average	8.65%

After calculating the average market equity risk premium of 8.65%, I adjusted it 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 is a logical means by which to allocate a company's, or proxy group's,

31 *See,* line 7 on page 8 of Schedule DWD-7.
32 As shown on page 8 of Schedule DWD-7.

share of the market's total equity risk premium relative to corporate bond yields. As shown on page 1 of Schedule DWD-8, the average of the mean and median beta for the Utility Proxy Group is 0.76. Multiplying the beta of the Utility Proxy Group of 0.76 by the market equity risk premium of 8.65% results in a beta-adjusted equity risk premium of 6.57% for the Utility Proxy Group.

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 10.63% and monthly A-rated public utility bond yields of 6.44% from 1928 to 2022, to arrive at an equity risk premium of 4.19%.[33] I then used the same historical data to derive an equity risk premium of 5.09% 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 March 2023, to arrive at a PRPM-derived equity risk premium of 5.50% for the S&P Utility Index.

I then derived expected total returns on the S&P Utilities Index of 9.38% and 6.45% using data from *Value Line* and Bloomberg, respectively, and subtracted the prospective A2-rated public utility bond yield (5.53%),[34] which

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33 As shown on line 1 on page 11 of Schedule DWD-7.
34 Derived on line 3 of page 3 of Schedule DWD-7.

results in risk premiums of 3.85% and 0.92%, respectively. As with the market equity risk premiums, I averaged each risk premium to arrive at my utility-specific equity risk premium of 3.91%.

Table 5: Summary of the Calculation of the Equity Risk Premium Using S&P Utility Index Holding Returns[35]

Historical Spread Between Total Returns of the S&P Utilities Index and A2-Rated Utility Bond Yields (1928 – 2022)	4.19%
Regression Analysis on Historical Data	5.09%
PRPM Analysis on Historical Data	5.50%
Prospective Equity Risk Premium using Measures of Capital Appreciation and Income Returns from *Value Line* for the S&P Utilities Index less Projected A2 Utility Bond Yields	3.85%
Prospective Equity Risk Premium using Measures of Capital Appreciation and Income Returns from Bloomberg Professional Services for the S&P Utilities Index less Projected A2 Utility Bond Yields	0.92%
Average	3.91%

Q. What is your conclusion of an equity risk premium for use in your total market approach RPM analysis?

A. The equity risk premium I applied to the Utility Proxy Group is 5.24%, which is the average of the beta-derived and the S&P utility equity risk premiums of 6.57% and 3.91%, respectively.[36]

[35] As shown on page 11 of Schedule DWD-7.
[36] As shown on page 7 of Schedule DWD-7.

Q. What is the indicated RPM common equity cost rate based on the total market approach?

A. As shown on line 7 of Schedule DWD-7, page 3, I calculated a common equity cost rate of 10.86% for the Utility Proxy Group based on the total market approach of the RPM.

Table 6: Summary of the Total Market Return Risk Premium Model[37]

Prospective Moody's A3-Rated Utility Bond Applicable to the Utility Proxy Group	5.62%
Prospective Equity Risk Premium	5.24%
Indicated Cost of Common Equity	10.86%

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-7, the indicated RPM-derived common equity cost rate is 11.64%, which gives equal weight to the PRPM (12.41%) and the adjusted market approach results (10.86%).

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 of less than 1.0 indicates lower variability than the market as a whole, while a beta of greater than 1.0 indicates greater variability than the market.

The CAPM assumes that all other risk (i.e., all non-market or unsystematic risk) can be eliminated through diversification. The risk that cannot be eliminated

[37] As shown on page 3 of Schedule DWD-7.

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 (volatility of the security relative to the market as a whole).

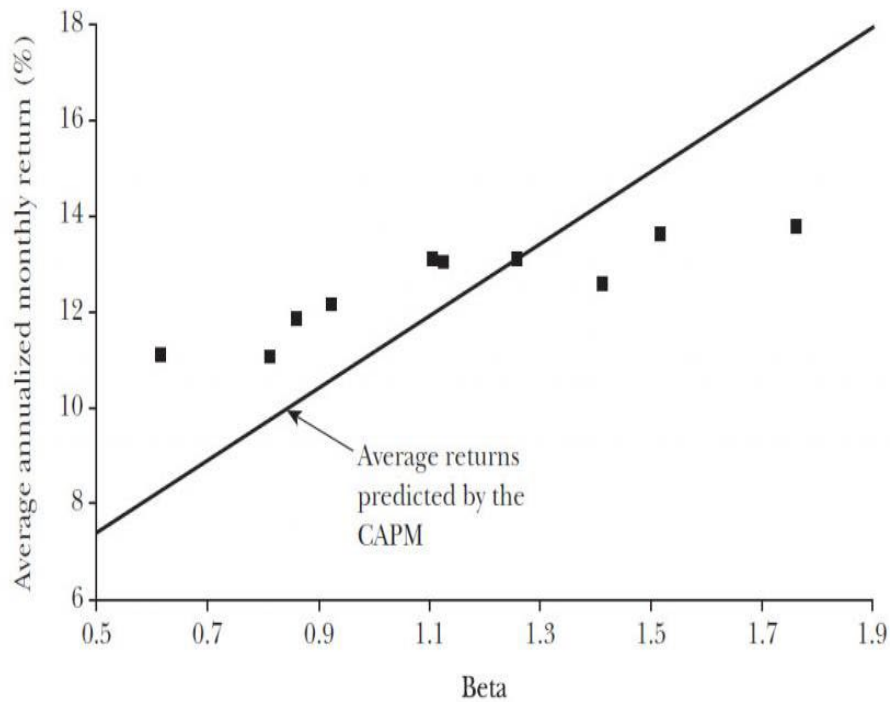
Numerous tests of the CAPM have measured the extent to which security returns and betas are related as predicted by the CAPM, confirming its validity. The empirical CAPM (“ECAPM”) reflects the reality that while the results of these tests support the notion that beta is related to security returns, the empirical Security Market Line (“SML”) described by the CAPM formula is not as steeply sloped as the predicted SML.[38] The ECAPM reflects this empirical reality. 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." [39]

[38] Morin, at 223.

[39] 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.[40]
>
> * * *
>
> 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 Return = 0.0829 +

40 Morin, at 207.

0.0520 β is between 0.25 and 0.30. If x = 0.25, the equation becomes:

$$K = R_F + 0.25(R_M - R_F) + 0.75\ \beta(R_M - R_F)^{41}$$

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 regression tests, like Fama and French (1992).[42]

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-Lintner CAPM predicts. The returns on the 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 is 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.[43]

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 beta did you use in your CAPM analysis?

A. With respect to beta, I considered two methods of calculation: the average of the beta coefficients of the Utility Proxy Group companies reported by Bloomberg and the average of the beta coefficients of the Utility Proxy Group companies as

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41 *Ibid.*, at 221.
42 Fama & French, at 32.
43 *Ibid.,* at 33.

reported by *Value Line*. 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's calculation is based on two years of data.

Q. Please describe your selection of a risk-free rate of return.

A. As discussed previously, the risk-free rate adopted for both applications of the CAPM is 3.84%. This risk-free rate of 3.84% is based on the average of the *Blue Chip* consensus forecast of the expected yields on 30-year U.S. Treasury bonds for the six quarters ending with the third calendar quarter of 2024, and long-term projections for the years 2024 to 2028 and 2029 to 2033.

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 2 of Schedule DWD-8. As discussed previously, the market risk premium is derived from an average of:

(i) Kroll-based market risk premiums;

(ii) *Value Line* data-based market risk premiums; and

(iii) Bloomberg data-based market risk premium.

The long-term income return on U.S. Government Securities of 5.00% was deducted from the SBBI - 2023 monthly historical total market return of 12.03%, which results in an historical market equity risk premium of 7.03%.[44] I applied a linear OLS regression to the monthly annualized historical returns on the S&P 500

[44] SBBI – 2023, at 248-250, 266-268.

relative to historical yields on long-term U.S. Government Securities from SBBI - 2023. That regression analysis yielded a market equity risk premium of 8.60%. The PRPM market equity risk premium is 10.86% and is derived using the PRPM relative to the yields on long-term U.S. Treasury securities from January 1926 through March 2023.

The *Value Line Summary & Index*-derived forecasted total market equity risk premium is derived by deducting the forecasted risk-free rate of 3.84%, discussed above, from the *Value Line* projected total annual market return of 14.65%, resulting in a forecasted total market equity risk premium of 10.81%. The S&P 500 projected market equity risk premium using *Value Line* data is derived by subtracting the projected risk-free rate of 3.84% from the projected total return of the S&P 500 of 15.08%. The resulting market equity risk premium is 11.24%.

The S&P 500 projected market equity risk premium using Bloomberg data is derived by subtracting the projected risk-free rate of 3.84% from the projected total return of the S&P 500 of 13.42%. The resulting market equity risk premium is 9.58%.

These six market risk premiums, when averaged, result in an average total market equity risk premium of 9.69%.

Table 7: Summary of the Calculation of the Market Risk Premium for Use in the CAPM[45]

Historical Spread Between Total Returns of Large Stocks and Long-Term Government Bond Yields (1926 – 2022)	7.03%
Regression Analysis on Historical Data	8.60%
PRPM Analysis on Historical Data	10.86%
Prospective Equity Risk Premium using Total Market Returns from *Value Line* Summary & Index less Projected 30-Year Treasury Bond Yields	10.81%
Prospective Equity Risk Premium using Measures of Capital Appreciation and Income Returns from *Value Line* for the S&P 500 less Projected 30-Year Treasury Bond Yields	11.24%
Prospective Equity Risk Premium using Measures of Capital Appreciation and Income Returns from Bloomberg Professional Services for the S&P 500 less Projected 30-Year Treasury Bond Yields	9.58%
Average	9.69%

Q. What are the results of your application of the traditional and empirical CAPM to the Utility Proxy Group?

A. As shown on page 1 of Schedule DWD-8, the mean and median results of my CAPM/ECAPM analyses are 11.69% and 11.24%, respectively, and the average of the two is 11.47%. Consistent with my reliance on the average of mean and median DCF results discussed above, the indicated common equity cost rate using the CAPM/ECAPM is 11.47%.

45 As shown on page 2 of Schedule DWD-8.

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

Q. Why did you also consider a proxy group of domestic, non-price regulated companies?

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

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 beta 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 37 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., non-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 are a measure of 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 <u>and</u> similar residual standard errors resulting from the same regression analyses should have similar total investment risk.

Q. Have you prepared a schedule which shows the data from which you selected the 37 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-9.

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 companies.

Page 2 of Schedule DWD-10 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 10.51%.

Pages 3 through 5 contain the data and calculations that support the 12.59% RPM cost rate. As shown on line 1 of page 3 of Schedule DWD-10, the consensus prospective yield on Moody's Baa2-rated corporate bonds for the six quarters ending in the third quarter of 2024, and for the years 2024 to 2028 and 2029 to 2033, is 5.84%.[46] Because the Non-Price Regulated Proxy Group has an average Moody's bond rating of Baa1/Baa2, a downward adjustment of 0.08% to the prospective Baa2-rated bond yield is necessary to reflect the difference in bond ratings.[47] Subtracting 0.08% from the prospective Baa2-rated bond yield of 5.84% is 5.76%.

When the beta-adjusted risk premium of 6.83%[48] relative to the Non-Price Regulated Proxy Group is added to the prospective Baa2-rated corporate bond yield of 5.76%, the indicated RPM cost rate is 12.59%.

Page 6 contains the inputs and calculations that support my indicated CAPM/ECAPM cost rate of 11.72%.

Q. What is the cost rate of common equity based on the Non-Price Regulated Proxy Group comparable in total risk to the Utility Proxy Group?

A. As shown on page 1 of Schedule DWD-10, 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 10.51%, 12.59%, and 11.72%, respectively. The

46 *Blue Chip Financial Forecasts*, December 2, 2022, at 14 and March 31, 2023, at 2.
47 As demonstrated on Schedule DWD-10, page 3, note 2.
48 Derived on page 5 of Schedule DWD-10.

average of the mean and median of these models is 11.67%, which I used as the indicated common equity cost rate for the Non-Price Regulated Proxy Group.

X. CONCLUSION OF COMMON EQUITY COST RATE BEFORE ADJUSTMENT

Q. What is the indicated range of common equity cost rates before adjustment?

A. Based on the results of the application of multiple cost of common equity models to the Utility Proxy Group and the Non-Price Regulated Proxy Group, the indicated model results are between 9.83% and 10.83%. I used multiple cost of common equity models as primary tools in arriving at my recommended common equity cost rate, because no single model is so inherently precise that it can be relied on solely to the exclusion of other theoretically sound models. The use of multiple models adds reliability to the estimation of the common equity cost rate, and the prudence of using multiple cost of common equity models is supported in both the financial literature and regulatory precedent.

XI. ADJUSTMENTS TO THE COMMON EQUITY COST RATE

A. BUSINESS RISK ADJUSTMENT

Q. Does Middlesex's smaller size increase its business risk?

A. Yes. Middlesex'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, all else equal, 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.

As further evidence illustrates that smaller firms are generally riskier than larger ones, all else equal, investors generally demand greater returns from smaller firms to compensate for less marketability and liquidity of their securities. Duff & Phelps (now 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 Premiums," 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)[49]

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 38, they note:

> **. . .** the higher average returns on small stocks and high book-to-market stocks reflect unidentified state variables that produce undiversifiable risks (covariances) in returns that are not captured by the market return and are priced separately from market betas.[50]

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

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49 Kroll: Cost of Capital Navigator: U.S. Cost of Capital Module, "Size as a Predictor of Equity Returns," at 1.

50 Fama & French, at 25-43.

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.[51] Eugene Brigham, a well-known authority, states:

> A number of researchers have observed that portfolios of small-firm stocks 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 firm to provide average returns in the stock market that are higher than those of large 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 large firms.** (emphasis added)[52]

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

Q. Is there a way to quantify a relative risk adjustment due to Middlesex's greater business risk relative to the Utility Proxy Group?

A. Yes. In the absence of other empirical methods, I compared Middlesex's and the Utility Proxy Group's relative size, as measured by an estimated market capitalization of common equity for Middlesex's.

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

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

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

	Market Capitalization* ($ Millions)	Times Greater than the Company
Middlesex Water Company	$998.476	
Utility Proxy Group Median	$3,328.028	3.3x
*From page 1 of Schedule DWD-11.		

The Company's estimated market capitalization was $998.476 million as of April 14, 2023, compared with the $3.3 billion median market capitalization of the companies in the Utility Proxy Group as of April 14, 2023. The Utility Proxy Group's median market capitalization is 3.3 times the size of Middlesex's estimated market capitalization.

The average size premium for the Utility Proxy Group with a market capitalization of $3.3 billion falls in the 5th decile, while Middlesex's market capitalization of $998.476 million places the Company in the 7th decile. The size premium spread between the 5th decile and the 7th decile is 0.44%. Even though the indicated size premium is 0.44%, I applied a size premium of 0.10% to Middlesex's indicated range of common equity cost rates.

B. <u>FLOTATION COST ADJUSTMENT</u>

Q. What are flotation costs?

A. Flotation costs are those costs associated with the sale of new issuances of common stock. They include market pressure and the essential costs of issuance (*e.g.*, underwriting fees and out-of-pocket costs for printing, legal, registration, etc.).

Q. Why is it important to recognize flotation costs in the allowed common equity cost rate?

A. It is important because there is no other mechanism in the ratemaking paradigm through which such costs are normally recovered. Because these costs are real and legitimate, these costs have to be recovered. As noted by Morin:

> The costs of issuing these securities are just as real as operating and maintenance expenses or costs incurred to build utility plants, and fair regulatory treatment must permit recovery of these costs….
>
> The simple fact of the matter is that common equity capital is not free….[Flotation costs] must be recovered through a rate of return adjustment.[53]

Q. Should flotation costs be recognized for the lives of the Company's securities?

A. Yes. As noted above, there is normally no mechanism to recapture such costs in the ratemaking paradigm other than an adjustment to the allowed common equity cost rate. Flotation costs are charged to capital accounts and are not normally expensed on a utility's income statement. As such, flotation costs are analogous to capital investments reflected on the balance sheet. Recovery of capital investments relates to the expected useful lives of the investment. Since common equity has a very long and indefinite life (assumed to be infinity in the standard regulatory DCF model), flotation costs should be recovered through an adjustment to common equity cost rate, even when there has not been an issuance during the test year or in the absence of an expected imminent issuance of additional shares of common stock.

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53 Morin, at 329.

Historical flotation costs are a permanent loss of investment to the utility and should be accounted for. When any company, including a utility, issues common stock, flotation costs are incurred for legal, accounting, printing fees and the like. For each dollar of issuing market price, a small percentage is expensed and is permanently unavailable for investment in utility rate base. These expenses are charged to capital accounts and not expensed on the income statement; therefore, the only way to restore the full value of that dollar of issuing price with an assumed investor required return of 10% is for the net investment, $0.95, to earn more than 10% to net back to the investor a fair return on that dollar. In other words, if a company issues stock at $1.00 with 5% in flotation costs, it will net $0.95 in investment. Assuming the investor in that stock requires a 10% return on his or her invested $1.00 (i.e., a return of $0.10), the company needs to earn approximately 10.5% on its invested $0.95 to receive a $0.10 return.

Q. Do the common equity cost rate models you have used already reflect investors' anticipation of flotation costs?

A. No. All of these models specifically assume no transaction costs. The literature is quite clear that these costs are not reflected in market prices paid for common stocks. For example, Brigham and Daves confirm this and provide the methodology utilized to calculate the flotation adjustment.[54] In addition, Morin confirms the need for such an adjustment even when no new equity issuance is imminent.[55] Consequently, it is proper to include a flotation cost adjustment when using cost of common equity models to estimate the common equity cost rate.

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54 Eugene F. Brigham and Phillip R. Daves, Intermediate Financial Management, 9th Edition, Thomson/Southwestern, at 342.

55 Morin, at 337-339.

Q. How did you calculate the flotation cost allowance?

A. I modified the DCF calculation to provide a dividend yield that would reimburse investors for issuance costs in accordance with the method cited in literature by Brigham and Daves, as well as by Morin. The flotation cost adjustment recognizes the costs of issuing equity that were incurred by Middlesex. Based upon the issuance costs shown on page 1 of Schedule DWD-12, an adjustment of 0.03% is required to reflect the flotation costs applicable to the Company.

Q. What is the indicated range of common equity cost rates after adjustments for size and flotation costs?

After applying the 0.10% business risk adjustment and the 0.03% flotation cost adjustment to the indicated range of common equity cost rates between 9.83% and 10.83%, based on the Utility Proxy Group results, a range of common equity cost rates between 9.95% and 10.95% is applicable to Middlesex.

XII. CONCLUSION

Q. What is your recommended return on investor-supplied capital for Middlesex?

A. Given my recommended ratemaking capital structure, which consists of 46.12% long-term debt at an embedded debt cost rate of 3.20%, 0.28% preferred equity at a 5.01% cost rate, and 53.60% common equity at my recommended ROE of 10.45%, I conclude that an appropriate return on investor-supplied capital for the Company is 7.09%. A common equity cost rate of 10.45% is 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 Middlesex 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. In your opinion, is your proposed common equity cost rate of 10.45% fair and reasonable to Middlesex, its shareholders, and its customers?

