KyPSC Case No. 2021-00190
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STAFF-DR-03-001

REQUEST:

Refer to the Application, Schedule L-1, page 10 of 88, Application for Service.

a. Provide the personal information requested of each new potential customer, explain why each item is needed, and for each one, indicate whether the information is required in order for the customer to receive service or if it is optional for the customer to provide.

b. Indicate whether Duke Kentucky has a standard Application for Service. If so, provide a copy.

RESPONSE:

a. To start service, the customer is requested to provide information on the location where service is to be provided, which includes the address, whether it is owned or rented, whether it is a mobile home, what services are required (gas and/or electric) and the date service is to begin. The Company will also run a credit check and request information to prove the customer's identity and creditworthiness. The information listed below is requested to positively identify each customer based on the rules established by the Fair and Accurate Credit Transaction Act (FACTA).

   1. Full legal first and last name.
   2. Date of Birth.
   3. Former Address.
   4. Social Security Number and/or Driver's License Number, or alternate ID (State ID, Passport, Matricula, Visa).

Finally, contact information for the customer is requested which includes an e-mail address, phone number and mailing address (if different from service address).

All of the requested information is optional except for the customer's full legal name, Social Security Number or alternate ID, telephone number, date of birth, previous location (address, city and state) and the new service address.

b. The Company has an online service application. Screen shots are provided in STAFF-DR-03-001b Attachment.

PERSON RESPONSIBLE: Jeff L. Kern

Start, Stop & Move (/home/start-stop-move)

Start Service

Move In Verify Identity Contact Info Review

Where are you moving?

Tell us the location of your new service address.

Street Address

Apt/Floor/Suite/Lot

City

State

Zip Code

Do you rent or own this property?

- ○ Own
- ○ Rent

☐ This property is a mobile home.

What services are needed?

☐ Electric

☐ Gas

CONTINUE

Cancel

Start, Stop & Move (/home/start-stop-move)

Start Service

Move In
Verify Identity
Contact Info
Review

Whose name should be on this account?

Next, we'll need to verify your identity. Please use your legal name, since this will be the name associated with the account.

Legal First Name

Legal Last Name

Social Security Number

Before starting new service, we run a credit check.

Date of Birth (MM / DD / YYYY)

Current Street Address

Apt/Floor/Suite/Lot

City

State

Zip Code

Don't have a Social Security Number? Contact Us (/customer-service/contact-us).

CONTINUE

PREVIOUS

Start, Stop & Move (/home/start-stop-move)

Start Service

Move In Verify Identity **Contact Info** Review

How should we contact you?

Email

Confirm Email

Phone Number

Phone Type

What's your mailing address?

(This is where we'll send your bill.)

☐ Same as Service Address

Street Address

Apt/Floor/Suite/Lot

City

State

Zip Code

CONTINUE

PREVIOUS

STAFF-DR-03-002

REQUEST:

Refer to the Application, Schedule L-2.2, page 23 of 92, Budget Billing Plan Description. With the proposed change to revise the bill amount after three, six, and nine months if the budget bill amount compared to the actual amount exceeds a Company-set threshold, explain what differentiates the annual budget billing plan from the quarterly budget billing plan.

RESPONSE:

Both the quarterly and annual budget billing plans will be reviewed every three months for adjustments, and the recalculation is intended to prevent large variances between the payment plan amount and the actual monthly amount due.

The annual plan is settled every 12 months. If the customer has paid more than their actual usage amount, a credit will be applied to the account. If they have used more energy than paid for through the budget billing plan, the difference is billed on the 12th month's bill, in addition to the monthly budget bill amount. Conversely, the quarterly plan does not have a year-end settle-up. Any difference in energy used versus what was paid under the plan is calculated into the next quarterly budget amount. The quarterly plan will be settled if the customer is removed from the budget billing program for any reason, including ending service with the Company.

PERSON RESPONSIBLE: Jeff L. Kern

STAFF-DR-03-003

REQUEST:

Refer to the Application, the Direct Testimony of Benjamin Passty, Ph.D., page 13, lines 9-10.

a. For the energy forecast, the rolling 30-year period is used for the weather normalization adjustment (WNA). Explain why a 30-year period is not used for the updated WNA.

b. Provide an update to the baseload and heat sensitivity factor using a 20-year WNA.

c. Provide an update to the baseload and heat sensitivity factor using a 30-year WNA.

RESPONSE:

a. The model for the WNA exposes sales to a temperature measure only, for the purpose of measuring how volumes can be normalized to express what the sales would have been had there been normal weather. For the WNA calculation, only thirty-six months are used to give an ample representation of the weather cycle without being affected by long-term changes in demographics/economics. This equation differs from the modeling equations—used for the load forecast—which are designed to account for long-term economic and demographic factors. In these, thirty years of weather are used to calculate what weather is expected during the forecast period, but weather is not the only driver of these projections. Using thirty years of data to perform an estimation without these economic factors would suffer from an extreme omitted-variable bias that would weight recent, strong weather far too much.

b. (and c.) Since the “normal weather” is not used for the calculation of the WNA parameters, calculating normal weather using only the last twenty years doesn’t affect the calculations. Excluding the oldest ten years from the sample produces the following average normal heating degree days (base 59) for the billing periods used in the estimation:

Month	20-Year Normal	30-Year Normal
Jan	810.13	838.06
Feb	880.95	865.14
Mar	612.13	609.67
Apr	276.13	289.56
May	66.99	71.09
Jun	5.07	3.54
Jul	0.00	0.00
Aug	0.00	0.00
Sep	0.00	0.01
Oct	26.79	29.91
Nov	247.91	255.55
Dec	638.47	609.46

PERSON RESPONSIBLE: Benjamin W. Passty, Ph.D.

Duke Energy Kentucky
Case No. 2021-00190
STAFF Third Set Data Requests
Date Received: August 4, 2021

STAFF-DR-03-004

REQUEST:

Refer to Duke Kentucky's Response to Commission Staff's Second Request for Information (Staff's Second Request), Item 2.

a. Explain whether the information in the tables provided with this response is conveyed to customers when they sign up for the budget billing programs. If so, explain how the information is conveyed to customers. If not, explain why not.

b. Indicate whether the tables provided with the response apply no matter whether the actual amount exceeds or is less than the budget bill amount.

RESPONSE:

a. The thresholds provided in response to STAFF-DR-02-002 are not provided to customers or call center specialists. Customers who enroll via the Company's call center are told that the plans are reviewed every third, sixth and ninth months and that the monthly amount will be adjusted if their actual usage amount falls outside the established thresholds. Additionally, the Company's website provides general information about the budget billing plans. The tables provided in the response to STAFF-DR-02-002 are not provided to customers since the thresholds are configurable and can be adjusted. In addition, providing these tables to customers would be more likely to cause confusion than help the customer in a meaningful way.

b. The budget billing plan amount is adjusted if the customer’s actual usage amount falls outside of the established threshold, whether it exceeds or is lower than the budget bill amount.

PERSON RESPONSIBLE: Jeff L. Kern

Duke Energy Kentucky
Case No. 2021-00190
STAFF Third Set Data Requests
Date Received: August 4, 2021

STAFF-DR-03-005

REQUEST:

Refer to Duke Kentucky's Response to Staff's Second Request, Item 6.

a. Explain how the provided information supports a bad check charge of $11.00.

b. Explain whether Duke Kentucky's current $11.00 bad check charge includes labor expense. If so, provide the amount that represents labor expense.

c. Explain why the bad check charge should not be broken down into two separate charges, one for ACH return items and one for deposited checks, seeing as they have different charges associated with them.

RESPONSE:

a. The Company provided the elements involved in the handling of a check when its returned as unpaid by the bank. The response described both Company actions and the bank fees to justify the $11 charge. However, the Company's bad check charge is not solely based on costs. The charge is intended to cover the costs associated with bank assessed fees and to deter customers from making payments that utilize accounts with insufficient funds. Also, the Company has found that the amount of its fee is supported by how it compares with other industries, including the bad check charge established in KRS 131.180 for the Kentucky Department of Revenue related to their collection practices, which shall not be less than $10.

b. As noted in the Company's previous response, there is time and labor involved in the administrative processes of handling returned checks, exceptions and returns by

Company employees, but it is not priced into the $11 bad check charge. The labor costs associated with handling bad checks would be captured in general O&M labor as part of cost of service.

c. The Company does not differentiate its pricing to customers based on the costs or necessary Company actions for the payment channel a customer chooses. Payment channel costs, except credit/debit card transactions, are included in the cost of service and borne by all customers. As stated above, the bad check charge is structured to cover the increment costs associated with bank assessed fees and to deter customers from making payments that utilize accounts with insufficient funds. Finally, charging multiple fees amounts would be administratively burdensome and additional manual intervention would be required to adjust each fee amount based on how the check originated in the system.

PERSON RESPONSIBLE: Lesley G. Quick

STAFF-DR-03-006

REQUEST:

Refer to Duke Kentucky's Response to Staff's Second Request, Item 15c. Explain why the weighted tenor average is 20.5 years.

RESPONSE:

The assumed tenor of 20.5 years was selected as it aligns with the average tenor of the Company's current long-term debt portfolio, excluding the two series of pollution control bonds, (see Table 1). Kentucky issues long-term debt securities in the private placement market where investor tenor demand is unknown from year to year. Therefore, the Company assumed the historical investor tenor demand average for the purpose of forecasting future issuances.

Table 1

Issuer	Type	Principal	Tenor
Duke Energy Kentucky	Unsecured	65,000,000	30.00
Duke Energy Kentucky	Unsecured	45,000,000	10.00
Duke Energy Kentucky	Unsecured	50,000,000	30.00
Duke Energy Kentucky	Unsecured	30,000,000	12.00
Duke Energy Kentucky	Unsecured	30,000,000	30.00
Duke Energy Kentucky	Unsecured	30,000,000	40.00
Duke Energy Kentucky	Unsecured	25,000,000	5.00
Duke Energy Kentucky	Unsecured	40,000,000	10.00
Duke Energy Kentucky	Unsecured	35,000,000	30.00
Duke Energy Kentucky	Unsecured	40,000,000	30.00
Duke Energy Kentucky	Unsecured	95,000,000	6.00
Duke Energy Kentucky	Unsecured	75,000,000	10.00
Duke Energy Kentucky	Unsecured	35,000,000	10.00
Duke Energy Kentucky	Unsecured	35,000,000	30.00
		Average	20.21

PERSON RESPONSIBLE: Chris R. Bauer

Duke Energy Kentucky
Case No. 2021-00190
STAFF Third Set Data Requests
Date Received: August 4, 2021

STAFF-DR-03-007

REQUEST:

Provide the article entitled "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" (2013) in which Dylan W. D'Ascendis was an author.

RESPONSE:

Please see STAFF-DR-03-007 Attachment.

PERSON RESPONSIBLE: Dylan W. D'Ascendis

Richard A. Michelfelder *is Clinical Associate Professor of Finance at Rutgers University, School of Business, Camden, New Jersey. He earlier held a number of entrepreneurial and executive positions in the public utility industry, some of them involving the application of renewable and energy efficiency resources in utility planning and regulation. He was CEO and chairperson of the board of Quantum Consulting, Inc., a national energy efficiency and utility consulting firm, and Quantum Energy Services and Technologies, LLC, an energy services company that he co-founded. He also helped to co-found and build Comverge, Inc., currently one of the largest demand-response firms in the world that went public in 2006 on the NASDAQ. He was also an executive at Atlantic Energy, Inc. and Chief Economist at Associated Utilities Services, where he testified on the cost of capital for public utilities in a number of state jurisdictions and before the Federal Energy Regulatory Commission. He holds a Ph.D. in Economics from Fordham University and has published numerous articles in academic journals.*

Pauline M. Ahern *is a Principal and with AUS Consultants located in Mount Laurel, New Jersey. She has served investor-owned and municipal utilities and authorities for nearly 25 years. A Certified Rate of Return Analyst (CRRA), she is responsible for the development of rate-of-return analyses, including the development of ratemaking capital structure ratios, senior capital cost rates, and the cost rate of common equity and related issues for regulated public utilities. She has testified as an expert witness before 29 regulatory commissions in the U.S. and Canada. In addition, she supervises the production of the various AUS Utility Reports publications and maintains the benchmark index against which the American Gas Association's Mutual Fund performance is measured. She holds an M.B.A. in finance from Rutgers University and a Bachelor of Arts Degree in Economics/Econometrics from Clark University.*

Dylan W. D'Ascendis *is Principal at AUS Consultants, located in Mt. Laurel, New Jersey. He is responsible for preparing fair-rate-of-return studies for AUS Consultants' rate-of-return expert witnesses and assists in every aspect of the rate case procedural process. He is also a Certified Rate of Return Analyst. He is the Editor of AUS Utility Reports and is responsible for the data collection and production of the AUS Monthly Utility Report. He also assists in the calculation and production of the AGA Index, a market capitalization weighted index of the common stocks of the approximately 70 corporate members of the American Gas Association. Mr. D'Ascendis holds an M.B.A. in both Finance and International Business from Rutgers University and a Bachelor of Arts Degree in Economic History from the University of Pennsylvania.*

Frank J. Hanley *is a Principal of AUS Consultants located in Mt. Laurel, New Jersey. He joined the firm in 1971 as Vice President, was elected Senior Vice President in 1975, and President of the Utility Services Group in 1989. Mr. Hanley has testified on cost-of-capital and related financial issues in more than 300 cases before 33 state regulatory commissions, the District of Columbia Public Service Commission, the Public Services Commission of the U.S. Virgin Islands, the Federal Energy Regulatory Commission, a U.S. District Court, a U.S. Bankruptcy Court and the U.S. Tax Court. He is a graduate of Drexel University and is a Certified Rate of Return Analyst. He is an Associate Member of the American Gas Association as well as a member of its Rate Committee. Also, he is a member of the Executive Advisory Council of the Rutgers University School of Business at Camden as well as a member of the Advisory Council of New Mexico State University's Center for Public Utilities.*

The authors wish to thank Selby P. Jones, III, Associate, AUS Consultants, for his technical assistance.

Comparative Evaluation of the Predictive Risk Premium Model, the Discounted Cash Flow Model and the Capital Asset Pricing Model for Estimating the Cost of Common Equity

The regulatory process for setting a utility's allowed rate of return on common equity has generally relied upon the Gordon Discounted Cash Flow Model and Capital Asset Pricing Model. The Predictive Risk Premium Model, introduced a year ago, resolves several of the widely known problems with these models. Further testing since its introduction a year ago suggests that it produces stable results which are consistent over time.

Richard A. Michelfelder, Pauline M. Ahern, Dylan W. D'Ascendis and Frank J. Hanley

I. Introduction

The lead article in the July 2008 issue of this *Journal*, "Integrating Renewables into the US Grid: Is it Sustainable," by Professors Peter Mark Jansson and Richard A. Michelfelder,[1] called for the reregulation of the electric utility industry and putting the planning of generation assets, whether renewable or not, back in the hands of the experts and those ultimately responsible for reliability, the electric utilities. During the last 10 years or so,

 1040-6190/\$–see front matter http://dx.doi.org/10.1016/j.tej.2013.04.005

states have been backpedaling on deregulation and therefore methods for estimating the cost of common equity and the allowed rate of return have generated new interest as regulating rate of return is not going away as once thought.

The regulatory process for setting a public utility's allowed rate of return on common equity has generally relied upon the familiar Gordon Discounted Cash Flow Model (DCF) and Capital Asset Pricing Model (CAPM). Despite the widely known problems with these models, there has been little initiative to adopt more recently developed asset pricing models with fewer limiting assumptions and requiring less subjective judgment than these traditional models. In December 2011, the article "New Approach to Estimating the Cost of Common Equity Capital for Public Utilities,"[2] published in *The Journal of Regulatory Economics*, introduced the Predictive Risk Premium Model (PRPM). The PRPM trademark refers to a general, yet simple, consumption-based asset pricing model of the risk/return relationship for common stocks which can be used to estimate the cost rate of common equity (ROE). The stability and consistency of the results of PRPM and the ex ante, i.e., expectational, nature of those results indicate that the model should be used to provide additional input into the process of determining an allowed rate of return on common equity for public utilities.

Since publication, more exhaustive empirical testing of the PRPM was conducted for the four utility industry groups which comprise the AUS Utility Reports[3] universe of publicly traded utilities: an electric utility group; a combination electric and natural gas distribution utility group; a natural gas distribution utility group, and a water utility group. The empirical testing confirms the conclusion of the original *Journal of Regulatory Economics* article: the PRPM produces stable results which are consistent over time.

Despite the widely known problems with these models, there has been little initiative to adopt more recently developed asset pricing models with fewer limiting assumptions and requiring less subjective judgment.

II. Development of the PRPM

The cost rate of common equity is not directly observable in the capital markets and must be inferred using various financial models. The most commonly used cost of common equity models in the regulatory arena are the aforementioned DCF and the CAPM. Since these models are based upon many restrictive assumptions, they involve a significant amount of analyst subjectivity in their application, resulting in much debate over the application and results of these models.

The empirical approach to the PRPM is based upon the work of Robert F. Engle, Ph.D.,[4] who shared the Nobel Prize in Economics in 2003 "for methods of analyzing economic *time series* with time-varying volatility (*ARCH*),"[5] with "ARCH" standing for autoregressive conditional heteroskedasticity. In other words, volatility (variance) changes over time and is related to itself from one period to the next, especially in financial markets. Engle discovered that the volatility (usually measured by variance) in prices and returns clusters over time. Therefore, volatility is highly predictable and can be used to predict future levels of risk. The theoretical asset pricing model was recently developed in the *Journal of Economics and Business* in December 2011 by Rutgers University professors Richard Michelfelder and Eugene Pilotte.[6]

In this study, the PRPM estimates the risk/return relationship directly using the outcomes of investors' historical pricing decisions and actual long-term U.S. Treasury security yields, with the predicted equity risk premium generated by the prediction of volatility, i.e., the risk, based upon the volatility of past equity risk premiums for the AUS Utility Reports universe of companies.

III. Estimation Method

The statistical details of the estimation method of the PRPM can be found in the original article in the *Journal of Regulatory Economics*, "New Approach to Estimating the Cost of Common Equity Capital for Public Utilities." Essentially, there are two steps to the application of the PRPM. First, predicted volatility, i.e., risk, is derived based upon previous volatility plus previous prediction error, because volatility is highly predictable and correlated over time. Second, the predicted volatility can then be used to generate the predicted equity risk premium (ERP) by multiplying it by the GARCH coefficient, i.e., the slope of the predicted volatility. A risk-free rate is then added to the ERP to estimate the ROE, i.e., the market based cost of common equity.

IV. Application of the PRPM to Publicly Traded Utility Companies

The PRPM was applied to the companies comprising the AUS Utility Reports' utility industry groups: the electric, combination electric and natural gas distribution, natural gas distribution, and water groups. The PRPM variances were calculated monthly for each individual utility beginning with the first available monthly data included for each individual utility in the University of Chicago Booth School of Business' Center for Research in Security Prices (CRSP) and corresponding monthly long-term U.S. Treasury bond yields from Morningstar's *Ibbotson SBBI – 2012 Valuation Yearbook – Market Results for Stocks, Bonds, Bills and Inflation – 1926–2011 (SBBI)* through 72-month ending periods, i.e., January 2006 through December 2011.

Using EViews Version 7.2, the PRPM coefficients and predicted monthly variances were estimated as described in the *JRE* article for each time series of equity risk premiums. Consistent with the conclusion drawn in the *JRE* article, the predicted equity risk premiums were calculated using the averaged predicted volatilities (variances) over the entire time period for which CRSP data were available for each utility, multiplied by the GARCH, or slope, coefficient generated through EViews for each time series. To calculate the PRPM cost rate of common equity for each utility, the average predicted utility specific equity risk premium through each month ending from January 2006 through December 2011 was then added to the projected consensus forecast of the expected yields on 30-year U.S. Treasury bonds for the next six quarters by the reporting economists in the concurrent *Blue Chip Financial Forecasts (Blue Chip).*

The DCF was applied in a simple manner, using a dividend yield, D_0/P_0, derived by dividing the month-end indicated dividend per share (D_0) by the month-end closing market price (P_0) for each utility. The dividend yield was then grown by the month-end I/B/E/S consensus five-year projected earnings per share (EPS) growth rate (g) to derive ($D_0\ (1+g)/P_0$). The one-month predicted dividend yield was then added to the concurrent month's I/B/E/S consensus

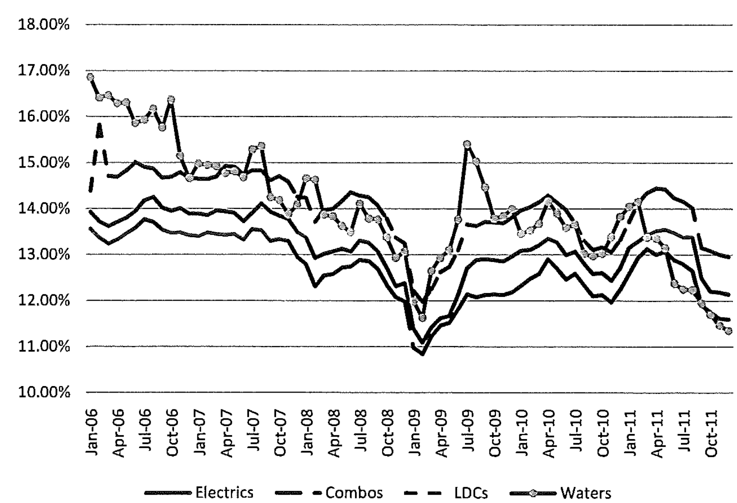

Figure 1: Indicated Return on Common Equity Based upon the PRPM for the AUS Utility Reports Companies

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five-year average projected EPS growth rate to obtain the DCF estimate of the cost of common equity capital, k. The DCF estimates were also calculated for each month from January 2006 through December 2011.

The CAPM was applied by multiplying Value Line Inc.'s beta (β),[7] for each utility, by the long-term historical arithmetic mean market equity risk premium ($R_m - R_f$) through the previous year. ($R_m - R_f$) was derived as the spread of the total return of large company common stocks over the income return on long-term government bonds from the annual *SBBI Valuation Yearbooks* for the years ending 2005 through 2010. The resulting utility-specific equity risk premium was then added to the same projected consensus forecast of the expected yields on 30-year U.S. Treasury bonds for the next six quarters by the reporting economists in the concurrent *Blue Chip* discussed above, to obtain the CAPM estimate of the cost of common equity capital, k. The CAPM estimates were also calculated for each month from January 2006 through December 2011.

Finally, the results for each of the models, the PRPM, DCF, and CAPM, were averaged for each utility group.[8] **Figure 1** presents the average PRPM results for each of the AUS Utility Reports utility groups for each month from January 2006 through December 2011.

Figure 1 shows that indicated ROEs derived from the PRPM were stable for all utility groups until the global financial crisis of 2008–2009. During 2008 and 2009, the PRPM-derived ROEs decline, which in the authors' opinion, was a result of a "flight to quality" by investors, i.e., the willingness of an investor to accept a lower, but more certain, return during financial downturns. Figure 1 also indicates that the PRPM-derived ROEs for the electric, combination electric and natural gas distribution, and natural gas distribution utility groups follow a nearly identical pattern throughout the 72-month period, with the water utility group following a similar, but more volatile pattern.

Figures 2–5 present a comparison of the average PRPM, DCF, and CAPM cost of common equity estimates for each AUS

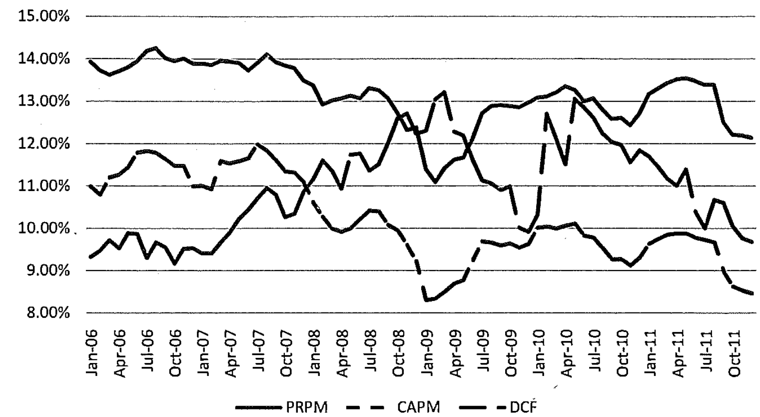

Figure 2: Indicated Return on Common Equity Based upon the PRPM, CAPM and DCF Methodologies for the AUS Utility Reports Electric Companies

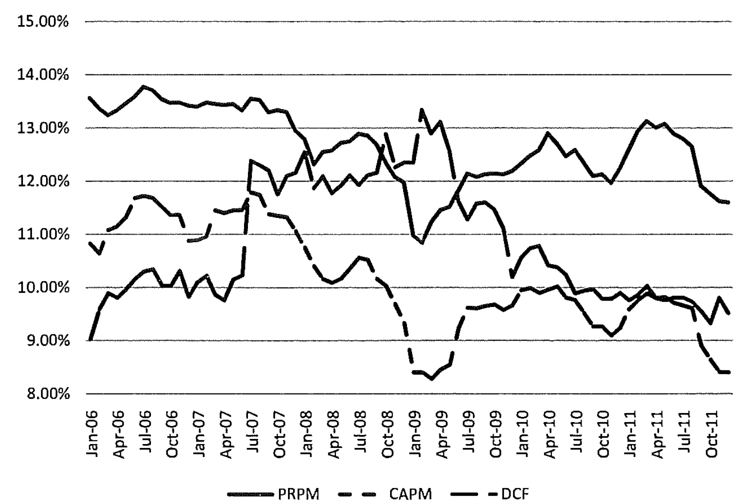

Figure 3: Indicated Return on Common Equity Based upon the PRPM, CAPM, and DCF Methodologies for the AUS Utility Reports Combination Companies

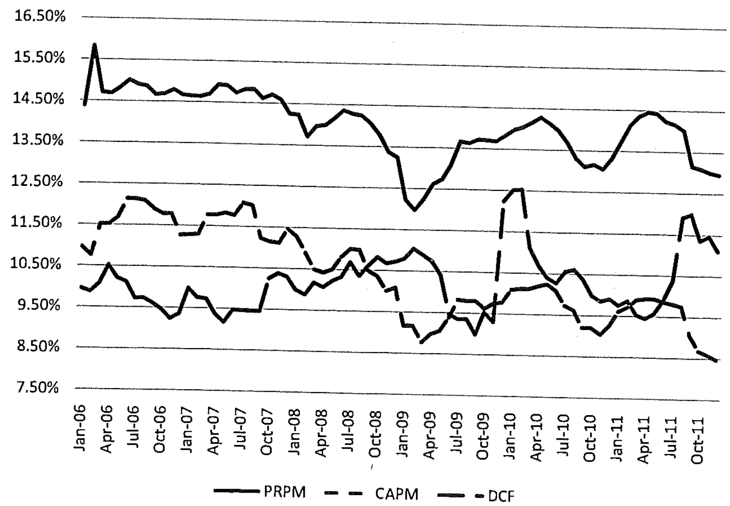

Figure 4: Indicated Return on Common Equity Based upon the PRPM, CAPM and DCF Methodologies for the AUS Utility Reports Gas Companies

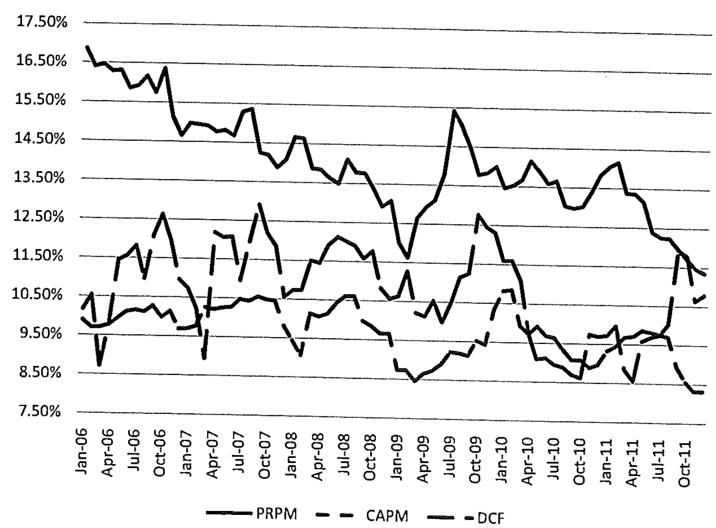

Figure 5: Indicated Return on Common Equity Based upon the PRPM, CAPM and DCF Methodologies for the AUS Utility Reports Water Companies

Utility Reports utility industry group, i.e., the electric utility group; the combination electric and natural gas distribution utility group; the natural gas distribution utility group; and, the water utility group for each month from January 2006 through December 2011.