A. Yes, it is.

Q. Does this conclude your Direct Testimony?

A. Yes, it does.

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 14 years. Dylan has testified as an expert witness on over 125 occasions regarding rate of return, cost of service, rate design, and valuation before more than 35 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				
ENSTAR Natural Gas Company	08/22	ENSTAR Natural Gas Company	Docket No. TA334-4	Rate of Return
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.	02/23	AltaLink, L.P., and EPCOR Distribution & Transmission, Inc.	Proceeding ID. 27804	Determination of Cost-of-Capital Parameters
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				
Arizona Water Company	12/22	Arizona Water Company – Eastern Group	Docket No. W-01445A-22-0286	Rate of Return
EPCOR Water Arizona, Inc.	08/22	EPCOR Water Arizona, Inc.	Docket No. WS-01303A-22-0236	Rate of Return
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				
Atmos Energy Corporation	08/22	Atmos Energy Corporation	Docket No. 22AL-0348G	Rate of Return
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.	12/22	Delmarva Power & Light Co.	Docket No. 22-0897 (Electric)	Return on Equity
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				
Ameren Illinois Company d/b/a Ameren Illinois	01/23	Ameren Illinois Company d/b/a Ameren Illinois	Docket No. 23-0082 (Electric)	Return on Equity
Ameren Illinois Company d/b/a Ameren Illinois	01/23	Ameren Illinois Company d/b/a Ameren Illinois	Docket No. 23-0067 (Gas)	Return on Equity
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 Corporation	07/19	Atmos Energy Corporation	19-ATMG-525-RTS	Rate of Return
Kentucky Public Service Commission				
Bluegrass Water Utility Operating Company	02/23	Bluegrass Water Utility Operating Company	2022-00432	Return on Equity
Atmos Energy Corporation	07/22	Atmos Energy Corporation	2022-00222	PRP Rider Rate
Water Service Corporation of KY	06/22	Water Service Corporation of KY	2022-00147	Rate of Return
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				
FirstEnergy, Inc.	03/23	Potomac Edison Company	Case No. 9695	Rate of Return
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	D.P.U. 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				
Great River Utility Operating Co.	07/22	Great River Utility Operating Co.	Docket No. 2022-UN-86	Rate of Return
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				
FirstEnergy	03/23	Jersey Central Power & Light Co.	Docket No. ER23030144	Rate of Return
Atlantic City Electric Company	02/23	Atlantic City Electric Company	Docket No. ER20120746	Return on Equity
Middlesex Water Company	05/21	Middlesex Water Company	Docket No. WR21050813	Rate of Return
Atlantic City Electric Company	12/20	Atlantic City Electric Company	Docket No. ER20120746	Return on Equity
FirstEnergy	02/20	Jersey Central Power & Light Co.	Docket No. ER20020146	Rate of Return
Aqua New Jersey, Inc.	12/18	Aqua New Jersey, Inc.	Docket No. WR18121351	Rate of Return
Middlesex Water Company	10/17	Middlesex Water Company	Docket No. WR17101049	Rate of Return
Middlesex Water Company	03/15	Middlesex Water Company	Docket No. WR15030391	Rate of Return
The Atlantic City Sewerage Company	10/14	The Atlantic City Sewerage Company	Docket No. WR14101263	Cost of Service / Rate Design
Middlesex Water Company	11/13	Middlesex Water Company	Docket No. WR1311059	Capital Structure
New Mexico Public Regulation Commission				
Southwestern Public Service Co.	11/22	Southwestern Public Service Co.	Case No. 22-00286-UT	Return on Equity
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.	07/22	Carolina Water Service, Inc.	Docket No. W-354 Sub 400	Rate of Return
Aqua North Carolina, Inc.	06/22	Aqua North Carolina, Inc.	Docket No. W-218 Sub 573	Rate of Return

Sponsor	Date	Case/Applicant	Docket No.	Subject
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				
Aqua Ohio, Inc.	11/22	Aqua Ohio, Inc.	Case No. 22-1094-WW-AIR	Rate of Return
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				
Borough of Ambler	06/22	Borough of Ambler – Bureau of Water	Docket No. R-2022-3031704	Rate of Return
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
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

Sponsor	Date	Case/Applicant	Docket No.	Subject
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
South Dakota Public Service Commission				
Northern States Power Company	06/22	Northern States Power Company	Docket No. EL22-017	Rate of Return
Tennessee Public Utility Commission				
Piedmont Natural Gas Company	07/20	Piedmont Natural Gas Company	Docket No. 20-00086	Return on Equity
Public Utility Commission of Texas				
Southwestern Public Service Co.	02/23	Southwestern Public Service Co.	Docket No. 54634	Return on Equity
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				
Washington Gas Light Company	06/22	Washington Gas Light Company	PUR-2022-00054	Return on Equity
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

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to Exhibit No. P-7
of Dylan W. D'Ascendis, CRRA, CVA

Middlesex Water Company
Recommended Capital Structure and Cost Rates
for Ratemaking Purposes

Type Of Capital	Ratios (1)	Cost Rate		Weighted Cost Rate
Long-Term Debt	46.12%	3.20%	(2)	1.48%
Preferred Equity	0.28%	5.01%	(3)	0.01%
Common Equity	53.60%	10.45%	(4)	5.60%
Total	100.00%			7.09%

Notes:

(1) Actual consolidated capital structure of Middlesex Water Company at March 31, 2023.
(2) From Schedule DWD-3.
(3) From Schedule DWD-4.
(4) From page 2 of this Schedule.

Middlesex Water Company
Brief Summary of Common Equity Cost Rate

Line No.	Principal Methods	Proxy Group of Six Water Companies
1.	Discounted Cash Flow Model (DCF) (1)	8.98%
2.	Risk Premium Model (RPM) (2)	11.64%
3.	Capital Asset Pricing Model (CAPM) (3)	11.47%
4.	Market Models Applied to Comparable Risk, Non-Price Regulated Companies (4)	11.67%
5.	Indicated Common Equity Cost Rate before Adjustment for Unique Risk	9.83% - 10.83%
6.	Business Risk Adjustment (5)	0.10%
7.	Flotation Cost Adjustment (6)	0.03%
8.	Indicated Common Equity Cost Rate after Adjustment	9.95% - 10.95%
9.	Recommended Common Equity Cost Rate	10.45%

Notes:
(1) From Schedule DWD-6.
(2) From page 1 of Schedule DWD-7.
(3) From page 1 of Schedule DWD-8.
(4) From page 1 of Schedule DWD-10.
(5) Business risk adjustment to reflect the Company's unique risk compared to the Utility Proxy Group as detailed in the accompanying direct testimony.
(6) From page 1 of Schedule DWD-12.

Middlesex Water Company
Capitalization and Capital Structure Ratios
Based Upon Investor-Provided Capital
Actual at March 31, 2023

	March 31, 2023 (Actual)	
Capitalization	Amount Outstanding	Ratios (%)
Long-Term Debt		
Total Long-Term Debt	347,085,000	46.12 %
Preferred Stock		
Total Preferred Stock	2,084,000	0.28
Common Equity		
Total Common Equity	403,355,000	53.60
Total Permanent Capital Employed	$752,524,000	100.00 %

Source of Information: SEC filed 10-Q for the three months ending March 31, 2023.

Capital Structure Based upon Total Permanent Capital for the
Proxy Group of Six Water Companies
2018 - 2022, Inclusive

	2022	2021	2020	2019	2018	5 YEAR AVERAGE
American States Water Company						
Long-Term Debt	38.65 %	37.56 %	40.72 %	31.87 %	36.54 %	37.07 %
Preferred Stock	0.00	0.00	0.00	0.00	0.00	0.00
Common Equity	61.35	62.44	59.28	68.13	63.46	62.93
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
American Water Works Company, Inc.						
Long-Term Debt	59.29 %	58.75 %	59.93 %	58.59 %	56.55 %	58.62 %
Preferred Stock	0.01	0.02	0.02	0.03	0.05	0.03
Common Equity	40.70	41.23	40.05	41.38	43.40	41.35
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
California Water Service Group						
Long-Term Debt	44.39 %	47.28 %	46.04 %	50.90 %	52.74 %	48.27 %
Preferred Stock	0.00	0.00	0.00	0.00	0.00	0.00
Common Equity	55.61	52.72	53.96	49.10	47.26	51.73
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
Essential Utilities Inc.						
Long-Term Debt	54.99 %	53.28 %	54.42 %	44.23 %	56.06 %	52.60 %
Preferred Stock	0.00	0.00	0.00	0.00	0.00	0.00
Common Equity	45.01	46.72	45.58	55.77	43.94	47.40
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
Middlesex Water Company						
Long-Term Debt	43.34 %	45.86 %	44.61 %	42.20 %	38.94 %	42.99 %
Preferred Stock	0.29	0.30	0.33	0.37	0.59	0.38
Common Equity	56.37	53.84	55.06	57.43	60.47	56.63
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
SJW Group						
Long-Term Debt	57.39 %	59.69 %	59.79 %	59.05 %	32.67 %	53.72 %
Preferred Stock	0.00	0.00	0.00	0.00	0.00	0.00
Common Equity	42.61	40.31	40.21	40.95	67.33	46.28
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
Proxy Group of Six Water Companies						
Long-Term Debt	49.67 %	50.41 %	50.92 %	47.80 %	45.58 %	48.88 %
Preferred Stock	0.05	0.05	0.06	0.07	0.11	0.07
Common Equity	50.28	49.54	49.02	52.13	54.31	51.05
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %

Source of Information
Annual Forms 10-K

Middlesex Water Company
Calculation of the Composite Cost Rate of Long-Term Debt Outstanding
Actual at January 31, 2023 and
Estimated at September 30, 2023

Actual at January 31, 2023

Series		Amount Outstanding (1)	Effective Cost Rate (2)	Annualized Cost	Composite Interest Rate
First Mortgage Bonds					
0.00% Series EE		$ 192,280	0.00	-	
3.00% to 5.50% Series FF		645,000	4.86	31,347	
0.00% Series GG		352,343	0.00	-	
4.00% to 5.00% Series HH		435,000	6.85	29,798	
0.00% Series II		151,772	0.00	-	
3.40% to 5.00% Series JJ		318,000	6.84	21,751	
0.00% Series KK		528,210	0.00	-	
5.00% to 5.50% Series LL		665,000	6.30	41,895	
0.00% Series MM		703,135	0.00	-	
3.00%- 4.375% Series NN		920,000	4.58	42,136	
0.00% Series OO due 2031		1,304,407	0.00	-	
2.00% - 5.00% Series PP due 2031		510,000	3.75	19,125	
5.00% Series QQ due 2023*		9,915,000	3.13	310,340	
0.00% Series TT due 2032		1,454,915	0.00	-	
3.00% - 3.25% Series UU due 2032		605,000	4.03	24,382	
0.00% Series VV due 2033		1,526,918	0.00	-	
3.00% - 5.00% Series WW due 2033		630,000	4.86	30,618	
0.00% Series 2018A 2017 RENEW - Fund due 2047		5,689,765	0.00	-	
3.00% to 5.00% Series 2018B 2017 RENEW - Trust due 2047		2,180,000	5.18	112,924	
0.00% Series XX due 2047		9,361,560	0.00	-	
3.00% to 5.00% Series YY due 2047		3,545,000	5.06	179,377	
4.00% NJEDA Series 2019A due 2059 *		32,500,000	3.66	1,189,500	
5.00% NJEDA Series 2019B due 2059 *		21,200,000	4.04	856,480	
2.90% Private Placement Series 2020A due 2050		40,000,000	2.91	1,164,000	
2.90% Private Placement Series 2021B due 11/18/2050		45,500,000	3.21	1,460,550	
2.79% Private Placement Series 2021A due 11/5/2041		19,500,000	2.80	546,000	
0.00% Series 2022B WTM/RENEW due 8/1/2056		34,933,118	0.00	-	
2.70% - 3.03% Series 2022A WTM/RENEW due 8/1/2056		16,230,000	4.20	681,660	
5.24% Private Placement Series 2023A due 3/2/2043		-	5.25	-	
Potential Issuance, September 2023**		-	5.39	-	
Total Long-Term Debt		$251,496,422		$6,741,883	2.68 %

Estimated at September 30, 2023

Series		Amount Outstanding (1)	Effective Cost Rate (2)	Annualized Cost	Composite Interest Rate
First Mortgage Bonds					
0.00% Series EE		0	0.00	-	
3.00% to 5.50% Series FF		310,000	4.86	15,066	
0.00% Series GG		268,858	0.00	-	
4.00% to 5.00% Series HH		335,000	6.85	22,948	
0.00% Series II		71,833	0.00	-	
3.40% to 5.00% Series JJ		220,000	6.84	15,048	
0.00% Series KK		449,260	0.00	-	
5.00% to 5.50% Series LL		566,000	6.30	35,658	
0.00% Series MM		636,423	0.00	-	
3.00%- 4.375% Series NN		820,000	4.58	37,556	
0.00% Series OO due 2031		1,204,068	0.00	-	
2.00% - 5.00% Series PP due 2031		460,000	3.75	17,250	
5.00% Series QQ due 2023*		-	3.13	-	
0.00% Series TT due 2032		1,354,576	0.00	-	
3.00% - 3.25% Series UU due 2032		550,000	4.03	22,165	
0.00% Series VV due 2033		1,431,486	0.00	-	
3.00% - 5.00% Series WW due 2033		585,000	4.86	28,431	
0.00% Series 2018A 2017 RENEW - Fund due 2047		5,530,762	0.00	-	
3.00% to 5.00% Series 2018B 2017 RENEW - Trust due 2047		2,130,000	5.18	110,334	
0.00% Series XX due 2047		9,108,545	0.00	-	
3.00% to 5.00% Series YY due 2047		3,455,000	5.06	174,823	
4.00% NJEDA Series 2019A due 2059 *		32,500,000	3.66	1,189,500	
5.00% NJEDA Series 2019B due 2059 *		21,200,000	4.04	856,480	
2.90% Private Placement Series 2020A due 2050		40,000,000	2.91	1,164,000	
2.90% Private Placement Series 2021B due 11/18/2050		45,500,000	3.21	1,460,550	
2.79% Private Placement Series 2021A due 11/5/2041		19,500,000	2.80	546,000	
0.00% Series 2022B WTM/RENEW due 8/1/2056		34,241,373	0.00	-	
2.70% - 3.03% Series 2022A WTM/RENEW due 8/1/2056		15,946,200	4.20	669,740	
5.24% Private Placement Series 2023A due 3/2/2043		40,000,000	5.25	2,100,000	
Potential Issuance, September 2023**	(3)	20,000,000	5.39	1,078,000	
Total Long-Term Debt		$298,374,383		$9,543,549	3.20 %

Notes:
(1) Company-Provided.
(2) As developed on page 2 of this Schedule.
(3) Assumed to be average March 2023 A2 rated utility bond.

Middlesex Water Company
Calculation of the Effective Cost Rate of Long-Term Debt by Series

Series	Nominal Date of Issue	Date of Maturity	Average Term in Years (1)		Principal Amount Issued	(Expense) Premium / (Discount) at Issuance	Net Proceeds	Net Proceeds Ratio	Effective Cost Rate to Maturity (2)	
First Mortgage Bonds										
0.00% Series EE	1-Nov-04	1-Aug-23	- -	(3)	7,715,909	(22,218)	7,693,691	99.71	0.00%	
3.00% to 5.50% Series FF	1-Nov-04	1-Aug-24	- -	(4)	8,920,000	(25,139)	8,894,861	99.72	4.86%	(5) (6)
0.00% Series GG	9-Nov-06	1-Aug-26	- -	(3)	1,750,000	(57,546)	1,692,454	96.71	0.00%	
4.00% to 5.00% Series HH	9-Nov-06	1-Aug-26	- -	(4)	1,950,000	(64,893)	1,885,107	96.67	6.85%	(5) (6)
0.00% Series II	8-Nov-07	1-Aug-24	- -	(3)	1,750,000	(33,984)	1,716,016	98.06	0.00%	
3.40% to 5.00% Series JJ	8-Nov-07	1-Aug-26	- -	(4)	1,750,000	(33,984)	1,716,016	98.06	6.84%	(5)
0.00% Series KK	6-Nov-08	1-Aug-28	- -	(3)	1,750,000	(25,604)	1,724,396	98.54	0.00%	
5.00% to 5.50% Series LL	6-Nov-08	1-Aug-28	- -	(4)	1,750,000	(25,604)	1,724,396	98.54	6.30%	(5)
0.00% Series MM	2-Dec-10	1-Aug-30	- -	(3)	1,968,000	(22,599)	1,945,401	98.85	0.00%	
3.00%- 4.375% Series NN	2-Dec-10	1-Aug-30	- -	(4)	1,985,000	(22,599)	1,962,401	98.86	4.58%	(5)
0.00% Series OO due 2031	2-May-12	1-Aug-31	- -	(3)	2,960,000	(16,193)	2,943,807	99.45	0.00%	
2.00% - 5.00% Series PP due 2031	2-May-12	1-Aug-31	- -	(4)	915,000	66,268	981,268	107.24	3.75%	(5)
5.00% Series QQ due 2023*	27-Nov-12	1-Oct-23	11.0		9,915,000	1,694,265	11,609,265	117.09	3.13%	
0.00% Series TT due 2032	2-May-13	1-Aug-32	- -	(3)	2,960,000	(32,264)	2,927,736	98.91	0.00%	
3.00% - 3.25% Series UU due 2032	2-May-13	1-Aug-32	- -	(4)	1,015,000	20,199	1,035,199	101.99	4.03%	(5)
0.00% Series VV due 2033	21-May-14	1-Aug-33	- -	(3)	2,815,555	(56,628)	2,758,927	97.99	0.00%	
3.00% - 5.00% Series WW due 2033	21-May-14	1-Aug-33	- -	(4)	935,000	40,492	975,492	104.33	4.86%	(5)
0.00% Series 2018A 2017 RENEW - Fund due 2047	22-May-18	1-Aug-47	- -	(3)	7,075,616	(189,359)	6,886,257	97.32	0.00%	
3.00% to 5.00% Series 2018B 2017 RENEW - Trust due 2047	22-May-18	1-Aug-47	- -	(4)	2,365,000	45,388	2,410,388	101.92	5.18%	(5)
0.00% Series XX due 2047	21-Nov-17	1-Aug-47	- -	(3)	11,259,174	(331,506)	10,927,668	97.06	0.00%	
3.00% to 5.00% Series YY due 2047	21-Nov-17	1-Aug-47	- -	(4)	3,860,000	(23,770)	3,836,230	99.38	5.06%	(5)
4.00% NJEDA Series 2019A due 2059 *	22-Aug-19	1-Aug-59	40.0		32,500,000	2,305,077	34,805,077	107.09	3.66%	
5.00% NJEDA Series 2019B due 2059 *	22-Aug-19	1-Aug-59	40.0		21,200,000	4,007,710	25,207,710	118.90	4.04%	
2.90% Private Placement Series 2020A due 2050	18-Nov-20	18-Nov-50	30.0		40,000,000	(108,974)	39,891,026	99.73	2.91%	
2.90% Private Placement Series 2021B due 11/18/2050	3-Nov-21	3-Nov-51	30.0		45,500,000	(2,672,083)	42,827,917	94.13	3.21%	
2.79% Private Placement Series 2021A due 11/5/2041	5-Nov-21	5-Nov-41	20.0		19,500,000	(30,626)	19,469,374	99.84	2.80%	
0.00% Series 2022B WTM/RENEW due 8/1/2056	1-May-22	1-Aug-56	34.0		35,970,735	(270,274)	35,700,461	99.25	0.00%	
2.70% - 3.03% Series 2022A WTM/RENEW due 8/1/2056	1-May-22	1-Aug-56	34.0		16,230,000	(898,998)	15,331,002	94.46	4.20%	(5)
5.24% Private Placement Series 2023A due 3/2/2043	2-Mar-23	2-Mar-43	20.0		40,000,000	(48,619)	39,951,381	99.88	5.25%	
Potential Issuance, September 2023**	30-Sep-23	30-Sep-53	30.0		20,000,000	0	20,000,000	100.00	5.39%	

* EDA financing
** Pending Transaction. Subject to change.

See page 3 for notes.

Source of Information: Company-provided data

Middlesex Water Company
Calculation of the Effective Cost Rate of Long-Term Debt by Series

Notes:

(1) Determined by taking into account the effect of annual sinking fund requirements, if any, which are met by the retirement of bonds which reduce the average term of each series.

(2) The effective cost rate for each issue is the cost rate to maturity using as inputs the average term of issue, coupon rate and net proceeds ratio.

(3) Average term not calculated since the effective cost rate to maturity is calculated based upon cash flows throughout the life of the series.

(4) Average term not calculated since the sinking fund payments are made semi-annually.

(5) Calculated based upon cash flows throughout the life of the series.

(6) The defeasance / deobligation / savings credit of the following Series during 2009, 2010 and 2011 were taken into account in the calculation of the effective cost rates to maturity:

Series	Amount	Date
Series FF	$720,000	March 2009
Series HH	$ 20,000	April 2010

Middlesex Water Company
Calculation of the Composite Cost Rate of Preferred Stock Outstanding
Actual at January 31, 2023 and
Estimated at September 30, 2023

Actual at January 31, 2023

Series	Amount Outstanding	Effective Cost Rate (1)	Annualized Cost	Composite Interest Rate
Cumulative Preferred Stock				
$7.00 Series	$78,400	7.00 %	$5,488	
$4.75 Series	1,000,000	4.85	48,500	
Total Preferred Stock	1,078,400		53,988	5.01 %

Estimated at September 30, 2023

Series	Amount Outstanding	Effective Cost Rate (1)	Annualized Cost	Composite Interest Rate
Cumulative Preferred Stock				
$7.00 Series	$78,400	7.00 %	$5,488	
$4.75 Series	1,000,000	4.85	48,500	
Total Preferred Stock	1,078,400		53,988	5.01 %

Notes:
(1) As developed on page 2 of this Schedule.

Source of Information: Company-provided data.