Figures 2–5 clearly show that, for the most part, the PRPM produces a higher average indicated ROE than both the DCF and CAPM. This is due to the fact that the PRPM prices *all* of the risk that investors actually face collectively. In contrast, the CAPM prices systematic risk (that investors face only if they have a perfectly diversified portfolio, which does not exist) and the DCF uses accounting-based, not market-based, I/B/E/S consensus five-year projected EPS growth rates.

V. Conclusion

In the authors' opinion, the PRPM benefits ratemaking with an additional model to estimate ROE. To that end, the authors have been including the PRPM in their rate-of-return testimonies and the model has been presented publicly in several venues.[9]

Its results are stable and consistent over time. It is not based upon restrictive assumptions, as are the DCF and CAPM. The PRPM is also not based upon an *estimate* of investor behavior, but rather, upon a statistical analysis of *actual* investor behavior by evaluating the results of that behavior, i.e., the volatility (variance) of historical equity risk premiums. In contrast, subjective decisions surround the choice of the inputs to both the DCF and CAPM, from the choice of the time period over which to measure the dividend yield for the DCF, the choice of the DCF growth rate (e.g., historical or projected, earnings per share or dividends per share, and the like), to the selection of the appropriate beta (e.g., adjusted or unadjusted), market equity risk premium (e.g., historical or projected) and the appropriate

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risk-free rate (e.g., historical or projected and/or long vs. short term) for the CAPM. In addition, as previously discussed, the CAPM exclusively prices systematic risk. In contrast, the PRPM prices *all* of the risk actually faced collectively by investors, because the model does not assume that investors' portfolios are perfectly diversified containing no unsystematic risk.

In addition, the inputs to the PRPM are widely available. The GARCH coefficient is calculated with the relatively inexpensive EViews, or other statistical, software, based upon the realized ERP, i.e., total returns minus the risk-free rate. The only subjective decisions to be made when applying the PRPM relate to which risk-free rate to use, e.g., long-term or short-term, and over what time period to estimate the PRPM-derived ROEs.

For all of these reasons, the authors conclude that the PRPM should be considered as appropriate additional evidence to measure the cost of common equity in regulatory rate setting for public utilities.■

Endnotes:

1. Peter Mark Jansson and Richard A. Michelfelder, *Integrating Renewables into the US Grid: Is It Sustainable?* ELEC. J.,July 2008, at 9–21.

2. Pauline M. Ahern, Frank J. Hanley and Richard A. Michelfelder, *New Approach to Estimating the Cost of Common Equity Capital for Public Utilities*, J. REG. ECON.(2011) 40, at 261–78.

3. AUS Monthly Utility Reports is a monthly pocket reference book covering the electricity, combination electricity & natural gas distribution, natural gas distribution, and water companies which have publicly traded common stock. The monthly reports provide comprehensive information on key ratios and industry rankings based upon the financial statistics presented in the report.

4. Professor Emeritus, University of California, San Diego, and currently the Michael Armellino Professor in Management of Financial Services at New York University's Stern School of Business.

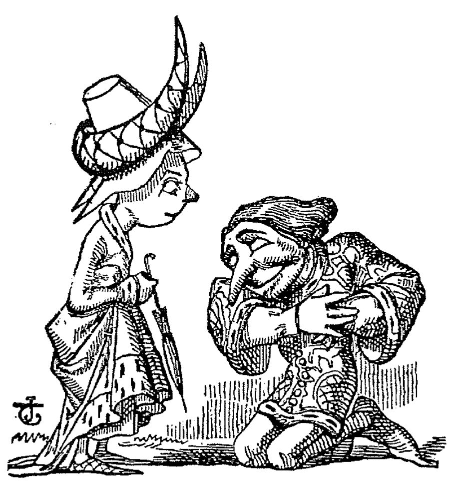
5. See www.nobelprize.org.

6. Richard Michelfelder and Eugene Pilotte, *Treasury Bond Risk and Return, the Implications for the Hedging of Consumption and Lessons for Asset Pricing*, J. ECON. & BUS.(2011) 63, at 605–37.

7. Using a proprietary data base available at mid-March, June, September, and December at the end of each year, from 2006–2011 from Value Line, Inc.

8. The results shown in the accompanying figures represent AUS Utility group averages of only those utilities in each group for which it was possible to estimate all three models in any given month. For example, if ABC Utility did not have the I/B/E/S consensus growth rate necessary to calculate the DCF in a given month, that utility's PRPM and CAPM were not included in the group average for that month.

9. Edison Electric Institute Cost of Capital Working Group (Webinar Oct. 2012); NARUC Staff Subcommittee on Accounting & Finance (Sept. 2012 and Mar. 2010); National Association of Water Companies Finance/Accounting/Taxation and Rates & Regulations Committees (Mar. 2012); NARUC Water Committee (Feb. 2012); Wall St. Utility Group (Dec. 2011); IN Utility Regulatory Commission Cost of Capital Task Force (Sept. 2010); Financial Research Inst. of the Univ. of Missouri Hot Topic Hotline Webinar (Dec. 2010); and Center for Research in Regulated Industries Annual Eastern Conference (May 2010 & May 2009).



Subjective decisions surround the choice of the inputs to both the DCF and CAPM.

 1040-6190/$–see front matter http://dx.doi.org/10.1016/j.tej.2013.04.005

STAFF-DR-03-008

REQUEST:

Refer to Duke Kentucky's Response to Staff's Second Request, Item 17a.

a. Explain why it is reasonable to include non-price regulated companies in any of the analyses and yet restrict the utility proxy group to a small number of natural gas utilities.

b. The commodity notwithstanding, explain why it would be unreasonable to include water utilities in the utility proxy group. Include in the response an analysis of risk comparing a proxy group of water utilities to both the utility proxy group and the non-price regulated proxy group.

RESPONSE:

a. As discussed on page 40, lines 3-11 of Mr. D'Ascendis' direct testimony, the proxy group of domestic, non-price regulated companies was chosen for their comparability to the Utility Proxy Group based on total risk.

b. One could not ignore the commodity when looking for similar risk companies, so Mr. D'Ascendis does not agree with the premise of the question. Nevertheless, the price of alternative energy sources indicates that natural gas utilities face competitive pressures from other energy sources and suppliers. Water utilities do not face similar risks, because there is no substitute for water. Further, because water is generally directly consumed by customers it must be treated before it is delivered. Lastly, water consumption is generally highest during warmer months, the opposite of natural gas usage.

PERSON RESPONSIBLE: Dylan W. D'Ascendis

STAFF-DR-03-009

REQUEST:

Refer to Duke Kentucky's Response to Staff's Second Request, Item 18c, and to the Direct Testimony of Dylan W D'Ascendis (D'Ascendis Testimony), page 12, line 12-15. Explain whether the lack of size consideration in S&P and Moody's bond ratings implies flaws within their rating methodologies.

RESPONSE:

Mr. D'Ascendis does not believe that the rating methodologies utilized by S&P or Moody's are flawed. As noted on page 10, lines 4-15 of Mr. D'Ascendis' direct testimony, analysts and rating agencies consider a variety of interrelated business risks that utilities face including size of the company (more specifically, the diversification of its operations) to measure the standalone risk of a firm. However, estimating the cost of equity is a comparative exercise and given that neither rating agency has a minimum company size requirement for a given rating level, a relative size analysis is required between companies with similar bond ratings.

PERSON RESPONSIBLE: Dylan W. D'Ascendis

STAFF-DR-03-010

REQUEST:

Refer to Duke Kentucky's Response to Staff's Second Request, Item 18, and to D'Ascendis Testimony, pages 44-48.

a. Explain whether Mr. D'Ascendis has ever proposed a negative size adjustment in any regulatory proceeding. If so, include in the response the docket/case number and copies of expert testimony and exhibits in PDF format.

b. Explain whether Mr. D'Ascendis has ever proposed a negative credit risk adjustment in any regulatory proceeding. If so, include in the response the docket/case number and copies of expert testimony and exhibits in PDF format.

c. Of the utilities included in the Utility Proxy Group, performing an identical analysis to the one provided in the expert testimony, explain which would require a negative size adjustment.

d. Of the utilities included in the Utility Proxy Group, performing an identical analysis to the one provided in the expert testimony, explain which would require a negative credit risk adjustment.

RESPONSE:

a. Mr. D'Ascendis has not performed an exhaustive review of all past regulatory proposals of size adjustments, but he has recently recommended against a size adjustment in his direct testimony for Piedmont Natural Gas Company (NC) in Docket No. G-9, Sub 781. Please see STAFF-DR-03-010(a) Attachment.

b. Mr. D’Ascendis has not performed an exhaustive review of all past regulatory proposals of credit risk adjustments but does regularly recommend negative credit risk adjustments for operations that have a higher credit rating than their representative proxy group. For example, Mr. D’Ascendis recommended a negative risk adjustment for Atmos Energy’s Kentucky operations in Docket No. 2021-00214. Please see STAFF-DR-03-010(b) Attachment.

c. Please see STAFF-DR-03-010(c) Attachment.

d. Please see STAFF-DR-03-010(d) Attachment.

PERSON RESPONSIBLE: Dylan W. D’Ascendis

BEFORE THE

NORTH CAROLINA UTILITIES COMMISSION

DIRECT TESTIMONY

OF

DYLAN W. D'ASCENDIS, CRRA, CVA

ON BEHALF OF

PIEDMONT NATURAL GAS COMPANY, INC.

Docket No. G-9, Sub 781

March 22, 2021

TABLE OF CONTENTS

I. INTRODUCTION

A. Witness Identification

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

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

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

A. I am a Director 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 before over 25 state regulatory commissions in the United States, the Federal Energy Regulatory Commission, the Alberta Utility Commission, and one American Arbitration Association panel on issues including, but not limited to, common equity cost rate, rate of return, valuation, capital structure, class cost of service, and rate design.

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

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 shown in Appendix A.

II. PURPOSE AND SUMMARY

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

A. The purpose of my testimony is to present evidence and provide a recommendation regarding Piedmont Natural Gas Company, Inc.'s ("Piedmont" or the "Company") return on common equity ("ROE").

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

A. Yes. I have prepared Exhibit No. __, consisting of Schedules DWD-1 through DWD-8, which were prepared by me or under my direction.

Q. PLEASE SUMMARIZE YOUR RECOMMENDED COMMON EQUITY COST RATE.

A. My recommended common equity cost rate of 10.25% 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 not necessarily identical, risk to Piedmont. 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] decisions. No proxy group can be identical in risk to any single company. Consequently, there must be an evaluation of relative risk between the company and the proxy group to determine if it is appropriate to adjust the proxy group's indicated rate of return.

My recommendation results from applying several cost of common equity models, specifically the Discounted Cash Flow ("DCF") model, the Risk Premium Model ("RPM"), [3] and the Capital Asset Pricing Model ("CAPM"), to the market data of a proxy group of eight natural gas distribution utilities ("Utility Proxy Group") whose selection criteria will be discussed below. In addition, I applied the

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1 *Federal Power Comm'n 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).

3 To derive my indicated cost of common equity under the RPM, I used two risk premium methods. The first method was the Predictive Risk Premium Model ("PRPM"), and the second method was a risk premium model using a total market approach.

DCF model, RPM, and CAPM to a proxy group of 47 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 1: Summary of Common Equity Cost Rates

Discounted Cash Flow Model	9.46%
Risk Premium Model	10.11%
Capital Asset Pricing Model	12.05%
Cost of Equity Models Applied to Comparable Risk, Non-Price Regulated Companies	12.18%
Indicated Range	9.46% - 12.18%
Size Adjustment	0.00%
Flotation Cost Adjustment	0.12%
Recommended Range	9.58% - 12.30%
Recommended Cost of Common Equity	10.25%

The indicated range of common equity cost rates applicable to the Utility Proxy Group is between 9.46% and 12.18% before any adjustment for flotation costs, which were 0.12%.[4] My Company-specific indicated range of common equity cost rates, adjusted for flotation costs, is between 9.58% and 12.30%. Given the Utility Proxy Group and Company-specific ranges of common equity cost rates, my recommended ROE for the Company is 10.25%. I have selected the lower end of my range to reflect the uncertainty surrounding the COVID-19 recovery and my

[4] *See* Section VII for a detailed discussion of my flotation cost adjustment.

recommendation should be considered a conservative measure of the Company's required ROE at this time.

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

A. The remainder of my Direct Testimony is organized as follows:

- Section III – Provides a summary of financial theory and regulatory principles pertinent to the development of the cost of common equity;
- Section IV – Explains my selection of the Utility Proxy Group used to develop my Cost of Common Equity analytical results;
- Section V – Describes the analyses on which my Cost of Common Equity recommendation is based;
- Section VI – Summarizes my common equity cost rate before adjustments to reflect Company-specific factors;
- Section VII – Explains my consideration of adjustments to my common equity cost rate to reflect Company-specific factors;
- Section VIII – Discusses economic conditions in North Carolina; and
- Section IX – Presents my conclusions.

III. GENERAL PRINCIPLES

Q. WHAT GENERAL PRINCIPLES HAVE YOU CONSIDERED IN ARRIVING AT YOUR RECOMMENDED COMMON EQUITY COST RATE OF 10.25%?

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

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

> The rate-making process under the Act, *i.e.*, the fixing of 'just and reasonable' rates, involves a balancing of the investor and the consumer interests. Thus we stated in the Natural Gas Pipeline Co. case that 'regulation does not insure that the business shall produce net revenues.' 315 U.S. at page 590, 62 S.Ct. at page 745. But such considerations aside, the investor interest has a legitimate concern with the financial integrity of the company whose rates are being regulated. From the investor or company point of view it is important that there be enough revenue not only for operating expenses but also for the capital costs of the business. These include service on the debt and dividends on the stock. Cf. Chicago & Grand Trunk R. Co. v. Wellman, 143 U.S. 339, 345, 346 12 S.Ct. 400,402. By that standard the return to the equity owner should be commensurate with returns on investments in other enterprises

> having corresponding risks. That return, moreover, should be sufficient to assure confidence in the financial integrity of the enterprise, so as to maintain its credit and to attract capital.[5]

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

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

When funding is provided by a parent entity, the return still must be sufficient to provide an incentive to allocate equity capital to the subsidiary or

5 *Hope*, 320 U.S. 591 (1944), at 603.

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

It therefore is important that the authorized ROE reflects the risks and prospects of the utility's operations and supports the utility's financial integrity from a stand-alone perspective as measured by their combined business and financial risks. Consequently, the ROE authorized in this proceeding should be sufficient to support the operational (*i.e.*, business risk) and financing (*i.e.*, financial risk) of the Company's North Carolina utility operations on a stand-alone basis.

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, as noted earlier, the costs of the individual sources of capital are weighted by their respective book values.

The cost of capital is the return investors require to make an investment in a firm. Investors will provide funds to a firm only if the return that they *expect* is equal to, or greater than, the return that they *require* to accept the risk of providing funds to the firm.

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

Whereas the cost of debt is contractually defined and can be directly observed as the interest rate or yield on debt securities, the cost of common equity must be estimated based on market data and various financial models. Because the cost of common 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.

Q. IS THE AUTHORIZED RETURN SET IN REGULATORY PROCEEDINGS GUARANTEED?

A. No, it is not. Consistent with the *Hope* and *Bluefield* standards, the rate-setting process should provide the utility a reasonable opportunity to recover its return of, and return on, its prudently incurred investments, but it does not guarantee that return. While a utility may have control over some factors that affect the ability to earn its authorized return (*e.g.*, management performance, operating and maintenance expenses, etc.), there are several factors beyond a utility's control that affect its ability to earn its authorized return. Those may include factors such as weather, the economy, and the prevalence and magnitude of regulatory lag.

A. <u>Business Risk</u>

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

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

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

Examples of business risks <u>generally</u> faced by utilities include, but are not limited to, the regulatory environment, mandatory environmental compliance requirements, customer mix and concentration of customers, service territory economic growth, market demand, risks and uncertainties of supply, operations, capital intensity, size, and the like, all of which have a direct bearing on earnings. Although analysts, including rating agencies, may categorize business risks individually, as a practical matter, such risks are interrelated and not wholly distinct from one another. Therefore, it is difficult to quantify the effect of any individual risk specifically and numerically on investors' required return, *i.e.*, the cost of capital. For determining an appropriate return on common equity, the relevant issue is where investors see the subject company as falling within a spectrum of risk. To the extent investors view a company as being exposed to high risk, the required return will increase, and vice versa.

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

Because utilities invest in long-lived assets, long-term business risks are of paramount concern to equity investors. That is, the risk of not recovering the return on their investment extends far into the future. The timing and nature of events that may lead to losses, however, also are uncertain and, consequently, those risks and their implications for the required return on equity tend to be difficult to quantify.

Regulatory commissions (like investors who commit their capital) must review a variety of quantitative and qualitative data and apply their reasoned judgment to determine how long-term risks weigh in their assessment of the market-required return on common equity.

B. <u>Financial Risk</u>

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

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

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

A. Yes, similar bond ratings/issuer credit ratings reflect, and are representative of, similar combined business and financial risks (*i.e.*, total risk) faced by bond investors.[6] Although specific business or financial risks may differ between companies, the same bond/credit rating indicates that the combined risks are

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

roughly similar from a debtholder perspective. The caveat is that these debtholder risk measures do not translate directly to risks for common equity.

Q. DO RATING AGENCIES ACCOUNT FOR COMPANY SIZE IN THEIR BOND RATINGS?

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

IV. PIEDMONT'S OPERATIONS AND THE UTILITY PROXY GROUP

Q. ARE YOU FAMILIAR WITH PIEDMONT'S OPERATIONS?

A. Yes. Piedmont, a subsidiary of Duke Energy Corporation ("DUK"), provides natural gas distribution service to approximately 1,085,000 customers in North Carolina, South Carolina, and Tennessee.[7] Of this total customer base, the Company's North Carolina operations services approximately 775,000 customers.[8] Piedmont currently has senior unsecured ratings of A3 (outlook: Stable) and BBB+ (outlook: Stable) from Moody's Investor Service and Standard & Poor's Rating Services, respectively.[9]

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

A. The companies selected for the Utility Proxy Group met the following criteria:

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7 Duke Energy Corporation, SEC Form 8-K, February 13, 2020, at 40.
8 Company provided.
9 Source: S&P Global Market Intelligence.

(i) They were included in the Natural Gas Utility Group of *Value Line's Standard Edition* ("*Value Line*") (January 29, 2021);

(ii) They have 60% or greater of fiscal year 2019 total operating income derived from, and 60% or greater of fiscal year 2019 total assets attributable to, regulated gas distribution 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 ended 2019 or through the time of preparation of this testimony;

(v) They have *Value Line* and Bloomberg Professional Services ("Bloomberg") adjusted Betas;

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

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

The following eight companies met these criteria: Atmos Energy Corporation, New Jersey Resources Corp., NiSource Inc., Northwest Natural Gas Company, ONE Gas, Inc., South Jersey Industries, Inc., Southwest Gas Holdings, Inc., and Spire, Inc.

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

A. Because the Company is not publicly traded and does not have publicly traded equity securities, it is necessary to develop groups of publicly traded, comparable companies to serve as "proxies" for the Company. In addition to the analytical necessity of doing so, the use of proxy companies is consistent with the *Hope* and

Bluefield comparable risk standards, as discussed above. I have selected two proxy groups that, in my view, are fundamentally risk-comparable to the Company: a Utility Proxy Group and a Non-Price Regulated Proxy Group, which is comparable in total risk to the Utility Proxy Group.[10]

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

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

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

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

V. COMMON EQUITY COST RATE MODELS

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

A. Yes. While a public utility such as DUK operates a regulated business within the states in which it operates, it still 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 companies. If an individual investor is choosing to invest their capital among companies of comparable risk, they will choose a company providing a higher return over a company providing a lower return.

Q. ARE YOUR COST OF COMMON EQUITY MODELS MARKET BASED?

A. Yes. The DCF model uses market prices in developing the model's dividend yield component. Regarding the RPM, the Predictive Risk Premium Model ("PRPM") uses monthly market returns in addition to expectations of the risk-free rate and the total market risk premium approach uses bond ratings and expected bond yields that reflect the market's assessment of bond/credit risk. In addition, Beta coefficients ("β"), which reflect the market/systematic risk component of equity risk premium, are derived from regression analyses of market prices. 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 Betas). Selection criteria for comparable risk non-price regulated companies are based on regression analyses of market prices and reflect the market's assessment of total risk.

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

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

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

A. <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 the cash flows received from dividends and market price appreciation. 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 as shown below:

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

where:

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

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

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

Q. PLEASE DESCRIBE THE DIVIDEND YIELD YOU USED IN APPLYING THE CONSTANT GROWTH DCF MODEL.

A. The unadjusted dividend yields are based on the proxy companies' dividends as of January 29, 2021, divided by the average closing market price for the 60 trading days ended January 29, 2021.[11]

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11 *See*, column 1, page 1 of Schedule DWD-2.

Q. PLEASE EXPLAIN YOUR ADJUSTMENT TO THE DIVIDEND YIELD.

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

DCF theory calls for using the full growth rate, or D_1, in calculating the model's dividend yield component. Since the companies in the Utility Proxy Group increase their quarterly dividends 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, this adjustment is a conservative approach that does not overstate the dividend yield. Therefore, the actual average dividend yields in Column 1, page 1 of Schedule DWD-2 have been adjusted upward to reflect one-half the average projected growth rate shown in Column 6.

Q. PLEASE EXPLAIN THE BASIS FOR THE GROWTH RATES YOU APPLY TO THE UTILITY PROXY GROUP IN YOUR CONSTANT GROWTH DCF MODEL.

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

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

Q. PLEASE SUMMARIZE THE CONSTANT GROWTH DCF MODEL RESULTS.

A. As shown on page 1 of Schedule DWD-2, for the Utility Proxy Group, the mean result of applying the single-stage DCF model is 9.59%, the median result is 9.32%, and the average of the two is 9.46%. In arriving at a conclusion for the constant growth DCF-indicated common equity cost rate for the Utility Proxy Group, I relied on an average of the mean and the median results of the DCF. This approach considers all the proxy utilities' results, while mitigating the high and low outliers of those individual results.

B. <u>The Risk Premium Model</u>

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 bonds to compensate them for bearing the additional risk.

While it is possible to directly observe bond returns and yields, investors' required common equity returns cannot be directly determined or observed. According to RPM theory, one can estimate a common equity risk premium over bonds (either historically or prospectively) and use that premium to derive a cost rate of common equity. The cost of common equity equals the expected cost rate for long-term debt capital, plus a risk premium over that cost rate, to compensate common shareholders for the added risk of being unsecured and last-in-line for any claim on the corporation's assets and earnings upon liquidation.

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

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

1. The Predictive Risk Premium Model

Q. PLEASE EXPLAIN THE PRPM.

A. The PRPM, published in the *Journal of Regulatory Economics,*[12] was developed

[12] Autoregressive conditional heteroscedasticity. See "A New Approach for Estimating the Equity Risk Premium for Public Utilities", Pauline M. Ahern, Frank J. Hanley and Richard A. Michelfelder, Ph.D. *The Journal of Regulatory Economics* (December 2011), 40:261-278.

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")".[13] Engle found that volatility changes over time and is related from one period to the next, especially in financial markets. Engle discovered that volatility of 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 predicting volatility or risk. The PRPM is not based on an estimate of investor behavior, but rather on an 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 Utility Proxy Group company minus the historical monthly yield on long-term U.S. Treasury securities through January 2021. Using a generalized form of ARCH, known as GARCH, I calculated each Utility Proxy Group company's projected equity risk premium using Eviews© statistical software. When the GARCH model is applied to the historical return data, it produces a predicted GARCH variance series[14] and a GARCH coefficient.[15] Multiplying the predicted monthly variance by the GARCH coefficient and then annualizing it[16] produces the predicted annual equity risk premium. I then added the forecasted 30-year U.S. Treasury bond yield

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13 www.nobelprize.org.
14 Illustrated on Columns 1 and 2, page 2 of Schedule DWD-3.
15 Illustrated on Column 4, page 2 of Schedule DWD-3.
16 Annualized Return = (1 + Monthly Return) ^12 - 1

of 2.31%[17] to each company's PRPM-derived equity risk premium to arrive at an indicated cost of common equity. The 30-year U.S. Treasury bond yield is a consensus forecast derived from Blue Chip Financial Forecasts (*"Blue Chip")*.[18] The mean PRPM indicated common equity cost rate for the Utility Proxy Group is 9.69%, the median is 9.94%, and the average of the two is 9.82%. Consistent with my reliance on the average of the median and mean results of the DCF models, 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 9.82%.

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

A. As shown in Schedules DWD-3 and 4, the risk-free rate adopted for applications of the RPM and CAPM is 2.31%. This risk-free rate 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 second calendar quarter of 2022, and long-term projections for the years 2022 to 2026 and 2027 to 2031.

Q. WHY DO YOU USE THE PROJECTED 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 Moody's A2-rated public utility bonds; the long-term investment horizon inherent in utilities' common stocks; and the long-term life of the jurisdictional rate

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17 See Column 6, page 2 of Schedule DWD-3.

18 *Blue Chip Financial Forecasts*, December 1, 2020 at page 14 and January 1, 2021 at 2.

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.

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

A. Yes. Even though I do not agree with using current interest rates in a rate of return analysis, I recognize that the Commission has stated its preference for the use of current, and not projected, interest rates.[19] As such, in addition to my normal practice of relying on projected interest rates, I have also presented my ROE analyses based on current interest rates.

2. The Total Market Risk Premium Approach

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, 2) an equity risk premium based on the S&P Utilities Index, and 3) an equity risk premium based on authorized ROEs for gas distribution utilities.

Q. PLEASE EXPLAIN THE BASIS OF THE EXPECTED BOND YIELD OF 3.56% 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

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

common equity cost rate, are prospective in nature, a prospective yield on similarly-rated long-term debt is essential. I relied 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 second calendar quarter of 2022, and *Blue Chip's* long-term projections for 2022 to 2026, and 2027 to 2031. As shown on line 1, page 3 of Schedule DWD-3, the average expected yield on Moody's Aaa-rated corporate bonds is 3.06%. To derive an expected yield on Moody's A2-rated public utility bonds, I made an upward adjustment of 0.50%, 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 A2-rated public utility bond yield.[20] Adding that recent 0.50% spread to the expected Aaa-rated corporate bond yield of 3.06% results in an expected A2-rated public utility bond yield of 3.56%.

I then reviewed the average credit rating for the Utility Proxy Group from Moody's to determine if an adjustment to the estimated A2-rated public utility bond was necessary. 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 is needed to reflect the difference in bond ratings. An upward adjustment of 0.10%, which represents one-third of a recent spread between A2-rated and Baa2-rated public utility bond yields, is necessary to make the A2 prospective bond yield

[20] As shown on line 2 and explained in note 2, page 3 of Schedule DWD-3.

applicable to an A3-rated public utility bond.[21] Adding the 0.10% to the 3.56% prospective A2-rated public utility bond yield results in a 3.66% expected bond yield applicable to the Utility Proxy Group.