Middlesex Water Company

Calculation of the Effective Cost Rate of Preferred Stock by Series

Non-Redeemable Preferred Stock	Nominal Date of Issue	Date of Maturity	Average Term in Years (1)	Principal Amount Issued	Total (Expense) Premium / (Discount) at Issuance	Net Proceeds	Net Proceeds Ratio	Effective Cost Rate to Maturity (2)
$7.00 Series	1963	Permanent	- -	$250,000	($25)	$249,975	99.99 %	7.00 % (3)
$4.75 Series	1963	Permanent	- -	1,000,000	(19,882)	980,118	98.01	4.85 (3)

Notes:
(1) Determined by taking into account the effect of annual purchase requirements of shares, if any, through redemption of each series.
(2) The effective cost rate for each issue is the cost rate to maturity using as inputs the average term of issue, coupon rate and net proceeds ratio.
(3) Effective cost rate calculated by dividing the nominal dividend rate by the net proceeds ratio.

Source of Information: Company-provided data

Proxy Group of Six Water Companies
CAPITALIZATION AND FINANCIAL STATISTICS (1)
2018 - 2022, Inclusive

	2022	2021	2020	2019	2018	5 YEAR AVERAGE
			(MILLIONS OF DOLLARS)			
Capitalization Statistics						
Amount of Capital Employed						
Total Permanent Capital	$6,283.805	$5,897.865	$5,348.616	$4,493.345	$3,706.817	
Short-Term Debt	$285.096	$155.749	$340.249	$220.672	$214.758	
Total Capital Employed	$6,568.901	$6,053.614	$5,688.865	$4,714.017	$3,921.575	
Indicated Average Capital Cost Rates (2)						
Total Debt	3.73 %	3.51 %	3.78 %	4.01 %	4.55 %	
Preferred Stock	5.76	5.76	5.76	5.84	5.92	
Capital Structure Ratios						
Based on Total Permanent Capital:						
Long-Term Debt	49.68 %	50.40 %	50.92 %	47.81 %	45.58 %	48.88 %
Preferred Stock	0.05	0.06	0.06	0.07	0.11	0.07
Common Equity	50.28	49.54	49.02	52.12	54.31	51.05
Total	100.01 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
Based on Total Capital:						
Total Debt, Including Short-Term Debt	51.76 %	52.56 %	54.67 %	51.78 %	49.31 %	52.01 %
Preferred Stock	0.05	0.05	0.06	0.07	0.10	0.06
Common Equity	48.19	47.39	45.28	48.16	50.60	47.92
Total	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
Financial Statistics						
Financial Ratios - Market Based						
Earnings / Price Ratio	3.00 %	3.20 %	3.24 %	2.64 %	3.33 %	3.08 %
Market / Average Book Ratio	329.40	352.63	315.40	332.39	304.57	326.88
Dividend Yield	1.83	1.67	1.83	1.77	1.97	1.82
Dividend Payout Ratio	59.26	52.51	56.85	74.00	59.40	60.40
Rate of Return on Average Book Common Equity	9.43 %	11.22 %	10.24 %	9.22 %	9.99 %	10.02 %
Total Debt / EBITDA (3)	5.17 x	5.04 x	5.57 x	5.91 x	4.37 x	5.21 x
Funds from Operations / Total Debt (4)	13.76 %	11.39 %	12.12 %	14.53 %	22.17 %	14.79 %
Total Debt / Total Capital	51.76 %	52.56 %	54.67 %	51.78 %	49.31 %	52.01 %

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

Middlesex Water Company
CAPITALIZATION AND FINANCIAL STATISTICS (1)
2018 - 2022, Inclusive

	2022	2021	2020	2019	2018	5 YEAR AVERAGE
			(MILLIONS OF DOLLARS)			
CAPITALIZATION STATISTICS						
AMOUNT OF CAPITAL EMPLOYED						
TOTAL PERMANENT CAPITAL	$ 654.680	$ 625.832	$ 586.505	$ 517.703	$ 369.141	
SHORT-TERM DEBT	41.500	12.000	-	5.000	35.500	
TOTAL-CAPITAL EMPLOYED	$ 696.180	$ 637.832	$ 586.505	$ 522.703	$ 404.641	
INDICATED AVERAGE CAPITAL COST RATES (2)						
TOTAL DEBT	2.20 %	2.06 %	1.81 %	2.14 %	2.64 %	
PREFERRED EQUITY	5.76	5.76	5.76	5.84	5.92	
CAPITAL STRUCTURE RATIOS						
BASED ON TOTAL PERMANENT CAPITAL:						
LONG-TERM DEBT	38.53 %	40.91 %	40.62 %	37.05 %	31.94 %	37.81 %
PREFERRED STOCK	0.32	0.33	0.36	0.40	0.66	0.41
COMMON EQUITY	61.15	58.76	59.03	62.54	67.40	61.78
TOTAL	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
BASED ON TOTAL CAPITAL:						
TOTAL DEBT, INCLUDING SHORT-TERM	42.20 %	42.02 %	40.62 %	37.66 %	37.92 %	40.08 %
PREFERRED STOCK	0.30	0.33	0.36	0.40	0.60	0.40
COMMON EQUITY	57.50	57.65	59.03	61.95	61.48	59.52
TOTAL	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
DIVIDEND PAYOUT RATIO (3)	62.04 %	66.61 %	57.00 %	55.57 %	54.92 %	59.23 %
RATE OF RETURN ON AVERAGE COMMON EQUITY	5.88 %	5.44 %	6.39 %	7.12 %	7.96 %	6.56 %
TOTAL DEBT / EBITDA (4)	6.63 x	9.24 x	8.13 x	7.05 x	5.22 x	7.25 x

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) The dividend payout ratio was based on adjusted dividends to reflect the ratio of operating and non-operating income.

(4) Total debt as a percentage of EBITDA (Earnings before Interest, Income Taxes, Depreciation and Amortization).

Source of Information: Company-Provided Information

Middlesex Water Company
Indicated Common Equity Cost Rate Using the Discounted Cash Flow Model for the
Proxy Group of Six Water Companies

	[1]	[2]	[3]	[4]	[5]	[6]	[7]
Proxy Group of Six Water Companies	Average Dividend Yield (1)	Value Line Projected Five Year Growth in EPS (2)	Zack's Five Year Projected Growth Rate in EPS	Yahoo! Finance Projected Five Year Growth in EPS	Average Projected Five Year Growth in EPS (3)	Adjusted Dividend Yield (4)	Indicated Common Equity Cost Rate (5)
American States Water Company	1.75 %	6.50 %	NA %	4.40 %	5.45 %	1.80 %	7.25 %
American Water Works Company, Inc.	1.79	3.00	8.10	8.28	6.46	1.85	8.31
California Water Service Group	1.76	6.50	NA	11.70	9.10	1.84	10.94
Essential Utilities Inc.	2.59	7.50	6.00	6.60	6.70	2.68	9.38
Middlesex Water Company	1.55	5.00	NA	2.70	3.85	1.58	5.43
SJW Group	1.97	6.00	NA	9.80	7.90	2.05	9.95
						Average	8.54 %
						Median	8.84 %
						Average of Mean and Median	8.69 %
						Average of Mean and Median Excluding Middlesex Water (6)	9.27 %
						Indicated DCF Result	8.98 %

NA= Not Available

Notes:

(1) Indicated dividend at 04/14/2023 divided by the average closing price of the last 60 trading days ending 04/14/2023 for each company.
(2) From pages 3 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, 1.75% x (1+(1/2 x 5.45%)) = 1.80%.
(5) Column 5 + Column 6.
(6) The indicated DCF cost rate for Middlesex Water Company is excluded as it is indistinguishable from the yield on A-rated public utility bonds.

Source of Information:

Value Line Investment Survey
www.zacks.com Downloaded on 04/14/2023
www.yahoo.com Downloaded on 04/14/2023
Bloomberg Professional Services

Middlesex Water Company
Hypothetical Example of the Inadequacy of
A DCF Return Rate Related to Book Value
When Market Value is Greater / Less than Book Value

Line No.		[1] Market Value		[2] Book Value with Market to Book Ratio of 200%		[3] Book Value with Market to Book Ratio of 80%	
1.	Per Share	$ 30.00		$ 15.00		$ 37.50	
2.	DCF Cost Rate (1)	10.00%		10.00%		10.00%	
3.	Return in Dollars	$ 3.000		$ 1.500		$ 3.750	
4.	Dividends (2)	$ 0.900		$ 0.900		$ 0.900	
5.	Growth in Dollars	$ 2.100		$ 0.600		$ 2.850	
6.	Return on Market Value	10.00%		5.00%	(3)	12.50%	(4)
7.	Rate of Growth on Market Value	7.00%	(5)	2.00%	(6)	9.50%	(7)

Notes:

(1) Comprised of 3.0% dividend yield and 6.0% growth.

(2) $30.00 * 3.0% yield = $0.900.

(3) $1.50 / $30.00 market value = 5.00%.

(4) $3.75 / $30.00 market value = 12.50%.

(5) Expected rate of growth per market based DCF model.

(6) Actual rate of growth when DCF cost rate is applied to book value ($1.500 possible earnings - $0.900 dividends = $0.600 for growth / $30.00 market value = 2.00%).

(7) Actual rate of growth when DCF cost rate is applied to book value ($3.750 possible earnings - $0.900 dividends = $2.850 for growth / $30.00 market value = 9.50%).

AMER. STATES WATER NYSE-AWR

RECENT PRICE 86.64 | P/E RATIO 33.3 (Trailing: 41.1 / Median: 30.0) | RELATIVE P/E RATIO 1.99 | DIV'D YLD 1.9% | VALUE LINE

TIMELINESS 4 Lowered 3/31/23
SAFETY 2 Raised 7/20/12
TECHNICAL 2 Lowered 3/24/23
BETA .70 (1.00 = Market)

18-Month Target Price Range

Low-High	Midpoint (% to Mid)
$73-$140	$107 (25%)

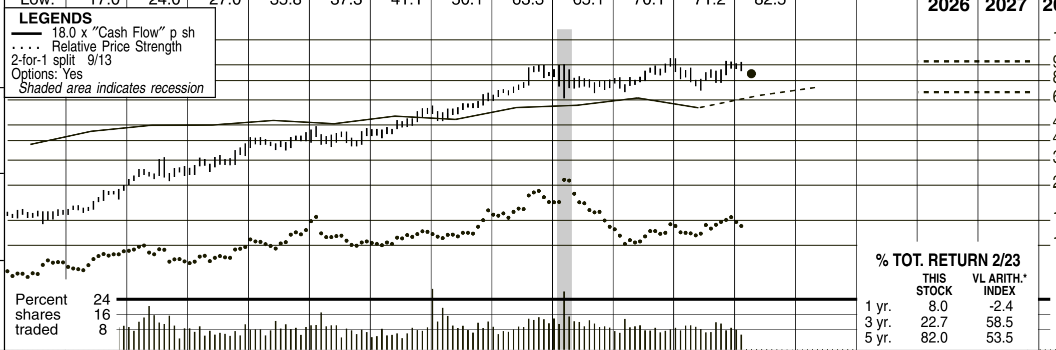
2026-28 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	100	(+15%)	6%
Low	70	(-20%)	-2%

Institutional Decisions

	2Q2022	3Q2022	4Q2022
to Buy	128	133	148
to Sell	150	124	127
Hld's(000)	26629	27450	28267

High:	24.1	33.1	38.7	44.1	47.2	58.4	69.6	96.0	96.6	103.8	103.4	99.2
Low:	17.0	24.0	27.0	35.8	37.3	41.1	50.1	63.3	65.1	70.1	71.2	82.5



Target Price Range 2026 2027 2028

% TOT. RETURN 2/23

	THIS STOCK	VL ARITH.* INDEX
1 yr.	8.0	-2.4
3 yr.	22.7	58.5
5 yr.	82.0	53.5

2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	© VALUE LINE PUB. LLC	26-28
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	13.30	*14.25*	*14.80*	Revenues per sh	*19.20*
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	3.25	*4.00*	*4.30*	"Cash Flow" per sh	*5.05*
.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	2.11	*2.85*	*2.95*	Earnings per sh A	*3.40*
.48	.50	.51	.52	.55	.64	.76	.83	.87	.91	.99	1.06	1.16	1.28	1.40	1.53	*1.62*	*1.72*	Div'd Decl'd per sh B■	*2.30*
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	4.50	*4.75*	*4.75*	Cap'l Spending per sh	*4.25*
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	19.20	*20.15*	*21.35*	Book Value per sh D	*24.55*
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	36.96	*37.50*	*37.50*	Common Shs Outst'g C	*37.50*
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	41.0	*Bold figures are*		Avg Ann'l P/E Ratio	*25.0*
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	1.79	2.38	*Value Line*		Relative P/E Ratio	*1.40*
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%	1.8%	*estimates*		Avg Ann'l Div'd Yield	*2.6%*

CAPITAL STRUCTURE as of 12/31/22
Total Debt $727.9 mill. **Due in 5 Yrs** $258.1 mill.
LT Debt $472.0 mill. **LT Interest** $22.0 mill.
(40% of Cap'l)

Leases, Uncapitalized: Annual rentals $2.3 mill.
Pension Assets-12/22 $190.7 mill.
Oblig. $186.9 mill.

Pfd Stock None

Common Stock 36,969,622 shs.
as of 2/28/23

MARKET CAP: $3.2 billion (Mid Cap)

2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024		26-28
472.1	465.8	458.6	436.1	440.6	436.8	473.9	488.2	498.9	491.5	*535*	*555*	Revenues ($mill)	*720*
62.7	61.1	60.5	59.7	69.4	63.9	84.3	86.4	94.3	78.4	*105*	*110*	Net Profit ($mill)	*130*
36.3%	38.4%	38.4%	36.8%	36.0%	22.0%	22.6%	24.6%	24.4%	23.2%	*24.5%*	*24.5%*	Income Tax Rate	*24.0%*
--	--	--	--	--	--	--	--	2.5%	--	*1.5%*	*2.0%*	AFUDC % to Net Profit	*1.5%*
39.8%	39.1%	41.1%	39.4%	38.0%	40.5%	44.4%	47.2%	46.1%	39.9%	*41.0%*	*44.0%*	Long-Term Debt Ratio	*50.0%*
60.2%	60.9%	58.9%	60.6%	62.0%	59.5%	55.6%	52.8%	53.9%	60.1%	*59.0%*	*56.0%*	Common Equity Ratio	*50.0%*
818.4	832.6	791.5	815.3	854.9	938.4	1082.5	1216.2	1272.6	1181.5	*1280*	*1425*	Total Capital ($mill)	*1840*
981.5	1003.5	1060.8	1150.9	1205.0	1296.3	1415.7	1512.0	1626.0	1753.8	*1865*	*1975*	Net Plant ($mill)	*2225*
8.9%	8.6%	9.0%	8.6%	9.3%	7.9%	8.9%	8.0%	8.3%	7.6%	*9.0%*	*9.0%*	Return on Total Cap'l	*8.0%*
12.7%	12.0%	13.0%	12.1%	13.1%	11.4%	14.0%	13.5%	13.8%	11.0%	*14.0%*	*14.0%*	Return on Shr. Equity	*14.0%*
12.7%	12.0%	13.0%	12.1%	13.1%	11.4%	14.0%	13.5%	13.8%	11.0%	*14.0%*	*14.0%*	Return on Com Equity	*14.0%*
6.8%	5.7%	6.0%	5.3%	6.2%	4.5%	6.9%	6.1%	6.2%	3.1%	*6.0%*	*6.0%*	Retained to Com Eq	*4.5%*
47%	53%	54%	56%	52%	61%	51%	55%	55%	72%	*57%*	*58%*	All Div'ds to Net Prof	*68%*

CURRENT POSITION ($MILL.)	2020	2021	12/31/22
Cash Assets	36.7	5.0	6.0
Accts Receivable	29.2	34.4	26.2
Other	91.2	98.7	119.1
Current Assets	157.1	138.1	151.3
Accts Payable	63.8	65.9	84.9
Debt Due	.4	31.4	255.9
Other	54.4	58.3	55.7
Current Liab.	118.6	155.6	396.5

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '20-'22 to '26-'28
Revenues	1.5%	2.0%	*6.5%*
"Cash Flow"	4.5%	4.0%	*7.0%*
Earnings	6.5%	6.5%	*6.5%*
Dividends	9.5%	8.5%	*8.5%*
Book Value	5.5%	6.5%	*5.0%*

Cal-endar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2020	109.1	121.3	133.6	124.2	488.2
2021	117.1	128.4	136.8	116.6	498.9
2022	108.6	122.5	135.0	125.4	491.5
2023	*113*	*127*	*150*	*145*	*535*
2024	*118*	*132*	*155*	*150*	*555*

Cal-endar	EARNINGS PER SHARE A Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2020	.38	.69	.72	.54	2.33
2021	.52	.72	.76	.55	2.55
2022	.38	.54	.69	.50	2.11
2023	*.50*	*.75*	*.85*	*.75*	*2.85*
2024	*.55*	*.77*	*.88*	*.75*	*2.95*

Cal-endar	QUARTERLY DIVIDENDS PAID B■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2019	.275	.275	.305	.305	1.16
2020	.305	.305	.335	.335	1.28
2021	.335	.335	.365	.365	1.40
2022	.365	.365	.3975	.3975	1.53
2023	.3975				

BUSINESS: American States Water Co. operates as a holding company. Through its principal subsidiary, Golden State Water Co., it supplies water to 263,265 customers in 10 California counties. Service areas include the metropolitan areas of Los Angeles and Orange Counties. The company also provides electricity to 24,705 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 811. BlackRock, Inc. owns 17.7% of out. shares; State St., 13.7%; off. & dir., 0.9% (4/22 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 did poorly last year. The holding company of California-based Golden State Water Utility posted a 9% earnings share loss in the fourth quarter. On a year-over-year basis, the company recorded a decline every quarter.

A long delay in approving rate relief is the prime reason for the company's problems. In California, utilities petition the California Public Utility Commission (CPUC) for higher tariffs once every three years. With no decision made yet, Golden State must still charge the same rates as it did in 2021 when costs where much lower. Absorbing these added expenses has been a major drag on the bottom line.

The higher rates will be retroactive, though. When the commission does permit an increase, it will be implemented as of January 1, 2022. So, the utility will ultimately recoup the costs. However, this regulatory lag negatively impacts overall profitability in an inflationary environment. Assuming a decision is made soon, we think the company's share earnings can climb to $2.85 in 2023. For next year, we are introducing our estimate at $2.95.

Nonutility operations provide an opportunity for American States to widen margins. Through its ASUS subsidiary, the company provides water services to military bases around the country, as the army is in the process of privatizing these operations. To date, ASUS has done well in winning a decent share of the new installations that are put out for public bidding. We expect this trend to continue. This sector is attractive because returns here are not regulated, as is the case with American States other utility businesses. Hence, greater returns are being made here.

The delay in the rate hikes could be a potential red flag. Compared to other states, California can be a difficult place to operate, thanks to strict requirements and high costs. If the current petition is not ruled on shortly, it could be a harbinger of tougher times ahead.

There are better selections available elsewhere. The stock is ranked to underperform the market averages in the year ahead. Longer term, the prospects are not much better, as the equity's total return potential is below the *Value Line* median.

James A. Flood *April 7, 2023*

(A) Primary earnings. Excludes nonrecurring gains/(losses):; '08, (14¢); '10, (23¢); '11, 10¢. Next earnings report due mid-May.
(B) Dividends historically paid in early March, June, September, and December. ■ Div'd reinvestment plan available.
(C) In millions, adjusted for split.
(D) Includes intangibles. As of 12/31/22; $1.1 million/$0.03 a share.

Company's Financial Strength	A
Stock's Price Stability	100
Price Growth Persistence	85
Earnings Predictability	90

AMERICAN WATER NYSE-AWK

RECENT PRICE	141.68	P/E RATIO	30.1 (Trailing: 31.4; Median: 28.0)	RELATIVE P/E RATIO	1.80	DIV'D YLD	2.0%	VALUE LINE

TIMELINESS 3 Lowered 11/11/22
SAFETY 3 New 7/25/08
TECHNICAL 4 Lowered 3/31/23
BETA .90 (1.00 = Market)

High:	39.4	45.1	56.2	61.2	85.2	92.4	98.2	129.9	172.6	189.6	189.3	162.6	
Low:	31.3	37.0	41.1	48.4	58.9	70.0	76.0	88.0	92.0	131.0	122.8	132.9	

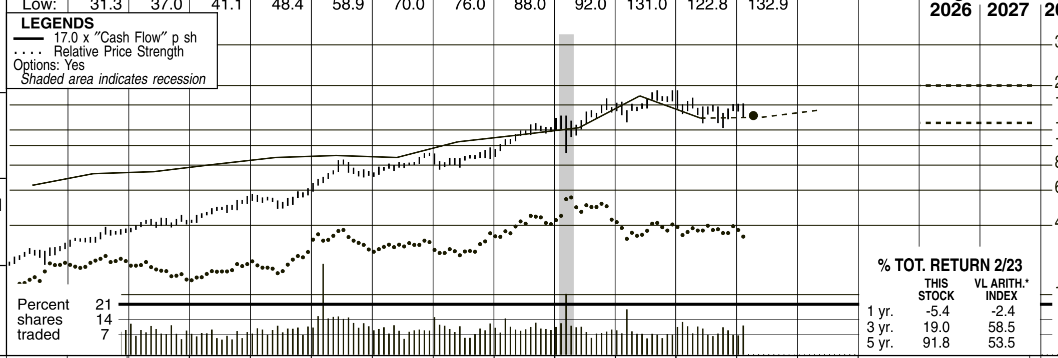
18-Month Target Price Range
Low-High Midpoint (% to Mid)
$129-$256 $193 (35%)

2026-28 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	200	(+40%)	11%
Low	130	(-10%)	Nil

Institutional Decisions

	2Q2022	3Q2022	4Q2022
to Buy	469	448	471
to Sell	415	405	416
Hld's(000)	151931	152383	156427



Target Price Range
2026 | 2027 | 2028

% TOT. RETURN 2/23

	THIS STOCK	VL ARITH.* INDEX
1 yr.	-5.4	-2.4
3 yr.	19.0	58.5
5 yr.	91.8	53.5

2007E	2008E	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	© VALUE LINE PUB. LLC	26-28
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	20.85	*21.10*	*22.50*	Revenues per sh	*26.75*
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	10.46	8.08	*8.20*	*8.70*	"Cash Flow" per sh	*10.20*
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	4.51	*4.75*	*5.10*	Earnings per sh A	*6.10*
- -	.40	.82	.86	.90	1.21	.84	1.21	1.33	1.47	1.62	1.78	1.96	2.15	2.36	2.57	*2.82*	*3.05*	Div'd Decl'd per sh B■	*3.80*
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	9.71	12.63	*12.00*	*12.25*	Cap'l Spending per sh	*11.50*
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	40.18	42.30	*50.15*	*51.75*	Book Value per sh D	*57.25*
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	181.86	*193.00*	*193.25*	Common Shs Outst'g C	*200.00*
- -	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	33.6	*Bold figures are*		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	1.28	1.95	*Value Line*		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%	1.7%	*estimates*		Avg Ann'l Div'd Yield	*2.3%*

CAPITAL STRUCTURE as of 12/31/22
Total Debt $12385 mil. **Due in 5 Yrs** $3661 mil.
LT Debt $10929 mil. **LT Interest** $412 mil.
(59% of Cap'l)

Leases, Uncapitalized: Annual rentals $.0 mill.
Pension Assets 12/22 $1578.0 mill
Oblig. $1413.0 mill.
Pfd Stock $3.0 mill. **Pfd Div'd** $.2 mill

Common Stock 181,858,062 shares
as of 1/31/22

MARKET CAP: $25.8 billion (Large Cap)

2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024		26-28
2901.9	3011.3	3159.0	3302.0	3357.0	3440.0	3610.0	3777.0	3920.0	3792.0	*4075*	*4350*	Revenues ($mill)	*5350*
369.3	429.8	476.0	468.0	426.0	567.0	621.0	709.0	1263.0	820.0	*910*	*985*	Net Profit ($mill)	*1220*
39.1%	39.4%	39.1%	39.2%	53.3%	28.2%	25.5%	23.3%	23.0%	18.7%	*22.0%*	*21.0%*	Income Tax Rate	*24.0%*
5.1%	- -	- -	- -	- -	- -	- -	- -	5.1%	2.9%	*5.0%*	*4.5%*	AFUDC % to Net Profit	*5.0%*
52.4%	52.4%	53.7%	52.4%	54.7%	56.3%	58.5%	59.1%	58.6%	58.7%	*54.0%*	*55.0%*	Long-Term Debt Ratio	*57.5%*
47.6%	47.4%	46.2%	47.5%	45.3%	43.6%	41.4%	40.9%	41.4%	41.3%	*46.0%*	*45.0%*	Common Equity Ratio	*42.5%*
9940.7	10364	10911	10967	11875	13433	14760	15787	17639	18619	*21175*	*22300*	Total Capital ($mill)	*27000*
12391	12900	13933	14992	16246	17409	18232	19710	21084	23223	*25000*	*27000*	Net Plant ($mill)	*30000*
5.1%	5.5%	5.7%	5.6%	4.9%	5.4%	5.4%	5.7%	8.2%	5.5%	*5.5%*	*5.5%*	Return on Total Cap'l	*5.5%*
7.8%	8.7%	9.4%	9.0%	7.9%	9.7%	10.1%	11.0%	17.3%	10.7%	*9.5%*	*10.0%*	Return on Shr. Equity	*10.5%*
7.8%	8.7%	9.4%	9.0%	7.9%	9.7%	10.1%	11.0%	17.3%	10.7%	*9.5%*	*10.0%*	Return on Com Equity	*10.5%*
4.7%	4.3%	4.7%	4.0%	2.5%	4.2%	4.4%	5.0%	11.4%	4.6%	*4.0%*	*4.0%*	Retained to Com Eq	*4.5%*
40%	50%	50%	56%	68%	56%	57%	55%	34%	57%	*59%*	*60%*	All Div'ds to Net Prof	*62%*

CURRENT POSITION ($MILL.)	2020	2021	12/31/22
Cash Assets	576	136	117
Accts Receivable	321	271	334
Other	1009	1147	799
Current Assets	1906	1554	1250
Accts Payable	189	235	706
Debt Due	1611	641	1456
Other	1081	1265	649
Current Liab.	2881	2141	2811

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '20-'22 to '26-'28
Revenues	3.0%	3.0%	4.0%
"Cash Flow"	8.5%	10.5%	3.0%
Earnings	11.0%	15.0%	3.0%
Dividends	9.0%	10.0%	8.5%
Book Value	5.0%	6.0%	6.5%

Cal-endar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2020	844	931	1079	923	3777
2021	888	999	1082	951	3920
2022	842	937	1082	931	3792
2023	*900*	*1000*	*1165*	*1010*	*4075*
2024	*960*	*1070*	*1235*	*1085*	*4350*

Cal-endar	EARNINGS PER SHARE A Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2020	.68	.97	1.46	.80	3.91
2021	.73	1.14	1.53	3.55	6.95
2022	.87	1.20	1.63	.81	4.51
2023	*.90*	*1.25*	*1.75*	*.85*	*4.75*
2024	*.95*	*1.35*	*1.90*	*.90*	*5.10*

Cal-endar	QUARTERLY DIVIDENDS PAID B■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2019	.455	.50	.50	.50	1.96
2020	.50	.55	.55	.55	2.15
2021	.55	.6025	.6025	.6025	2.36
2022	.6025	.655	.655	.655	2.57
2023	.655				

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 2022 revenues. New Jersey is its largest market accounting for 25.9% of regulated revenues; Pennsylvania, 23.4%; Missouri, 10.9%. Has 6,500 employees. Vanguard owns 11.8% of outstanding shares; BlackRock, 8.9%; State St., 5.4%; officers & directors, less than 1.0% (4/22 Proxy). President & CEO: Susan N. Story. Chairman: George MacKenzie. Address: 1 Water Street, Camden, NJ 08102. Tel.: 856-346-8200. Internet: www.amwater.com.

American Water Works held a rare equity offering. On the last day of February, the water utility sold 11 million shares at a price of $135 per share, increasing its amount of outstanding shares by 11%. In the previous 14 years, the company's number of shares had only risen by 4%. This was very unusual for a corporation that depends heavily on external funding to finance its large capital expenditure and acquisition strategy (more below). It should be noted that leadership could make the case that with interest rates so low, why not take advantage of the cheap money available?

We expect the utility to continue to grow earnings and dividends at a solid and predictable pace for the foreseeable future. As can be seen from the Annual Rates box to the left of this comment, American Water has an impressive five- and 10-year track record. The rise in both share profits and distributions ought to moderate, however, as management is looking for annual increases for these two to be in the range of 6%-9% out to 2028. For 2023, we estimate that the bottom line will increase 5.3%, followed by a 7.4% gain in 2024. All of our assumption are based on a continued constructive relationship with regulators.

Acquisitions will continue to be one of the main contributors to profits. The water utility industry in the United States is made up of tens of thousands of small independent water authorities. These small entities are inefficient and undercapitalized, as they do not have the means necessary to finance the replacement of an aging water distribution system. American Water Works is by far the largest publicly traded member of this industry and has always been making bolt-on acquisitions. (Last year wasn't a particularly active one, but 26 acquisitions were made for $335 million.) With these purchased assets, it has proven that it can improve efficiency meaningfully. American Water also expands its rate base, on which it earns a return.

Theses share do not hold much appeal. Despite their recent weak showing, water utility stocks still trade at a high premium. Hence, total return potential over the pull to 2026-2028 is subpar.

James A. Flood *April 7, 2023*

(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 mid-May.
(B) Dividends paid in March, June, September, and December. ■ Div. reinvestment available.
(C) In millions. (D) Includes intangibles. On 12/31/22: $1.225 billion, $6.75/share.
(E) Pro forma numbers for '07.

Company's Financial Strength	B++
Stock's Price Stability	80
Price Growth Persistence	80
Earnings Predictability	75

CALIFORNIA WATER NYSE-CWT

RECENT PRICE 56.88 | P/E RATIO 26.5 (Trailing: 32.3 Median: 28.0) | RELATIVE P/E RATIO 1.59 | DIV'D YLD 1.8% | VALUE LINE

TIMELINESS 2 Raised 3/17/23
SAFETY 3 Lowered 7/27/07
TECHNICAL 2 Lowered 3/24/23
BETA .70 (1.00 = Market)

18-Month Target Price Range
Low-High Midpoint (% to Mid)
$46-$87 $67 (15%)

2026-28 PROJECTIONS

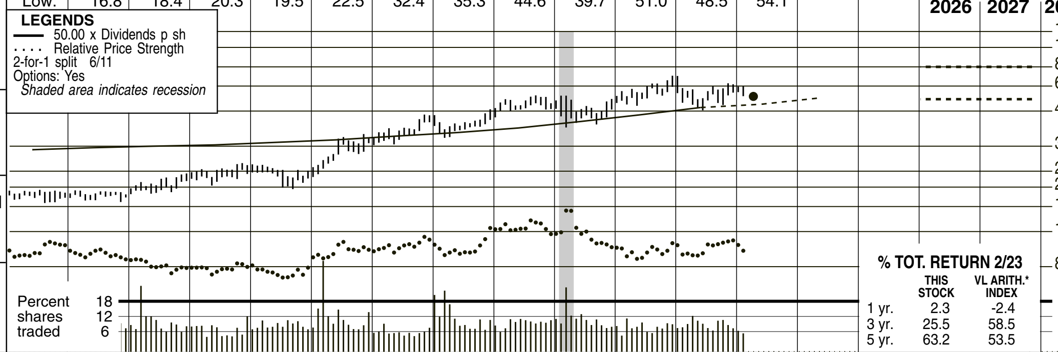
	Price	Gain	Ann'l Total Return
High	80	(+40%)	10%
Low	55	(-5%)	1%

Institutional Decisions

	2Q2022	3Q2022	4Q2022
to Buy	121	140	141
to Sell	141	102	113
Hld's(000)	43653	43549	45352

High:	19.3	23.4	26.4	26.0	36.8	46.2	49.1	57.5	57.4	72.1	72.0	63.9
Low:	16.8	18.4	20.3	19.5	22.5	32.4	35.3	44.6	39.7	51.0	48.5	54.1

LEGENDS
—— 50.00 x Dividends p sh
.... Relative Price Strength
2-for-1 split 6/11
Options: Yes
Shaded area indicates recession



Target Price Range
2026 | 2027 | 2028

% TOT. RETURN 2/23

	THIS STOCK	VL ARITH.* INDEX
1 yr.	2.3	-2.4
3 yr.	25.5	58.5
5 yr.	63.2	53.5

2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	© VALUE LINE PUB. LLC	26-28
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	15.22	16.90	17.60	Revenues per sh	19.30
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	3.79	3.75	4.00	"Cash Flow" per sh	4.35
.75	.95	.98	.91	.86	1.02	1.02	1.19	.94	1.01	1.40	1.36	1.31	1.97	1.96	1.77	2.25	2.45	Earnings per sh A	2.75
.58	.59	.59	.60	.62	.63	.64	.65	.67	.69	.72	.75	.79	.85	.92	1.00	1.04	1.12	Div'd Decl'd per sh B ■	1.35
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	5.90	6.00	6.15	Cap'l Spending per sh	6.45
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	23.70	25.75	27.10	Book Value per sh C	29.50
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	55.60	53.00	52.00	Common Shs Outst'g D	50.00
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	33.0	Bold figures are		Avg Ann'l P/E Ratio	24.0
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	1.65	1.92	Value Line		Relative P/E Ratio	1.30
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%	1.7%	estimates		Avg Ann'l Div'd Yield	2.0%

CAPITAL STRUCTURE as of 12/31/22
Total Debt $1125.8 mill. **Due in 5 Yrs** $357.0 mill.
LT Debt $1052.5 mill. **LT Interest** $40.0 mill.
(Total interest coverage: 5.3x) (44% of Cap'l)

Pension Assets-12/22 $637.3 mill.
Oblig. $685.3 mill.

Pfd Stock None

Common Stock 55,600,000 shs.

MARKET CAP: $3.2 billion (Mid Cap)

2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024		26-28
584.1	597.5	588.4	609.4	666.9	698.2	714.6	794.3	790.9	846.4	895	915	Revenues ($mill) E	965
47.3	56.7	45.0	48.7	67.2	65.6	63.1	96.8	101.1	96.0	120	128	Net Profit ($mill)	138
30.3%	33.0%	36.0%	35.5%	30.1%	24.5%	19.1%	11.1%	20.1%	3.3%	21.0%	21.0%	Income Tax Rate	21.0%
4.3%	2.7%	4.3%	6.1%	3.5%	3.1%	5.8%	3.3%	1.7%	1.7%	5.0%	5.0%	AFUDC % to Net Profit	5.0%
41.6%	40.1%	44.4%	44.6%	42.7%	49.3%	50.2%	45.9%	47.3%	44.4%	42.5%	41.0%	Long-Term Debt Ratio	38.0%
58.4%	59.9%	55.6%	55.4%	57.3%	50.7%	49.8%	54.1%	52.7%	55.6%	57.5%	59.0%	Common Equity Ratio	62.0%
1024.9	1045.9	1154.4	1191.2	1209.3	1440.2	1566.7	1702.4	2233.4	2370.1	2365	2385	Total Capital ($mill)	2375
1515.8	1590.4	1701.8	1859.3	2048.0	2232.7	2406.4	2650.6	2846.9	3058.9	3085	3120	Net Plant ($mill)	3200
6.0%	6.3%	5.2%	5.5%	7.1%	5.9%	5.5%	7.0%	5.5%	5.0%	5.5%	6.0%	Return on Total Cap'l	6.5%
7.9%	9.1%	7.0%	7.4%	9.7%	9.0%	8.1%	10.5%	8.6%	7.3%	8.5%	9.0%	Return on Shr. Equity	9.5%
7.9%	9.1%	7.0%	7.4%	9.7%	9.0%	8.1%	10.5%	8.6%	7.3%	8.5%	9.0%	Return on Com Equity	9.5%
3.4%	4.1%	2.0%	2.4%	4.7%	4.0%	3.2%	6.0%	4.6%	3.2%	4.5%	5.0%	Retained to Com Eq	4.5%
56%	55%	71%	68%	51%	55%	60%	43%	47%	56%	46%	46%	All Div'ds to Net Prof	49%

CURRENT POSITION ($MILL.)	2020	2021	12/31/22
Cash Assets	44.6	78.4	62.1
Other	221.4	222.1	233.4
Current Assets	266.0	300.5	295.5
Accts Payable	131.7	144.4	141.0
Debt Due	375.1	40.2	73.3
Other	81.9	72.0	80.4
Current Liab.	588.7	256.6	294.7

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '20-'22 to '26-'28
Revenues	2.5%	3.5%	4.0%
"Cash Flow"	6.0%	9.0%	2.0%
Earnings	7.5%	11.0%	6.5%
Dividends	4.0%	6.0%	6.5%
Book Value	7.0%	9.0%	5.5%

Cal-endar	QUARTERLY REVENUES ($ mill.)E Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2020	125.6	175.5	304.1	189.1	794.3
2021	147.7	213.1	256.7	173.4	790.9
2022	173.0	206.2	266.3	200.9	846.4
2023	185	220	280	210	895
2024	190	225	285	215	915

Cal-endar	EARNINGS PER SHARE A Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2020	d.42	.11	1.94	.31	1.97
2021	d.06	.75	1.20	.07	1.96
2022	.02	.36	1.03	.35	1.77
2023	.10	.55	1.15	.45	2.25
2024	.15	.60	1.20	.50	2.45

Cal-endar	QUARTERLY DIVIDENDS PAID B ■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2019	.1975	.1975	.1975	.1975	.79
2020	.2125	.2125	.2125	.2125	.85
2021	.230	.230	.230	.230	.92
2022	.250	.250	.250	.250	1.00
2023	.260				

BUSINESS: California Water Service Group provides regulated and nonregulated water service to 496,400 customers in 100 communities in the state of California. Accounts for about 90% 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, '22: residential, 67%; business, 20%; industrial, 3%; public authorities, 5%; other 5%. Off. and dir. own 1% of common stock (4/22 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.

A share-profit rebound is likely in the cards this year for California Water Service Group. The water utility operator ended 2022 on a strong note, posting revenues of $201 million, which were on par with our expectations, and better-than-anticipated earnings of $0.35 per share. To wit, the company should continue to benefit greatly from cumulative rate increases, as well as an expanding customer base. Moreover, we look for healthier operating margins this year, supported by moderating production and administrative costs. Meanwhile, subsiding expenses related to benefit plan investment valuations should be a boon, too. Adding it all up, we are lifting our current-year bottom-line estimate by $0.10, to $2.25 per share, or a 28% annual advance.

Additional rate hikes are set to take effect in April. In February, California Water received the nod from state regulators to increase customer charges by about 4% across the majority of its operating districts. Note that the approval is for modified interim rates due to a delay in a decision on the company's 2021 general rate case filing.

A penny has been added to the quarterly dividend payment. The recent raise is in line with historical annual increases and, at current levels, equates to a yield of nearly 2%. Moreover, the company is likely to return capital to shareholders via periodic stock buybacks.

Bolt-on acquisitions will probably be par for the course going forward. Leadership followed up a handful of transactions in 2022 with the purchase of Bethel Greenacres Water Association in February. The deal is expected to add roughly 200 connections in the Washington area.

The equity is best suited for subscribers with a short-term holding period. Shares of California Water have moved up a notch in our Timeliness Ranking System, to 2 (Above Average). While the company holds promising long-term business prospects, namely runway for further rate hikes, an expanding customer base, and an improved economic backdrop, the stock does not particularly stand out over the 3- to 5-year window. Thus, we suggest patient investors hold off, for now.