Table 2: Summary of the Calculation of the Utility Proxy Group Projected Bond Yield[22]

Prospective Yield on Moody's Aaa-Rated Corporate Bonds (*Blue Chip)*	3.06%
Adjustment to Reflect Yield Spread Between Moody's Aaa-Rated Corporate Bonds and Moody's A2-Rated Utility Bonds	0.50%
Adjustment to Reflect the Utility Proxy Group's Average Moody's Bond Rating of A3	0.10%
Prospective Bond Yield Applicable to the Utility Proxy Group	3.66%

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.

a. The Beta-Derived Risk Premium

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

A. The components of the Beta-derived risk premium model are: 1) an expected market equity risk premium over corporate bonds, and 2) the Beta coefficient. The derivation of the Beta-derived equity risk premium that I applied to the Utility

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21 As shown on line 5 and explained in note 4, page 3 of Schedule DWD-3. Moody's does not provide public utility bond yields for A3-rated bonds. As such, it was necessary to estimate the difference between A2-rated and A3-rated public utility bonds. Because there are three steps between Baa2 and A2 (Baa2 to Baa1, Baa1 to A3, and A3 to A2) I assumed an adjustment of one-third of the difference between the A2-rated and Baa2-rated public utility bond yield was appropriate.

22 As shown on page 3 of Schedule DWD-3.

Proxy Group is shown on lines 1 through 9, page 8 of Schedule DWD-3. The total Beta-derived equity risk premium I applied is based on an average of three historical market data-based equity risk premiums, two *Value Line*-based equity risk premiums, and a Bloomberg-based equity risk premium. Each of these is described below.

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

A. To derive a historical market equity risk premium, I used the most recent holding period returns for the large company common stocks from the Stocks, Bonds, Bills, and Inflation ("SBBI") Yearbook 2020 ("SBBI - 2020")[23] less the average historical yield on Moody's Aaa/Aa-rated corporate bonds for the period 1928 to 2019. Using holding period returns over a very long 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 11.83%, and the long-term arithmetic mean monthly yield on Moody's Aaa/Aa-rated corporate bonds was 6.05%.[24] As shown on line 1, page 8 of Schedule DWD-3, subtracting the mean monthly bond yield from the total return on large company stocks results in a long-term historical equity risk premium of 5.78%.

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23 SBBI Appendix A Tables: Morningstar Stocks, Bonds, Bills, & Inflation 1926-2019.
24 As explained in note 1, page 9 of Schedule DWD-3.

I used the arithmetic mean monthly total return rates for the large company stocks and yields (income returns) for the Moody's Aaa/Aa corporate bonds, because they are appropriate for the purpose of estimating the cost of capital as noted in SBBI - 2020.[25] Using the arithmetic mean return rates and yields is appropriate because historical total returns and equity risk premiums provide insight into the variance and standard deviation of returns needed by investors in estimating future risk when making a current investment. If investors relied on the geometric mean of historical equity risk premiums, they would have no insight into the potential variance of future returns, because the geometric mean relates the change over many periods to a constant rate of change, thereby obviating the year-to-year fluctuations, or variance, which is critical to risk analysis.

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

A. To derive the regression-based market equity risk premium of 9.30% shown on line 2, page 8 of Schedule DWD-3, 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. I modeled the relationship between interest rates and the market equity risk premium 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 then used a linear Ordinary Least Squares ("OLS") regression, in which

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25 SBBI - 2020, at 10-22.

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 THE PRPM EQUITY RISK PREMIUM.

A. I used the same PRPM approach described above as applied to the Utility Proxy Group to the historical equity risk premium. The inputs to the model are the historical monthly returns on large company common stocks minus the monthly yields on Moody's Aaa/Aa-rated corporate bonds during the period from January 1928 through January 2021.[26] 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 a market equity risk premium of 9.65%.[27]

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

A. As noted above, 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, page 8 of Schedule DWD-3. Consistent with my calculation of the dividend yield component in my DCF analysis, this prospective market equity risk premium is derived from

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[26] Data from January 1928 to December 2019 is from SBBI - 2020. Data from January 2020 to January 2021 is from Bloomberg.

[27] Shown on line 3, page 8 of Schedule DWD-3.

an average of the three- to five-year median market price appreciation potential by *Value Line* for the 13 weeks ended January 29, 2021, 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.[28]

The average median expected price appreciation is 35%, which translates to a 7.79% annual appreciation, and, when added to the average of *Value Line's* median expected dividend yields of 2.04%, equates to a forecasted annual total return rate on the market of 9.83%. The forecasted Moody's Aaa-rated corporate bond yield of 3.06% is deducted from the total market return of 9.83%, resulting in an equity risk premium of 6.77%, as shown on line 4, page 8 of Schedule DWD-3.

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 companies 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 14.10%. Subtracting the prospective yield on Moody's Aaa-rated corporate bonds of 3.06% results in an 11.04% 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

[28] As explained in detail in note 1, page 2 of Schedule DWD-3.

capital appreciation, identical to the method described above. The expected total return for the S&P 500 is 17.78%. Subtracting the prospective yield on Moody's Aaa-rated corporate bonds of 3.06% results in a 14.72% 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 all six equity risk premiums based on each source - historical, *Value Line*, and Bloomberg - in arriving at a 9.54% equity risk premium.

Table 3: Summary of the Calculation of the Equity Risk Premium Using Total Market Returns[29]

Historical Spread Between Total Returns of Large Stocks and Aaa and Aa2-Rated Corporate Bond Yields (1928 – 2019)	5.78%
Regression Analysis on Historical Data	9.30%
PRPM Analysis on Historical Data	9.65%
Prospective Equity Risk Premium using Total Market Returns from *Value Line* Summary & Index less Projected Aaa Corporate Bond Yields	6.77%
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	11.04%
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	14.72%
Average	9.54%

After calculating the average market equity risk premium of 9.54%, I adjusted it by the Beta coefficient to account for the risk of the Utility Proxy Group. As discussed below, the Beta coefficient is a meaningful measure of prospective relative risk to the market as a whole, and is a logical way to allocate a company's, or proxy

[29] As shown on page 8 of Schedule DWD-3.

group's, share of the market's total equity risk premium relative to corporate bond yields. As shown on page 1 of Schedule DWD-4, the average of the mean and median Beta coefficient for the Utility Proxy Group is 0.93. Multiplying the 0.93 average by the market equity risk premium of 9.54% results in a Beta-adjusted equity risk premium for the Utility Proxy Group of 8.87%.

b. The S&P Utility Index Derived Risk Premium

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

A. I estimated three equity risk premiums based on S&P Utility Index holding period returns, and two equity risk premiums based on the expected returns of the S&P Utilities Index, using *Value Line* and Bloomberg data, respectively. Turning first to the S&P Utility Index holding period returns, I derived a long-term monthly arithmetic mean equity risk premium between the S&P Utility Index total returns of 10.74%, and monthly Moody's A-rated public utility bond yields of 6.53% from 1928 to 2019, to arrive at an equity risk premium of 4.21%.[30] I then used the same historical data to derive an equity risk premium of 6.83% 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 January 2021 to arrive at a PRPM-derived equity risk premium of 5.59% for the S&P Utility Index.

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[30] As shown on line 1, page 12 of Schedule DWD-3.

I then derived expected total returns on the S&P Utilities Index of 10.36% and 7.67% using data from *Value Line* and Bloomberg, respectively, and subtracted the prospective Moody's A2-rated public utility bond yield of 3.56%[31], which resulted in equity risk premiums of 6.80% and 4.11%, respectively. As with the market equity risk premiums, I averaged each risk premium based on each source (*i.e.*, historical, *Value Line*, and Bloomberg) to arrive at my utility-specific equity risk premium of 5.51%.

Table 4: Summary of the Calculation of the Equity Risk Premium Using S&P Utility Index Holding Returns[32]

Historical Spread Between Total Returns of the S&P Utilities Index and A2-Rated Utility Bond Yields (1928 – 2019)	4.21%
Regression Analysis on Historical Data	6.83%
PRPM Analysis on Historical Data	5.59%
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	6.80%
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	4.11%
Average	5.51%

c. Authorized Return-Derived Equity Risk Premium

Q. HOW DID YOU DERIVE AN EQUITY RISK PREMIUM OF 5.83% BASED ON AUTHORIZED ROES FOR GAS DISTRIBUTION UTILITIES?

A. The equity risk premium of 5.83% shown on line 3, page 7 of Schedule DWD-3 is the result of a regression analysis based on regulatory awarded ROEs related to the yields on Moody's A-rated public utility bonds. That analysis is shown on page 13

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31 Derived on line 3, page 3 of Schedule DWD-3.

32 As shown on page 12 of Schedule DWD-3.

of Schedule DWD-3. Page 13 of Schedule DWD-3 contains the graphical results of a regression analysis of 797 rate cases for gas distribution utilities which were fully litigated during the period from January 1, 1980 through January 29, 2021. It shows the implicit equity risk premium relative to the yields on A-rated public utility bonds immediately prior to the issuance of each regulatory decision. It is readily discernible that there is an inverse relationship between the yield on A-rated public utility bonds and equity risk premiums. In other words, as interest rates decline, the equity risk premium rises and vice versa, a result consistent with financial literature on the subject.[33] I used the regression results to estimate the equity risk premium applicable to the projected yield on Moody's A2-rated public utility bonds of 3.56%. Given the expected A-rated utility bond yield of 3.56%, it can be calculated that the indicated equity risk premium applicable to that bond yield is 5.83%, which is shown on line 3, page 7 of Schedule DWD-3.

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 apply to the Utility Proxy Group is 6.74%, which is the average of the Beta-adjusted equity risk premium for the Utility Proxy Group, the S&P Utilities Index, and the authorized return utility equity risk premiums of 8.87%, 5.51%, and 5.83%, respectively.[34]

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33 *See, e.g.*, Robert S. Harris and Felicia C. Marston, *The Market Risk Premium: Expectational Estimates Using Analysts' Forecasts*, Journal of Applied Finance, Vol. 11, No. 1, 2001, at 11 to 12; Eugene F. Brigham, Dilip K. Shome, and Steve R. Vinson, *The Risk Premium Approach to Measuring a Utility's Cost of Equity*, Financial Management, Spring 1985, at 33 to 45.

34 As shown on page 7 of Schedule DWD-3.

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

A. As shown on line 8, page 3 of Schedule DWD-3, I calculated a common equity cost rate of 10.40% for the Utility Proxy Group based on the total market approach RPM.

Table 5: Summary of the Total Market Return Risk Premium Model[35]

Prospective Moody's A3-Rated Utility Bond Applicable to the Utility Proxy Group	3.66%
Prospective Equity Risk Premium	6.74%
Indicated Cost of Common Equity	10.40%

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-3, the indicated RPM-derived common equity cost rate is 10.11%, which gives equal weight to the PRPM (9.82%) and the adjusted-market approach results (10.40%).

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 the Beta coefficient (β). A Beta coefficient less than 1.0 indicates lower variability than the market as a whole, while a Beta coefficient greater than 1.0 indicates greater variability than the market.

The CAPM assumes that all non-market or unsystematic risk can be eliminated through diversification. The risk that cannot be eliminated through

35 As shown on page 3 of Schedule DWD-3.

diversification is called market, or systematic, risk. In addition, the CAPM presumes that investors only require compensation 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 the Beta coefficient. 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
- β = Adjusted Beta coefficient (volatility of the security relative to the market as a whole)

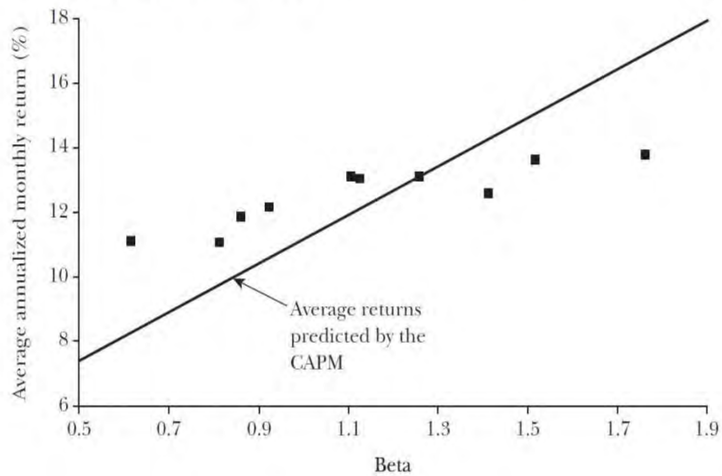
Numerous tests of the CAPM have measured the extent to which security returns and Beta coefficients are related as predicted by the CAPM, confirming its validity. The empirical CAPM ("EC") reflects the reality that while the results of these tests support the notion that the Beta coefficient is related to security returns, the empirical Security Market Line ("SML") described by the CAPM formula is not as steeply sloped as the predicted SML.[36]

[36] Roger A. Morin, New Regulatory Finance (Public Utility Reports, Inc., 2006), at 175. ("Morin")

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." [37]

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.[38]
>
> * * *
>
> Therefore, the empirical evidence suggests that the expected return on a security is related to its risk by the following approximation:

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

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[37] 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")

[38] Morin, at 175.

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

$$K = R_F + 0.25(R_M - R_F) + 0.75\,\beta(R_M - R_F)$$ [39]

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

> The early tests firmly reject the Sharpe-Lintner version of the CAPM. There is a positive relation between beta and average return, but it is too 'flat.'… The regressions consistently find that the intercept is greater than the average risk-free rate… and the coefficient on beta is less than the average excess market return… This is true in the early tests… as well as in more recent cross-section regressions tests, like Fama and French (1992).[40]

Finally, Fama and French further note:

> Confirming earlier evidence, the relation between beta and average return for the ten portfolios is much flatter than the Sharpe-Linter CAPM predicts. The returns on low beta portfolios are too high, and the returns on the high beta portfolios are too low. For example, the predicted return on the portfolio with the lowest beta is 8.3 percent per year; the actual return as 11.1 percent. The predicted return on the portfolio with the t beta is 16.8 percent per year; the actual is 13.7 percent.[41]

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.

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[39] Morin, at 190.
[40] Fama & French, at 32.
[41] *Ibid.*, at 33.

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

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

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

A. As discussed previously, the risk-free rate adopted for both applications of the CAPM is 2.31%. This risk-free rate 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 second calendar quarter of 2022, and long-term projections for the years 2022 to 2026 and 2027 to 2031.

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 Schedule DWD-4. As discussed above, the market risk premium is derived from an average of three historical data-based market risk premiums, two *Value Line* data-based market risk premiums, and one Bloomberg data-based market risk premium.

The long-term income return on U.S. Government securities of 5.09% was deducted from the SBBI - 2020 monthly historical total market return of 12.10%, which results in an historical market equity risk premium of 7.01%.[42] I applied a linear OLS regression to the monthly annualized historical returns on the S&P 500 relative to historical yields on long-term U.S. Government securities from SBBI - 2020. That regression analysis yielded a market equity risk premium of 9.98%. The PRPM market equity risk premium is 10.76% and is derived using the PRPM relative to the yields on long-term U.S. Treasury securities from January 1926 through January 2021.

The *Value Line*-derived forecasted total market equity risk premium is derived by deducting the forecasted risk-free rate of 2.31%, discussed above, from the *Value Line* projected total annual market return of 9.83%, resulting in a forecasted total market equity risk premium of 7.52%. The S&P 500 projected market equity risk premium using *Value Line* data is derived by subtracting the projected risk-free rate of 2.31% from the projected total return of the S&P 500 of 14.10%. The resulting market equity risk premium is 9.66%.

The S&P 500 projected market equity risk premium using Bloomberg data is derived by subtracting the projected risk-free rate of 2.31% from the projected total return of the S&P 500 of 17.78%. The resulting market equity risk premium is 15.47%. These six measures, when averaged, result in an average total market equity risk premium of 10.42%.

42 SBBI - 2020, at Appendix A-1 (1) through A-1 (3) and Appendix A-7 (19) through A-7 (21).

Table 6: Summary of the Calculation of the Market Risk Premium for Use in the CAPM[43]

Historical Spread Between Total Returns of Large Stocks and Long-Term Government Bond Yields (1926 – 2019)	7.01%
Regression Analysis on Historical Data	9.98%
PRPM Analysis on Historical Data	10.76%
Prospective Equity Risk Premium using Total Market Returns from *Value Line* Summary & Index less Projected 30-Year Treasury Bond Yields	7.52%
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	11.79%
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	15.47%
Average	10.42%

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-4, the mean result of my CAPM/ECAPM analyses is 12.09%, the median is 12.00%, and the average of the two is 12.05%. 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 12.05%.

43 As shown on page 2 of Schedule DWD-4.

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 DO 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 marketplace competition, non-price regulated firms operating in the competitive marketplace make an excellent proxy group if they are comparable in total risk to the Utility Proxy Group being used to estimate the cost of common equity. The selection of such domestic, non-price regulated competitive firms theoretically and empirically results in a proxy group which is comparable in total risk to the Utility Proxy Group, since all of these companies compete for capital in the exact same markets.

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

A. In order to select a proxy group of domestic, non-price regulated companies similar in total risk to the Utility Proxy Group, I relied on the Beta coefficients and related statistics derived from *Value Line* regression analyses of weekly market prices over the most recent 260 weeks (*i.e.*, five years). These selection criteria resulted in a proxy group of 47 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 selecting the domestic, non-price regulated firms was:

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

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

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

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

Beta coefficients measure market, or systematic, risk, which is not diversifiable. The residual standard errors of the regressions measure each firm's company-specific, diversifiable risk. Companies that have similar Beta coefficients <u>and</u> similar residual standard errors resulting from the same regression analyses have similar total investment risk.

Q. HAVE YOU PREPARED A SCHEDULE WHICH SHOWS THE DATA FROM WHICH YOU SELECTED THE 47 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-5.

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

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

Page 2 of Schedule DWD-6 derives the constant growth DCF model common equity cost rate. As shown, the indicated common equity cost rate, using the constant growth DCF for the Non-Price Regulated Proxy Group comparable in total risk to the Utility Proxy Group, is 11.97%.

Pages 3 through 5 of Schedule DWD-6 contain the data and calculations that support the 12.82% RPM common equity cost rate. As shown on line 1, page 3 of Schedule DWD-6, the consensus prospective yield on Moody's Baa-rated corporate bonds for the six quarters ending in the second quarter of 2022, and for the years 2022 to 2026 and 2027 to 2031, is 4.04%.[44]

When the Beta-adjusted risk premium of 8.78%[45] relative to the Non-Price Regulated Proxy Group is added to the prospective Baa2-rated corporate bond yield of 4.04%, the indicated RPM common equity cost rate is 12.82%.

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[44] *Blue Chip Financial Forecasts*, December 1, 2020, at 14 and January 1, 2021, at 2.

[45] Derived on page 5 of Schedule DWD-6.

Page 6 of Schedule DWD-6 contains the inputs and calculations that support my indicated CAPM/ECAPM common equity cost rate of 12.07%.

Q. HOW 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-6, the results of the common equity models applied to the Non-Price Regulated Proxy Group -- which group is comparable in total risk to the Utility Proxy Group -- are as follows: 11.97% (DCF), 12.82% (RPM), and 12.07% (CAPM). The average of the mean and median of these models is 12.18%, which I used as the indicated common equity cost rates for the Non-Price Regulated Proxy Group.

VI. CONCLUSION OF COMMON EQUITY COST RATE BEFORE ADJUSTMENTS

Q. WHAT ARE THE INDICATED COMMON EQUITY COST RATES BEFORE ADJUSTMENTS?

A. By applying multiple cost of common equity models to the Utility Proxy Group and the Non-Price Regulated Proxy Group, the indicated range of common equity cost rates before any relative risk adjustment is between 9.46% and 12.18%. 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 to the exclusion of other theoretically sound models. Using multiple models adds reliability to the estimated common equity cost rate, with the prudence of using multiple cost of common equity models supported in both the financial literature and regulatory precedent.

Based on these common equity cost rate results, I conclude that a common equity cost rate between 9.46% and 12.18% is reasonable and appropriate before any adjustments for relative risk differences between Piedmont and the Utility Proxy Group are made.[46]

VII. ADJUSTMENTS TO THE COMMON EQUITY COST RATE

A. Size Adjustment

Q. DOES A COMPANY'S SIZE RELATIVE TO THE UTILITY PROXY GROUP COMPANIES IMPACT ITS BUSINESS RISK?

A. Yes. A smaller size relative to the Utility Proxy Group companies indicates greater relative business risk for a utility because, all else being equal, size has a material bearing on risk.

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

[46] The 9.46% low end of the range represents the lowest model result. The 12.18% high end of the range is the highest model result.

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.

Q. HAVE YOU APPLIED A RELATIVE RISK ADJUSTMENT DUE TO PIEDMONT'S SMALL SIZE RELATIVE TO THE UTILITY PROXY GROUP?

A. No. While Piedmont has greater relative risk than the average utility in the Utility Proxy Group as measured by its estimated market capitalization of common equity, the difference is not large enough to merit a relative risk adjustment as shown on Table 7, below.

Table 7: Size as Measured by Market Capitalization for Piedmont and the Utility Proxy Group

	Market Capitalization*	Times Greater than The Company
	($ Millions)	
Piedmont	$4,004.929	
Utility Proxy Group	$4,505.920	1.1x
*From page 1 of Schedule DWD-7.		

Piedmont's estimated market capitalization for its North Carolina operations was $4.0 billion as of January 29, 2021,[47] compared with the market capitalization of the average company in the Utility Proxy Group of $4.5 billion as

[47] $4,004.929M = $4,822.659M (requested rate base) * 52.00% (requested equity ratio) * 159.7% (market-to-book ratio of the Utility Proxy Group) as demonstrated on page 2 of Schedule DWD-7.

of January 29, 2021. The average company in the Utility Proxy Group has a market capitalization 1.1 times the size of Piedmont's estimated market capitalization.

As a result, even though there is a difference in size between Piedmont and the Utility Proxy Group, in my opinion, it is not necessary to upwardly adjust the range of indicated common equity cost rates between 9.46% to 12.18% to reflect greater risk due to smaller relative size.

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 mandatory unavoidable costs of issuance (*e.g.*, underwriting fees and out-of-pocket costs for printing, legal, registration, etc.). For every dollar raised through debt or equity offerings, the Company receives less than one full dollar in financing.

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 can be recognized and recovered. Because these costs are real, necessary, and legitimate, recovery of these costs should be permitted. 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.[48]

Q. SHOULD FLOTATION COSTS BE RECOGNIZED ONLY IF THERE WAS AN ISSUANCE DURING THE TEST YEAR OR THERE IS AN IMMINENT POST-TEST YEAR ISSUANCE OF ADDITIONAL COMMON STOCK?

A. No. As noted above, there is 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 expensed on a utility's income statement. As such, flotation costs are analogous to capital investments, albeit negative, 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.

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. Since these

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[48] Morin, at 321.

expenses are charged to capital accounts and not expensed on the income statement, 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 assume no transaction costs. The literature is quite clear that these costs are not reflected in the market prices paid for common stocks. For example, Brigham and Daves confirm this and provide the methodology utilized to calculate the flotation adjustment.[49] In addition, Morin confirms the need for such an adjustment even when no new equity issuance is imminent.[50] Consequently, it

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

50 Morin, at pp. 327-30.

is proper to include a flotation cost adjustment when using cost of common equity models to estimate the common equity cost rate.

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 actual costs of issuing equity that were incurred by DUK in its last three equity issuances. Based on the issuance costs shown on page 1 of Schedule DWD-8, an adjustment of 0.12% is required to reflect the flotation costs applicable to the Utility Proxy Group.

Q. WHAT IS THE INDICATED COST OF COMMON EQUITY AFTER YOUR COMPANY-SPECIFIC ADJUSTMENTS?

A. Applying the 0.12% flotation cost adjustment to the indicated cost of common equity range of 9.46% to 12.18% results in a Company-specific cost of common equity rate range of 9.58% to 12.30%, which is my recommended common equity cost rate range. Based on that range I recommend a Company-specific cost of common equity rate of 10.25%.

VIII. ECONOMIC CONDITIONS IN NORTH CAROLINA

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

A. Yes, I did. As a preliminary matter, I understand and appreciate that the Commission must balance the interests of investors and customers in setting the return on common equity. As the Commission has stated, it "…is and must always be mindful of the North Carolina Supreme Court's command that the Commission's task is to set rates as low as possible consistent with the dictates of the United States and North Carolina Constitutions."[51] In that regard, the return should be neither excessive nor confiscatory; it should be the minimum amount needed to meet the *Hope* and *Bluefield* Comparable Risk, Capital Attraction, and Financial Integrity standards.

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

> … adjusting investors' required costs based on factors upon which investors do not base their willingness to invest is an unsupportable theory or concept. The proper way to take into account customer ability to pay is in the Commission's exercise of fixing rates as low as reasonably possible without violating constitutional proscriptions against confiscation of property. This is in accord with the "end result" test of Hope. This the Commission has done.[52]

The North Carolina Supreme Court agreed, and upheld the Commission's Order on Remand.[53] The North Carolina Supreme Court has also, however, made clear that the Commission "must make findings of fact regarding the impact of

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

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

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

changing economic conditions on customers when determining the proper ROE for a public utility."[54] In *Cooper II*, the North Carolina Supreme Court directed the Commission on remand to "make additional findings of fact concerning the impact of changing economic conditions on customers",[55] which the Commission made in its Order on Remand.[56] In light of the *Cooper II* decision and the North Carolina Supreme Court precedent that preceded it,[57] I appreciate the Commission's need to consider economic conditions in the State. As such, I have undertaken several analyses to provide such a review.

Q. PLEASE SUMMARIZE YOUR ANALYSES AND CONCLUSIONS.

A. In its Order on Remand in Docket No. E-22, Sub 479, the Commission observed that economic conditions in North Carolina were highly correlated with national conditions, such that they were reflected in the analyses used to determine the cost of common equity.[58] As discussed below, those relationships still hold:

- Although economic conditions in North Carolina declined significantly in the second quarter of 2020 as a result of the COVID-19 pandemic, they improved considerably in the third and fourth quarters. Notably, economic conditions in North Carolina continued to be strongly correlated to the U.S. economy;

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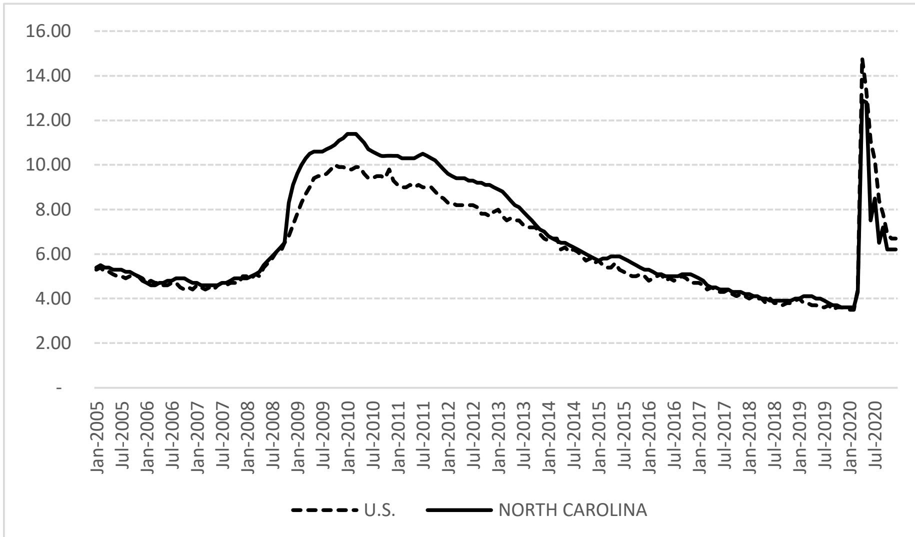
54 State of North Carolina ex rel. Utilities Commission v. Cooper, 758 S.E.2d 635, 642 (2014) ("Cooper II").
55 Cooper II, 758 S.E.2d at 643.
56 DNCP Remand Order, at 4-10.
57 Cooper I, 366 N.C. 484, 739 S.E.2d 541 (2013).
58 *See*, State of North Carolina Utilities Commission, Docket No. E-22, Sub 479, Order on Remand, July 23, 2015, at 39.