Nicholas Patrikis *April 7, 2023*

(A) Basic EPS. Excl. nonrecurring gain (loss): '11, 4¢. Next earnings report due late May.
(B) Dividends historically paid in late Feb., May, Aug., and Nov. ■ Div'd reinvestment plan available.
(C) Incl. intangible assets. In '22 : $64.6 mill., $1.16/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	85
Earnings Predictability	50

ESSENTIAL UTIL. NYSE-WTRG

RECENT PRICE 42.13 | P/E RATIO 23.1 (Trailing: 23.8 Median: 26.0) | RELATIVE P/E RATIO 1.38 | DIV'D YLD 2.8% | VALUE LINE

TIMELINESS 3 Raised 2/24/23
SAFETY 3 Lowered 1/8/21
TECHNICAL 3 Raised 4/7/23
BETA .95 (1.00 = Market)

18-Month Target Price Range
Low-High Midpoint (% to Mid)
$35-$63 $49 (15%)

2026-28 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	75	(+80%)	18%
Low	50	(+20%)	8%

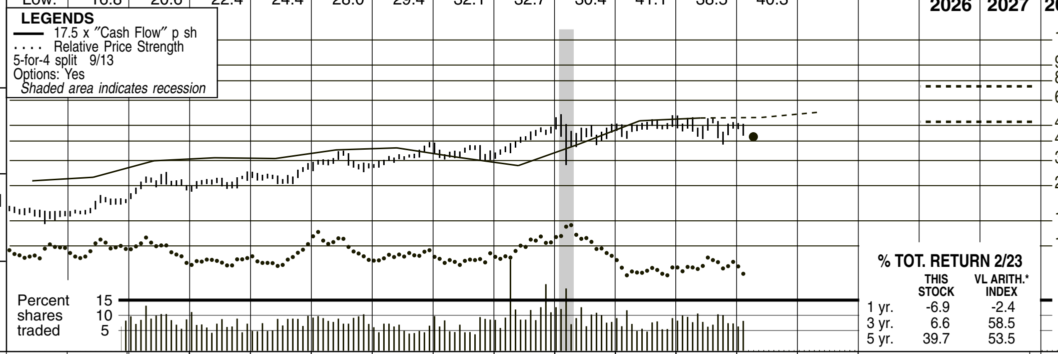
Institutional Decisions

	2Q2022	3Q2022	4Q2022
to Buy	277	301	312
to Sell	249	222	266
Hld's(000)	183099	184861	194278

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
High:	21.5	28.1	28.2	31.1	35.8	39.6	39.4	47.3	54.5	53.9	53.7
Low:	16.8	20.6	22.4	24.4	28.0	29.4	32.1	32.7	30.4	41.1	38.5

High 49.3, Low 40.3 (2023)

LEGENDS
— 17.5 x "Cash Flow" p sh
.... Relative Price Strength
5-for-4 split 9/13
Options: Yes
Shaded area indicates recession



Target Price Range
2026 2027 2028

% TOT. RETURN 2/23

	THIS STOCK	VL ARITH.* INDEX
1 yr.	-6.9	-2.4
3 yr.	6.6	58.5
5 yr.	39.7	53.5

2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	© VALUE LINE PUB. LLC	26-28
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	8.68	*8.40*	*8.90*	Revenues per sh	*9.10*
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	2.98	*3.10*	*3.35*	"Cash Flow" per sh	*3.85*
.57	.58	.62	.72	.83	.87	1.16	1.20	1.14	1.32	1.35	1.08	1.04	1.12	1.67	1.77	*1.85*	*2.00*	Earnings per sh	*2.35*
.38	.41	.44	.47	.50	.54	.58	.63	.69	.74	.79	.85	.91	.97	1.04	1.11	*1.20*	*1.28*	Div'd Decl'd per sh	*1.65*
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	4.03	*4.20*	*4.00*	Cap'l Spending per sh	*3.85*
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	20.39	*21.30*	*22.80*	Book Value per sh	*25.95*
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	263.74	*268.00*	*270.00*	Common Shs Outst'g	*285.00*
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	26.6	*Bold figures are*		Avg Ann'l P/E Ratio	*26.0*
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	1.53	1.54	*Value Line*		Relative P/E Ratio	*1.45*
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%	2.4%	*estimates*		Avg Ann'l Div'd Yield	*2.6%*

CAPITAL STRUCTURE as of 12/31/22
Total Debt $6845.9 mill. **Due in 5 Yrs** $1400 mill.
LT Debt $6418.0 mill. **LT Interest** $238.0 mill.
(54% of Cap'l)

Pension Assets-12/22 $333.2 mill.
Oblig. $324.7 mill.
Pfd Stock None
Common Stock 264,141,265 shares
as of 2/17/23

MARKET CAP: $11.1 billion (Large Cap)

2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024		26-28
768.6	779.9	814.2	819.9	809.5	838.1	889.7	1462.7	1878.1	2288.0	*2250*	*2400*	Revenues ($mill)	*2600*
205.0	213.9	201.8	234.2	239.7	192.0	224.5	284.8	431.6	465.2	*495*	*540*	Net Profit ($mill)	*670*
10.0%	10.5%	6.9%	8.2%	6.6%	- -	- -	- -	- -	- -	*8.0%*	*10.0%*	Income Tax Rate	*16.0%*
1.1%	2.4%	3.1%	3.8%	6.3%	6.8%	7.2%	4.5%	4.8%	1.3%	*3.0%*	*5.0%*	AFUDC % to Net Profit	*5.0%*
48.9%	48.5%	50.3%	48.4%	50.6%	54.4%	43.1%	54.0%	52.7%	54.2%	*54.0%*	*54.5%*	Long-Term Debt Ratio	*56.0%*
51.1%	51.5%	49.7%	51.6%	49.4%	45.6%	56.9%	46.0%	47.3%	45.8%	*46.0%*	*45.5%*	Common Equity Ratio	*44.0%*
3003.6	3216.0	3469.5	3587.7	3965.4	4407.8	6824.2	10192	10964	11748	*12450*	*13500*	Total Capital ($mill)	*16800*
4167.3	4402.0	4688.9	5001.6	5399.9	5930.3	6345.8	9512.9	10252	11131	*12100*	*12975*	Net Plant ($mill)	*14600*
8.0%	7.8%	6.9%	7.6%	7.1%	5.5%	4.2%	3.7%	4.8%	5.0%	*5.0%*	*5.0%*	Return on Total Cap'l	*5.0%*
13.4%	12.9%	11.7%	12.7%	12.2%	9.6%	5.8%	6.1%	8.3%	8.7%	*8.5%*	*8.5%*	Return on Shr. Equity	*9.0%*
13.4%	12.9%	11.7%	12.7%	12.2%	9.6%	5.8%	6.1%	8.3%	8.7%	*8.5%*	*8.5%*	Return on Com Equity	*9.0%*
6.7%	6.1%	4.7%	5.6%	5.1%	2.1%	.9%	1.1%	3.3%	3.3%	*3.0%*	*3.0%*	Retained to Com Eq	*2.5%*
50%	52%	60%	56%	59%	79%	84%	82%	60%	62%	*60%*	*64%*	All Div'ds to Net Prof	*70%*

CURRENT POSITION ($MILL.)	2020	2021	12/31/22
Cash Assets	4.8	10.6	11.4
Receivables	154.8	141.0	206.3
Inventory (AvgCst)	58.4	109.6	46.6
Other	162.2	176.6	393.9
Current Assets	380.2	437.8	658.2
Accts Payable	177.5	192.9	238.8
Debt Due	162.6	197.1	427.9
Other	263.8	285.1	355.2
Current Liab.	603.9	675.1	1021.9

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '20-'22 to '26-'28
Revenues	5.5%	10.0%	*3.5%*
"Cash Flow"	6.5%	6.0%	*6.0%*
Earnings	6.5%	3.5%	*7.5%*
Dividends	7.5%	7.0%	*8.0%*
Book Value	10.5%	14.0%	*4.5%*

Cal-endar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2020	255.6	384.5	348.6	474.0	1462.7
2021	583.5	397.0	361.9	535.7	1878.1
2022	699.3	448.7	434.6	705.4	2288.0
2023	*705*	*470*	*455*	*620*	*2250*
2024	*735*	*510*	*480*	*675*	*2400*

Cal-endar	EARNINGS PER SHARE A Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2020	.21	.29	.22	.40	1.12
2021	.72	.32	.19	.44	1.67
2022	.76	.31	.26	.44	1.77
2023	*.77*	*.33*	*.28*	*.47*	*1.85*
2024	*.80*	*.35*	*.30*	*.55*	*2.00*

Cal-endar	QUARTERLY DIVIDENDS PAID B ■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2019	.219	.219	.2343	.2343	.91
2020	.2343	.2343	.2507	.2507	.97
2021	.2507	.2507	.2682	.2682	1.04
2022	.2682	.2682	.287	.287	1.11
2023	.287				

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 2022, Aqua Amer. provided water and wastewater services in the states of 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 47% of revenues in 2022; residential, 27%; commercial, 7%; industrial, wastewater & other, 13%. Gas 50%; other, 3.0%. Off. & dir. own less than 1% of the common stock; BlackRock, 11.1%; Vanguard, 10.1%; Can. Pen. Plan 8.2% (3/23 proxy). Pres. & CEO: Christopher Franklin. Inc.: PA Addr.: 762 W Lancaster Ave., Bryn Mawr, PA 19010. Tel.: 610-525-1400. Int.: www.essential.co.

Investors' interest in Essential Utilities has waned lately. Year to date, the price of the equity is down more than 12%. By comparison, the S&P 500 Index has generated positive returns of about 3%. High inflation and interest rates are most likely the main reasons for the stock losing favor on Wall Street.

We look for decent earnings growth. The company is a regulated utility that provides water and gas. With the chance that the economy might slip into a recession, demand for these two services ought to remain relatively inelastic. For 2023, Essential's share earnings may well rise a solid 5% to $1.85. Next year, an 8% increase to $2.00 a share is possible. This is based on our assumption of continued constructive relations with various state regulatory authorities (more below).

The water side of the business will likely drive long-term growth. Management has targeted a majority of its projected $1.1 billion capital expenditures this year toward the water sector. This is due mostly to the fact that an aging pipeline infrastructure badly needs to be repaired. We expect this trend to continue in the years ahead.

Regulatory treatment remains a caveat. Over the past decade, water utilities and state regulatory bodies have worked well together in trying to improve the nation's water distribution systems. Hence, authorities have allowed the water companies to recoup the massive amounts of money that they have spent on modernizing their assets. It should be noted that this occurred during a period of low inflation. Passing along much larger cost hikes to consumers is more difficult politically during times of robust inflation. Regulatory bodies have historically treated water utilities better than gas utilities.

These shares do not have much appeal. The stock is just ranked to perform in line with the market in the year ahead. Moreover, it has below average total return potential out to 2026-2028. Our 18-month model also doesn't favor the equity. And though its longer-term prospects don't stand out, they are better than most in this industry, where investors typically have to pay a high premium for earnings the companies generate.

James A. Flood *April 7, 2023*

(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 mid-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: 12/31/22, $2345.4 bill./$8.89 a share.

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

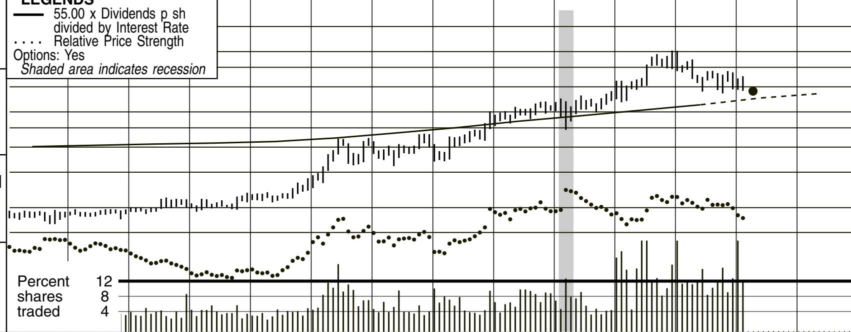
MIDDLESEX WATER NDQ-MSEX

RECENT PRICE 76.17 | P/E RATIO 31.1 (Trailing: 32.0 Median: 26.0) | RELATIVE P/E RATIO 1.86 | DIV'D YLD 1.6% | VALUE LINE

TIMELINESS 5 Lowered 3/31/23
SAFETY 2 New 10/21/11
TECHNICAL 3 Raised 4/7/23
BETA .75 (1.00 = Market)

High:	19.6	22.5	23.7	28.0	44.5	46.7	60.3	67.7	76.1	121.4	121.1	90.6
Low:	17.5	18.6	19.1	21.2	25.0	32.2	34.0	51.0	48.8	67.1	74.2	72.6

LEGENDS
— 55.00 x Dividends p sh divided by Interest Rate
.... Relative Price Strength
Options: Yes
Shaded area indicates recession



Target Price Range 2026 | 2027 | 2028

18-Month Target Price Range

Low-High	Midpoint (% to Mid)
$66-$151	$109 (40%)

2026-28 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	95	(+25%)	8%
Low	70	(-10%)	Nil

Institutional Decisions

	2Q2022	3Q2022	4Q2022
to Buy	90	82	99
to Sell	93	85	70
Hld's(000)	11842	11820	12563

Percent shares traded 12 8 4

% TOT. RETURN 2/23

	THIS STOCK	VL ARITH.* INDEX
1 yr.	-22.5	-2.4
3 yr.	33.9	58.5
5 yr.	132.0	53.5

2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	© VALUE LINE PUB. LLC	26-28
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	9.21	9.90	10.35	Revenues per sh	11.10
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	3.70	3.70	3.85	"Cash Flow" per sh	4.10
.87	.89	.72	.96	.84	.90	1.03	1.13	1.22	1.38	1.38	1.96	2.01	2.18	2.07	2.39	2.70	2.80	Earnings per sh A	3.00
.69	.70	.71	.72	.73	.74	.75	.76	.78	.81	.86	.91	.98	1.04	1.11	1.18	1.28	1.35	Div'd Decl'd per sh B■	1.60
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	5.18	5.25	5.45	Cap'l Spending per sh	6.00
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	22.65	22.85	23.35	Book Value per sh	23.70
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	17.64	17.85	17.90	Common Shs Outst'g C	18.00
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	38.6	Bold figures are Value Line estimates		Avg Ann'l P/E Ratio	28.0
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	2.39	2.24			Relative P/E Ratio	1.30
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%	1.3%			Avg Ann'l Div'd Yield	1.9%

2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024		26-28
114.8	117.1	126.0	132.9	130.8	138.1	134.6	141.6	143.1	162.4	177	185	Revenues ($mill)	200
16.6	18.4	20.0	22.7	22.8	32.5	33.9	38.4	36.5	42.4	48.0	50.0	Net Profit ($mill)	54.0
34.1%	35.0%	34.5%	34.0%	32.7%	2.8%	--	--	2.8%	7.1%	21.0%	21.0%	Income Tax Rate	21.0%
1.9%	1.7%	1.9%	2.7%	3.1%	1.4%	3.4%	3.9%	3.9%	3.9%	2.5%	2.5%	AFUDC % to Net Profit	2.5%
40.4%	40.5%	39.4%	37.9%	37.5%	37.8%	41.5%	44.0%	45.3%	41.9%	42.0%	41.0%	Long-Term Debt Ratio	40.5%
58.7%	58.8%	59.8%	61.5%	61.8%	61.6%	58.2%	55.7%	54.4%	57.7%	58.0%	58.5%	Common Equity Ratio	59.5%
321.4	335.8	345.4	355.4	370.7	404.1	556.7	621.5	676.3	692.7	705	715	Total Capital ($mill)	720
446.5	465.4	481.9	517.8	557.2	618.5	705.7	796.6	865.4	920.6	925	930	Net Plant ($mill)	950
5.9%	6.3%	6.6%	7.1%	6.9%	8.9%	6.7%	6.8%	6.0%	6.8%	7.0%	7.5%	Return on Total Cap'l	8.0%
8.7%	9.2%	9.6%	10.3%	9.8%	12.9%	10.4%	11.0%	9.9%	10.5%	11.5%	12.0%	Return on Shr. Equity	12.5%
8.7%	9.3%	9.6%	10.3%	9.9%	13.0%	10.4%	11.1%	9.9%	10.6%	12.0%	12.0%	Return on Com Equity	12.5%
2.4%	3.1%	3.5%	4.3%	3.8%	7.0%	5.4%	5.8%	4.6%	5.4%	6.0%	6.0%	Retained to Com Eq	6.0%
73%	67%	63%	58%	62%	46%	48%	48%	53%	49%	47%	48%	All Div'ds to Net Prof	53%

CAPITAL STRUCTURE as of 12/31/22
Total Debt $307.8 mill. **Due in 5 Yrs** $43.7 mill.
LT Debt $290.3 mill. **LT Interest** $7.5 mill.
(Total interest coverage: 8.3x)
(42% of Cap'l)

Pension Assets-12/22 $84.8 mill.
Oblig. $87.8 mill.
Pfd Stock $2.4 mill. **Pfd Div'd:** $.1 mill.

Common Stock 17,640,000 shs.

MARKET CAP: $1.3 billion (Small Cap)

CURRENT POSITION ($MILL.)	2020	2021	12/31/22
Cash Assets	4.5	3.5	3.8
Other	29.6	30.9	33.5
Current Assets	34.1	34.4	37.3
Accts Payable	30.4	21.1	24.8
Debt Due	9.3	6.7	17.5
Other	17.1	28.8	75.6
Current Liab.	56.8	56.6	117.9

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '20-'22 to '26-'28
Revenues	2.5%	1.5%	4.5%
"Cash Flow"	8.5%	10.0%	3.0%
Earnings	9.5%	11.0%	5.0%
Dividends	4.0%	6.5%	6.5%
Book Value	6.5%	9.5%	2.0%

Cal-endar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2020	31.8	35.3	39.9	34.6	141.6
2021	32.5	36.7	39.9	34.0	143.1
2022	36.2	39.7	47.7	38.8	162.4
2023	42.0	43.0	50.0	42.0	177
2024	43.0	45.0	52.0	45.0	185

Cal-endar	EARNINGS PER SHARE A Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2020	.44	.55	.72	.47	2.18
2021	.39	.62	.65	.41	2.07
2022	.68	.50	.80	.40	2.39
2023	.53	.62	.90	.65	2.70
2024	.55	.65	.93	.67	2.80

Cal-endar	QUARTERLY DIVIDENDS PAID B■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2019	.24	.24	.24	.2562	.98
2020	.2562	.2562	.2562	.2725	1.04
2021	.2725	.2725	.2725	.29	1.11
2022	.29	.29	.29	.3125	1.18
2023	.3125				

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 2022, the Middlesex System accounted for 65% of operating revenues. At 12/31/22, the company had 350 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% (4/22 proxy). Add.: 485 C Route 1 South, Suite 400, Iselin, NJ 08830. Telephone: 732-634-1500. Int.: www.middlesexwater.com.

Shares of Middlesex Water have taken a breather since our early January review. The stock, which treaded water in the back half of 2022 subsequent to hovering around fresh all-time highs last March, recently traded near a 52-week low. Over the past three months, the equity is down nearly 15% in value. The investment community's recent hesitation can likely be attributed to the stock's relatively stretched valuation, as well as the potential beginning of a rotation out of flight-to-safety investments that have performed well since the pandemic. Moreover, looking at the six- to 12-month window, MSEX shares are pegged to trail the broader market averages (Timeliness: 5).

Respectable top- and bottom-line growth is probably in the cards this year. The regulated water utility delivered solid double-digit revenue and earnings expansion in 2022, thanks to a combination of base rate increases across the company's New Jersey operations, and a wider customer base, particularly in the Delaware system. Given these sticky tailwinds, we look for revenues of $177 million (+9% year over year) and earnings of $2.70 per share (+13%) in 2023. For next year, top- and bottom-line growth is poised to moderate a bit, to $185 million and $2.80 per share, respectively.

We think that leadership will continue to implement an aggressive long-term capital allocation plan. Specifically, spending on infrastructure upgrades, such as water main, service line, and fire hydrant replacements, as well as treatment facility enhancements, is apt to accelerate in the coming years. Indeed, many of these water system improvement-related expenses can eventually be passed along to the consumer. Thus, Middlesex is likely to pursue regulatory approval for additional customer rate increases further down the road.

Even with the recent step back in price, investment appeal over the pull to late-decade is limited. Too, the current dividend yield pales in comparison to the *Value Line* median. That said, subscribers with an 18-month horizon may want to consider initiating a position here, as capital appreciation potential over this time frame is worthwhile.

Nicholas Patrikis *April 7, 2023*

(A) Diluted earnings. Quarterly figures may not sum due to rounding. 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	90
Price Growth Persistence	95
Earnings Predictability	90

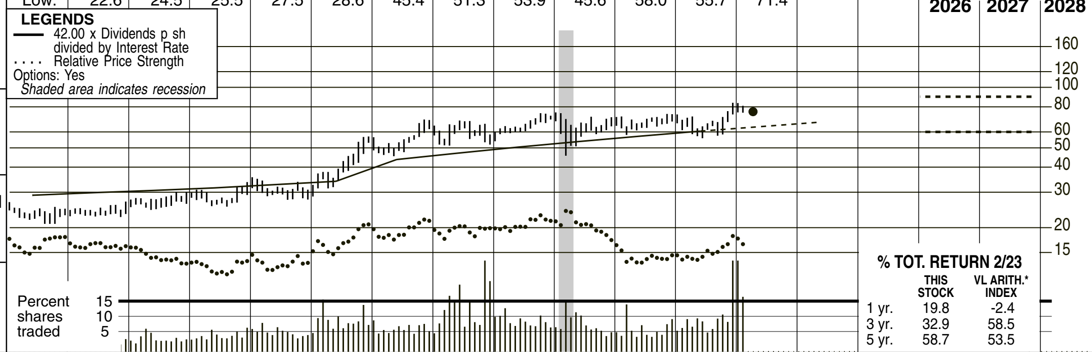
SJW GROUP NYSE-SJW

RECENT PRICE 75.62 | P/E RATIO 26.6 (Trailing: 31.4 Median: 25.0) | RELATIVE P/E RATIO 1.59 | DIV'D YLD 2.0% | VALUE LINE

TIMELINESS 2 Lowered 3/17/23
SAFETY 3 New 4/22/11
TECHNICAL 3 Lowered 3/24/23
BETA .80 (1.00 = Market)

High:	26.9	30.1	33.7	35.7	56.9	69.3	68.4	74.5	75.0	73.7	83.9	83.7
Low:	22.6	24.5	25.5	27.5	28.6	45.4	51.3	53.9	45.6	58.0	55.7	71.4

Target Price Range
2026 | 2027 | 2028



18-Month Target Price Range

Low-High	Midpoint (% to Mid)
$62-$106	$84 (10%)

2026-28 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	90	(+20%)	6%
Low	60	(-20%)	-3%

Institutional Decisions

	2Q2022	3Q2022	4Q2022
to Buy	78	96	128
to Sell	104	77	86
Hld's(000)	21790	22026	27200

% TOT. RETURN 2/23

	THIS STOCK	VL ARITH.* INDEX
1 yr.	19.8	-2.4
3 yr.	32.9	58.5
5 yr.	58.7	53.5

2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	© VALUE LINE PUB. LLC	26-28
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	*21.15*	*21.85*	Revenues per sh	*23.15*
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	5.79	*4.25*	*4.40*	"Cash Flow" per sh	*4.90*
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	2.43	*2.60*	*2.75*	Earnings per sh A	*3.25*
.61	.65	.66	.68	.69	.71	.73	.75	.78	.81	1.04	1.12	1.20	1.28	1.36	1.44	*1.52*	*1.60*	Div'd Decl'd per sh B■	*1.80*
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	7.85	*8.00*	*8.25*	Cap'l Spending per sh	*8.75*
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	36.06	*38.35*	*40.00*	Book Value per sh	*42.50*
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	30.80	*30.00*	*30.00*	Common Shs Outst'g C	*30.00*
33.4	26.2	28.7	29.1	21.2	20.4	24.3	11.2	16.6	15.7	18.8	32.7	78.8	30.0	32.9	27.3	*Bold figures are Value Line estimates*		Avg Ann'l P/E Ratio	*23.0*
1.77	1.58	1.91	1.85	1.33	1.30	1.37	.59	.84	.82	.95	1.77	4.20	1.54	1.78	1.58			Relative P/E Ratio	*1.30*
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%	2.2%			Avg Ann'l Div'd Yield	*2.4%*

CAPITAL STRUCTURE as of 12/31/22
Total Debt $1496.4 mill. **Due in 5 Yrs** $39.0 mill.
LT Debt $1492.0 mill. **LT Interest** $50.0 mill.
(LT Interest Coverage: 7.2x)
(57% of Cap'l)

Pension Assets-12/22 $252.0 mill.
Oblig. $289.1 mill.
Pfd Stock None.
Common Stock 30,800,000 shs.

MARKET CAP: $2.3 billion (Mid Cap)

2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024		26-28
276.9	319.7	305.1	339.7	389.2	397.7	420.5	564.5	573.7	620.7	*635*	*655*	Revenues ($mill)	*695*
23.5	51.8	37.9	52.8	59.2	38.8	23.4	61.5	60.5	73.8	*78.0*	*83.0*	Net Profit ($mill)	*98.0*
38.7%	32.5%	38.1%	38.8%	36.7%	20.6%	26.4%	12.0%	12.2%	10.3%	*21.0%*	*21.0%*	Income Tax Rate	*21.0%*
--	--	--	--	--	--	--	--	2.0%	6.4%	*1.5%*	*1.5%*	AFUDC % to Net Profit	*1.5%*
51.1%	51.6%	49.8%	50.7%	48.2%	32.7%	59.1%	58.4%	59.1%	57.3%	*54.5%*	*50.0%*	Long-Term Debt Ratio	*44.0%*
48.9%	48.4%	50.2%	49.3%	51.8%	67.3%	40.9%	41.6%	40.9%	42.7%	*45.5%*	*50.0%*	Common Equity Ratio	*56.0%*
656.2	744.5	764.6	855.0	894.3	1320.7	2173.6	2204.7	2527.5	2602.8	*2525*	*2400*	Total Capital ($mill)	*2275*
898.7	963.0	1036.8	1146.4	1239.3	1328.8	2206.5	2334.9	2497.5	2630.3	*2685*	*2725*	Net Plant ($mill)	*2825*
5.0%	8.3%	6.3%	7.4%	7.9%	3.9%	1.8%	4.0%	3.5%	4.0%	*3.5%*	*4.0%*	Return on Total Cap'l	*5.0%*
7.3%	14.4%	9.9%	12.5%	12.8%	4.4%	2.6%	6.7%	5.8%	6.6%	*7.0%*	*7.0%*	Return on Shr. Equity	*7.5%*
7.3%	14.4%	9.9%	12.5%	12.8%	4.4%	2.6%	6.7%	5.8%	6.6%	*7.0%*	*7.0%*	Return on Com Equity	*7.5%*
2.8%	10.2%	5.7%	8.6%	8.2%	1.8%	NMF	2.7%	2.0%	2.7%	*3.0%*	*3.0%*	Retained to Com Eq	*3.5%*
62%	29%	42%	31%	36%	60%	NMF	59%	66%	59%	*58%*	*58%*	All Div'ds to Net Prof	*55%*

CURRENT POSITION ($MILL.)

	2020	2021	12/31/22
Cash Assets	9.3	10.9	12.3
Accts Receivable	58.1	53.7	58.2
Other	59.9	69.5	84.2
Current Assets	127.3	134.1	154.7
Accts Payable	34.2	30.4	29.6
Debt Due	76.2	39.1	4.4
Other	240.4	133.8	230.7
Current Liab.	350.8	203.3	264.7

ANNUAL RATES

of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '20-'22 to '26-'28
Revenues	4.5%	3.0%	*3.0%*
"Cash Flow"	7.0%	3.0%	*-1.5%*
Earnings	7.5%	-2.0%	*6.0%*
Dividends	7.0%	9.0%	*5.0%*
Book Value	9.0%	10.5%	*3.5%*

Cal-endar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2020	115.8	147.2	165.9	135.6	564.5
2021	114.8	152.2	166.9	139.8	573.7
2022	124.3	149.0	176.0	171.4	620.7
2023	*135*	*160*	*180*	*160*	*635*
2024	*140*	*165*	*185*	*165*	*655*

Cal-endar	EARNINGS PER SHARE A Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2020	.08	.69	.91	.46	2.14
2021	.09	.69	.64	.60	2.03
2022	.12	.38	.82	1.09	2.43
2023	*.23*	*.57*	*.95*	*.85*	*2.60*
2024	*.25*	*.60*	*1.00*	*.90*	*2.75*

Cal-endar	QUARTERLY DIVIDENDS PAID BD■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2019	.30	.30	.30	.30	1.20
2020	.32	.32	.32	.32	1.28
2021	.34	.34	.34	.34	1.36
2022	.36	.36	.36	.36	1.44
2023	.38				

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 757 employees. Officers and directors own less than 1.0% of outstanding shares (3/23 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 reported good results to conclude 2022. The nationwide provider of regulated water services posted revenues of $171 million (up 22% year over year) and earnings of $1.09 per share (up 82%) in the December period. Meanwhile, for the full year, top- and bottom-line expansion of 8% and 19%, respectively, was bolstered by cumulative rate increases and a wider customer base, which more than offset a decline in overall water usage. To round out the year, SJW invested nearly $220 million on infrastructure projects, including a $60 million allocation in a new drinking water treatment facility.

Based on our model, we think revenue and earnings growth is poised to moderate somewhat this year. Recent rate hikes are expected to add roughly $15 million to the top line, while operational costs may well edge higher, thereby squeezing margins a bit. Nevertheless, we look for 2023 revenues to advance 2%, $635 million, and net income to jump 8%, to $2.60 per share.

The board of directors recently raised the quarterly payout 6%, to $0.38 per share. That was brought about by the company's notable improvement on the profit front last year. Moreover, we expect steady annual increases to the distribution out to late-decade.

SJW Group's long-term capital spending plan is likely to top $1 billion over the next five years. For the current year, the company anticipates an infrastructure upgrade bill (investments in pipeline replacements, water main repairs, and treatment facility enhancements) in the realm of $250 million. Indeed, these initiatives (as well as the top line) ought to be supported by numerous rate increase requests across the group's operating subsidiaries over the next few years.

The equity is a good selection for momentum investors with a short-term horizon. Shares of SJW are ranked to outpace the broader market averages over the coming six to 12 months (Timeliness, 2). That said, total return potential over the pull to 2026-2028 is unexciting. All told, waiting on the sidelines for a better entry point is probably the prudent move here for subscribers with a three- to five-year holding period, in our view.

Nicholas Patrikis *April 7, 2023*

(A) Diluted earnings. Excludes nonrecurring losses: '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	90
Price Growth Persistence	70
Earnings Predictability	45

Middlesex Water Company
Summary of Risk Premium Models for the
Proxy Group of Six Water Companies

		Proxy Group of Six Water Companies
Predictive Risk Premium Model (PRPM) (1)		12.41 %
Risk Premium Using an Adjusted Total Market Approach (2)		10.86
	Average	11.64 %

Notes:
(1) From page 2 of this Schedule.
(2) From page 3 of this Schedule.

Middlesex Water Company
Indicated ROE
Derived by the Predictive Risk Premium Model (1)

Proxy Group of Six 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%	0.43%	0.38%	1.8585	8.88%	3.84%	12.72%
American Water Works Company, Inc.	0.29%	0.37%	0.29%	4.2312	15.49%	3.84%	NMF
California Water Service Group	0.33%	0.49%	0.33%	1.8985	7.79%	3.84%	11.63%
Essential Utilities Inc.	0.45%	0.58%	0.45%	2.1549	12.19%	3.84%	16.03%
Middlesex Water Company	0.34%	0.90%	0.34%	1.8678	7.87%	3.84%	11.71%
SJW Group	0.42%	0.53%	0.42%	1.5660	8.16%	3.84%	12.00%
						Average	12.82%
						Median	12.00%
						Average of Mean and Median	12.41%

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) Recommended variance based on the long-term average predicted variance.
(3) (1+(Column [3] * Column [4])^12) - 1.
(4) From note 2 on page 2 of Schedule DWD-8.
(5) Column [5] + Column [6].

Middlesex Water Company
Indicated Common Equity Cost Rate
Through Use of a Risk Premium Model
Using an Adjusted Total Market Approach

Line No.		Proxy Group of Six Water Companies
1.	Prospective Yield on Aaa Rated Corporate Bonds (1)	4.76 %
2.	Adjustment to Reflect Yield Spread Between Aaa Rated Corporate Bonds and A2 Rated Public Utility Bonds (2)	0.77
3.	Adjusted Prospective Yield on A2 Rated Public Utility Bonds	5.53 %
4.	Adjustment to Reflect Bond Rating Difference of Proxy Group (3)	0.09
5.	Adjusted Prospective Bond Yield	5.62 %
6.	Equity Risk Premium (4)	5.24
7.	Risk Premium Derived Common Equity Cost Rate	10.86 %

Notes:
(1) Consensus forecast of Moody's Aaa Rated Corporate bonds from Blue Chip Financial Forecasts (see pages 9 and 10 of this Schedule).
(2) The average yield spread of A2 rated public utility bonds over Aaa rated corporate bonds of 0.77% from page 4 of this Schedule.
(3) Adjustment to reflect the A3 Moody's LT issuer rating of the Utility Proxy Group as shown on page 5 of this Schedule. The 0.09% upward adjustment is derived by taking 1/3 of the spread between A2 and Baa2 Public Utility Bonds (1/3 * 0.28% = 0.09%) as derived from page 4 of this Schedule.
(4) From page 7 of this Schedule.

Middlesex Water Company
Interest Rates and Bond Spreads for
Moody's Corporate and Public Utility Bonds

Selected Bond Yields

	[1]	[2]	[3]
	Aaa Rated Corporate Bond	A2 Rated Public Utility Bond	Baa2 Rated Public Utility Bond
Mar-2023	4.60 %	5.39 %	5.68 %
Feb-2023	4.56	5.29	5.54
Jan-2023	4.40	5.20	5.49
Average	4.52 %	5.29 %	5.57 %

Selected Bond Spreads

A2 Rated Public Utility Bonds Over Aaa Rated Corporate Bonds:
0.77 % (1)

Baa2 Rated Public Utility Bonds Over A2 Rated Public Utility Bonds:
0.28 % (2)

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

Source of Information:
Bloomberg Professional Services

Middlesex Water Company
Comparison of Long-Term Issuer Ratings for
Proxy Group of Six Water Companies

	Moody's		Standard & Poor's	
	Long-Term Issuer Rating April 2023		Long-Term Issuer Rating April 2023	
Proxy Group of Six 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-	7.0
Average	A3	7.0	A	5.8

Notes:
(1) From page 6 of this Schedule.
(2) Ratings that of Golden State Water Company.
(3) Ratings that of New Jersey American Water Co., and Pennsylvania American Water Co.
(4) Ratings that of PNG Companies and Aqua Pennsylvania, Inc. (S&P).
(5) Ratings are that of San Jose Water Company, Connecticut Water Inc. and Connecticut Water Service 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-

Middlesex Water Company
Judgment of Equity Risk Premium for the
Proxy Group of Six Water Companies

Line No.		Proxy Group of Six Water Companies
1.	Calculated equity risk premium based on the total market using the beta approach (1)	6.57 %
2.	Mean equity risk premium based on a study using the holding period returns of public utilities with A2 rated bonds (2)	3.91
3.	Average equity risk premium	5.24 %

Notes: (1) From page 8 of this Schedule.
(2) From page 11 of this Schedule.

Middlesex Water Company
Derivation of Equity Risk Premium Based on the Total Market Approach
Using the Beta for the
Proxy Group of Six Water Companies

Line No.	Equity Risk Premium Measure	Proxy Group of Six Water Companies
1.	Kroll Equity Risk Premium (1)	5.82 %
2.	Regression on Kroll Risk Premium Data (2)	7.45
3.	Kroll Equity Risk Premium based on PRPM (3)	9.76
4.	Equity Risk Premium Based on Value Line Summary and Index (4)	9.89
5.	Equity Risk Premium Based on Value Line S&P 500 Companies (5)	10.32
6.	Equity Risk Premium Based on Bloomberg S&P 500 Companies (6)	8.66
7.	Conclusion of Equity Risk Premium	8.65 %
8.	Adjusted Beta (7)	0.76
9.	Forecasted Equity Risk Premium	6.57 %

Notes:

(1) Based on the arithmetic mean historical monthly returns on large company common stocks from Kroll 2023 SBBI® Yearbook minus the arithmetic mean monthly yield of Moody's average Aaa and Aa2 corporate bonds from 1928-2022.

(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 1928-2022 referenced in Note 1 above.

(3) The Predictive Risk Premium Model (PRPM) is discussed in the accompanying direct testimony. The Kroll equity risk premium based on the PRPM is derived by applying the PRPM to the monthly risk premiums between Kroll large company common stock monthly returns and average Aaa and Aa2 corporate monthly bond yields, from January 1928 through March 2023.

(4) The equity risk premium based on the Value Line Summary and Index is derived by subtracting the average consensus forecast of Aaa corporate bonds of 4.76% (from page 3 of this Schedule) from the projected 3-5 year total annual market return of 14.65% (described fully in note 1 on page 2 of Schedule DWD-8).

(5) Using data from Value Line for the S&P 500, an expected total return of 15.08% was derived based upon expected dividend yields and long-term earnings growth estimates as a proxy for capital appreciation. Subtracting the average consensus forecast of Aaa corporate bonds of 4.76% results in an expected equity risk premium of 10.32%.

(6) Using data from the Bloomberg Professional Services for the S&P 500, an expected total return of 13.42% was derived based upon expected dividend yields and long-term earnings growth estimates as a proxy for capital appreciation. Subtracting the average consensus forecast of Aaa corporate bonds of 4.76% results in an expected equity risk premium of 8.66%.

(7) Average of mean and median beta from Schedule DWD-8.

Sources of Information:

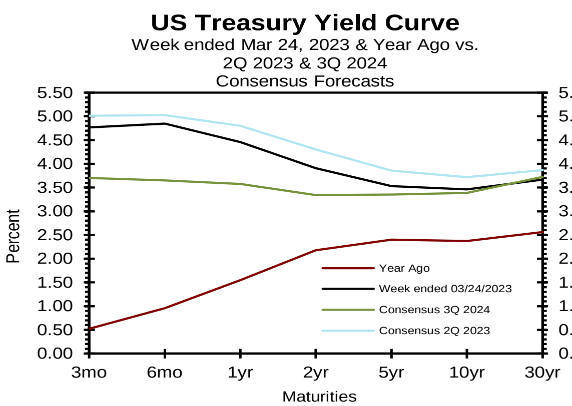
Kroll 2023 SBBI® Yearbook
Industrial Manual and Mergent Bond Record Monthly Update.
Value Line Summary and Index
Blue Chip Financial Forecasts, December 2, 2022 and March 31, 2023
Bloomberg Professional Services

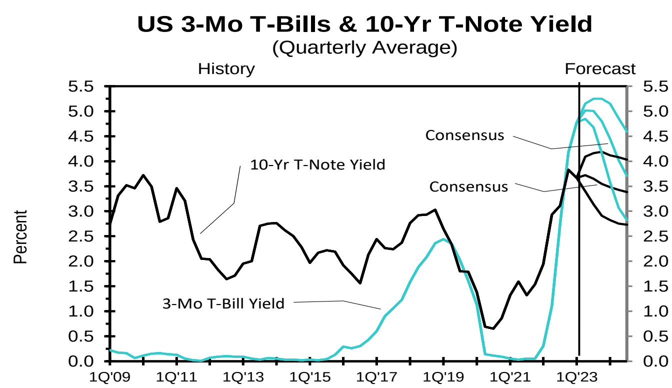
Consensus Forecasts of U.S. Interest Rates and Key Assumptions

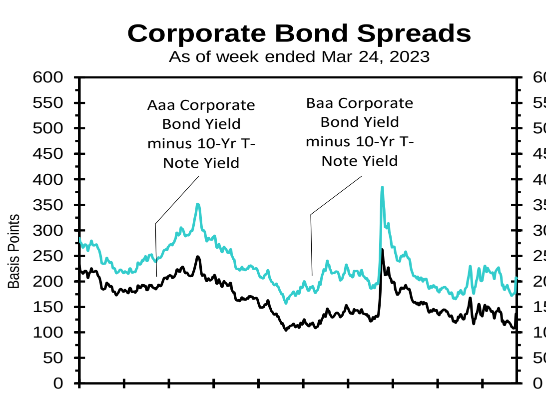
	History								Consensus Forecasts-Quarterly Avg.					
	Average For Week Ending				Average For Month			*Latest Qtr*						
Interest Rates	Mar 24	Mar 17	Mar 10	Mar 3	Feb	Jan	Dec	1Q 2023*	2Q 2023	3Q 2023	4Q 2023	1Q 2024	2Q 2024	3Q 2024
Federal Funds Rate	4.58	4.57	4.57	4.58	4.57	4.33	4.10	4.50	**5.0**	**5.1**	**4.9**	**4.6**	**4.2**	**3.8**
Prime Rate	7.75	7.75	7.75	7.75	7.74	7.50	7.27	7.67	**8.2**	**8.2**	**8.1**	**7.7**	**7.3**	**6.9**
SOFR	4.65	4.56	4.55	4.55	4.54	4.30	4.08	4.48	**5.0**	**5.0**	**4.9**	**4.5**	**4.1**	**3.7**
Commercial Paper, 1-mo.	4.78	4.76	4.66	4.59	4.55	4.33	4.20	4.55	**5.0**	**5.1**	**4.8**	**4.5**	**4.1**	**3.8**
Treasury bill, 3-mo.	4.77	4.75	5.02	4.90	4.79	4.69	4.36	4.78	**5.0**	**5.0**	**4.8**	**4.5**	**4.0**	**3.7**
Treasury bill, 6-mo.	4.85	4.82	5.27	5.18	4.97	4.80	4.71	4.92	**5.0**	**5.0**	**4.6**	**4.3**	**4.0**	**3.7**
Treasury bill, 1 yr.	4.46	4.34	5.12	5.04	4.93	4.69	4.68	4.77	**4.8**	**4.7**	**4.4**	**4.1**	**3.8**	**3.6**
Treasury note, 2 yr.	3.91	4.02	4.89	4.85	4.53	4.21	4.29	4.36	**4.3**	**4.1**	**3.9**	**3.7**	**3.5**	**3.3**
Treasury note, 5 yr.	3.53	3.64	4.22	4.24	3.94	3.64	3.76	3.81	**3.9**	**3.8**	**3.6**	**3.5**	**3.4**	**3.4**
Treasury note, 10 yr.	3.46	3.53	3.91	3.98	3.75	3.53	3.62	3.65	**3.7**	**3.7**	**3.5**	**3.5**	**3.4**	**3.4**
Treasury note, 30 yr.	3.67	3.70	3.85	3.95	3.80	3.66	3.66	3.75	**3.9**	**3.8**	**3.8**	**3.8**	**3.8**	**3.7**
Corporate Aaa bond	4.83	4.89	5.00	5.07	4.87	4.73	4.80	4.84	**4.8**	**4.7**	**4.7**	**4.6**	**4.6**	**4.6**
Corporate Baa bond	5.52	5.60	5.68	5.75	5.50	5.37	5.49	5.50	**5.9**	**5.9**	**5.8**	**5.8**	**5.7**	**5.6**
State & Local bonds	4.18	4.20	4.32	4.35	4.16	4.05	4.23	4.15	**4.0**	**4.0**	**3.9**	**3.9**	**3.9**	**3.8**
Home mortgage rate	6.42	6.60	6.73	6.65	6.26	6.27	6.36	6.38	**6.4**	**6.2**	**6.1**	**5.9**	**5.7**	**5.6**