- Unemployment at both the state and county level remains highly correlated with national rates of unemployment;
- Real Gross Domestic Product ("GDP") in North Carolina also remains highly correlated with U.S. real GDP growth; and
- Median household income in North Carolina has grown at a rate consistent with the rest of the U.S. and remains strongly correlated with national levels.

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

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

Chart 1: Unemployment Rate (Seasonally Adjusted)[59]



Between 2005 and 2020, the correlation between North Carolina's unemployment rate and the national rate was 96.66%, indicating the two are highly correlated.

Second, I reviewed (seasonally unadjusted) unemployment rates in the counties served by Piedmont. As with the seasonally adjusted statistics described above, the unemployment rate in those counties spiked in April 2020 at 11.58% (0.92% below the state-wide average), but by November 2020 it had fallen substantially to 6.26%, somewhat above the rate statewide in North Carolina (6.10%) and below the overall rate in the U.S. (6.40%). From 2005 through November 2020, the correlation in unemployment rates between the counties served by Piedmont and the U.S., as well as North Carolina, were approximately 93.76% and 98.91%, respectively. In summary, county-level unemployment has

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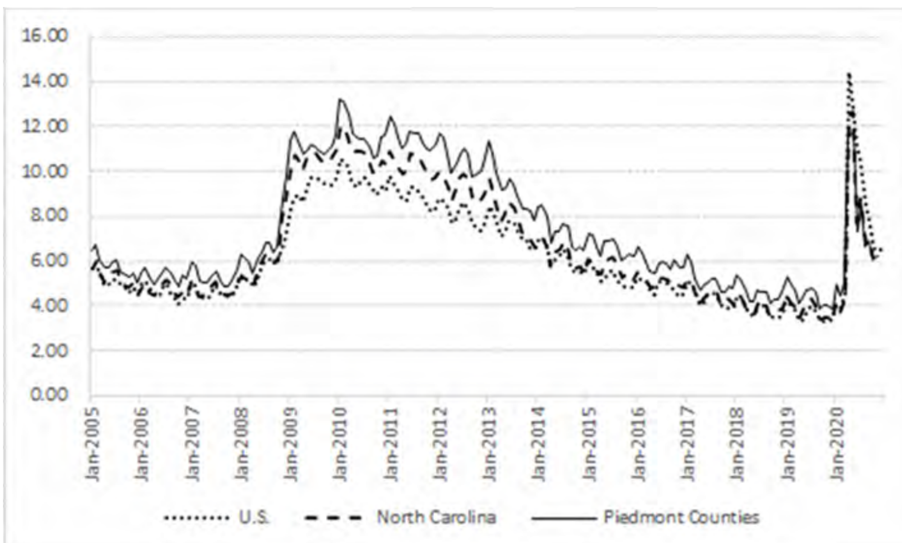
59 Source: Bureau of Labor Statistics.

fallen considerably since it recently spiked in April 2020, is similar to the U.S. and statewide unemployment rates, and is highly correlated to state and national unemployment rates.

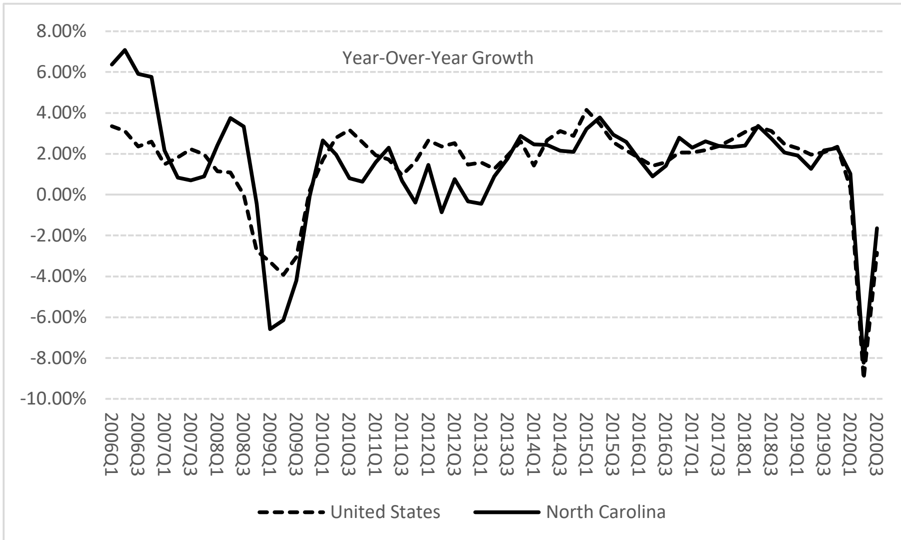
Chart 2: Seasonally Unadjusted Unemployment Rates[60]



Looking to real Gross Domestic Product growth, there also has been a relatively strong correlation between North Carolina and the national economy (approximately 81.50%). While the national rate of growth at times outpaced North Carolina between 2010 and 2014, since the first quarter of 2015, North Carolina's economic growth has been relatively consistent with U.S. economic growth. Moreover, North Carolina's real GDP growth fared better than the overall U.S. in 2020; North Carolina's real GDP grew faster than the overall U.S. in the first quarter, and did not decline as much as the U.S. economy declined in the second and third quarters.

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

Chart 3: Real Gross Domestic Product Growth Rate (Year over Year)[61]



As to median household income, the correlation between North Carolina and the U.S. is relatively strong (94.00% from 2005 through 2019). Since 2009 (that is, the years subsequent to the financial crisis), nominal median household income in North Carolina has grown at a slightly faster pace than the national median income (3.85% vs. 3.27%, respectively; *see* Chart 4, below). To put household income in perspective, the Missouri Economic Research and Information Center reports that in the second quarter of 2019, North Carolina had the 22nd lowest cost of living index among the 50 states, the District of Columbia, and Puerto Rico.[62]

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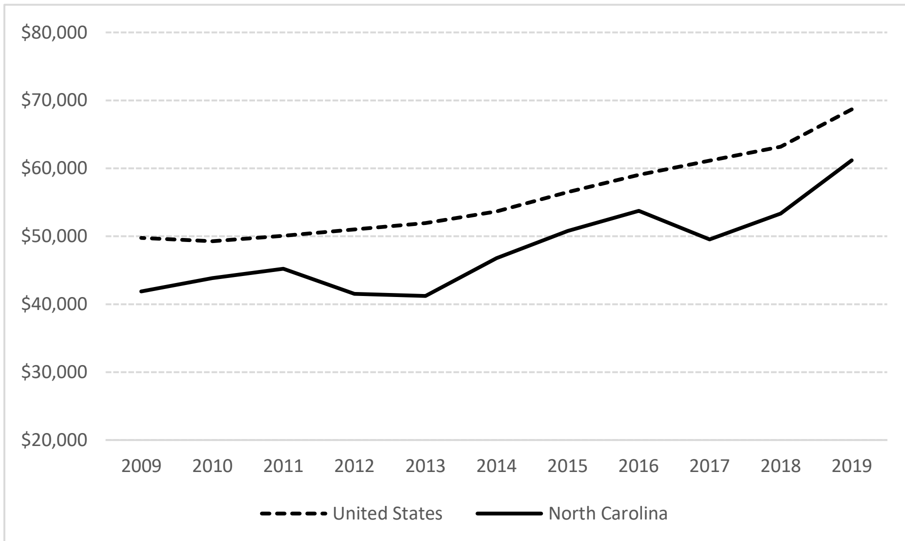
[61] Source: Bureau of Economic Analysis.
[62] Source: meric.mo.gov/data/cost-living-data-series accessed January 27, 2021.

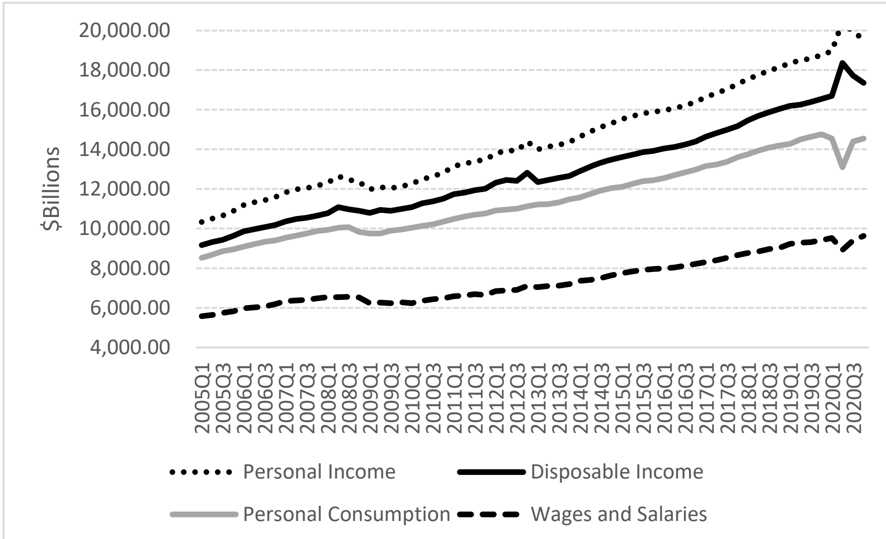
Chart 4: Median Household Income[63]



Similarly, as shown in Chart 5, below, since 2009 total personal income, disposable income, personal consumption, and wages and salaries have generally been on an increasing trend at the national level. Although wages and salaries dipped in the second quarter of 2020, they rebounded in the third and fourth quarter to end the year higher than the first quarter of 2020.

63 Source: U.S. Census Bureau, Current Population Survey.

Chart 5: United States Income and Consumption[64]



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

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

- Unemployment at both the state and county level remains highly correlated with national rates of unemployment. North Carolina's unemployment rate and the rate in the counties served by Piedmont have fallen significantly since spiking in April 2020.
- The state's real Gross Domestic Product remains highly correlated with national GDP.
- Similarly, since 2005, median household income has grown in North

64 Source: Bureau of Economic Analysis.

Carolina and has grown at a rate slightly faster than the national average. Additionally, the overall cost of living in North Carolina also is below the national average. Furthermore, at the national level, income has generally been increasing since the financial crisis.

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

Q. IN YOUR OPINION, IS AN ROE OF 10.25% FAIR AND REASONABLE TO PIEDMONT, ITS SHAREHOLDERS, AND ITS CUSTOMERS, AND NOT UNDULY BURDENSOME TO PIEDMONT'S CUSTOMERS CONSIDERING THE CHANGING ECONOMIC CONDITIONS?

A. Yes. Based on the factors I have discussed here, I believe that an ROE of 10.25% is fair and reasonable to Piedmont, its shareholders, and its customers in light of the uncertainty surrounding the COVID-19 recovery.

IX. CONCLUSION

Q. WHAT IS YOUR RECOMMENDED OVERALL ROE FOR PIEDMONT?

A. Given the indicated ROE range applicable to the Utility Proxy Group of 9.46% to 12.18% and the Company-specific ROE range of 9.58% to 12.30%, I conclude that an appropriate ROE for the Company is 10.25%.

Q. IN YOUR OPINION, IS YOUR PROPOSED ROE OF 10.25% FAIR AND REASONABLE TO PIEDMONT AND ITS CUSTOMERS?

A. Yes, it is.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes, it does.

Piedmont Natural Gas Company, Inc.
General Rate Case
Docket No. G-9, Sub 781

APPENDIX A

scottmadden
MANAGEMENT CONSULTANTS

Appendix A - Resume & Testimony Listing of:
Dylan W. D'Ascendis, CRRA, CVA
Director

Summary

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

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

Areas of Specialization

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

Recent Expert Testimony Submission/Appearances

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

Recent Assignments

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

Recent Publications and Speeches

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

scottmadden
MANAGEMENT CONSULTANTS

Appendix A - Resume & Testimony Listing of:
Dylan W. D'Ascendis, CRRA, CVA
Director

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

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MANAGEMENT CONSULTANTS

Appendix A - Resume & Testimony Listing of:
Dylan W. D'Ascendis, CRRA, CVA
Director

SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
Aqua Illinois, Inc.	04/17	Aqua Illinois, Inc.	Docket No. 17-0259	Rate of Return
Utility Services of Illinois, Inc.	04/15	Utility Services of Illinois, Inc.	Docket No. 14-0741	Rate of Return
Indiana Utility Regulatory Commission				
Aqua Indiana, Inc.	03/16	Aqua Indiana, Inc. Aboite Wastewater Division	Docket No. 44752	Rate of Return
Twin Lakes, Utilities, Inc.	08/13	Twin Lakes, Utilities, Inc.	Docket No. 44388	Rate of Return
Kansas Corporation Commission				
Atmos Energy	07/19	Atmos Energy	19-ATMG-525-RTS	Rate of Return
Kentucky Public Service Commission				
Bluegrass Water Utility Operating Company	10/20	Bluegrass Water Utility Operating Company	2020-00290	Return on Equity
Louisiana Public Service Commission				
Southwestern Electric Power Company	12/20	Southwestern Electric Power Company	Docket No. U-35441	Return on Equity
Atmos Energy	04/20	Atmos Energy	Docket No. U-35535	Rate of Return
Louisiana Water Service, Inc.	06/13	Louisiana Water Service, Inc.	Docket No. U-32848	Rate of Return
Maryland Public Service Commission				
Washington Gas Light Company	08/20	Washington Gas Light Company	Case No. 9651	Rate of Return
FirstEnergy, Inc.	08/18	Potomac Edison Company	Case No. 9490	Rate of Return
Massachusetts Department of Public Utilities				
Unitil Corporation	12/19	Fitchburg Gas & Electric Co. (Elec.)	D.P.U. 19-130	Rate of Return
Unitil Corporation	12/19	Fitchburg Gas & Electric Co. (Gas)	D.P.U. 19-131	Rate of Return
Liberty Utilities	07/15	Liberty Utilities d/b/a New England Natural Gas Company	Docket No. 15-75	Rate of Return
Minnesota Public Utilities Commission				
Northern States Power Company	11/20	Northern States Power Company	Docket No. E002/GR-20-723	Rate of Return
Mississippi Public Service Commission				
Atmos Energy	03/19	Atmos Energy	Docket No. 2015-UN-049	Capital Structure
Atmos Energy	07/18	Atmos Energy	Docket No. 2015-UN-049	Capital Structure
Missouri Public Service Commission				
Spire Missouri, Inc.	12/20	Spire Missouri, Inc.	Case No. GR-2021-0108	Return on Equity
Indian Hills Utility Operating Company, Inc.	10/17	Indian Hills Utility Operating Company, Inc.	Case No. SR-2017-0259	Rate of Return
Raccoon Creek Utility Operating Company, Inc.	09/16	Raccoon Creek Utility Operating Company, Inc.	Docket No. SR-2016-0202	Rate of Return
Public Utilities Commission of Nevada				
Southwest Gas Corporation	08/20	Southwest Gas Corporation	Docket No. 20-02023	Return on Equity
New Hampshire Public Utilities Commission				
Aquarion Water Company of New Hampshire, Inc.	12/20	Aquarion Water Company of New Hampshire, Inc.	Docket No. DW 20-184	Rate of Return
New Jersey Board of Public Utilities				
Atlantic City Electric Company	12/20	Atlantic City Electric Company	Docket No. ER20120746	Return on Equity

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MANAGEMENT CONSULTANTS

Appendix A - Resume & Testimony Listing of:
Dylan W. D'Ascendis, CRRA, CVA
Director

Sponsor	Date	Case/Applicant	Docket No.	Subject
FirstEnergy	02/20	Jersey Central Power & Light Co.	Docket No. ER20020146	Rate of Return
Aqua New Jersey, Inc.	12/18	Aqua New Jersey, Inc.	Docket No. WR18121351	Rate of Return
Middlesex Water Company	10/17	Middlesex Water Company	Docket No. WR17101049	Rate of Return
Middlesex Water Company	03/15	Middlesex Water Company	Docket No. WR15030391	Rate of Return
The Atlantic City Sewerage Company	10/14	The Atlantic City Sewerage Company	Docket No. WR14101263	Cost of Service / Rate Design
Middlesex Water Company	11/13	Middlesex Water Company	Docket No. WR1311059	Capital Structure
New Mexico Public Regulation Commission				
Southwestern Public Service Company	01/21	Southwestern Public Service Company	Case No. 20-00238-UT	Return on Equity
North Carolina Utilities Commission				
Duke Energy Carolinas, LLC	07/20	Duke Energy Carolinas, LLC	Docket No. E-7, Sub 1214	Return on Equity
Duke Energy Progress, LLC	07/20	Duke Energy Progress, LLC	Docket No. E-2, Sub 1219	Return on Equity
Aqua North Carolina, Inc.	12/19	Aqua North Carolina, Inc.	Docket No. W-218 Sub 526	Rate of Return
Carolina Water Service, Inc.	06/19	Carolina Water Service, Inc.	Docket No. W-354 Sub 364	Rate of Return
Carolina Water Service, Inc.	09/18	Carolina Water Service, Inc.	Docket No. W-354 Sub 360	Rate of Return
Aqua North Carolina, Inc.	07/18	Aqua North Carolina, Inc.	Docket No. W-218 Sub 497	Rate of Return
North Dakota Public Service Commission				
Northern States Power Company	11/20	Northern States Power Company	Case No. PU-20-441	Rate of Return
Public Utilities Commission of Ohio				
Aqua Ohio, Inc.	05/16	Aqua Ohio, Inc.	Docket No. 16-0907-WW-AIR	Rate of Return
Pennsylvania Public Utility Commission				
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

Appendix A - Resume & Testimony Listing of:
Dylan W. D'Ascendis, CRRA, CVA
Director

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
Tennessee Public Utility Commission				
Piedmont Natural Gas Company	07/20	Piedmont Natural Gas Company	Docket No. 20-00086	Return on Equity
Public Utility Commission of Texas				
Southwestern Public Service Company	02/21	Southwestern Public Service Company	Docket No. 51802	Return on Equity
Southwestern Electric Power Company	10/20	Southwestern Electric Power Company	Docket No. 51415	Rate of Return
Virginia State Corporation Commission				
Massanutten Public Service Corporation	12/20	Massanutten Public Service Corporation	Case No. 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

Piedmont Natural Gas Company, Inc.
Table of Contents
Supporting Schedules Accompanying the Direct Testimony of
Dylan W. D'Ascendis, CRRA, CVA

Piedmont Natural Gas Company, Inc.
General Rate Case
Docket No. G-9, Sub 781

SCHEDULE DWD-1

Piedmont Natural Gas Company
Brief Summary of Common Equity Cost Rate

Line No.	Principal Methods	Proxy Group of Eight Natural Gas Distribution Companies	Results using Current Interest Rates
1.	Discounted Cash Flow Model (DCF) (1)	9.46%	9.46%
2.	Risk Premium Model (RPM) (2)	10.11%	9.64%
3.	Capital Asset Pricing Model (CAPM) (3)	12.05%	11.83%
4.	Market Models Applied to Comparable Risk, Non-Price Regulated Companies (4)	12.18%	12.03%
5.	Indicated Range of Common Equity Cost Rates before Adjustment for Size Risk	9.46% - 12.18%	9.46% - 12.03%
6.	Size Risk Adjustment (5)	0.00%	0.00%
7	Flotation Cost Adjustment (6)	0.12%	0.12%
8.	Recommended Range of Common Equity Cost Rates after Adjustment for Size Risk	9.58% - 12.30%	9.58% - 12.15%
9.	Recommended Cost of Common Equity Cost Rates after Adjustment for Size Risk	10.25%	

Notes: (1) From Schedule DWD-2.
(2) From page 1 of Schedule DWD-3.
(3) From page 1 of Schedule DWD-4.
(4) From page 1 of Schedule DWD-5.
(5) As discussed in the accompanying Direct Testimony, a size adjustment not applicable in this proceeding.
(6) From Schedule DWD-8.

Piedmont Natural Gas Company, Inc.
General Rate Case
Docket No. G-9, Sub 781

SCHEDULE DWD-2

Piedmont Natural Gas Company
Indicated Common Equity Cost Rate Using the Discounted Cash Flow Model for
Proxy Group of Eight Natural Gas Distribution Companies

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	
Proxy Group of Eight Natural Gas Distribution Companies	Average Dividend Yield (1)	Value Line Projected Five Year Growth in EPS (2)	Zack's Five Year Projected Growth Rate in EPS	Yahoo! Finance Projected Five Year Growth in EPS	Bloomberg Projected Five Year Growth in EPS	Average Projected Five Year Growth in EPS (3)	Adjusted Dividend Yield (4)	Indicated Common Equity Cost Rate (5)	
Atmos Energy Corporation	2.64 %	7.00 %	7.10 %	6.77 %	7.22 %	7.02 %	2.73 %	9.76 %	
New Jersey Resources Corporation	3.80	2.00	6.00	6.00	6.63	5.16	3.90	9.06	
NiSource, Inc.	3.81	13.00	5.60	1.65	5.92	6.54	3.93	10.48	
Northwest Natural Holding Company	4.10	NMF	3.10	3.10	2.96	3.05	4.16	7.22	
ONE Gas, Inc.	3.05	6.50	6.00	5.00	5.67	5.79	3.14	8.93	
South Jersey Industries, Inc.	5.42	12.50	24.50	24.50	13.75	18.81	5.93	24.74	(6)
Southwest Gas Holdings, Inc.	3.59	9.00	5.00	4.00	4.50	5.63	3.69	9.32	
Spire Inc.	4.13	5.50	16.50	5.37	5.00	8.09	4.30	12.39	
							Average	9.59 %	
							Median	9.32 %	
							Average of Mean and Median	9.46 %	

NA= Not Available

Notes:

(1) Indicated dividend at 01/29/2021 divided by the average closing price of the last 60 trading days ending 01/29/2021 for each company.

(2) From pages 2 through 9 of this Schedule.

(3) Average of columns 2 through 5 excluding negative growth rates.

(4) This reflects a growth rate component equal to one-half the conclusion of growth rate (from column 6) x column 1 to reflect the periodic payment of dividends (Gordon Model) as opposed to the continuous payment. Thus, for Atmos Energy Corporation, 2.64% x (1+(1/2 x 7.02%)) = 2.73%.

(5) Column 6 + column 7.

(6) South Jersey Industries, Inc.'s DCF results were excluded from the final average and median as they were more than 2 standard deviations above the proxy group's mean.

Source of Information:

Value Line Investment Survey
www.zacks.com Downloaded on 01/29/2021
www.yahoo.com Downloaded on 01/29/2021
Bloomberg Professional Services

ATMOS ENERGY CORP. NYSE-ATO

RECENT PRICE	101.28	P/E RATIO	20.4 (Trailing: 21.5) (Median: 18.0)	RELATIVE P/E RATIO	0.97	DIV'D YLD	2.5%	VALUE LINE

TIMELINESS 1 Raised 11/27/20
SAFETY 1 Raised 6/6/14
TECHNICAL 4 Lowered 11/27/20
BETA .80 (1.00 = Market)

18-Month Target Price Range
Low-High **Midpoint (% to Mid)**
$77-$171 $124 (20%)

2023-25 PROJECTIONS

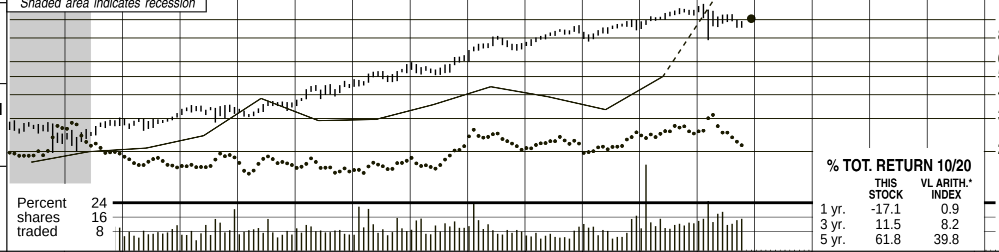
	Price	Gain	Ann'l Total Return
High	160	(+60%)	*14%*
Low	130	(+30%)	*9%*

Institutional Decisions

	4Q2019	1Q2020	2Q2020
to Buy	272	268	233
to Sell	215	251	262
Hld's(000)	102747	103070	108597

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
High:	30.3	32.0	35.6	37.3	47.4	58.2	64.8	82.0	93.6	100.8	115.2	121.1
Low:	20.1	25.9	28.5	30.4	34.9	44.2	50.8	60.0	72.5	76.5	89.2	77.9

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



Target Price Range
2023 | 2024 | 2025

% TOT. RETURN 10/20

	THIS STOCK	VL ARITH.* INDEX
1 yr.	-17.1	0.9
3 yr.	11.5	8.2
5 yr.	61.8	39.8

2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	© VALUE LINE PUB. LLC	23-25
46.50	61.75	75.27	66.03	79.52	53.69	53.12	48.15	38.10	42.88	49.22	40.82	32.23	26.01	28.00	24.32	*22.75*	*22.80*	Revenues per sh A	*37.95*
2.91	3.90	4.26	4.14	4.19	4.29	4.64	4.72	4.76	5.14	5.42	5.81	6.19	6.62	7.24	7.57	*8.15*	*8.55*	"Cash Flow" per sh	*9.80*
1.58	1.72	2.00	1.94	2.00	1.97	2.16	2.26	2.10	2.50	2.96	3.09	3.38	3.60	4.00	4.35	4.72	*5.00*	Earnings per sh AB	*6.00*
1.22	1.24	1.26	1.28	1.30	1.32	1.34	1.36	1.38	1.40	1.48	1.56	1.68	1.80	1.94	2.10	2.30	*2.50*	Div'ds Decl'd per sh C■	*3.15*
3.03	4.14	5.20	4.39	5.20	5.51	6.02	6.90	8.12	9.32	8.32	9.61	10.46	10.72	13.19	14.19	*15.60*	*16.15*	Cap'l Spending per sh	*15.50*
18.05	19.90	20.16	22.01	22.60	23.52	24.16	24.98	26.14	28.47	30.74	31.48	33.32	36.74	42.87	48.18	*54.80*	*58.10*	Book Value per sh	*66.20*
62.80	80.54	81.74	89.33	90.81	92.55	90.16	90.30	90.24	90.64	100.39	101.48	103.93	106.10	111.27	119.34	*124.00*	*130.00*	Common Shs Outst'g D	*145.00*
15.9	16.1	13.5	15.9	13.6	12.5	13.2	14.4	15.9	15.9	16.1	17.5	20.8	22.0	21.7	23.2	22.3		Avg Ann'l P/E Ratio	*24.0*
.84	.86	.73	.84	.82	.83	.84	.90	1.01	.89	.85	.88	1.09	1.11	1.17	1.27	1.11		Relative P/E Ratio	*1.35*
4.9%	4.5%	4.7%	4.2%	4.8%	5.3%	4.7%	4.2%	4.1%	3.5%	3.1%	2.9%	2.4%	2.3%	2.2%	2.1%	2.2%		Avg Ann'l Div'd Yield	*2.2%*

CAPITAL STRUCTURE as of 6/30/20
Total Debt $4531.5 mill. **Due in 5 Yrs** $565.0 mill.
LT Debt $4531.3 mill. **LT Interest** $275.0 mill.
(LT interest earned: 7.3x; total interest coverage: 7.3x)
Leases, Uncapitalized Annual rentals $21.0 mill.

Pfd Stock None

Pension Assets-9/19 $530.1 mill. **Oblig.** $577.3 mill.