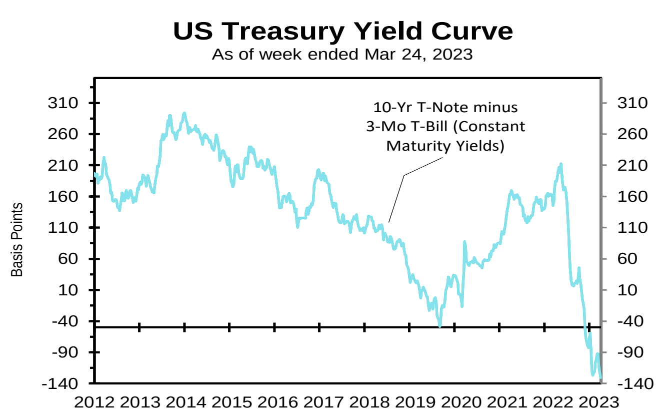
	History								Consensus Forecasts-Quarterly					
Key Assumptions	2Q 2021	3Q 2021	4Q 2021	1Q 2022	2Q 2022	3Q 2022	4Q 2022	1Q 2023**	2Q 2023	3Q 2023	4Q 2023	1Q 2024	2Q 2024	3Q 2024
Fed's AFE $ Index	102.8	104.9	106.9	108.3	113.5	118.8	119.8	115.6	**116.6**	**115.9**	**115.0**	**114.1**	**113.8**	**113.0**
Real GDP	7.0	2.7	7.0	-1.6	-0.6	3.2	2.6	0.5	**0.0**	**-0.2**	**0.3**	**0.9**	**1.5**	**1.9**
GDP Price Index	6.3	6.2	6.8	8.3	9.0	4.4	3.9	3.2	**3.2**	**2.9**	**2.7**	**2.5**	**2.3**	**2.2**
Consumer Price Index	7.5	6.6	8.8	9.2	9.7	5.5	4.2	3.7	**3.4**	**3.0**	**2.7**	**2.4**	**2.3**	**2.3**
PCE Price Index	6.4	5.6	6.2	7.5	7.3	4.3	3.7	3.6	**3.1**	**2.8**	**2.5**	**2.3**	**2.2**	**2.1**

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. *Interest rate data for 1Q 2023 based on historical data through the week ended March 24. **Data for 1Q 2023 for the Fed's AFE $ Index based on data through the week ended March 24. Figures for 1Q 2023 Real GDP, GDP Chained Price Index, Consumer Price Index, and PCE Price Index are consensus forecasts from the March 2023 survey.









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 2024 through 2028 and averages for the five-year periods 2024-2028 and 2029-2033. 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	
		2024	2025	2026	2027	2028	2024-2028	2029-2033
1. Federal Funds Rate	**CONSENSUS**	**3.7**	**2.9**	**2.8**	**2.8**	**2.7**	**3.0**	**2.8**
	Top 10 Average	4.5	3.7	3.6	3.5	3.4	3.7	3.4
	Bottom 10 Average	2.7	2.2	2.2	2.2	2.2	2.3	2.3
2. Prime Rate	**CONSENSUS**	**6.8**	**6.1**	**5.9**	**5.9**	**5.9**	**6.1**	**5.9**
	Top 10 Average	7.6	6.8	6.7	6.6	6.5	6.8	6.5
	Bottom 10 Average	5.9	5.3	5.3	5.3	5.3	5.4	5.3
3. SOFR	**CONSENSUS**	**3.7**	**2.9**	**2.8**	**2.8**	**2.7**	**3.0**	**2.8**
	Top 10 Average	4.4	3.6	3.4	3.3	3.2	3.6	3.3
	Bottom 10 Average	3.0	2.3	2.2	2.2	2.2	2.4	2.2
4. Commercial Paper, 1-Mo	**CONSENSUS**	**3.7**	**3.1**	**3.0**	**2.9**	**2.9**	**3.1**	**2.9**
	Top 10 Average	4.4	3.6	3.5	3.4	3.3	3.6	3.3
	Bottom 10 Average	3.2	2.6	2.5	2.4	2.4	2.6	2.5
5. Treasury Bill Yield, 3-Mo	**CONSENSUS**	**3.7**	**3.0**	**2.9**	**2.8**	**2.8**	**3.0**	**2.8**
	Top 10 Average	4.4	3.7	3.6	3.5	3.4	3.7	3.4
	Bottom 10 Average	2.9	2.2	2.3	2.2	2.2	2.4	2.3
6. Treasury Bill Yield, 6-Mo	**CONSENSUS**	**3.7**	**3.0**	**3.0**	**3.0**	**2.9**	**3.1**	**3.0**
	Top 10 Average	4.4	3.7	3.7	3.6	3.5	3.8	3.5
	Bottom 10 Average	3.1	2.4	2.4	2.4	2.4	2.5	2.4
7. Treasury Bill Yield, 1-Yr	**CONSENSUS**	**3.8**	**3.1**	**3.1**	**3.1**	**3.0**	**3.2**	**3.1**
	Top 10 Average	4.4	3.8	3.7	3.6	3.5	3.8	3.6
	Bottom 10 Average	3.1	2.5	2.5	2.5	2.5	2.6	2.6
8. Treasury Note Yield, 2-Yr	**CONSENSUS**	**3.6**	**3.2**	**3.2**	**3.1**	**3.1**	**3.2**	**3.1**
	Top 10 Average	4.4	3.9	3.8	3.8	3.7	3.9	3.8
	Bottom 10 Average	2.7	2.5	2.6	2.6	2.6	2.6	2.6
9. Treasury Note Yield, 5-Yr	**CONSENSUS**	**3.6**	**3.3**	**3.4**	**3.4**	**3.3**	**3.4**	**3.4**
	Top 10 Average	4.4	4.0	4.0	4.0	3.9	4.1	3.9
	Bottom 10 Average	2.9	2.7	2.7	2.8	2.8	2.8	2.9
10. Treasury Note Yield, 10-Yr	**CONSENSUS**	**3.7**	**3.5**	**3.6**	**3.6**	**3.6**	**3.6**	**3.7**
	Top 10 Average	4.4	4.2	4.4	4.4	4.3	4.3	4.3
	Bottom 10 Average	3.0	2.9	2.8	2.9	3.0	2.9	3.0
11. Treasury Bond Yield, 30-Yr	**CONSENSUS**	**4.0**	**3.9**	**3.9**	**4.0**	**3.9**	**3.9**	**4.0**
	Top 10 Average	4.6	4.5	4.7	4.6	4.6	4.6	4.7
	Bottom 10 Average	3.4	3.3	3.3	3.3	3.3	3.3	3.3
12. Corporate Aaa Bond Yield	**CONSENSUS**	**5.1**	**4.9**	**5.0**	**5.0**	**5.0**	**5.0**	**5.1**
	Top 10 Average	5.7	5.5	5.6	5.6	5.6	5.6	5.7
	Bottom 10 Average	4.6	4.4	4.4	4.4	4.5	4.4	4.5
13. Corporate Baa Bond Yield	**CONSENSUS**	**6.2**	**5.9**	**5.9**	**6.0**	**5.9**	**6.0**	**6.0**
	Top 10 Average	6.6	6.4	6.5	6.5	6.5	6.5	6.6
	Bottom 10 Average	5.7	5.3	5.3	5.4	5.4	5.4	5.5
14. State & Local Bonds Yield	**CONSENSUS**	**4.4**	**4.2**	**4.3**	**4.3**	**4.3**	**4.3**	**4.4**
	Top 10 Average	4.8	4.7	4.8	4.7	4.7	4.7	4.8
	Bottom 10 Average	3.9	3.7	3.8	3.9	3.9	3.9	3.9
15. Home Mortgage Rate	**CONSENSUS**	**5.9**	**5.5**	**5.5**	**5.5**	**5.5**	**5.6**	**5.5**
	Top 10 Average	6.6	6.2	6.2	6.2	6.2	6.3	6.2
	Bottom 10 Average	5.3	4.8	4.8	4.8	4.8	4.9	4.9
A. Fed's AFE Nominal $ Index	**CONSENSUS**	**117.6**	**116.0**	**114.5**	**113.5**	**112.2**	**114.8**	**110.7**
	Top 10 Average	120.7	119.3	118.5	118.0	117.9	118.9	116.7
	Bottom 10 Average	115.1	112.9	110.7	109.2	107.2	111.0	105.4
		Year-Over-Year, % Change					Five-Year Averages	
		2024	2025	2026	2027	2028	2024-2028	2029-2033
B. Real GDP	**CONSENSUS**	**1.4**	**2.2**	**2.1**	**2.0**	**2.0**	**1.9**	**1.9**
	Top 10 Average	2.2	2.6	2.6	2.4	2.4	2.5	2.3
	Bottom 10 Average	0.5	1.8	1.7	1.7	1.7	1.5	1.6
C. GDP Chained Price Index	**CONSENSUS**	**2.3**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**
	Top 10 Average	2.7	2.4	2.3	2.3	2.3	2.4	2.2
	Bottom 10 Average	2.0	1.9	1.9	1.9	1.9	1.9	1.9
D. Consumer Price Index	**CONSENSUS**	**2.4**	**2.2**	**2.2**	**2.2**	**2.2**	**2.2**	**2.1**
	Top 10 Average	2.8	2.5	2.4	2.3	2.3	2.5	2.3
	Bottom 10 Average	2.0	2.0	2.0	2.0	2.0	2.0	2.0
E. PCE Price Index	**CONSENSUS**	**2.3**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**
	Top 10 Average	2.6	2.4	2.4	2.3	2.2	2.4	2.2
	Bottom 10 Average	1.9	1.9	1.9	1.9	2.0	1.9	1.9

Middlesex Water Company
Derivation of Mean Equity Risk Premium Based Studies
Using Holding Period Returns and
Projected Market Appreciation of the S&P Utility Index

Line No.		Implied Equity Risk Premium
1.	Historical Equity Risk Premium (1)	4.19 %
2.	Regression of Historical Equity Risk Premium (2)	5.09
3.	Forecasted Equity Risk Premium Based on PRPM (3)	5.50
4.	Forecasted Equity Risk Premium based on Projected Total Return on the S&P Utilities Index (Value Line Data) (4)	3.85
5.	Forecasted Equity Risk Premium based on Projected Total Return on the S&P Utilities Index (Bloomberg Data) (5)	0.92
6.	Average Equity Risk Premium (6)	3.91 %

Notes:
(1) Based on S&P Public Utility Index monthly total returns and Moody's Public Utility Bond average monthly yields from 1928-2022. 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 - 2022 referenced in note 1 above.
(3) The Predictive Risk Premium Model (PRPM) is applied to the risk premium of the monthly total returns of the S&P Utility Index and the monthly yields on Moody's A2 rated public utility bonds from January 1928 - March 2023.
(4) Using data from Value Line for the S&P Utilities Index, an expected return of 9.38% was derived based on expected dividend yields and long-term growth estimates as a proxy for market appreciation. Subtracting the expected A2 rated public utility bond yield of 5.53%, calculated on line 3 of page 3 of this Schedule results in an equity risk premium of 3.85%. (9.38% - 5.53% = 3.85%)
(5) Using data from Bloomberg Professional Services for the S&P Utilities Index, an expected return of 6.45% was derived based on expected dividend yields and long-term growth estimates as a proxy for market appreciation. Subtracting the expected A2 rated public utility bond yield of 5.53%, calculated on line 3 of page 3 of this Schedule results in an equity risk premium of 0.92%. (6.45% - 5.53% = 0.92%)
(6) Average of lines 1 through 5.

Middlesex Water Company
Indicated Common Equity Cost Rate Through Use
of the Traditional Capital Asset Pricing Model (CAPM) and Empirical Capital Asset Pricing Model (ECAPM)

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Proxy Group of Six Water Companies	Value Line Adjusted Beta	Bloomberg Adjusted Beta	Average Beta	Market Risk Premium (1)	Risk-Free Rate (2)	Traditional CAPM Cost Rate	ECAPM Cost Rate	Indicated Common Equity Cost Rate (3)
American States Water Company	0.70	0.74	0.72	9.69 %	3.84 %	10.81 %	11.49 %	11.15 %
American Water Works Company, Inc.	0.90	0.93	0.92	9.69	3.84	12.75	12.95	12.85
California Water Service Group	0.70	0.77	0.73	9.69	3.84	10.91	11.57	11.24
Essential Utilities Inc.	0.95	0.82	0.88	9.69	3.84	12.36	12.66	12.51
Middlesex Water Company	0.75	0.71	0.73	9.69	3.84	10.91	11.57	11.24
SJW Group	0.80	0.65	0.72	9.69	3.84	10.81	11.49	11.15
Mean			0.78			11.43 %	11.95 %	11.69 %
Median			0.73			10.91 %	11.57 %	11.24 %
Average of Mean and Median			0.76			11.17 %	11.76 %	11.47 %

Notes on page 2 of this Schedule.

Middlesex Water Company
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: Kroll, Value Line, and Bloomberg as illustrated below:

Measure 1: Kroll Arithmetic Mean MRP (1926-2022)

Arithmetic Mean Monthly Returns for Large Stocks 1926-2022:	12.03	%
Arithmetic Mean Income Returns on Long-Term Government Bonds:	5.00	
MRP based on Kroll Historical Data:	7.03	%

Measure 2: Application of a Regression Analysis to Kroll Historical Data (1926-2022)	8.60	%

Measure 3: Application of the PRPM to Kroll Historical Data: (January 1926 - March 2023)	10.86	%

Measure 4: Value Line Projected MRP (Thirteen weeks ending April 14, 2023)

Total projected return on the market 3-5 years hence*:	14.65	%
Projected Risk-Free Rate (see note 2):	3.84	
MRP based on Value Line Summary & Index:	10.81	%

*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:	15.08	%
Projected Risk-Free Rate (see note 2):	3.84	
MRP based on Value Line data	11.24	%

Measure 6: Bloomberg Projected MRP

Total return on the Market based on the S&P 500:	13.42	%
Projected Risk-Free Rate (see note 2):	3.84	
MRP based on Bloomberg data	9.58	%
Average of Value Line, Kroll, and Bloomberg MRP:	9.69	%

(2) For reasons explained in the Direct Testimony, the appropriate risk-free rate for cost of capital purposes is the average forecast of 30 year Treasury Bonds per the consensus of nearly 50 economists reported in Blue Chip Financial Forecasts. (See pages 9 and 10 of Schedule DWD-7.) The projection of the risk-free rate is illustrated below:

Second Quarter 2023	3.90	%
Third Quarter 2023	3.80	
Fourth Quarter 2023	3.80	
First Quarter 2024	3.80	
Second Quarter 2024	3.80	
Third Quarter 2024	3.70	
2024-2028	3.90	
2029-2033	4.00	
	3.84	%

(3) Average of Column 6 and Column 7.

Sources of Information:

Value Line Summary and Index
Blue Chip Financial Forecasts, December 2, 2022 and March 31, 2023
Kroll 2023 SBBI® Yearbook
Bloomberg Professional Services

<u>Middlesex Water Company</u>
Basis of Selection of the Group of Non-Price Regulated Companies
<u>Comparable in Total Risk to the Utility Proxy Group</u>

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

The Non-Price Regulated Proxy Group companies were then selected based on the unadjusted beta range of 0.53 – 0.81 and residual standard error of the regression range of 2.8619 – 3.4135 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 0.1379. 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

$$\text{Thus, } 0.1379 = \frac{3.1377}{\sqrt{518}} = \frac{3.1377}{22.7596}$$

Source of Information: Value Line, Inc., March 2023
<u>Value Line Investment Survey</u> (Standard Edition)

Middlesex Water Company
Basis of Selection of Comparable Risk
Domestic Non-Price Regulated Companies

Proxy Group of Six 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	0.70	0.48	2.7033	0.0597
American Water Works Company, Inc.	0.90	0.82	3.3627	0.0743
California Water Service Group	0.70	0.53	3.1528	0.0697
Essential Utilities Inc.	0.95	0.92	2.7659	0.0611
Middlesex Water Company	0.75	0.55	3.5204	0.0778
SJW Group	0.80	0.69	3.3208	0.0734
Average	0.80	0.67	3.1377	0.0693

Beta Range (+/- 2 std. Devs. of Beta)	0.53	0.81
2 std. Devs. of Beta	0.14	
Residual Std. Err. Range (+/- 2 std. Devs. of the Residual Std. Err.)	2.8619	3.4135
Std. dev. of the Res. Std. Err.	0.1379	
2 std. devs. of the Res. Std. Err.	0.2758	

Source of Information: Valueline Proprietary Database, March 2023

Middlesex Water Company
Proxy Group of Non-Price Regulated Companies
Comparable in Total Risk to the
Proxy Group of Six Water Companies

	[1]	[2]	[3]	[4]
Proxy Group of Thirty Seven Non-Price Regulated Companies	Value Line Adjusted Beta	Unadjusted Beta	Residual Standard Error of the Regression	Standard Deviation of Beta
AmerisourceBergen	0.85	0.73	3.2507	0.0718
Assurant Inc.	0.90	0.79	3.0159	0.0666
Akamai Technologies	0.75	0.61	3.3451	0.0739
Booz Allen Hamilton	0.85	0.73	3.2594	0.0720
Baxter Int'l Inc.	0.75	0.56	3.0305	0.0670
Becton, Dickinson	0.80	0.62	3.0213	0.0668
Black Knight, Inc.	0.70	0.54	3.1992	0.0707
Bristol-Myers Squibb	0.80	0.68	3.0454	0.0673
Broadridge Fin'l	0.90	0.80	2.9470	0.0651
CACI Int'l	0.90	0.78	3.1164	0.0689
Casey's Gen'l Stores	0.90	0.80	3.0966	0.0684
Chemed Corp.	0.80	0.64	2.8624	0.0632
Check Point Software	0.80	0.62	2.9302	0.0647
C.H. Robinson	0.75	0.57	3.4003	0.0751
CSG Systems Int'l	0.75	0.58	3.0807	0.0681
CSW Industrials	0.90	0.79	3.1823	0.0703
Quest Diagnostics	0.80	0.63	3.3170	0.0733
Heartland Express	0.70	0.54	2.9904	0.0661
J&J Snack Foods	0.90	0.79	3.4064	0.0753
Henry (Jack) & Assoc	0.85	0.70	3.0520	0.0674
Landstar System	0.80	0.65	2.9663	0.0655
McKesson Corp.	0.90	0.80	3.2941	0.0728
McCormick & Co.	0.80	0.62	3.0763	0.0680
Monster Beverage	0.85	0.74	3.0206	0.0667
Altria Group	0.90	0.78	3.1148	0.0688
NewMarket Corp.	0.75	0.60	2.9519	0.0652
Oracle Corp.	0.85	0.73	2.9060	0.0642
Pfizer, Inc.	0.80	0.68	2.9998	0.0663
Progressive Corp.	0.75	0.59	3.0453	0.0673
RLI Corp.	0.80	0.65	2.9522	0.0652
Rollins, Inc.	0.85	0.73	3.4052	0.0752
Selective Ins. Group	0.85	0.75	3.0515	0.0674
Schneider National	0.80	0.68	3.3870	0.0748
Hostess Brands	0.75	0.56	3.2230	0.0712
Werner Enterprises	0.75	0.56	3.3192	0.0733
Watsco, Inc.	0.90	0.79	3.0230	0.0668
Western Union	0.80	0.69	3.0392	0.0671
Average	0.82	0.68	3.1169	0.0689
Proxy Group of Six Water Companies	0.80	0.67	3.1377	0.0693

Source of Information: Valueline Proprietary Database, March 2023

Middlesex Water Company
Summary of Cost of Equity Models Applied to
Proxy Group of Thirty Seven Non-Price Regulated Companies
Comparable in Total Risk to the
Proxy Group of Six Water Companies