Common Stock 123,354,982 shs. as of 7/31/20

MARKET CAP: $12.5 billion (Large Cap)

2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021		23-25
4789.7	4347.6	3438.5	3886.3	4940.9	4142.1	3349.9	2759.7	3115.5	2901.8	2821.1	*2965*	Revenues ($mill) A	*5500*
201.2	199.3	192.2	230.7	289.8	315.1	350.1	382.7	444.3	511.4	580.5	*645*	Net Profit ($mill)	*870*
38.5%	36.4%	33.8%	38.2%	39.2%	38.3%	36.4%	36.6%	27.0%	21.4%	19.5%	*20.5%*	Income Tax Rate	*24.0%*
4.2%	4.6%	5.6%	5.9%	5.9%	7.6%	10.5%	13.9%	14.3%	17.6%	20.6%	*21.8%*	Net Profit Margin	*15.8%*
45.4%	49.4%	45.3%	48.8%	44.3%	43.5%	38.7%	44.0%	34.3%	38.0%	*40.0%*	*40.0%*	Long-Term Debt Ratio	*40.0%*
54.6%	50.6%	54.7%	51.2%	55.7%	56.5%	61.3%	56.0%	65.7%	62.0%	*60.0%*	*60.0%*	Common Equity Ratio	*60.0%*
3987.9	4461.5	4315.5	5036.1	5542.2	5650.2	5651.8	6965.7	7263.6	9279.7	*11325*	*12600*	Total Capital ($mill)	*16000*
4793.1	5147.9	5475.6	6030.7	6725.9	7430.6	8280.5	9259.2	10371	11788	*13355*	*14590*	Net Plant ($mill)	*18700*
6.9%	6.1%	6.1%	5.9%	6.4%	6.6%	7.2%	6.4%	6.9%	6.1%	*6.5%*	*6.5%*	Return on Total Cap'l	*6.5%*
9.2%	8.8%	8.1%	8.9%	9.4%	9.9%	10.1%	9.8%	9.3%	8.9%	*8.5%*	*8.5%*	Return on Shr. Equity	*9.0%*
9.2%	8.8%	8.1%	8.9%	9.4%	9.9%	10.1%	9.8%	9.3%	8.9%	*8.5%*	*8.5%*	Return on Com Equity	*9.0%*
3.5%	3.3%	2.8%	4.0%	4.7%	4.9%	5.1%	4.9%	4.8%	4.6%	*4.5%*	*4.0%*	Retained to Com Eq	*4.5%*
62%	62%	65%	56%	50%	51%	50%	50%	48%	48%	*49%*	*50%*	All Div'ds to Net Prof	*52%*

CURRENT POSITION ($MILL.)	2018	2019	6/30/20
Cash Assets	13.8	24.5	208.1
Other	465.1	433.5	394.1
Current Assets	478.9	458.0	602.2
Accts Payable	217.3	265.0	200.1
Debt Due	1150.8	464.9	.2
Other	547.0	479.5	502.4
Current Liab.	1915.1	1209.4	702.7
Fix. Chg. Cov.	926%	990%	980%

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '17-'19 to '23-'25
Revenues	-9.0%	-9.5%	*6.5%*
"Cash Flow"	5.5%	7.0%	*5.5%*
Earnings	7.5%	9.5%	*7.0%*
Dividends	4.0%	6.5%	*7.5%*
Book Value	6.5%	8.5%	*7.5%*

Fiscal Year Ends	QUARTERLY REVENUES ($ mill.) A Dec.31	Mar.31	Jun.30	Sep.30	Full Fiscal Year
2017	780.2	988.2	526.5	464.8	2759.7
2018	889.2	1219.4	562.2	444.7	3115.5
2019	877.8	1094.6	485.7	443.7	2901.8
2020	875.6	977.6	493.0	474.9	2821.1
2021	*890*	*1050*	*540*	*485*	*2965*

Fiscal Year Ends	EARNINGS PER SHARE A B E Dec.31	Mar.31	Jun.30	Sep.30	Full Fiscal Year
2017	1.08	1.52	.67	.34	3.60
2018	1.40	1.57	.64	.41	4.00
2019	1.38	1.82	.68	.49	4.35
2020	1.47	1.95	.79	.53	4.72
2021	*1.54*	*2.06*	*.83*	*.57*	*5.00*

Cal-endar	QUARTERLY DIVIDENDS PAID C■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2016	.42	.42	.42	.45	1.71
2017	.45	.45	.45	.485	1.84
2018	.485	.485	.485	.525	1.98
2019	.525	.525	.525	.575	2.15
2020	.575	.575	.575	.625	

BUSINESS: Atmos Energy Corporation is engaged primarily in the distribution and sale of natural gas to over three million customers through six regulated natural gas utility operations: Louisiana Division, West Texas Division, Mid-Tex Division, Mississippi Division, Colorado-Kansas Division, and Kentucky/Mid-States Division. Gas sales breakdown for fiscal 2019: 66%, residential; 27%, commercial; 5%, industrial; and 2% other. The company sold Atmos Energy Marketing, 1/17. Officers and directors own approximately 1.4% of common stock (12/19 Proxy). President and Chief Executive Officer: Kevin Akers. Incorporated: Texas. Address: Three Lincoln Centre, Suite 1800, 5430 LBJ Freeway, Dallas, Texas 75240. Telephone: 972-934-9227. Internet: www.atmosenergy.com.

We expect another decent profit advance for Atmos Energy Corporation in fiscal 2021. (The year started on October 1st.) The natural gas distribution unit, which generates the lion's share of total revenues, might well enjoy higher consumption levels, assuming that temperatures across the service areas are generally favorable. Furthermore, there ought to be a respectable showing from the pipeline and storage division. If there are no significant coronavirus-related setbacks, consolidated share net stands to increase around 6%, to $5.00, compared to last year's figure of $4.72. Regarding fiscal 2022, we believe the company's bottom line can rise at a similar percentage rate, to $5.30 a share, as operating margins expand further.

Prospects out to mid-decade are solid, in our opinion. Atmos ranks as one of the country's largest natural gas-only distributors, boasting more than three million customers across several states, including Texas, Louisiana, and Mississippi. Moreover, we think the pipeline and storage unit has healthy overall growth opportunities, given that it operates in one of the most-active drilling regions in the world. Finally, corporate finances are in strong shape. In the company's present configuration, annual earnings increases may be between 5% and 7% during the 2023-2025 horizon.

The quarterly common stock dividend was raised 8.7%, to $0.625 a share. What's more, our 3- to 5-year projections show that additional steady hikes in the distribution may occur. The payout ratio over that span should be in the vicinity of 50%, which seems manageable. However, the dividend yield is not spectacular relative to the average of *Value Line's* Natural Gas Utility Industry group.

These shares ought to draw the attention of various types of investors. The Timeliness rank resides at 1 (Highest). Also, capital gains potential in the 18-month period is appealing. Appreciation possibilities out to mid-decade are decent, as well. Consider, too, the stock's defensive characteristics, indicated by the 1 (Highest) rank for Safety, good Price Stability score (i.e., 95 out of 100), and lower-than-market Beta coefficient.

Frederick L. Harris, III November 27, 2020

(A) Fiscal year ends Sept. 30th. **(B)** Diluted shrs. Excl. nonrec. gains (loss): '10, 5¢; '11, (1¢); '18, $1.43; 3Q '20, 17¢. Excludes discontinued operations: '11, 10¢; '12, 27¢; '13, 14¢; '17, 13¢. Next egs. rpt. due early Feb.
(C) Dividends historically paid in early March, June, Sept., and Dec. ■ Div. reinvestment plan. Direct stock purchase plan avail.
(D) In millions.
(E) Qtrs may not add due to change in shrs outstanding.

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

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Mar 22 2021

NEW JERSEY RES. NYSE-NJR

RECENT PRICE 37.42 | P/E RATIO 17.4 (Trailing: 20.9 Median: 17.0) | RELATIVE P/E RATIO 0.83 | DIV'D YLD 3.6% | VALUE LINE

TIMELINESS 4 Lowered 4/3/20

SAFETY 2 Lowered 4/17/20

TECHNICAL 5 Lowered 11/27/20

BETA .95 (1.00 = Market)

18-Month Target Price Range

Low-High	Midpoint (% to Mid)
$22-$53	$38 (0%)

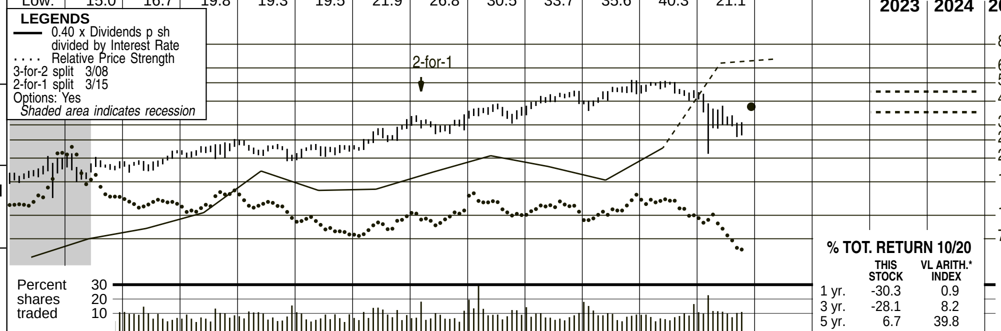
2023-25 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	45	(+20%)	8%
Low	35	(-5%)	3%

Institutional Decisions

	4Q2019	1Q2020	2Q2020
to Buy	169	123	139
to Sell	99	131	97
Hld's(000)	67787	67063	67573

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
High:	21.2	22.0	25.2	25.1	23.8	32.1	34.1	38.9	45.4	51.8	51.2	44.7
Low:	15.0	16.7	19.8	19.3	19.5	21.9	26.8	30.5	33.7	35.6	40.3	21.1



Target Price Range

2023 | 2024 | 2025

% TOT. RETURN 10/20

	THIS STOCK	VL ARITH.* INDEX
1 yr.	-30.3	0.9
3 yr.	-28.1	8.2
5 yr.	6.7	39.8

2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	© VALUE LINE PUB. LLC	23-25
30.44	38.10	39.81	36.31	45.37	31.17	32.05	36.30	27.08	38.38	44.40	32.09	21.90	26.28	33.24	29.01	*21.35*	*28.35*	Revenues per sh A	*30.05*
1.25	1.31	1.37	1.22	1.81	1.58	1.63	1.70	1.86	1.93	2.73	2.52	2.46	2.68	3.72	2.99	*2.90*	*3.30*	"Cash Flow" per sh	*3.55*
.85	.88	.93	.78	1.35	1.20	1.23	1.29	1.36	1.37	2.08	1.78	1.61	1.73	2.72	1.96	*1.90*	*2.25*	Earnings per sh B	*2.40*
.43	.45	.48	.51	.56	.62	.68	.72	.77	.81	.86	.93	.98	1.04	1.11	1.19	1.27	*1.34*	Div'ds Decl'd per sh C■	*1.57*
.72	.64	.64	.73	.86	.90	1.05	1.13	1.26	1.33	1.52	3.76	4.15	3.80	4.39	5.83	*4.70*	*4.10*	Cap'l Spending per sh	*4.00*
5.62	5.30	7.50	7.75	8.64	8.29	8.81	9.36	9.80	10.65	11.48	12.99	13.58	14.33	16.18	17.37	*20.50*	*21.65*	Book Value per sh D	*25.80*
83.22	82.64	82.88	83.22	84.12	83.17	82.35	82.89	83.05	83.32	84.20	85.19	85.88	86.32	87.69	89.34	*96.00*	*97.00*	Common Shs Outst'g E	*100.00*
15.3	16.8	16.1	21.6	12.3	14.9	15.0	16.8	16.8	16.0	11.7	16.6	21.3	22.4	15.6	24.3	*17.3*		Avg Ann'l P/E Ratio	*17.0*
.81	.89	.87	1.15	.74	.99	.95	1.05	1.07	.90	.62	.84	1.12	1.13	.84	1.33	*.95*		Relative P/E Ratio	*.95*
3.3%	3.1%	3.2%	3.0%	3.3%	3.5%	3.7%	3.3%	3.4%	3.7%	3.5%	3.1%	2.9%	2.7%	2.6%	2.5%	3.9%		Avg Ann'l Div'd Yield	*3.7%*

CAPITAL STRUCTURE as of 6/30/20
Total Debt $2243.6 mill. **Due in 5 Yrs** $420.5 mill.
LT Debt $1664.5 mill. **LT Interest** $47.1 mill.
Incl. $38.6 mill. capitalized leases.
(LT interest earned: 5.0x; total interest coverage: 5.0x)

Pension Assets-9/19 $372.6 mill. **Oblig.** $620.5 mill.

Pfd Stock None

Common Stock 95,930,191 shs.
as of 8/5/20

MARKET CAP: $3.6 billion (Mid Cap)

2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021		23-25
2639.3	3009.2	2248.9	3198.1	3738.1	2734.0	1880.9	2268.6	2915.1	2592.0	*2050*	*2750*	Revenues ($mill) A	*3005*
101.8	106.5	112.4	113.7	176.9	153.7	138.1	149.4	240.5	175.0	*185*	*220*	Net Profit ($mill)	*240*
41.4%	30.2%	7.1%	25.4%	30.2%	26.3%	15.5%	17.2%	NMF	NMF	*15.0%*	*15.0%*	Income Tax Rate	*15.0%*
3.9%	3.5%	5.0%	3.6%	4.7%	5.6%	7.3%	6.6%	8.2%	6.7%	*8.9%*	*8.0%*	Net Profit Margin	*8.0%*
37.2%	35.5%	39.2%	36.6%	38.2%	43.2%	47.7%	44.6%	45.4%	49.8%	*44.5%*	*44.5%*	Long-Term Debt Ratio	*43.5%*
62.8%	64.5%	60.8%	63.4%	61.8%	56.8%	52.3%	55.4%	54.6%	50.2%	*55.5%*	*55.5%*	Common Equity Ratio	*56.5%*
1154.4	1203.1	1339.0	1400.3	1564.4	1950.6	2230.1	2233.7	2599.6	3088.9	*3500*	*3800*	Total Capital ($mill)	*4580*
1135.7	1295.9	1484.9	1643.1	1884.1	2128.3	2407.7	2609.7	2651.0	3041.2	*3800*	*3875*	Net Plant ($mill)	*4115*
9.7%	9.7%	9.2%	9.0%	12.1%	8.6%	6.9%	7.7%	10.1%	6.4%	*6.0%*	*6.5%*	Return on Total Cap'l	*6.0%*
14.0%	13.7%	13.8%	12.8%	18.3%	13.9%	11.8%	12.1%	16.9%	11.3%	*9.5%*	*10.5%*	Return on Shr. Equity	*9.5%*
14.0%	13.7%	13.8%	12.8%	18.3%	13.9%	11.8%	12.1%	16.9%	11.3%	*9.5%*	*10.5%*	Return on Com Equity	*9.5%*
6.7%	6.2%	6.2%	5.2%	11.0%	7.0%	4.8%	5.0%	10.2%	4.6%	*3.0%*	*4.5%*	Retained to Com Eq	*3.0%*
52%	55%	55%	59%	40%	50%	60%	59%	40%	59%	*67%*	*59%*	All Div'ds to Net Prof	*65%*

CURRENT POSITION ($MILL.)

	2018	2019	6/30/20
Cash Assets	1.5	2.7	42.8
Other	768.6	508.9	478.3
Current Assets	770.1	511.6	521.1
Accts Payable	373.5	295.9	222.4
Debt Due	275.5	46.9	579.1
Other	101.9	103.6	100.8
Current Liab.	750.9	446.4	902.3
Fix. Chg. Cov.	545%	545%	550%

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '17-'19 to '23-'25
Revenues	-2.5%	-4.0%	*.5%*
"Cash Flow"	7.5%	7.5%	*2.0%*
Earnings	7.0%	6.0%	*2.0%*
Dividends	7.0%	6.5%	*6.0%*
Book Value	7.0%	8.5%	*8.5%*

Fiscal Year Ends	QUARTERLY REVENUES ($ mill.) A Dec.31	Mar.31	Jun.30	Sep.30	Full Fiscal Year
2017	541.1	733.5	457.5	536.5	2268.6
2018	705.3	1019.0	543.4	647.3	2915.1
2019	811.8	866.3	434.9	479.1	2592.0
2020	615.0	639.6	299.0	*496.4*	*2050*
2021	*665*	*965*	*535*	*585*	*2750*

Fiscal Year Ends	EARNINGS PER SHARE A B Dec.31	Mar.31	Jun.30	Sep.30	Full Fiscal Year
2017	.47	1.21	.20	d.14	1.73
2018	1.53	1.61	d.09	d.33	2.72
2019	.61	1.27	d.20	.29	1.96
2020	.44	1.12	d.06	*.40*	*1.90*
2021	*.55*	*1.25*	*d.05*	*.50*	*2.25*

Cal-endar	QUARTERLY DIVIDENDS PAID C ■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2016	.24	.24	.24	.255	.98
2017	.255	.255	.255	.273	1.04
2018	.273	.273	.273	.2925	1.11
2019	.2925	.2925	.2925	.3125	1.19
2020	.3125	.3125	.3125	.3325	

BUSINESS: New Jersey Resources Corp. is a holding company providing retail/wholesale energy svcs. to customers in NJ, and in states from the Gulf Coast to New England, and Canada. New Jersey Natural Gas had 547,600 cust. at 9/30/19. Fiscal 2019 volume: 232 bill. cu. ft. (17% interruptible, 17% res., 9% commercial & elec. utility, 40% capacity release programs). N.J. Natural Energy subsidiary provides unregulated retail/wholesale natural gas and related energy svcs. 2019 dep. rate: 2.6%. Has 1,108 empls. Off./dir. own 1.3% of common; BlackRock, 13.9%; Vanguard, 10.4% (12/19 Proxy). CEO, President & Director: Steven D. Westhoven. Incorporated: New Jersey. Address: 1415 Wyckoff Road, Wall, NJ 07719. Telephone: 732-938-1480. Web: www.njresources.com.

Since our August review, shares of New Jersey Resources have rebounded nicely. We think this likely reflected the general uptrend in the broader market averages over this time frame, coupled with the news of the recent dividend raise.

Still, the utility provider faced a challenging operating environment in fiscal 2020 (ended September 30th). We look for the company to post year-over-year revenue and earnings declines as the coronavirus pandemic continues to weigh on end-use consumer demand. (Note: New Jersey Resources was scheduled to report annual financial results shortly after this report went to press.) The slump in volumes is only exacerbated by the downturn in commodity prices earlier this year. NJR's regulated utility business probably continued to grow modestly as that division added new customer accounts. However, the nonutility operations, like the retail and wholesale energy services, were down sharply over the past 12 months and were a drag on overall operations. Moving forward, growth projects, more-normalized commodity prices, and an anticipated COVID-19 vaccine should help to turn things around in fiscal 2021.

New developments like the recently completed solar project are encouraging. The NJR Clean Energy Ventures division and the Borough of Hopatcong turned the former municipal landfill into a new 1.5 megawatt ground-mounted solar facility. This project brings NJR's total installed solar capacity to more than 350 megawatts, representing over $970 million in capital expenditures. It is also a solid push to the company's green initiatives.

An increase in the quarterly dividend may appeal to income-seekers. The board approved a raise in the quarterly payout nearly 6.5%, to $0.3325. Opportunistic yield-seeking accounts may look for some sort of near-term price correction to establish a position here.

At the moment, these shares do not stand out. The stock is ranked to lag the broader market averages in the year ahead. And the equity is trading inside our 3- to 5-year Target Price Range, suggesting that it offers limited upside potential for that time frame.

Bryan J. Fong *November 27, 2020*

(A) Fiscal year ends Sept. 30th.
(B) Diluted earnings. Qtly. sales and egs. may not sum to total due to rounding and change in shares outstanding. Next earnings report due early Feb.
(C) Dividends historically paid in early Jan., April, July, and October. ■ Dividend reinvestment plan available.
(D) Includes regulatory assets in 2019: $496.6 million, $5.56/share.
(E) In millions, adjusted for splits.

Company's Financial Strength	A+
Stock's Price Stability	85
Price Growth Persistence	60
Earnings Predictability	50

NISOURCE INC. NYSE-NI

RECENT PRICE **24.62** | P/E RATIO **18.4** (Trailing: 17.2 Median: 21.0) | RELATIVE P/E RATIO **0.88** | DIV'D YLD **3.4%** | VALUE LINE

TIMELINESS	3	Lowered 4/5/19
SAFETY	2	Raised 11/29/19
TECHNICAL	5	Lowered 11/27/20

BETA .85 (1.00 = Market)

18-Month Target Price Range

Low-High Midpoint (% to Mid)

$18-$39 $29 (15%)

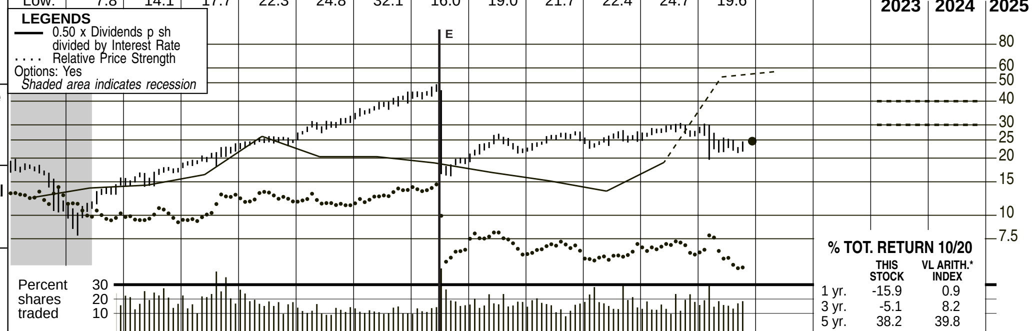
2023-25 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	40	(+60%)	15%
Low	30	(+20%)	8%

Institutional Decisions

	4Q2019	1Q2020	2Q2020
to Buy	255	214	212
to Sell	203	230	218
Hld's(000)	347952	345200	342381

High:	15.8	18.0	24.0	26.2	33.5	44.9	49.2	26.9	27.8	28.1	30.7	30.5
Low:	7.8	14.1	17.7	22.3	24.8	32.1	16.0	19.0	21.7	22.4	24.7	19.6



% TOT. RETURN 10/20

	THIS STOCK	VL ARITH.* INDEX
1 yr.	-15.9	0.9
3 yr.	-5.1	8.2
5 yr.	38.2	39.8

2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	© VALUE LINE PUB. LLC	23-25
24.63	28.97	27.37	28.96	32.36	24.02	22.99	21.33	16.31	18.04	20.47	14.58	13.90	14.46	13.74	13.63	*13.05*	*14.05*	Revenues per sh	*17.20*
3.47	3.14	3.18	3.20	3.32	2.96	3.19	2.98	3.13	3.41	3.60	2.27	2.71	2.07	2.82	3.03	*3.10*	*3.25*	"Cash Flow" per sh	*4.10*
1.62	1.08	1.14	1.14	1.34	.84	1.06	1.05	1.37	1.57	1.67	.63	1.00	.39	1.30	1.32	*1.30*	*1.40*	Earnings per sh A	*2.05*
.92	.92	.92	.92	.92	.92	.92	.92	.94	.98	1.02	.83	.64	.70	.78	.80	*.86*	*.92*	Div'd Decl'd per sh B ■	*1.16*
1.91	2.17	2.33	2.88	3.54	2.81	2.88	3.99	4.83	5.99	6.42	4.26	4.57	5.03	4.88	4.72	*4.70*	*4.70*	Cap'l Spending per sh	*4.70*
17.69	18.09	18.32	18.52	17.24	17.54	17.63	17.71	17.90	18.77	19.54	12.04	12.60	12.82	13.08	13.36	*13.75*	*14.20*	Book Value per sh C	*16.20*
270.63	272.62	273.65	274.18	274.26	276.79	279.30	282.18	310.28	313.68	316.04	319.11	323.16	337.02	372.36	382.14	*383.00*	*384.00*	Common Shs Outst'g D	*385.00*
13.0	21.4	19.2	18.8	12.1	14.3	15.3	19.4	17.9	18.9	22.7	37.3	23.2	NMF	19.3	21.2	*Bold figures are*		Avg Ann'l P/E Ratio	*16.0*
.69	1.14	1.04	1.00	.73	.95	.97	1.22	1.14	1.06	1.19	1.88	1.22	NMF	1.04	1.15	*Value Line*		Relative P/E Ratio	*.90*
4.4%	4.0%	4.2%	4.3%	5.7%	7.6%	5.7%	4.5%	3.8%	3.3%	2.7%	3.5%	2.8%	2.8%	3.1%	2.9%	*estimates*		Avg Ann'l Div'd Yield	*3.5%*

CAPITAL STRUCTURE as of 9/30/20
Total Debt $10618.5 mill. **Due in 5 Yrs** $2196 mill.
LT Debt $9208.9 mill. **LT Interest** $379 mill.
(Interest cov. earned: 2.2x) (63% of Cap'l)

Leases, Uncapitalized Annual rentals $27.2 mill.
Pension Assets-12/19 $2.3 bill. **Oblig.** $2.7 bill.

Pfd Stock $880 mill. **Pfd Div'd** $28.5 mill.

Common Stock 383,212,193 shs.
as of 10/26/20
MARKET CAP: $9.4 billion (Large Cap)

2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021		23-25
6422.0	6019.1	5061.2	5657.3	6470.6	4651.8	4492.5	4874.6	5114.5	5208.9	*5000*	*5400*	Revenues ($mill)	*6615*
294.6	303.8	410.6	490.9	530.7	198.6	328.1	128.6	463.3	494.7	*490*	*530*	Net Profit ($mill)	*785*
32.4%	35.0%	34.4%	34.8%	36.9%	41.6%	35.7%	71.0%	19.7%	20.2%	*21.0%*	*21.0%*	Income Tax Rate	*22.0%*
--	--	--	--	--	--	--	--	2.9%	2.0%	*2.0%*	*2.0%*	AFUDC % to Net Profit	*2.0%*
54.7%	55.6%	55.1%	56.3%	56.9%	60.7%	59.8%	63.5%	55.3%	56.8%	*55.5%*	*55.0%*	Long-Term Debt Ratio	*55.0%*
45.3%	44.4%	44.9%	43.7%	43.1%	39.3%	40.2%	36.5%	37.9%	36.9%	*44.5%*	*45.0%*	Common Equity Ratio	*45.0%*
10859	11264	12373	13480	14331	9792.0	10129	11832	12856	13843	*15875*	*16105*	Total Capital ($mill)	*17005*
11097	11800	12916	14365	16017	12112	13068	14360	15543	16912	*15750*	*16000*	Net Plant ($mill)	*17250*
4.5%	4.4%	5.0%	5.2%	5.3%	4.0%	5.0%	2.6%	5.0%	4.9%	*3.0%*	*3.5%*	Return on Total Cap'l	*4.5%*
6.0%	6.1%	7.4%	8.3%	8.6%	5.2%	8.1%	3.0%	8.1%	8.3%	*8.0%*	*8.5%*	Return on Shr. Equity	*11.0%*
6.0%	6.1%	7.4%	8.3%	8.6%	5.2%	8.1%	3.0%	9.3%	8.6%	*8.0%*	*8.5%*	Return on Com Equity	*11.0%*
.8%	.9%	2.5%	3.1%	3.4%	NMF	3.0%	NMF	3.7%	2.7%	*2.0%*	*2.5%*	Retained to Com Eq	*4.5%*
87%	85%	67%	62%	61%	NMF	63%	NMF	61%	72%	*73%*	*72%*	All Div'ds to Net Prof	*61%*

CURRENT POSITION ($MILL.)	2018	2019	9/30/20
Cash Assets	112.8	139.3	58.6
Other	1942.6	1714.6	2762.2
Current Assets	2055.4	1853.9	2820.8
Accts Payable	883.8	666.0	410.3
Debt Due	2027.2	1783.6	1409.6
Other	1125.8	1296.2	1626.9
Current Liab.	4036.8	3745.8	3446.8
Fix. Chg. Cov.	246%	250%	255%

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '17-'19 to '23-'25
Revenues	-7.0%	-5.5%	*3.5%*
"Cash Flow"	-2.0%	-5.0%	*7.5%*
Earnings	-1.0%	-8.0%	*13.0%*
Dividends	-2.0%	-5.0%	*7.5%*
Book Value	-3.0%	-7.0%	*5.0%*

Cal-endar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2017	1598.6	990.7	917.0	1368.3	4874.6
2018	1750.8	1007.0	895.0	1461.7	5114.5
2019	1869.8	1010.4	931.5	1397.2	5208.9
2020	1605.5	962.7	902.5	*1529.3*	*5000*
2021	*1680*	*1040*	*1075*	*1605*	*5400*

Cal-endar	EARNINGS PER SHARE A Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2017	.65	d.14	.04	d.16	.39
2018	.77	.07	.10	.38	1.30
2019	.82	.05	--	.45	1.32
2020	.76	.13	.09	*.32*	*1.30*
2021	*.78*	*.15*	*.12*	*.35*	*1.40*

Cal-endar	QUARTERLY DIVIDENDS PAID B ■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2016	.155	.155	.165	.165	.64
2017	.175	.175	.175	.175	.70
2018	.195	.195	.195	.195	.78
2019	.200	.200	.200	.200	.80
2020	.21	.21	.21	.21	

BUSINESS: NiSource Inc. is a holding company for Northern Indiana Public Service Company (NIPSCO), which supplies electricity and gas to the northern third of Indiana. Customers: 472,000 electric in Indiana, 3.5 million gas in Indiana, Ohio, Pennsylvania, Kentucky, Virginia, Maryland, Massachusetts through its Columbia subsidiaries. Revenue breakdown, 2019: electrical, 33%; gas, 67%; other, less than 1%. Generating sources, 2018: coal, 69.4%; purchased & other, 30.6%. 2019 reported depreciation rates: 2.9% electric, 2.2% gas. Has 8,087 employees. Chairman: Richard L. Thompson. President & Chief Executive Officer: Joseph Hamrock. Incorporated: Indiana. Address: 801 East 86th Ave., Merrillville, Indiana 46410. Tel.: 877-647-5990. Internet: www.nisource.com.

NiSource continues to post mixed financial results this year. The September-period revenues fell 3.1%, to $902.5 million, reflecting a 7.6% downturn from the electric division, partially offset by a slight 1.3% rise in volumes at the gas segment. These trends highlight the continued challenges impacting NiSource's operating environment this year, as the coronavirus weighs on end-user demand. Moreover, the increased volatility with regard to commodity prices adds further uncertainty. On the profitability front, operating expenses declined 440 basis points, as a percentage of the top line. Combined, these factors drove the bottom line significantly higher, to $0.09 per share. This was in line with our expectation.

We continue to look for the utility provider to register flattish to slightly lower earnings this year. NiSource will probably experience a 1.5% downturn in earnings, to $1.30 a share, for 2020. Our call falls within management's recently reaffirmed guidance range of $1.28-$1.36 per share. This year-over-year earnings decline ought to reflect a 4% drop in revenues, to $5.0 billion due to reduced demand from both its commercial and industrial customers. One big unknown here is the number of accounts that will fall into the bad-debt category, as economic hardship stemming from the pandemic weighs on customers' ability to pay.

That said, we believe NiSource will be in a good position to turn things around in 2021. The gas distribution segment has pending rate cases in both Pennsylvania and Maryland, which would add roughly $100 million and $3.5 million in annual revenues, respectively. Additionally, management plans to spend about $1.75 billion on capital growth projects this year for both wind and solar initiatives. Those developments should begin to bear fruit in the near future. Finally, assuming a COVID-19 vaccine comes down the pipeline, we may see a return to more-normalized consumer demand.

The healthy dividend yield may appeal to income-seeking accounts. That said, the difficult economic backdrop and pandemic headwinds do add a bit of uncertainty here. And 3- to 5-year appreciation potential is below average.

Bryan J. Fong *November 27, 2020*

(A) Dil. EPS. Excl. nonrec. gains (losses): '05, (4¢); gains (losses) on disc. ops.: '05, 10¢; '06, (11¢); '07, 3¢; '08, ($1.14); '15, (30¢); '18, ($1.48). Next egs. report due late Feb. Qtl'y egs. may not sum to total due to rounding.
(B) Div'ds historically paid in mid-Feb., May, Aug., Nov. ■ Div'd reinv. avail.
(C) Incl. intang in '19: $1485.9 million, $3.89/sh.
(D) In mill.
(E) Spun off Columbia Pipeline Group (7/15)

Company's Financial Strength	B++
Stock's Price Stability	95
Price Growth Persistence	35
Earnings Predictability	40

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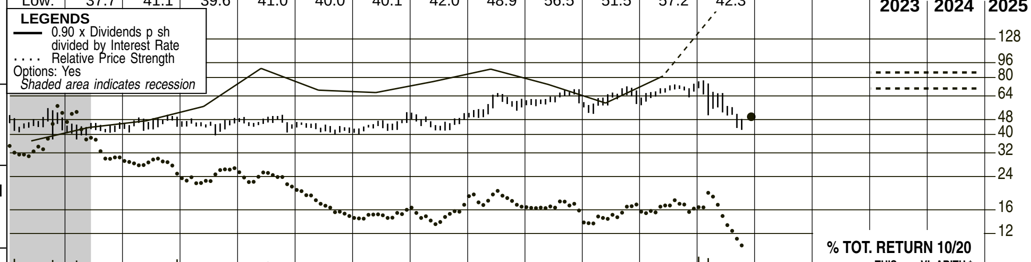
Mar 22 2021

N.W. NATURAL NYSE-NWN

RECENT PRICE 49.69 | P/E RATIO 21.2 (Trailing: 24.1; Median: 23.0) | RELATIVE P/E RATIO 1.01 | DIV'D YLD 3.9% | VALUE LINE

TIMELINESS 3 Lowered 5/22/20
SAFETY 1 Raised 3/18/05
TECHNICAL 3 Raised 4/3/20
BETA .80 (1.00 = Market)

High:	46.5	50.9	49.0	50.8	46.6	52.6	52.3	66.2	69.5	71.8	74.1	77.3
Low:	37.7	41.1	39.6	41.0	40.0	40.1	42.0	48.9	56.5	51.5	57.2	42.3



18-Month Target Price Range

Low-High	Midpoint (% to Mid)
$39-$98	$69 (40%)

2023-25 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	85	(+70%)	17%
Low	70	(+40%)	12%

Institutional Decisions

	4Q2019	1Q2020	2Q2020
to Buy	120	88	73
to Sell	95	133	103
Hld's(000)	23102	22679	21936

Percent shares traded 15 10 5

% TOT. RETURN 10/20

	THIS STOCK	VL ARITH.* INDEX
1 yr.	-34.2	0.9
3 yr.	-27.1	8.2
5 yr.	8.0	39.8

2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	© VALUE LINE PUB. LLC	23-25
25.69	33.01	37.20	39.13	39.16	38.17	30.56	31.72	27.14	28.02	27.64	26.39	23.61	26.52	24.45	24.49	**24.70**	**26.45**	Revenues per sh	**29.40**
3.92	4.34	4.76	5.41	5.31	5.20	5.18	5.00	4.94	5.04	5.05	4.91	4.93	1.04	5.28	5.15	**4.70**	**5.15**	"Cash Flow" per sh	**6.15**
1.86	2.11	2.35	2.76	2.57	2.83	2.73	2.39	2.22	2.24	2.16	1.96	2.12	d1.94	2.33	2.19	**2.25**	**2.50**	Earnings per sh A	**3.20**
1.30	1.32	1.39	1.44	1.52	1.60	1.68	1.75	1.79	1.83	1.85	1.86	1.87	1.88	1.89	1.90	**1.91**	**1.92**	Div'ds Decl'd per sh B■	**1.97**
5.52	3.48	3.56	4.48	3.92	5.09	9.35	3.76	4.91	5.13	4.40	4.37	4.87	7.43	7.43	7.95	**7.80**	**6.15**	Cap'l Spending per sh	**6.25**
20.64	21.28	22.01	22.52	23.71	24.88	26.08	26.70	27.23	27.77	28.12	28.47	29.71	25.85	26.41	28.42	**29.70**	**31.85**	Book Value per sh D	**38.40**
27.55	27.58	27.24	26.41	26.50	26.53	26.58	26.76	26.92	27.08	27.28	27.43	28.63	28.74	28.88	30.47	**31.00**	**31.00**	Common Shs Outst'g C	**32.00**
16.7	17.0	15.9	16.7	18.1	15.2	17.0	19.0	21.1	19.4	20.7	23.7	26.9	- -	26.6	30.9	*Bold figures are*	*Value Line estimates*	Avg Ann'l P/E Ratio	**24.0**
.88	.91	.86	.89	1.09	1.01	1.08	1.19	1.34	1.09	1.09	1.19	1.41	- -	1.44	1.68			Relative P/E Ratio	**1.35**
4.2%	3.7%	3.7%	3.1%	3.3%	3.7%	3.6%	3.9%	3.8%	4.2%	4.1%	4.0%	3.3%	3.0%	3.0%	2.8%			Avg Ann'l Div'd Yield	**2.6%**
						812.1	848.8	730.6	758.5	754.0	723.8	676.0	762.2	706.1	746.4	**765**	**820**	Revenues ($mill)	**940**
						72.7	63.9	59.9	60.5	58.7	53.7	58.9	d55.6	67.3	65.3	**75.0**	**85.0**	Net Profit ($mill)	**95.0**
						40.5%	40.4%	42.4%	40.8%	41.5%	40.0%	40.9%	- -	26.4%	16.2%	**21.0%**	**21.0%**	Income Tax Rate	**21.0%**
						8.9%	7.5%	8.2%	8.0%	7.8%	7.4%	8.7%	NMF	9.5%	8.8%	**9.1%**	**9.5%**	Net Profit Margin	**10.9%**
						46.1%	47.3%	48.5%	47.6%	44.8%	42.5%	44.4%	47.9%	48.1%	48.2%	**47.5%**	**47.0%**	Long-Term Debt Ratio	**47.5%**
						53.9%	52.7%	51.5%	52.4%	55.2%	57.5%	55.6%	52.1%	51.9%	51.8%	**52.5%**	**53.0%**	Common Equity Ratio	**52.5%**
						1284.8	1356.2	1424.7	1433.6	1389.0	1357.7	1529.8	1426.0	1468.9	1672.0	**1755**	**1855**	Total Capital ($mill)	**1825**
						1854.2	1893.9	1973.6	2062.9	2121.6	2182.7	2260.9	2255.0	2421.4	2438.9	**2535**	**2640**	Net Plant ($mill)	**3065**
						7.0%	6.2%	5.7%	5.8%	5.8%	5.5%	5.1%	NMF	5.8%	5.2%	**5.0%**	**5.0%**	Return on Total Cap'l	**5.5%**
						10.5%	8.9%	8.2%	8.1%	7.6%	6.9%	6.9%	NMF	8.8%	7.5%	**7.5%**	**8.0%**	Return on Shr. Equity	**8.5%**
						10.5%	8.9%	8.2%	8.1%	7.6%	6.9%	6.9%	NMF	8.8%	7.5%	**7.5%**	**8.0%**	Return on Com Equity	**8.5%**
						4.0%	2.4%	1.6%	1.5%	1.1%	.6%	.9%	NMF	2.1%	1.4%	**1.0%**	**2.0%**	Retained to Com Eq	**3.0%**
						61%	73%	80%	81%	85%	92%	87%	NMF	76%	82%	**85%**	**77%**	All Div'ds to Net Prof	**61%**

CAPITAL STRUCTURE as of 9/30/20
Total Debt $1178.4 mill. **Due in 5 Yrs** $910.0 mill.
LT Debt $860.2 mill. **LT Interest** $40.0 mill.

(Total interest coverage: 3.1x)

Pension Assets-12/19 $313.1 mill. **Oblig.** $515.7 mill.

Pfd Stock None

Common Stock 30,568,578 shares
as of 10/29/20

MARKET CAP $1.5 billion (Mid Cap)

CURRENT POSITION ($MILL.)	2018	2019	9/30/20
Cash Assets	12.6	9.6	35.9
Other	283.3	284.1	206.9
Current Assets	295.9	293.7	242.8
Accts Payable	115.9	113.4	83.8
Debt Due	247.6	224.2	318.2
Other	145.6	144.6	149.3
Current Liab.	509.1	482.2	551.3
Fix. Chg. Cov.	357%	336%	312%

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '17-'19 to '23-'25
Revenues	-4.0%	-2.0%	2.5%
"Cash Flow"	-3.0%	-5.5%	8.0%
Earnings	-11.0%	-17.0%	24.5%
Dividends	2.0%	.5%	.5%
Book Value	1.5%	-.5%	6.0%

Cal-endar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2017	297.3	136.3	88.2	240.4	762.2
2018	264.7	124.6	91.2	226.7	706.1
2019	285.4	123.4	90.3	247.3	746.4
2020	285.2	135.0	93.3	*251.5*	*765*
2021	*305*	*145*	*110*	*260*	*820*

Cal-endar	EARNINGS PER SHARE A Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2017	1.40	.10	d.30	d3.14	d1.94
2018	1.46	d.01	d.39	1.27	2.33
2019	1.50	.07	d.61	1.26	2.19
2020	1.58	d.17	d.61	*1.45*	*2.25*
2021	*1.60*	*d.10*	*d.50*	*1.50*	*2.50*

Cal-endar	QUARTERLY DIVIDENDS PAID B ■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2016	.4675	.4675	.4675	.47	1.87
2017	.47	.47	.47	.4725	1.88
2018	.4725	.4725	.4725	.475	1.89
2019	.475	.475	.475	.4775	1.90
2020	.4775	.4775	.4775	.48	

BUSINESS: Northwest Natural Holding Co. distributes natural gas to 1000 communities, 750,000 customers, in Oregon (89% of customers) and in southwest Washington state. Principal cities served: Portland and Eugene, OR; Vancouver, WA. Service area population: 3.7 mill. (77% in OR). Company buys gas supply from Canadian and U.S. producers; has transportation rights on Northwest Pipeline system. Owns local underground storage. Rev. breakdown: residential, 37%; commercial, 22%; industrial, gas transportation, 41%. Employs 1,167. BlackRock Inc. owns 15.5% of shares; Off./Dir. own less than 1% (4/20 proxy). CEO: David H. Anderson. Inc.: Oregon. Address: 220 NW 2nd Ave., Portland, OR 97209. Tel.: 503-226-4211. Internet: www.nwnatural.com.

Northwest Natural Holding recorded flat results in the third quarter. Revenues increased slightly to $93.3 million, aided by greater throughput and a larger customer base. Around 13,800 new customers were added in the natural gas space over the past year, while the company benefited from recently acquired operations in water and other utilities. Despite a decline in interest expense (reflecting the rollover of debt at lower rates), higher operating costs (including maintenance and depreciation expenses) were a drag. These factors netted out to a loss of $0.61 per share. Northwest should have decent results in the fourth quarter as cooler weather helps the top line expand. Moreover, recent rates cases should help, as the Oregon Public Utility Commission allowed for an additional $45 million in charges. We expect costs will remain steady, allowing earnings to reach $1.45 per share.

The company ought to see some bottom-line improvements in the years ahead. Revenues will likely advance as more people move into the Portland area. Additionally, Northwest has purchased several water utilities over the past few years, including some in Texas and Washington, and will likely continue to do so. These ought to help the top line expand in the coming years. Meantime, the company will probably benefit from the additional distribution of natural gas in the Portland area. Economies of scale will start to emerge with these new operations, helping profits expand. All told, we think earnings will reach $2.50 per share in 2021 and $3.20 per share by 2023-2025.

Management has raised the quarterly dividend by 1%, to $0.48. This increase continues the streak of 65 annual dividend hikes, which remains among the longest in the *Survey* and the payout remains adequately covered by earnings. Looking forward, it should grow at a moderate pace.

Shares of Northwest Natural Holding are ranked Average (3). This stock holds above average 3- to 5-year appreciation potential, based on a substantial earnings improvement. Additionally, the dividend yield is above average, while it holds our Highest (1) Safety rank. Overall, we think that this issue should appeal to most long-term investors.

John E. Seibert III *November 27, 2020*

(A) Diluted earnings per share. Excludes nonrecurring items: '06, ($0.06); '08, ($0.03); '09, $0.06; May not sum due to rounding. Next earnings report due in early February.
(B) Dividends historically paid in mid-February, May, August, and November.
■ Dividend reinvestment plan available.
(C) In millions.
(D) Includes intangibles. In 2019: $343.2 million, $11.26/share.

Company's Financial Strength	A
Stock's Price Stability	90
Price Growth Persistence	40
Earnings Predictability	5

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Mar 22 2021

ONE GAS, INC. NYSE-OGS

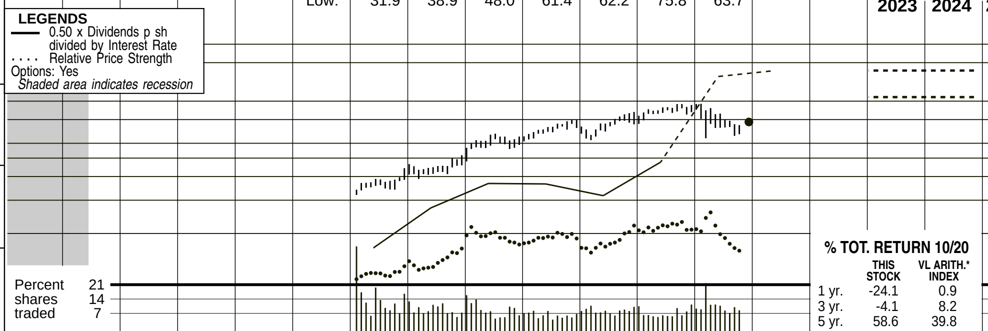
RECENT PRICE **77.68** | P/E RATIO **21.2** (Trailing: 21.9 Median: NMF) | RELATIVE P/E RATIO **1.01** | DIV'D YLD **3.0%** | VALUE LINE

TIMELINESS 4 Lowered 11/27/20
SAFETY 2 New 6/2/17
TECHNICAL 4 Lowered 11/27/20
BETA .80 (1.00 = Market)

High:	44.3	51.8	67.4	79.5	87.8	96.7	97.0	
Low:	31.9	38.9	48.0	61.4	62.2	75.8	63.7	

Target Price Range
2023 | 2024 | 2025

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



18-Month Target Price Range

Low-High	Midpoint (% to Mid)
$59-$131	$95 (20%)

2023-25 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	145	(+85%)	*19%*
Low	105	(+35%)	*10%*

Institutional Decisions

	4Q2019	1Q2020	2Q2020
to Buy	153	124	142
to Sell	132	157	137
Hld's(000)	41714	41769	42060

% TOT. RETURN 10/20

	THIS STOCK	VL ARITH.* INDEX
1 yr.	-24.1	0.9
3 yr.	-4.1	8.2
5 yr.	58.6	39.8

The shares of ONE Gas, Inc. began trading "regular-way" on the New York Stock Exchange on February 3, 2014. That happened as a result of the separation of ONEOK's natural gas distribution operation. Regarding the details of the spinoff, on January 31, 2014, ONEOK distributed one share of OGS common stock for every four shares of ONEOK common stock held by ONEOK shareholders of record as of the close of business on January 21. It should be mentioned that ONEOK did not retain any ownership interest in the new company.

2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	© VALUE LINE PUB. LLC	23-25
- -	- -	- -	- -	34.92	29.62	27.30	29.43	31.08	31.32	*28.30*	*30.20*	Revenues per sh	*40.00*
- -	- -	- -	- -	4.52	4.82	5.43	5.96	6.32	6.96	*7.15*	*7.50*	"Cash Flow" per sh	*9.65*
- -	- -	- -	- -	2.07	2.24	2.65	3.02	3.25	3.51	*3.56*	*3.70*	Earnings per sh A	*4.75*
- -	- -	- -	- -	.84	1.20	1.40	1.68	1.84	2.00	*2.16*	*2.32*	Div'ds Decl'd per sh B■	*2.80*
- -	- -	- -	- -	5.70	5.63	5.91	6.81	7.50	7.91	*8.80*	*8.95*	Cap'l Spending per sh	*9.35*
- -	- -	- -	- -	34.45	35.24	36.12	37.47	38.86	40.35	*42.70*	*45.80*	Book Value per sh	*54.10*
- -	- -	- -	- -	52.08	52.26	52.28	52.31	52.57	52.77	*53.00*	*53.50*	Common Shs Outst'g C	*55.00*
- -	- -	- -	- -	17.8	19.8	22.7	23.5	23.1	25.3	*Bold figures are*		Avg Ann'l P/E Ratio	*26.5*
- -	- -	- -	- -	.94	1.00	1.19	1.18	1.25	1.37	*Value Line*		Relative P/E Ratio	*1.45*
- -	- -	- -	- -	2.3%	2.7%	2.3%	2.4%	2.5%	2.3%	*estimates*		Avg Ann'l Div'd Yield	*2.2%*
- -	- -	- -	- -	1818.9	1547.7	1427.2	1539.6	1633.7	1652.7	*1500*	*1615*	Revenues ($mill)	*2200*
- -	- -	- -	- -	109.8	119.0	140.1	159.9	172.2	186.7	*190*	*200*	Net Profit ($mill)	*260*
- -	- -	- -	- -	38.4%	38.0%	37.8%	36.4%	23.7%	18.7%	*18.0%*	*18.5%*	Income Tax Rate	*22.0%*
- -	- -	- -	- -	6.0%	7.7%	9.8%	10.4%	10.5%	11.3%	*12.7%*	*12.4%*	Net Profit Margin	*11.8%*
- -	- -	- -	- -	40.1%	39.5%	38.7%	37.8%	38.6%	37.7%	*42.0%*	*40.0%*	Long-Term Debt Ratio	*38.0%*
- -	- -	- -	- -	59.9%	60.5%	61.3%	62.2%	61.4%	62.3%	*58.0%*	*60.0%*	Common Equity Ratio	*62.0%*
- -	- -	- -	- -	2995.3	3042.9	3080.7	3153.5	3328.1	3415.5	*3900*	*4085*	Total Capital ($mill)	*4800*
- -	- -	- -	- -	3293.7	3511.9	3731.6	4007.6	4283.7	4565.2	*4830*	*5060*	Net Plant ($mill)	*5750*
- -	- -	- -	- -	4.4%	4.7%	5.2%	5.8%	5.9%	6.4%	*6.0%*	*6.0%*	Return on Total Cap'l	*6.5%*
- -	- -	- -	- -	6.1%	6.5%	7.4%	8.2%	8.4%	8.8%	*8.5%*	*8.0%*	Return on Shr. Equity	*8.5%*
- -	- -	- -	- -	6.1%	6.5%	7.4%	8.2%	8.4%	8.8%	*8.5%*	*8.0%*	Return on Com Equity	*8.5%*
- -	- -	- -	- -	3.7%	3.1%	3.5%	3.7%	3.7%	3.8%	*3.5%*	*3.0%*	Retained to Com Eq	*3.5%*
- -	- -	- -	- -	40%	53%	52%	55%	56%	56%	*60%*	*62%*	All Div'ds to Net Prof	*59%*

CAPITAL STRUCTURE as of 9/30/20
Total Debt $1890.2 mill. **Due in 5 Yrs** $1150.0 mill.
LT Debt $1582.2 mill. **LT Interest** $85.0 mill.
(LT interest earned: 4.7x; total interest coverage: 4.7x)
Leases, Uncapitalized Annual rentals $7.6 mill.
Pfd Stock None
Pension Assets-12/19 $908.0 mill.
Oblig. $1001.4 mill.
Common Stock 53,096,893 shs.
as of 10/26/20
MARKET CAP: $4.1 billion (Mid Cap)

CURRENT POSITION ($MILL.)	2018	2019	9/30/20
Cash Assets	21.3	17.9	6.2
Other	522.0	488.3	363.5
Current Assets	543.3	506.2	369.7
Accts Payable	174.5	120.5	65.3
Debt Due	299.5	516.5	308.0
Other	224.9	235.7	202.4
Current Liab.	698.9	872.7	575.7
Fix. Chg. Cov.	677%	567%	563%

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '17-'19 to '23-'25
Revenues	- -	-2.5%	*4.5%*
"Cash Flow"	- -	7.0%	*7.0%*
Earnings	- -	9.5%	*6.5%*
Dividends	- -	17.0%	*7.5%*
Book Value	- -	2.5%	*5.5%*

Cal-endar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2017	550.4	279.7	247.1	462.4	1539.6
2018	638.5	292.5	238.3	464.4	1633.7
2019	661.0	290.6	248.6	452.5	1652.7
2020	528.2	273.3	244.6	*453.9*	*1500*
2021	*590*	*310*	*255*	*460*	*1615*

Cal-endar	EARNINGS PER SHARE A Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2017	1.34	.39	.36	.93	3.02
2018	1.72	.39	.31	.83	3.25
2019	1.76	.46	.33	.96	3.51
2020	1.72	.48	.39	*.97*	*3.56*
2021	*1.80*	*.50*	*.41*	*.99*	*3.70*

Cal-endar	QUARTERLY DIVIDENDS PAID B■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2016	.35	.35	.35	.35	1.40
2017	.42	.42	.42	.42	1.68
2018	.46	.46	.46	.46	1.84
2019	.50	.50	.50	.50	2.00
2020	.54	.54	.54	.54	

BUSINESS: ONE Gas, Inc. provides natural gas distribution services to more than two million customers. There are three divisions: Oklahoma Natural Gas, Kansas Gas Service, and Texas Gas Service. The company purchased 174 Bcf of natural gas supply in 2019, compared to 180 Bcf in 2018. Total volumes delivered by customer (fiscal 2019): transportation, 56.6%; residential, 32.5%; commercial & industrial, 10.3%; other, .6%. ONE Gas has around 3,600 employees. BlackRock owns 12.1% of common stock; The Vanguard Group, 10.1%; T. Rowe Price Associates, 7.0%; officers and directors, 1.9% (4/20 Proxy). CEO: Pierce H. Norton II. Incorporated: Oklahoma. Address: 15 East Fifth Street, Tulsa, Oklahoma 74103. Tel.: 918-947-7000. Internet: www.onegas.com.

It's shaping up to be an underwhelming year for ONE Gas, Inc. Indeed, through the first nine months, share net of $2.59 was just a few cents higher than 2019's $2.55 tally. This stemmed, to some extent, from lower gas sales, net of weather normalization, primarily in Kansas and Oklahoma because of warmer temperatures. Also, there were diminished fees associated with collection activities and late payments mainly related to moratoriums on disconnects for nonpayment in response to COVID-19. (Notably, expenses incurred due to the pandemic are eligible for future recovery under regulatory orders the company received in each of its jurisdictions.) Meanwhile, the company benefited from new rates (including in Kansas and Texas) plus a rise in residential sales (supported by net customer growth). Still, it seems that the bottom line will increase only modestly, to $3.56 a share, for the full year, versus the 2019 figure of $3.51. But concerning 2021, the bottom line stands to increase a stronger 4%, to $3.70 a share, if operating margins expand further.

We are constructive about the energy firm's business prospects over the 2023-2025 horizon. It presently ranks as the leading natural gas distributor (as measured by customer count) in both Oklahoma and Kansas, and holds the number-three position in Texas. Moreover, these markets appear to have decent growth possibilities and are located in one of the most active drilling regions in the United States. Also, with a solid balance sheet, ONE Gas ought to be able to meet its working capital requirements, capital expenditures, and other commitments for a while.

The equity has faced some pressure during the past six months. We think that price movement can be traced, to a certain degree, to the company's not-so-exciting results of late. Consider, also, these shares' 4 (Below Average) rank for Timeliness. But capital appreciation potential in the 18-month period and out to mid-decade is solid. Dividend growth prospects are promising, as well, though the yield does not stand out relative to the group average of *Value Line's* Natural Gas Utility Industry.