Principal Methods	Proxy Group of Thirty Seven Non-Price Regulated Companies
Discounted Cash Flow Model (DCF) (1)	10.51 %
Risk Premium Model (RPM) (2)	12.59
Capital Asset Pricing Model (CAPM) (3)	11.72
Mean	11.61 %
Median	11.72 %
Average of Mean and Median	11.67 %

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

Middlesex Water Company
DCF Results for the Proxy Group of Non-Price-Regulated Companies Comparable in Total Risk to the
Proxy Group of Six Water Companies

	[1]	[2]	[3]	[4]	[6]	[7]	[8]
Proxy Group of Thirty Seven 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)
AmerisourceBergen	1.22 %	8.50 %	8.70 %	7.38 %	8.19 %	1.27 %	9.46 %
Assurant Inc.	2.26	15.50	11.90	11.40	12.93	2.41	15.34
Akamai Technologies	-	5.00	10.00	12.00	9.00	-	NA
Booz Allen Hamilton	1.99	8.00	8.90	9.10	8.67	2.08	10.75
Baxter Int'l Inc.	2.80	7.00	5.60	1.18	4.59	2.86	7.45
Becton, Dickinson	1.49	5.00	7.80	6.30	6.37	1.54	7.91
Black Knight, Inc.	-	10.50	7.60	2.40	6.83	-	NA
Bristol-Myers Squibb	3.25	NMF	5.70	4.06	4.88	3.33	8.21
Broadridge Fin'l	2.02	8.50	NA	11.80	10.15	2.12	12.27
CACI Int'l	-	7.00	7.30	6.70	7.00	-	NA
Casey's Gen'l Stores	0.70	7.00	NA	8.63	7.82	0.73	8.55
Chemed Corp.	0.29	6.50	8.80	8.80	8.03	0.30	8.33
Check Point Software	-	8.50	7.30	5.95	7.25	-	NA
C.H. Robinson	2.46	8.00	7.30	0.96	5.42	2.53	7.95
CSG Systems Int'l	1.99	12.00	NA	6.30	9.15	2.08	11.23
CSW Industrials	0.55	11.50	NA	12.00	11.75	0.58	12.33
Quest Diagnostics	2.01	5.00	NA	(7.74)	5.00	2.06	7.06
Heartland Express	0.49	5.00	NA	13.30	9.15	0.51	9.66
J&J Snack Foods	1.93	9.00	NA	73.10	41.05	2.33	43.38 (2)
Henry (Jack) & Assoc	1.28	8.50	9.00	9.00	8.83	1.34	10.17
Landstar System	0.68	6.00	12.00	21.80	13.27	0.73	14.00
McKesson Corp.	0.60	10.00	10.40	11.87	10.76	0.63	11.39
McCormick & Co.	2.04	4.50	6.90	3.51	4.97	2.09	7.06
Monster Beverage	-	11.00	22.10	24.86	19.32	-	NA
Altria Group	8.20	6.00	4.00	4.64	4.88	8.40	13.28
NewMarket Corp.	2.39	1.00	NA	7.70	4.35	2.44	6.79
Oracle Corp.	1.80	10.00	8.00	9.06	9.02	1.88	10.90
Pfizer, Inc.	3.91	2.00	9.00	(13.14)	5.50	4.02	9.52
Progressive Corp.	0.29	6.50	23.90	28.64	19.68	0.32	20.00
RLI Corp.	0.79	12.00	NA	9.80	10.90	0.83	11.73
Rollins, Inc.	1.43	10.50	NA	8.20	9.35	1.50	10.85
Selective Ins. Group	1.24	14.00	18.90	13.40	15.43	1.34	16.77
Schneider National	1.32	14.50	2.70	3.19	6.80	1.36	8.16
Hostess Brands	-	8.00	NA	8.31	8.16	-	NA
Werner Enterprises	1.13	9.00	3.00	5.11	5.70	1.16	6.86
Watsco, Inc.	3.25	12.00	NA	4.42	8.21	3.38	11.59
Western Union	7.52	3.50	NA	(11.05)	3.50	7.65	11.15
						Mean	10.56 %
						Median	10.46 %
						Average of Mean and Median	10.51 %

NA= Not Available
NMF= Not Meaningful Figure

(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 April 14, 2023. 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.
(2) Result excluded as they were more than two standard deviations away from the mean result.

Source of Information:
Value Line Investment Survey
www.zacks.com Downloaded on 04/14/2023
www.yahoo.com Downloaded on 04/14/2023
Bloomberg Professional Services

Middlesex Water Company
Indicated Common Equity Cost Rate
Through Use of a Risk Premium Model
Using an Adjusted Total Market Approach

Line No.		Proxy Group of Thirty Seven Non-Price Regulated Companies
1.	Prospective Yield on Baa2 Rated Corporate Bonds (1)	5.84 %
2.	Adjustment to Reflect Bond rating Difference of Non-Price Regulated Companies (2)	(0.08)
3.	Adjusted Prospective Bond Yield	5.76 %
4.	Equity Risk Premium (3)	6.83
5.	Risk Premium Derived Common Equity Cost Rate	12.59 %

Notes: (1) Average forecast of Baa2 corporate bonds based upon the consensus of nearly 50 economists reported in Blue Chip Financial Forecasts dated December 2, 2022 and March 31, 2023 (see pages 9 and 10 of Schedule DWD-7). The estimates are detailed below.

Second Quarter 2023	5.90 %
Third Quarter 2023	5.90
Fourth Quarter 2023	5.80
First Quarter 2024	5.80
Second Quarter 2024	5.70
Third Quarter 2024	5.60
2024-2028	6.00
2029-2033	6.00
Average	5.84 %

(2) The average yield spread of Baa rated corporate bonds over A corporate bonds for the three months ending March 2023 . To reflect the Baa1/Baa2 average rating of the non-utility proxy group, the prosepctive yield on Baa corporate bonds must be adjusted by 1/6 of the spread between A and Baa corporate bond yields as shown below:

	A Corp. Bond Yield	Baa Corp. Bond Yield	Spread
Mar-23	5.25 %	5.71 %	0.46 %
Feb-23	5.16	5.59	0.43
Jan-23	5.04	5.50	0.46
		Average yield spread	0.45
		1/6 of spread	0.08

(3) From page 5 of this Schedule.

Middlesex Water Company
Comparison of Long-Term Issuer Ratings for the
Proxy Group of Thirty Seven Non-Price Regulated Companies of Comparable risk to the
Proxy Group of Six Water Companies

	Moody's Long-Term Issuer Rating April 2023		Standard & Poor's Long-Term Issuer Rating April 2023	
Proxy Group of Thirty Seven Non-Price Regulated Companies	Long-Term Issuer Rating	Numerical Weighting (1)	Long-Term Issuer Rating	Numerical Weighting (1)
AmerisourceBergen	Baa2	9.0	BBB+	8.0
Assurant Inc.	Baa2	9.0	BBB	9.0
Akamai Technologies	NA	--	NR	--
Booz Allen Hamilton	NA	--	NA	--
Baxter Int'l Inc.	Baa2	9.0	BBB	9.0
Becton, Dickinson	Baa2	9.0	BBB	9.0
Black Knight, Inc.	Ba3	13.0	BB	12.0
Bristol-Myers Squibb	A2	6.0	A+	5.0
Broadridge Fin'l	Baa1	8.0	BBB+	8.0
CACI Int'l	NA	--	BB+	11.0
Casey's Gen'l Stores	NA	--	NA	--
Chemed Corp.	WR	--	NR	--
Check Point Software	NA	--	NA	--
C.H. Robinson	Baa2	9.0	BBB+	8.0
CSG Systems Int'l	NA	--	BB+	11.0
CSW Industrials	NA	--	NA	--
Quest Diagnostics	Baa2	9.0	BBB+	8.0
Heartland Express	NA	--	NA	--
J&J Snack Foods	NA	--	NA	--
Henry (Jack) & Assoc	NA	--	NA	--
Landstar System	NA	--	NA	--
McKesson Corp.	Baa1	8.0	BBB+	8.0
McCormick & Co.	Baa2	9.0	BBB	9.0
Monster Beverage	NA	--	NA	--
Altria Group	A3	7.0	BBB	9.0
NewMarket Corp.	Baa2	9.0	BBB+	8.0
Oracle Corp.	Baa2	9.0	BBB	9.0
Pfizer, Inc.	A1	5.0	A+	5.0
Progressive Corp.	A2	6.0	A	6.0
RLI Corp.	Baa2	9.0	BBB	9.0
Rollins, Inc.	NA	--	NA	--
Selective Ins. Group	Baa2	9.0	BBB	9.0
Schneider National	NA	--	NA	--
Hostess Brands	NA	--	BB-	13.0
Werner Enterprises	NA	--	NA	--
Watsco, Inc.	NA	--	NA	--
Western Union	Baa2	9.0	BBB	9.0
Average	Baa1/Baa2	8.5	BBB	8.7

Notes:
(1) From page 6 of Schedule DWD-7.

Source of Information:
Bloomberg Professional Services

Middlesex Water Company
Derivation of Equity Risk Premium Based on the Total Market Approach
Using the Beta for
Proxy Group of Thirty Seven Non-Price Regulated Companies of Comparable risk to the
Proxy Group of Six Water Companies

Line No.	Equity Risk Premium Measure	Proxy Group of Thirty Seven Non-Price Regulated Companies
1.	Kroll Equity Risk Premium (1)	5.82 %
2.	Regression on Kroll Risk Premium Data (2)	7.45
3.	Kroll Equity Risk Premium based on PRPM (3)	9.76
4.	Equity Risk Premium Based on Value Line Summary and Index (4)	9.89
5	Equity Risk Premium Based on Value Line S&P 500 Companies (5)	10.32
6.	Equity Risk Premium Based on Bloomberg S&P 500 Companies (6)	8.66
7.	Conclusion of Equity Risk Premium	8.65 %
8.	Adjusted Beta (7)	0.79
9.	Forecasted Equity Risk Premium	6.83 %

Notes:
(1) From note 1 of page 8 of Schedule DWD-7.
(2) From note 2 of page 8 of Schedule DWD-7.
(3) From note 3 of page 8 of Schedule DWD-7.
(4) From note 4 of page 8 of Schedule DWD-7.
(5) From note 5 of page 8 of Schedule DWD-7.
(6) From note 6 of page 8 of Schedule DWD-7.
(7) Average of mean and median beta from page 6 of this Schedule.

Sources of Information:
Kroll 2023 SBBI® Yearbook
Value Line Summary and Index
Blue Chip Financial Forecasts, December 2, 2022 and March 31, 2023
Bloomberg Professional Services

Middlesex Water Company
Traditional CAPM and ECAPM Results for the Proxy Group of Non-Price-Regulated Companies Comparable in Total Risk to the
Proxy Group of Six Water Companies

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Proxy Group of Thirty Seven Non-Price Regulated Companies	Value Line Adjusted Beta	Bloomberg Beta	Average Beta	Market Risk Premium (1)	Risk-Free Rate (2)	Traditional CAPM Cost Rate	ECAPM Cost Rate	Indicated Common Equity Cost Rate (3)
AmerisourceBergen	0.85	0.74	0.79	9.69 %	3.84 %	11.49 %	12.00 %	11.75 %
Assurant Inc.	0.90	0.78	0.84	9.69	3.84	11.98	12.36	12.17
Akamai Technologies	0.75	1.01	0.88	9.69	3.84	12.36	12.66	12.51
Booz Allen Hamilton	0.85	0.76	0.80	9.69	3.84	11.59	12.07	11.83
Baxter Int'l Inc.	0.75	0.77	0.76	9.69	3.84	11.20	11.78	11.49
Becton, Dickinson	0.80	0.71	0.76	9.69	3.84	11.20	11.78	11.49
Black Knight, Inc.	0.70	0.59	0.64	9.69	3.84	10.04	10.91	10.48 (4)
Bristol-Myers Squibb	0.80	0.54	0.67	9.69	3.84	10.33	11.13	10.73
Broadridge Fin'l	0.90	1.01	0.96	9.69	3.84	13.14	13.24	13.19 (4)
CACI Int'l	0.90	0.74	0.82	9.69	3.84	11.78	12.22	12.00
Casey's Gen'l Stores	0.90	0.78	0.84	9.69	3.84	11.98	12.36	12.17
Chemed Corp.	0.80	0.68	0.74	9.69	3.84	11.01	11.64	11.32
Check Point Software	0.80	0.74	0.77	9.69	3.84	11.30	11.86	11.58
C.H. Robinson	0.75	0.82	0.79	9.69	3.84	11.49	12.00	11.75
CSG Systems Int'l	0.75	0.82	0.79	9.69	3.84	11.49	12.00	11.75
CSW Industrials	0.90	0.75	0.83	9.69	3.84	11.88	12.29	12.09
Quest Diagnostics	0.80	0.74	0.77	9.69	3.84	11.30	11.86	11.58
Heartland Express	0.70	0.80	0.75	9.69	3.84	11.11	11.71	11.41
J&J Snack Foods	0.90	0.59	0.75	9.69	3.84	11.11	11.71	11.41
Henry (Jack) & Assoc	0.85	0.74	0.80	9.69	3.84	11.59	12.07	11.83
Landstar System	0.80	0.83	0.81	9.69	3.84	11.69	12.15	11.92
McKesson Corp.	0.90	0.70	0.80	9.69	3.84	11.59	12.07	11.83
McCormick & Co.	0.80	0.74	0.77	9.69	3.84	11.30	11.86	11.58
Monster Beverage	0.85	0.72	0.79	9.69	3.84	11.49	12.00	11.75
Altria Group	0.90	0.61	0.75	9.69	3.84	11.11	11.71	11.41
NewMarket Corp.	0.75	0.65	0.70	9.69	3.84	10.62	11.35	10.98
Oracle Corp.	0.85	1.04	0.94	9.69	3.84	12.95	13.09	13.02 (4)
Pfizer, Inc.	0.80	0.71	0.76	9.69	3.84	11.20	11.78	11.49
Progressive Corp.	0.75	0.76	0.75	9.69	3.84	11.11	11.71	11.41
RLI Corp.	0.80	0.75	0.77	9.69	3.84	11.30	11.86	11.58
Rollins, Inc.	0.85	0.85	0.85	9.69	3.84	12.07	12.44	12.26
Selective Ins. Group	0.85	0.73	0.79	9.69	3.84	11.49	12.00	11.75
Schneider National	0.80	0.89	0.84	9.69	3.84	11.98	12.36	12.17
Hostess Brands	0.75	0.65	0.70	9.69	3.84	10.62	11.35	10.98
Werner Enterprises	0.75	0.79	0.77	9.69	3.84	11.30	11.86	11.58
Watsco, Inc.	0.90	1.08	0.99	9.69	3.84	13.43	13.45	13.44 (4)
Western Union	0.85	0.84	0.84	9.69	3.84	11.98	12.36	12.17
Mean			0.79			11.53 %	12.03 %	11.69 %
Median			0.79			11.49 %	12.00 %	11.75 %
Average of Mean and Median			0.79			11.51 %	12.02 %	11.72 %

Notes:
(1) From Schedule DWD-8, note 1.
(2) From Schedule DWD-8, note 2.
(3) Average of CAPM and ECAPM cost rates.
(4) Result excluded as they were more than two standard deviations away from the mean result.

Middlesex Water Company
Derivation of Investment Risk Adjustment Based upon
Kroll Associates' Size Premia for the Decile Portfolios of the NYSE/AMEX/NASDAQ

Line No.		[1] Market capitalization on April 14, 2023 (1) (millions)	[1] (times larger)	[2] Applicable Decile of the NYSE/AMEX/ NASDAQ (2)	[3] Applicable Size Premium (3)	[4] Spread from Applicable Size Premium (4)
1.	Middlesex Water Company	$ 998.476		7	1.37%	
2.	Proxy Group of Six Water Companies	$ 3,328.028	3.3 x	5	0.93%	0.44%

	[A] Decile	[B] Market Capitalization of Smallest Company (millions)	[C] Market Capitalization of Largest Company (millions)	[D] Size Premium (Return in Excess of CAPM)*
Largest	1	$ 31,549.077	$ 2,203,381.286	-0.26%
	2	12,372.885	31,316.513	0.45%
	3	5,918.981	12,323.854	0.57%
	4	3,770.176	5,916.017	0.58%
	5	2,365.425	3,769.877	0.93%
	6	1,389.851	2,365.076	1.16%
	7	789.019	1,389.118	1.37%
	8	377.076	782.383	1.18%
	9	218.389	373.879	2.15%
Smallest	10	2.015	218.227	4.83%

*From 2023 Kroll 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 0.44% in Column [4], Line No. 2 is derived as follows 0.44% = 1.37% - 0.93%.

Middlesex Water Company
Market Capitalization of Middlesex Water Company and the
Proxy Group of Six Water Companies

Company	Exchange	[1] Common Stock Shares Outstanding at Fiscal Year End 2022 (millions)	[2] Book Value per Share at Fiscal Year End 2021 (1)	[3] Total Common Equity at Fiscal Year End 2022 (millions)	[4] Closing Stock Market Price on April 14, 2023	[5] Market-to-Book Ratio on April 14, 2023 (2)	[6] Market Capitalization on April 14, 2023 (3) (millions)
Middlesex Water Company		NA	NA	$ 334.947 (4)	NA		
Based upon Proxy Group of Six Water Companies						298.1 (5)	$ 998.476 (6)
Proxy Group of Six Water Companies							
American States Water Company	NYSE	36.962	$ 19.197	$ 709.549	$ 91.210	475.1 %	$ 3,371.326
American Water Works Company, Inc.	NYSE	187.201	41.095	7,693.000	149.700	364.3	28,023.921
California Water Service Group	NYSE	55.598	23.785	1,322.394	59.080	248.4	3,284.730
Essential Utilities Inc.	NYSE	263.737	20.389	5,377.386	43.190	211.8	11,390.805
Middlesex Water Company	NASDAQ	17.642	22.692	400.328	78.930	347.8	1,392.483
SJW Group	NYSE	30.802	36.065	1,110.868	79.080	219.3	2,435.815
Median		46.280	$ 23.239	$ 1,216.631	$ 79.005	298.1 %	$ 3,328.028

NA= Not Available

Notes:
(1) Column 3 / Column 1.
(2) Column 4 / Column 2.
(3) Column 1 * Column 4.
(4) Requested rate base multiplied by requested common equity ratio.
(5) The market-to-book ratio of Middlesex Water Company on April 14, 2023 is assumed to be equal to the market-to-book ratio of Proxy Group of Six Water Companies on April 14, 2023 as appropriate.
(6) Column [3] multiplied by Column [5].

Source of Information: 2022 Annual Forms 10K
Bloomberg Financial Services

Middlesex Water Company
Derivation of the Flotation Cost Adjustment to the Cost of Common Equity

Equity Issuances since 2011

		[Column 1]	[Column 2]	[Column 3]	[Column 4]	[Column 5]	[Column 6]	[Column 7]	[Column 8]	[Column 9]	[Column 10]
Date of Offering	Transaction (1)	Shares Issued (2)	Market Price per Share (1)	Average Offering Price per Share (1)	Market Pressure (3)	Issuance Expense (1)	Net Proceeds per Share (4)	Gross Equity Issue before Costs (5)	Total Net Proceeds (6)	Total Flotation Costs (7)	Flotation Cost Percentage (8)
11/20/2019	Equity Offering	760,330	$ 60.5600	$ 60.5000	$ 0.06	$ 0.8000	$ 59.7000	$ 46,045,585	$ 45,391,701	$ 653,884	1.42%
								$ 46,045,585	$ 45,391,701	$ 653,884	1.42%

Flotation Cost Adjustment

	[Column 11]	[Column 12]	[Column 13]	[Column 14]	[Column 15]	[Column 16]
	Average Dividend Yield (9)	Average Projected EPS Growth Rate (9)	Adjusted Dividend Yield (9)	Average DCF Cost Rate Unadjusted for Flotation (10)	DCF Cost Rate Adjusted for Flotation (11)	Flotation Cost Adjustment (12)
Proxy Group of Six Water Companies	1.90 %	6.58 %	1.96 %	8.54 %	8.56 %	0.03 %

Notes:
(1) From Company SEC filings
(2) Includes an over-allotment option of 84,000 shares.
(3) Col. 2 - Col. 3
(4) Col. 2 - Col. 4 - Col. 5
(5) Col. 1 x Col. 2
(6) Col. 1 x Col. 6
(7) Col. 1 *(Col. 4 + Col. 5)
(8) (Col. 7 - Col. 8) / Col. 7
(9) From Schedule DWD-6
(10) Col. 12 + Col. 13
(11) (Col. 13 / (1 - Col. 10)) + Col. 12
(12) Col. 15 - Col. 14

Source of Information: Company SEC filings.