Frederick L. Harris, III November 27, 2020

(A) Diluted EPS. Excludes nonrecurring gain: 2017, $0.06. Next earnings report due early Feb. Quarterly EPS for 2018 don't add up due to rounding.
(B) Dividends historically paid in early March, June, Sept., and Dec. ■ Dividend reinvestment plan. Direct stock purchase plan.
(C) In millions.

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

SOUTH JERSEY INDS. NYSE-SJI

RECENT PRICE 23.26 | P/E RATIO 13.4 (Trailing: 15.1 Median: 19.0) | RELATIVE P/E RATIO 0.64 | DIV'D YLD 5.3% | VALUE LINE

High:	20.4	27.1	29.0	29.0	31.1	30.6	30.4	34.8	38.4	36.7	34.5	33.4	
Low:	16.0	18.6	21.4	22.9	25.3	25.9	21.2	22.1	30.8	26.0	26.6	18.2	

TIMELINESS 3 Lowered 7/20/18

SAFETY 3 Lowered 11/27/20

TECHNICAL 3 Raised 4/24/20

BETA 1.05 (1.00 = Market)

18-Month Target Price Range

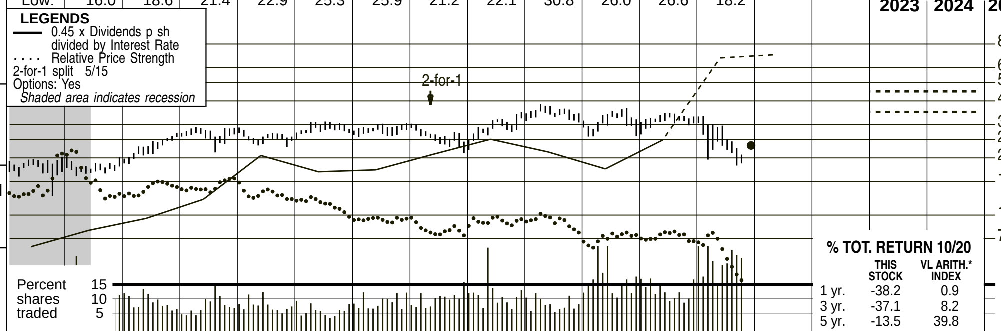
Low-High	Midpoint (% to Mid)
$18-$50	$34 (45%)

2023-25 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	45	(+95%)	22%
Low	35	(+50%)	15%

Institutional Decisions

	4Q2019	1Q2020	2Q2020
to Buy	124	108	88
to Sell	95	125	110
Hld's(000)	79196	78322	83521



% TOT. RETURN 10/20

	THIS STOCK	VL ARITH.* INDEX
1 yr.	-38.2	0.9
3 yr.	-37.1	8.2
5 yr.	-13.5	39.8

2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	© VALUE LINE PUB. LLC	23-25
14.75	15.89	15.88	16.15	16.18	14.19	15.48	13.71	11.16	11.18	12.98	13.52	13.04	15.63	19.20	17.63	**15.60**	**16.25**	Revenues per sh	**19.55**
1.22	1.25	1.75	1.60	1.74	1.86	2.10	2.23	2.34	2.48	2.67	2.42	2.67	2.79	2.91	2.56	**2.70**	**2.90**	"Cash Flow" per sh	**3.85**
.79	.86	1.23	1.05	1.14	1.19	1.35	1.45	1.52	1.52	1.57	1.44	1.34	1.23	1.38	1.12	**1.65**	**1.80**	Earnings per sh A	**2.50**
.41	.43	.46	.51	.56	.61	.68	.75	.83	.90	.96	1.02	1.06	1.10	1.13	1.16	**1.20**	**1.25**	Div'ds Decl'd per sh B ■	**1.40**
1.34	1.60	1.26	.94	1.04	1.83	2.79	3.20	4.01	4.84	5.01	4.87	3.50	3.43	3.99	5.46	**4.95**	**5.85**	Cap'l Spending per sh	**7.25**
6.20	6.75	7.55	8.12	8.67	9.12	9.54	10.33	11.63	12.64	13.65	14.62	16.22	14.99	14.82	15.41	**16.60**	**17.25**	Book Value per sh C	**20.45**
55.52	57.96	58.65	59.22	59.46	59.59	59.75	60.43	63.31	65.43	68.33	70.97	79.48	79.55	85.51	92.39	**101.00**	**103.00**	Common Shs Outst'g D	**110.00**
14.1	16.6	11.9	17.2	15.9	15.0	16.8	18.4	16.9	18.9	18.0	17.9	21.7	27.9	22.6	28.3	*Bold figures are*		Avg Ann'l P/E Ratio	**16.0**
.74	.88	.64	.91	.96	1.00	1.07	1.15	1.08	1.06	.95	.90	1.14	1.40	1.22	1.53	*Value Line*		Relative P/E Ratio	**.90**
3.7%	3.0%	3.2%	2.8%	3.1%	3.4%	3.0%	2.8%	3.2%	3.1%	3.4%	3.9%	3.6%	3.2%	3.6%	3.7%	*estimates*		Avg Ann'l Div'd Yield	**3.5%**

CAPITAL STRUCTURE as of 9/30/20
Total Debt $3271.4 mill. **Due in 5 Yrs** $1045 mill.
LT Debt $2531.6 mill. **LT Interest** $100 mill.

Leases, Uncapitalized Annual rentals $1.2 mill.
Pension Assets-12/19 $312.5 mill. **Oblig.** $439.4 mill.

Pfd Stock None

Common Stock 100,590,307 shs. **as of 11/1/20**

MARKET CAP: $2.3 billion (Mid Cap)

2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021		23-25
925.1	828.6	706.3	731.4	887.0	959.6	1036.5	1243.1	1641.3	1628.6	**1575**	**1675**	Revenues ($mill)	**2150**
81.0	87.0	93.3	97.1	104.0	99.0	102.8	98.1	116.2	103.0	**165**	**180**	Net Profit ($mill)	**275**
15.2%	22.4%	10.8%	- -	- -	5.9%	42.0%	- -	- -	22.0%	**21.0%**	**21.0%**	Income Tax Rate	**21.0%**
8.8%	10.5%	13.2%	13.3%	11.7%	10.3%	9.9%	7.9%	7.1%	6.3%	**10.5%**	**10.7%**	Net Profit Margin	**12.8%**
37.4%	40.5%	45.0%	45.1%	48.0%	49.2%	38.5%	48.5%	62.4%	59.2%	**61.0%**	**61.0%**	Long-Term Debt Ratio	**59.0%**
62.6%	59.5%	55.0%	54.9%	52.0%	50.8%	61.5%	51.5%	37.6%	40.8%	**39.0%**	**39.0%**	Common Equity Ratio	**41.0%**
910.1	1048.3	1337.6	1507.4	1791.9	2043.9	2097.2	2315.4	3373.9	3493.9	**4275**	**4575**	Total Capital ($mill)	**5500**
1193.3	1352.4	1578.0	1859.1	2134.1	2448.1	2623.8	2700.2	3653.5	4073.5	**4350**	**4700**	Net Plant ($mill)	**5600**
9.5%	8.9%	7.4%	6.8%	6.4%	5.4%	5.4%	5.1%	4.4%	4.0%	**5.0%**	**5.0%**	Return on Total Cap'l	**6.0%**
14.2%	13.9%	12.7%	11.7%	11.2%	9.5%	8.0%	8.2%	9.2%	7.2%	**10.0%**	**10.0%**	Return on Shr. Equity	**12.0%**
14.2%	13.9%	12.7%	11.7%	11.2%	9.5%	8.0%	8.2%	9.2%	7.2%	**10.0%**	**10.0%**	Return on Com Equity	**12.0%**
7.1%	6.7%	5.8%	4.8%	4.3%	2.8%	1.6%	.9%	1.7%	NMF	**2.5%**	**3.0%**	Retained to Com Eq	**5.5%**
50%	52%	55%	59%	61%	71%	80%	89%	82%	104%	**73%**	**72%**	All Div'ds to Net Prof	**56%**

CURRENT POSITION ($MILL.)	2018	2019	9/30/20
Cash Assets	30.0	6.4	10.1
Other	633.2	646.1	344.7
Current Assets	663.2	652.5	354.8
Accts Payable	410.5	232.2	162.8
Debt Due	1004.4	1316.6	739.8
Other	165.9	183.1	201.1
Current Liab.	1580.8	1731.9	1103.7
Fix. Chg. Cov.	112%	176%	216%

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '17-'19 to '23-'25
Revenues	- -	6.0%	*2.0%*
"Cash Flow"	5.0%	3.5%	*6.0%*
Earnings	1.5%	-2.5%	*12.5%*
Dividends	8.0%	6.0%	*3.5%*
Book Value	6.5%	6.0%	*5.0%*

Cal-endar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2017	425.8	244.4	227.1	345.8	1243.1
2018	521.9	227.3	302.5	589.6	1641.3
2019	637.3	266.9	261.2	463.2	1628.6
2020	534.1	260.0	261.5	***519.4***	***1575***
2021	***575***	***285***	***285***	***530***	***1675***

Cal-endar	EARNINGS PER SHARE A Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2017	.72	.06	d.05	.50	1.23
2018	1.19	.07	d.27	.39	1.38
2019	1.09	d.13	d.30	.46	1.12
2020	1.15	d.01	d.06	***.57***	***1.65***
2021	***1.20***	***.02***	***d.05***	***.63***	***1.80***

Cal-endar	QUARTERLY DIVIDENDS PAID B■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2016	- -	.264	.264	.536	1.06
2017	- -	.273	.273	.553	1.10
2018	- -	.280	.280	.567	1.13
2019	- -	.287	.287	.582	1.16
2020	- -	.295	.295	.295	

BUSINESS: South Jersey Industries, Inc. is a holding company. The company distributes natural gas in New Jersey and Maryland. South Jersey Gas rev. mix '19: residential, 47%; commercial, 23%; cogen. and electric gen., 12%; industrial, 18%. Acq. Elizabethtown Gas and Elkton Gas, 7/18. Nonutil. operations include South Jersey Energy, South Jersey Resources Group, South Jersey Exploration, Marina Energy, South Jersey Energy Service Plus, and SJI Midstream. Has about 1,100 employees. Off./dir. own less than 1% of common; BlackRock, 15.5%; The Vanguard Group, 11.4% (3/20 proxy). Pres. & CEO: Michael J. Renna. Chairman: Joseph M. Rigby. Inc.: NJ. Addr.: 1 South Jersey Plaza, Folsom, NJ 08037. Tel.: 609-561-9000. Internet: www.sjindustries.com.

Shares of South Jersey Industries have perked up in price over the past three months. The company reported much-improved bottom-line results for the third quarter. The top line was roughly flat compared with the prior-year level. However, operating expenses decreased, and the share deficit narrowed considerably, to $0.06. (Losses are common here for the September period.) Looking forward, favorable earnings comparisons probably continued for the fourth quarter, aided by a decrease in costs. All told, we anticipate that earnings per share of $1.65 at South Jersey for full-year 2020 will compare favorably with the prior-year tally.

We envision solid results for the coming years. The company's utility businesses ought to further benefit from growth in the customer base. Infrastructure investments will allow South Jersey to modernize its system and meet increasing demand for natural gas within its service territories. Infrastructure replacement programs allow the company to earn an authorized return on approved investments. Regulatory initiatives should also bear fruit. Elsewhere, we look for better results on the nonutility side. Performance at the Energy Group business ought to be driven by fuel management and a reshaped wholesale portfolio. The Energy Services operation will probably further benefit from solar investment in support of the New Jersey Master Plan, along with legacy energy production activities. The Midstream business will continue to invest in long-term contracted energy infrastructure projects, such as the PennEast Pipeline.

This stock does not stand out for year-ahead relative price performance. That said, utility investors with a long time horizon might find something to like here. We anticipate greater revenues and significant growth in earnings per share for the company over the pull to mid-decade. The payout should also increase at a steady pace. From the recent quotation, these shares offer attractive long-term total return potential. This is aided by a relatively generous dividend yield. On top of that, South Jersey Industries earns favorable marks for Price Stability and Earnings Predictability.

Michael Napoli, CFA *November 27, 2020*

(A) Based on economic egs. from 2007. GAAP EPS: '08, $1.29; '09, $0.97; '10, $1.11; '11, $1.49; '12, $1.49; '13, $1.28; '14, $1.46; '15, $1.52; '16, $1.56; '17, ($0.04); '18, $0.21; '19, $0.84. Excl. nonrecur. gain (loss): '09, ($0.22); '10, ($0.24); '11, $0.04; '12, ($0.03); '13, ($0.24); '14, ($0.11); '15, $0.08; '16, $0.22; '17, ($1.27); '18, ($1.17); '19, ($0.28). Next egs. rpt. due late February. (B) Div'ds paid early April, July, Oct., and late Dec. ■ Div. reinvest. plan avail. (C) Incl. reg. assets. In 2019: $665.9 mill., $7.21 per shr. (D) In mill., adj. for split.

Company's Financial Strength	B++
Stock's Price Stability	70
Price Growth Persistence	15
Earnings Predictability	65

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Mar 22 2021

SOUTHWEST GAS NYSE-SWX

RECENT PRICE **70.44** | P/E RATIO **16.2** (Trailing: 17.7, Median: 18.0) | RELATIVE P/E RATIO **0.77** | DIV'D YLD **3.3%** | VALUE LINE

TIMELINESS 2 Raised 11/27/20
SAFETY 3 Lowered 1/4/91
TECHNICAL 4 Lowered 11/27/20
BETA .95 (1.00 = Market)

18-Month Target Price Range

Low-High	Midpoint (% to Mid)
$48-$116	$82 (15%)

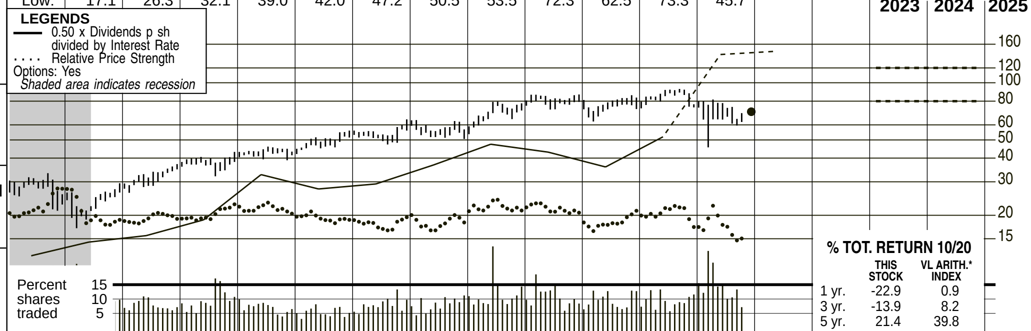
2023-25 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	120	(+70%)	17%
Low	80	(+15%)	7%

Institutional Decisions

	4Q2019	1Q2020	2Q2020
to Buy	155	118	130
to Sell	136	155	123
Hld's(000)	47563	47511	48082

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
High:	29.5	37.3	43.2	46.1	56.0	64.2	63.7	79.6	86.9	86.0	92.9	81.6
Low:	17.1	26.3	32.1	39.0	42.0	47.2	50.5	53.5	72.3	62.5	73.3	45.7



% TOT. RETURN 10/20

	THIS STOCK	VL ARITH.* INDEX
1 yr.	-22.9	0.9
3 yr.	-13.9	8.2
5 yr.	21.4	39.8

2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	© VALUE LINE PUB. LLC	23-25
40.14	43.59	48.47	50.28	48.53	42.00	40.18	41.07	41.77	42.08	45.61	52.00	51.82	53.00	54.31	56.72	**57.65**	**59.30**	Revenues per sh	**65.40**
5.57	5.20	5.97	6.21	5.76	6.16	6.46	6.81	7.73	8.24	8.47	8.62	9.29	8.83	8.14	9.40	**9.90**	**10.50**	"Cash Flow" per sh	**13.45**
1.66	1.25	1.98	1.95	1.39	1.94	2.27	2.43	2.86	3.11	3.01	2.92	3.18	3.62	3.68	3.94	**4.00**	**4.45**	Earnings per sh A	**6.25**
.82	.82	.82	.86	.90	.95	1.00	1.06	1.18	1.32	1.46	1.62	1.80	1.98	2.08	2.18	**2.26**	**2.35**	Div'ds Decl'd per sh B■†	**2.65**
8.23	7.49	8.27	7.96	6.79	4.81	4.73	8.29	8.57	7.86	8.53	10.30	11.15	12.97	14.44	17.06	**14.05**	**16.95**	Cap'l Spending per sh	**23.10**
19.18	19.10	21.58	22.98	23.49	24.44	25.62	26.66	28.35	30.47	31.95	33.61	35.03	37.74	42.47	45.56	**47.80**	**50.85**	Book Value per sh	**61.55**
36.79	39.33	41.77	42.81	44.19	45.09	45.56	45.96	46.15	46.36	46.52	47.38	47.48	48.09	53.03	55.01	**57.00**	**59.00**	Common Shs Outst'g C	**65.00**
14.3	20.6	15.9	17.3	20.3	12.2	14.0	15.7	15.0	15.8	17.9	19.4	21.6	22.2	20.6	21.3	*Bold figures are*		Avg Ann'l P/E Ratio	**16.0**
.76	1.10	.86	.92	1.22	.81	.89	.98	.95	.89	.94	.98	1.13	1.12	1.11	1.15	*Value Line*		Relative P/E Ratio	**.90**
3.5%	3.2%	2.6%	2.6%	3.2%	4.0%	3.2%	2.8%	2.8%	2.7%	2.7%	2.9%	2.6%	2.5%	2.7%	2.6%	*estimates*		Avg Ann'l Div'd Yield	**2.7%**

CAPITAL STRUCTURE as of 9/30/20
Total Debt $2784.6 mill. **Due in 5 Yrs** $898.8 mill.
LT Debt $2685.7 mill. **LT Interest** $100.0 mill.
(Total interest coverage: 3.6x) (50% of Cap'l)
Leases, Uncapitalized Annual rentals $13.0 mill.
Pension Assets-12/19 $1027.8 mill. **Oblig.** $1405.7 mill.
Pfd Stock None

Common Stock 56,464,880 shs. **as of 10/30/20**

MARKET CAP: $4.0 billion (Mid Cap)

2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021		23-25
1830.4	1887.2	1927.8	1950.8	2121.7	2463.6	2460.5	2548.8	2880.0	3119.9	**3285**	**3500**	Revenues ($mill)	**4250**
103.9	112.3	133.3	145.3	141.1	138.3	152.0	173.8	182.3	213.9	**225**	**260**	Net Profit ($mill)	**395**
34.7%	36.2%	36.2%	35.0%	35.7%	36.4%	33.9%	32.8%	25.3%	20.5%	**21.0%**	**21.0%**	Income Tax Rate	**21.0%**
5.7%	6.0%	6.9%	7.4%	6.7%	5.6%	6.2%	6.8%	6.3%	6.9%	**6.8%**	**7.4%**	Net Profit Margin	**9.3%**
49.1%	43.2%	49.2%	49.4%	52.4%	49.3%	48.2%	49.8%	48.3%	47.9%	**50.0%**	**50.0%**	Long-Term Debt Ratio	**44.5%**
50.9%	56.8%	50.8%	50.6%	47.6%	50.7%	51.8%	50.2%	51.7%	52.1%	**50.0%**	**50.0%**	Common Equity Ratio	**55.5%**
2291.7	2155.9	2576.9	2793.7	3123.9	3143.5	3213.5	3613.3	4359.3	4806.4	**5475**	**6000**	Total Capital ($mill)	**7200**
3072.4	3218.9	3343.8	3486.1	3658.4	3891.1	4132.0	4523.7	5093.2	5685.2	**6200**	**6700**	Net Plant ($mill)	**8000**
6.1%	6.4%	6.4%	6.3%	5.7%	5.5%	5.8%	5.8%	5.2%	5.4%	**5.0%**	**5.0%**	Return on Total Cap'l	**6.5%**
8.9%	9.2%	10.2%	10.3%	9.5%	8.7%	9.1%	9.6%	8.1%	8.5%	**8.5%**	**8.5%**	Return on Shr. Equity	**10.0%**
8.9%	9.2%	10.2%	10.3%	9.5%	8.7%	9.1%	9.6%	8.1%	8.5%	**8.5%**	**8.5%**	Return on Com Equity	**10.0%**
5.1%	5.3%	6.1%	6.1%	5.0%	4.0%	4.1%	4.5%	3.6%	3.9%	**3.5%**	**4.0%**	Retained to Com Eq	**5.5%**
43%	43%	40%	41%	47%	54%	55%	53%	55%	54%	**57%**	**53%**	All Div'ds to Net Prof	**44%**

CURRENT POSITION ($MILL.)	2018	2019	9/30/20
Cash Assets	85.4	49.5	23.9
Other	754.4	810.4	708.9
Current Assets	839.8	859.9	732.8
Accts Payable	249.0	238.9	175.5
Debt Due	185.1	374.5	98.9
Other	504.5	466.5	564.8
Current Liab.	938.6	1079.9	839.2
Fix. Chg. Cov.	370%	340%	259%

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '17-'19 to '23-'25
Revenues	1.5%	5.0%	*3.0%*
"Cash Flow"	4.0%	1.5%	*7.5%*
Earnings	8.0%	4.5%	*9.0%*
Dividends	8.5%	9.5%	*4.0%*
Book Value	6.0%	6.5%	*6.5%*

Cal-endar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2017	654.7	560.5	593.2	740.4	2548.8
2018	754.3	670.9	668.1	786.7	2880.0
2019	833.6	713.0	725.2	848.1	3119.9
2020	836.3	757.2	791.2	***900.3***	***3285***
2021	***875***	***825***	***850***	***950***	***3500***

Cal-endar	EARNINGS PER SHARE A D Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2017	1.45	.37	.21	1.58	3.62
2018	1.63	.44	.25	1.36	3.68
2019	1.77	.41	.10	1.67	3.94
2020	1.31	.68	.32	***1.69***	***4.00***
2021	***1.70***	***.65***	***.32***	***1.78***	***4.45***

Cal-endar	QUARTERLY DIVIDENDS PAID B■† Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2016	.405	.450	.450	.450	1.76
2017	.450	.495	.495	.495	1.94
2018	.495	.520	.520	.520	2.06
2019	.520	.545	.545	.545	2.16
2020	.545	.570	.570		

BUSINESS: Southwest Gas Holdings, Inc. is the parent holding company of Southwest Gas and Centuri Group. Southwest Gas is a regulated gas distributor serving about 2.1 million customers in parts of Arizona, Nevada, and California. Centuri provides construction services. 2019 margin mix: residential and small commercial, 84%; large commercial and industrial, 3%; transportation, 13%. Total throughput: 2.3 billion therms. Has 8,944 employees. Off. & dir. own .8% of common stock; BlackRock, Inc., 13.5%; The Vanguard Group, Inc., 10.3%; T.Rowe Price Assoc., Inc., 6.8% (3/20 Proxy). Chairman: Michael J. Melarkey. Pres. & CEO: John P. Hester. Inc.: DE. Address: 8360 S. Durango Drive, P.O. Box 98510 Las Vegas, Nevada 89193. Tel.: 702-876-7237. Web: www.swgas.com.

Southwest Gas reported strong results for the third quarter. The top line advanced roughly 9%, on a year-to-year basis. Although operating expenses also increased, earnings per share of $0.32 improved markedly from the prior-year tally. The utility infrastructure services business posted net income of $34.9 million for the period, compared with the prior-year figure of $25.8 million. This business benefited from growing core customer demands, as it provided emergency restoration services to its electric customers following regional storms. The natural gas utility business reported a narrower loss of $16 million for the quarter, compared with the year-ago level of $20 million. Losses are not uncommon for this business in the September period. Looking forward, Southwest Gas will likely report solid bottom-line results for the fourth quarter, though we don't expect much in the way of growth given the impressive figure generated in the year-ago period.

Long-term prospects appear to be relatively favorable here. Southwest's utility business will probably further benefit from growth in the customer base. This operation continues to make significant infrastructure installation progress in support of its service territory expansions in both northern and southern Nevada. Rate relief will probably also provide support. Elsewhere, the company's infrastructure services business ought to perform quite well in the years ahead. This business should be able to capitalize on the ongoing need for utilities to replace aging infrastructure. It has a robust client base, many with multiyear pipeline replacement programs.

This stock is ranked to outperform the broader market averages for the coming six to 12 months. We anticipate healthy growth in revenues and earnings per share for the company for the pull to mid-decade. From the recent quotation, this equity offers decent long-term total return potential. Dividend growth should continue to be steady in the coming years, assuming earnings come through as projected. Southwest Gas earns attractive marks for Financial Strength, Price Stability, Growth Persistence, and Earnings Predictability.

Michael Napoli, CFA *November 27, 2020*

(A) Diluted earnings. Excl. nonrec. gains (losses): '05, (11¢); '06, 7¢. Next egs. report due late February. (B) Dividends historically paid early March, June, September, and December. ■† Div'd reinvestment and stock purchase plan avail. (C) In millions. (D) Totals may not sum due to rounding.

Company's Financial Strength	A
Stock's Price Stability	80
Price Growth Persistence	65
Earnings Predictability	95

SPIRE INC. NYSE-SR

RECENT PRICE 63.76 | P/E RATIO 17.6 (Trailing: NMF; Median: 18.0) | RELATIVE P/E RATIO 0.84 | DIV'D YLD 4.1% | VALUE LINE

TIMELINESS 4 Lowered 11/27/20
SAFETY 2 Raised 6/20/03
TECHNICAL 5 Lowered 11/27/20
BETA .85 (1.00 = Market)

18-Month Target Price Range
Low-High: $44-$106 | Midpoint (% to Mid): $75 (20%)

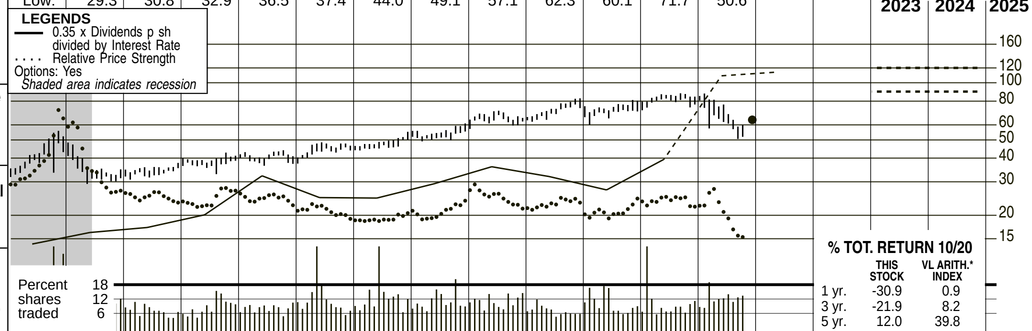
2023-25 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	120	(+90%)	20%
Low	90	(+40%)	12%

Institutional Decisions

	4Q2019	1Q2020	2Q2020
to Buy	127	120	127
to Sell	114	116	130
Hld's(000)	42195	42039	40679

High:	48.3	37.8	42.8	44.0	48.5	55.2	61.0	71.2	82.9	81.1	88.0	88.0
Low:	29.3	30.8	32.9	36.5	37.4	44.0	49.1	57.1	62.3	60.1	71.7	50.6



Target Price Range 2023 | 2024 | 2025

% TOT. RETURN 10/20

	THIS STOCK	VL ARITH.* INDEX
1 yr.	-30.9	0.9
3 yr.	-21.9	8.2
5 yr.	12.0	39.8

2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	© VALUE LINE PUB. LLC	23-25
59.59	75.43	93.51	93.40	100.44	85.49	77.83	71.48	49.90	31.10	37.68	45.59	33.68	36.07	38.78	38.30	35.70	36.75	Revenues per sh A	58.20
2.79	2.98	3.81	3.87	4.22	4.56	4.11	4.62	4.58	3.12	3.87	6.15	6.16	6.54	7.55	7.12	5.50	7.25	"Cash Flow" per sh	9.75
1.82	1.90	2.37	2.31	2.64	2.92	2.43	2.86	2.79	2.02	2.35	3.16	3.24	3.43	4.33	3.52	1.44	3.30	Earnings per sh A B	5.15
1.35	1.37	1.40	1.45	1.49	1.53	1.57	1.61	1.66	1.70	1.76	1.84	1.96	2.10	2.25	2.37	2.49	2.60	Div'ds Decl'd per sh C■	3.00
2.45	2.84	2.97	2.72	2.57	2.36	2.56	3.02	4.83	4.00	3.96	6.68	6.42	9.08	9.86	16.15	12.30	11.25	Cap'l Spending per sh	10.35
16.96	17.31	18.85	19.79	22.12	23.32	24.02	25.56	26.67	32.00	34.93	36.30	38.73	41.26	44.51	45.14	48.50	53.50	Book Value per sh D	72.00
20.98	21.17	21.36	21.65	21.99	22.17	22.29	22.43	22.55	32.70	43.18	43.36	45.65	48.26	50.67	50.97	52.00	52.50	Common Shs Outst'g E	55.00
15.7	16.2	13.6	14.2	14.3	13.4	13.7	13.0	14.5	21.3	19.8	16.5	19.6	19.8	16.7	22.8	NMF		Avg Ann'l P/E Ratio	20.5
.83	.86	.73	.75	.86	.89	.87	.82	.92	1.20	1.04	.83	1.03	1.00	.90	1.24	NMF		Relative P/E Ratio	1.15
4.7%	4.4%	4.3%	4.4%	3.9%	3.9%	4.7%	4.3%	4.1%	4.0%	3.8%	3.5%	3.1%	3.1%	3.1%	3.0%	3.4%		Avg Ann'l Div'd Yield	2.9%

CAPITAL STRUCTURE as of 6/30/20
Total Debt $2961.3 mill. **Due in 5 Yrs** $725.0 mill.
LT Debt $2478.3 mill. **LT Interest** $120.0 mill.
(Total interest coverage: 3.1x)

Leases, Uncapitalized Annual rentals $8.2 mill.
Pension Assets-9/19 $521.8 mill. **Oblig.** $751.4 mill.
Pfd Stock $242.0 mill. **Pfd Div'd** $3.4 mill.
Common Stock 51,482,424 shs.
as of 7/31/20

MARKET CAP: $3.3 billion (Mid Cap)

2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021		23-25
1735.0	1603.3	1125.5	1017.0	1627.2	1976.4	1537.3	1740.7	1965.0	1952.4	1855.4	1930	Revenues ($mill) A	3200
54.0	63.8	62.6	52.8	84.6	136.9	144.2	161.6	214.2	184.6	88.6	175	Net Profit ($mill)	285
33.4%	31.4%	29.6%	25.0%	27.6%	31.2%	32.5%	32.4%	32.4%	15.7%	12.3%	16.0%	Income Tax Rate	23.5%
3.1%	4.0%	5.6%	5.2%	5.2%	6.9%	9.4%	9.3%	10.9%	9.5%	4.8%	9.1%	Net Profit Margin	8.9%
40.5%	38.9%	36.1%	46.6%	55.1%	53.0%	50.9%	50.0%	45.7%	45.0%	49.0%	48.0%	Long-Term Debt Ratio	45.0%
59.5%	61.1%	63.9%	53.4%	44.9%	47.0%	49.1%	50.0%	54.3%	55.0%	51.0%	52.0%	Common Equity Ratio	55.0%
899.9	937.7	941.0	1959.0	3359.4	3345.1	3601.9	3986.3	4155.5	4625.6	4945	5400	Total Capital ($mill)	7200
884.1	928.7	1019.3	1776.6	2759.7	2941.2	3300.9	3665.2	3970.5	4352.0	4680	5070	Net Plant ($mill)	6500
7.4%	8.1%	7.9%	3.3%	3.1%	5.1%	4.9%	5.0%	6.3%	5.1%	3.5%	4.5%	Return on Total Cap'l	5.5%
10.1%	11.1%	10.4%	5.0%	5.6%	8.7%	8.2%	8.1%	9.5%	7.3%	3.5%	6.0%	Return on Shr. Equity	7.0%
10.1%	11.1%	10.4%	5.0%	5.6%	8.7%	8.2%	8.1%	9.5%	7.9%	3.5%	6.0%	Return on Com Equity	7.0%
3.6%	4.9%	4.3%	1.0%	1.5%	3.7%	3.3%	3.3%	4.7%	2.7%	NMF	1.5%	Retained to Com Eq	3.0%
64%	56%	59%	81%	73%	58%	59%	60%	51%	66%	NMF	79%	All Div'ds to Net Prof	60%

CURRENT POSITION ($MILL.)	2018	2019	6/30/20
Cash Assets	4.4	5.8	7.4
Other	655.2	608.7	551.9
Current Assets	659.6	614.5	559.3
Accts Payable	290.1	301.5	200.8
Debt Due	729.1	783.2	483.0
Other	302.5	384.1	424.0
Current Liab.	1321.7	1468.8	1107.8
Fix. Chg. Cov.	284%	272%	275%

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '17-'19 to '23-'25
Revenues	-8.5%	-1.0%	7.5%
"Cash Flow"	5.5%	13.0%	5.5%
Earnings	3.5%	9.5%	5.5%
Dividends	4.0%	5.5%	5.0%
Book Value	7.0%	7.0%	8.5%

Fiscal Year Ends	QUARTERLY REVENUES ($ mill.)A Dec.31	Mar.31	Jun.30	Sep.30	Full Fiscal Year
2017	495.1	663.4	323.5	258.7	1740.7
2018	561.8	813.4	350.6	239.2	1965.0
2019	602.0	803.5	321.3	225.6	1952.4
2020	566.9	715.5	321.1	251.9	1855.4
2021	580	760	340	250	1930

Fiscal Year Ends	EARNINGS PER SHARE A B F Dec.31	Mar.31	Jun.30	Sep.30	Full Fiscal Year
2017	.99	2.36	.45	d.28	3.43
2018	2.39	2.03	.52	d.51	4.33
2019	1.32	3.04	d.09	d.74	3.52
2020	1.24	2.54	d1.87	d.45	1.44
2021	1.27	2.61	.20	d.78	3.30

Cal-endar	QUARTERLY DIVIDENDS PAID C■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2016	.49	.49	.49	.49	1.96
2017	.525	.525	.525	.525	2.10
2018	.5625	.5625	.5625	.5625	2.25
2019	.5925	.5925	.5925	.5925	2.37
2020	.6225	.6225	.6225	.6225	

BUSINESS: Spire Inc., formerly known as the Laclede Group, Inc., is a holding company for natural gas utilities, which distributes natural gas across Missouri, including the cities of St. Louis and Kansas City, Alabama, and Mississippi. Has roughly 1.7 million customers. Acquired Missouri Gas 9/13, Alabama Gas Co 9/14. Utility therms sold and transported in fiscal 2019: 3.4 bill. Revenue mix for regulated operations: residential, 68%; commercial and industrial, 23%; transportation, 6%; other, 3%. Has about 3,536 employees. Officers and directors own 2.9% of common shares; BlackRock, 15.0% (1/20 proxy). Chairman: Edward Glotzbach; CEO: Suzanne Sitherwood. Inc.: Missouri. Address: 700 Market Street, St. Louis, Missouri 63101. Tel.: 314-342-0500. Internet: www.spireenergy.com.

Spire Inc. stands to stage a big earnings rebound in fiscal 2021. (The year started on October 1st.) This is based partially on our assumption that COVID-19 has a less severe effect on the company. Notably, in last year's third quarter, it recorded a total pre-tax impairment charge of $148.6 million, equivalent to $2.29 a share after tax, attributed primarily to the writedown of the value of storage assets and, to a lesser degree, two commercial compressed natural gas fueling stations. (Spire states, however, that it is pursuing potential regulatory mechanisms to help offset the damage from the health crisis.) So, at this juncture, it appears that share net will jump more than twofold, to $3.30, compared to the fiscal 2020 figure of $1.44. If operating margins widen further, profits may advance another 7%, to $3.55 a share, the following year.

Capital expenditures for last year were around $638 million. (That marked a significant decrease from the fiscal 2019 figure of $823 million, reflecting the completion of the Spire STL Pipeline.) Funds were allocated to such areas as infrastructure upgrades at the utilities and new business development initiatives. For fiscal 2021, spending is currently expected to be around $590 million. Management looks for total expenditures over the 2021-2025 period to be some $3.0 billion, which seems reasonable.

***Value Line* continues to be upbeat, in general, about the energy firm's operating performance out to mid-decade.** The gas utilities boast 1.7 million customers in Mississippi, Alabama, and Missouri, providing a measure of regional diversity. Furthermore, the other operations, particularly pipelines, hold promising potential. Additional expansionary projects and technological enhancements in customer service and elsewhere ought to help, too. Finally, Spire's decent finances make acquisitions possible. The usual risks include unfortunate events like leaks and pipeline ruptures.

The stock, though untimely, has some appealing qualities. Consider the dividend yield and payout growth prospects. Capital gains potential in both the 18-month period and out to 2023-2025 is solid, too.

Frederick L. Harris, III November 27, 2020

(A) Fiscal year ends Sept. 30th. (B) Based on diluted shares outstanding. Excludes nonrecurring loss: '06, 7¢. Excludes gain from discontinued operations: '08, 94¢. Next earnings report due late Jan. (C) Dividends paid in early January, April, July, and October. ■ Dividend reinvestment plan available. (D) Incl. deferred charges. In '19: $1,171.6 mill., $22.99/sh. (E) In millions. (F) Qtly. egs. may not sum due to rounding or change in shares outstanding.

Company's Financial Strength	B++
Stock's Price Stability	95
Price Growth Persistence	60
Earnings Predictability	50

Piedmont Natural Gas Company, Inc.
General Rate Case
Docket No. G-9, Sub 781

SCHEDULE DWD-3

Piedmont Natural Gas Company
Summary of Risk Premium Models for the
Proxy Group of Eight Natural Gas Distribution Companies

	Proxy Group of Eight Natural Gas Distribution Companies	Results using Current Interest Rates
Predictive Risk Premium Model (PRPM) (1)	9.82 %	9.21 %
Risk Premium Using an Adjusted Total Market Approach (2)	10.40 %	10.07 %
Average	10.11 %	9.64 %

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

Piedmont Natural Gas Company
Indicated ROE
Derived by the Predictive Risk Premium Model (1)

Using Projected Interest Rates

Proxy Group of Eight Natural Gas Distribution 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 (6)
Atmos Energy Corporation	0.33%	0.25%	0.33%	2.13052	8.75%	2.31%	11.06%
New Jersey Resources Corporation	0.38%	0.52%	0.38%	2.01870	9.70%	2.31%	12.01%
NiSource, Inc.	0.49%	0.39%	0.49%	0.72854	4.40%	2.31%	6.71%
Northwest Natural Holding Company	0.32%	0.40%	0.32%	1.47770	5.90%	2.31%	8.21%
ONE Gas, Inc.	0.27%	0.31%	0.27%	3.76881	12.93%	2.31%	15.24% (7)
South Jersey Industries, Inc.	0.39%	0.82%	0.39%	1.59683	7.63%	2.31%	9.94%
Southwest Gas Holdings, Inc.	0.44%	0.39%	0.44%	1.32031	7.11%	2.31%	9.42%
Spire Inc.	0.71%	0.48%	0.71%	0.92510	8.19%	2.31%	10.50%
						Average	9.69%
						Median	9.94%
						Average of Mean and Median	9.82%

Using Current Interest Rates

Proxy Group of Eight Natural Gas Distribution Companies	LT Average Predicted Variance	Spot Predicted Variance	Recommended Variance (2)	GARCH Coefficient	Predicted Risk Premium (3)	Risk-Free Rate (5)	Indicated ROE (6)
Atmos Energy Corporation	0.33%	0.25%	0.33%	2.13052	8.75%	1.70%	10.45%
New Jersey Resources Corporation	0.38%	0.52%	0.38%	2.01870	9.70%	1.70%	11.40%
NiSource, Inc.	0.49%	0.39%	0.49%	0.72854	4.40%	1.70%	6.10%
Northwest Natural Holding Company	0.32%	0.40%	0.32%	1.47770	5.90%	1.70%	7.60%
ONE Gas, Inc.	0.27%	0.31%	0.27%	3.76881	12.93%	1.70%	14.63% (7)
South Jersey Industries, Inc.	0.39%	0.82%	0.39%	1.59683	7.63%	1.70%	9.33%
Southwest Gas Holdings, Inc.	0.44%	0.39%	0.44%	1.32031	7.11%	1.70%	8.81%
Spire Inc.	0.71%	0.48%	0.71%	0.92510	8.19%	1.70%	9.89%
						Average	9.08%
						Median	9.33%
						Average of Mean and Median	9.21%

Notes:
(1) The Predictive Risk Premium Model uses historical data to generate a predicted variance and a GARCH coefficient. The historical data used are the equity risk premiums for the first available trading month as reported by Bloomberg Professional Service.
(2) Given current market conditions, I recommend using the long-term average predicted variance.
(3) $(1+(\text{Column [3]} * \text{Column [4]})^{12}) - 1$.
(4) From note 2 on page 2 of Schedule DWD-4.
(5) From note 3 on page 2 of Schedule DWD-4.
(6) Column [5] + Column [6].
(7) ONE Gas Inc.'s PRPM results were excluded from the final average and median as they were more than 2 standard deviations from the proxy group's mean.

Piedmont Natural Gas Company
Indicated Common Equity Cost Rate
Through Use of a Risk Premium Model
Using an Adjusted Total Market Approach

Line No.		Proxy Group of Eight Natural Gas Distribution Companies	Results using Current Interest Rates
1.	Prospective Yield on Aaa Rated Corporate Bonds (1)	3.06 %	
2.	Adjustment to Reflect Yield Spread Between Aaa Rated Corporate Bonds and A2 Rated Public Utility Bonds	0.50 (2)	
3.	Adjusted Prospective Yield on A2 Rated Public Utility Bonds	3.56 %	
4.	Current Yield on A2 Rated Public Utility Bonds (3)		2.84 %
5.	Adjustment to Reflect Bond Rating Difference of Proxy Group(4)	0.10	0.10
6.	Adjusted Bond Yield	3.66 %	2.94 %
7.	Equity Risk Premium (4)	6.74	7.13
8.	Risk Premium Derived Common Equity Cost Rate	10.40 %	10.07 %

Notes:
(1) Consensus forecast of Moody's Aaa Rated Corporate bonds from Blue Chip Financial Forecasts (see pages 10-11 of this Schedule).
(2) The average yield spread of A2 rated public utility bonds over Aaa rated corporate bonds of 0.50% from page 4 of this Schedule.
(3) Source of Information: Bloomberg Professional Services.
(4) Adjustment to reflect the A3 Moody's LT issuer rating of the Utility Proxy Group as shown on page 5 of this Schedule. The 0.10% upward adjustment is derived by taking 1/3 of the spread between A2 and Baa2 Public Utility Bonds (1/3 * 0.30% = 0.10%) as derived from page 4 of this Schedule.
(5) From page 7 of this Schedule.

Piedmont Natural Gas Company
Interest Rates and Bond Spreads for
Moody's Corporate and Public Utility Bonds

Selected Bond Yields - Moody's

	[1] Aaa Rated Corporate Bond	[3] A2 Rated Public Utility Bond	[4] Baa2 Rated Public Utility Bond
Jan-2021	2.45 %	2.91 %	3.19 %
Dec-2020	2.26	2.77	3.05
Nov-2020	2.30	2.85	3.17
Average	2.34 %	2.84 %	3.14 %

Selected Bond Spreads

A2 Rated Public Utility Bonds Over Aaa Rated Corporate Bonds:
0.50 % (1)

Baa2 Rated Public Utility Bonds Over A2 Rated Public Utility Bonds:
0.30 % (2)

Notes:
(1) Column [3] - Column [1].
(2) Column [4] - Column [3].

Source of Information:
Bloomberg Professional Service

Piedmont Natural Gas Company
Comparison of Long-Term Issuer Ratings for
Proxy Group of Eight Natural Gas Distribution Companies

	Moody's Long-Term Issuer Rating January 2021		Standard & Poor's Long-Term Issuer Rating January 2021	
Proxy Group of Eight Natural Gas Distribution Companies	Long-Term Issuer Rating	Numerical Weighting (1)	Long-Term Issuer Rating	Numerical Weighting(1)
Atmos Energy Corporation	A1	5.0	A	6.0
New Jersey Resources Corp. (2)	A1	5.0	NR	- -
Nisource, Inc. (3)	Baa1	8.0	BBB+	8.0
Northwest Natural Holding Company (4)	Baa1	8.0	A+	5.0
ONE Gas, Inc.	A2	6.0	A	6.0
South Jersey Inds. (5)	A3	7.0	BBB	9.0
Southwest Gas Holdings, Inc. (6)	Baa1	8.0	A-	7.0
Spire Inc. (7)	A1/A2	5.5	A-	7.0
Average	A3	6.6	A-	6.9

Notes:

(1) From page 6 of this Schedule.
(2) Ratings that of New Jersey Natural Gas Company.
(3) Ratings that of Northern Indiana Public Service Co.
(4) Ratings that of Northwest Natural Gas Co.
(5) Ratings that of Elizabethtown Gas Company and South Jersey Gas Company.
(6) Ratings that of Southwest Gas Corp.
(7) Ratings that of Spire Alabama and Spire Missouri.

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-

Piedmont Natural Gas Company
Judgment of Equity Risk Premium for
Proxy Group of Eight Natural Gas Distribution Companies

Line No.		Proxy Group of Eight Natural Gas Distribution Companies	Results using Current Interest Rates
1.	Calculated equity risk premium based on the total market using the beta approach (1)	8.87 %	9.29 %
2.	Mean equity risk premium based on a study using the holding period returns of public utilities with A2 rated bonds (2)	5.51	5.92
3.	Predicted Equity Risk Premium Based on Regression Analysis of 797 Fully-Litigated Natural Gas Utility Rate Cases (3)	5.83	6.18
4.	Average equity risk premium	6.74 %	7.13 %

Notes: (1) From page 8 of this Schedule.
(2) From page 12 of this Schedule.
(3) From page 13 of this Schedule.

Piedmont Natural Gas Company
Derivation of Equity Risk Premium Based on the Total Market Approach
Using the Beta for the
Proxy Group of Eight Natural Gas Distribution Companies

Line No.	Equity Risk Premium Measure	Proxy Group of Eight Natural Gas Distribution Companies		Results using Current Interest Rates	
	Ibbotson-Based Equity Risk Premiums:				
1.	Ibbotson Equity Risk Premium (1)	5.78	%	5.78	%
2.	Regression on Ibbotson Risk Premium Data	9.30	(2)	10.05	(3)
3.	Ibbotson Equity Risk Premium based on PRPM (4)	9.65		9.65	
4.	Equity Risk Premium Based on Value Line Summary and Index	6.77	(5)	7.41	(6)
5.	Equity Risk Premium Based on Value Line S&P 500 Companies	11.04	(7)	11.68	(8)
6.	Equity Risk Premium Based on Bloomberg S&P 500 Companies	14.72	(9)	15.36	(10)
7.	Conclusion of Equity Risk Premium	9.54	%	9.99	%
8.	Adjusted Beta (11)	0.93		0.93	
9.	Forecasted Equity Risk Premium	8.87	%	9.29	%

Notes provided on page 9 of this Schedule.

Piedmont Natural Gas Company
Derivation of Equity Risk Premium Based on the Total Market Approach
Using the Beta for the
Proxy Group of Eight Natural Gas Distribution Companies

Notes:

(1) Based on the arithmetic mean historical monthly returns on large company common stocks from Ibbotson® SBBI® 2020 Market Report minus the arithmetic mean monthly yield of Moody's average Aaa and Aa2 corporate bonds from 1926-2019.

(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 1928-2019 referenced in Note 1 above. Using the equation generated from the regression, an expected equity risk premium is calculated using the average consensus forecast of Aaa corporate bonds of 3.06% (from page 3 of this Schedule).

(3) 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 1928-2019 referenced in Note 1 above. Using the equation generated from the regression, an expected equity risk premium is calculated using the three-month average Aaa and Aa2 rated corporate bond of 2.43%.

(4) The Predictive Risk Premium Model (PRPM) is discussed in the accompanying direct testimony. The Ibbotson equity risk premium based on the PRPM is derived by applying the PRPM to the monthly risk premiums between Ibbotson large company common stock monthly returns and average Aaa and Aa2 corporate monthly bond yields, from January 1928 through January 2021.

(5) The equity risk premium based on the Value Line Summary and Index is derived by subtracting the average consensus forecast of Aaa corporate bonds of 3.06% (from page 3 of this Schedule) from the projected 3-5 year total annual market return of 9.83% (described fully in note 1 on page 2 of Schedule DWD-5).

(6) The equity risk premium based on the Value Line Summary and Index is derived by subtracting the current 3 month average of Aaa and Aa2 corporate bond yields of 2.43% from the projected 3-5 year total annual market return of 9.83% (described fully in note 1 on page 2 of Schedule DWD-5).

(7) Using data from Value Line for the S&P 500, an expected total return of 14.10% was derived based upon expected dividend yields and long-term earnings growth estimates as a proxy for capital appreciation. Subtracting the average consensus forecast of Aaa corporate bonds of 3.06% results in an expected equity risk premium of 11.04%.

(8) Using data from Value Line for the S&P 500, an expected total return of 14.10% was derived based upon expected dividend yields and long-term earnings growth estimates as a proxy for capital appreciation. Subtracting the current 3 month average of Aaa and Aa2 corporate bond yields of 2.43% results in an expected equity risk premium of 11.68%.

(9) Using data from the Bloomberg Professional Service for the S&P 500, an expected total return of 17.78% was derived based upon expected dividend yields and long-term earnings growth estimates as a proxy for capital appreciation. Subtracting the average consensus forecast of Aaa corporate bonds of 3.06% results in an expected equity risk premium of 14.72%.

(10) Using data from the Bloomberg Professional Service for the S&P 500, an expected total return of 17.78% was derived based upon expected dividend yields and long-term earnings growth estimates as a proxy for capital appreciation. Subtracting the current 3 month average of Aaa and Aa2 corporate bond yields of 2.43% results in an expected equity risk premium of 15.36%.

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

Sources of Information:

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

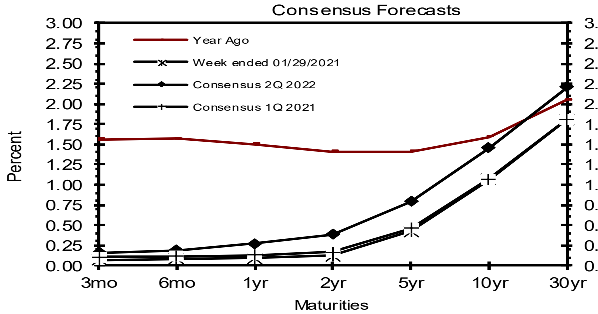
Consensus Forecasts of U.S. Interest Rates and Key Assumptions

	History								Consensus Forecasts-Quarterly Avg.					
	Average For Week Ending				Average For Month			*Latest Qtr*	1Q	2Q	3Q	4Q	1Q	2Q
Interest Rates	Jan 22	Jan 15	Jan 8	Jan 1	Dec	Nov	Oct	4Q 2020	2021	2021	2021	2021	2022	2022
Federal Funds Rate	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Prime Rate	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	**3.3**	**3.3**	**3.3**	**3.3**	**3.3**	**3.3**
LIBOR, 3-mo.	0.22	0.23	0.23	0.24	0.23	0.22	0.22	0.22	**0.2**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**
Commercial Paper, 1-mo.	0.08	0.09	0.09	0.09	0.09	0.09	0.09	0.09	**0.1**	**0.1**	**0.2**	**0.2**	**0.2**	**0.2**
Treasury bill, 3-mo.	0.09	0.09	0.09	0.10	0.09	0.09	0.10	0.09	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.2**
Treasury bill, 6-mo.	0.10	0.10	0.09	0.10	0.09	0.10	0.11	0.10	**0.1**	**0.1**	**0.1**	**0.2**	**0.2**	**0.2**
Treasury bill, 1 yr.	0.10	0.11	0.10	0.11	0.10	0.12	0.13	0.12	**0.1**	**0.2**	**0.2**	**0.2**	**0.2**	**0.3**
Treasury note, 2 yr.	0.13	0.14	0.13	0.13	0.14	0.17	0.15	0.15	**0.2**	**0.2**	**0.3**	**0.3**	**0.3**	**0.4**
Treasury note, 5 yr.	0.45	0.49	0.42	0.37	0.39	0.39	0.34	0.37	**0.5**	**0.5**	**0.6**	**0.7**	**0.7**	**0.8**
Treasury note, 10 yr.	1.11	1.13	1.03	0.94	0.93	0.87	0.79	0.86	**1.1**	**1.2**	**1.2**	**1.3**	**1.4**	**1.5**
Treasury note, 30 yr.	1.85	1.86	1.78	1.66	1.67	1.62	1.57	1.62	**1.8**	**1.9**	**2.0**	**2.1**	**2.1**	**2.2**
Corporate Aaa bond	2.65	2.67	2.61	2.49	2.52	2.58	2.65	2.58	**2.5**	**2.6**	**2.7**	**2.8**	**2.9**	**2.9**
Corporate Baa bond	3.13	3.16	3.12	3.00	3.03	3.13	3.27	3.14	**3.4**	**3.6**	**3.7**	**3.8**	**3.9**	**3.9**
State & Local bonds	2.66	2.67	2.67	2.67	2.70	2.82	2.93	2.82	**2.5**	**2.6**	**2.7**	**2.8**	**2.8**	**2.9**
Home mortgage rate	2.77	2.79	2.65	2.67	2.68	2.77	2.83	2.76	**2.8**	**3.0**	**3.0**	**3.1**	**3.2**	**3.2**

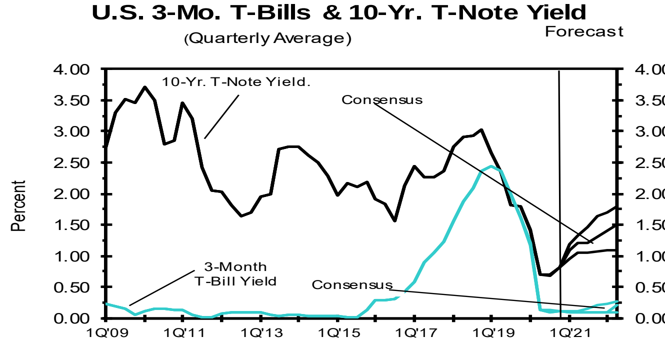
	History								Consensus Forecasts-Quarterly					
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q
Key Assumptions	2019	2019	2019	2019	2020	2020	2020	2020	2021	2021	2021	2021	2022	2022
Fed's AFE $ Index	109.4	110.3	110.5	110.3	111.2	112.4	107.2	105.2	**103.4**	**102.8**	**102.7**	**102.7**	**102.5**	**102.6**
Real GDP	2.9	1.5	2.6	2.4	-5.0	-31.4	33.4	4.0	**2.1**	**5.4**	**6.0**	**4.5**	**3.4**	**3.0**
GDP Price Index	1.2	2.5	1.5	1.4	1.4	-1.8	3.5	2.0	**1.8**	**1.7**	**1.9**	**1.9**	**1.9**	**2.0**
Consumer Price Index	0.9	3.0	1.8	2.4	1.2	-3.5	5.2	2.2	**2.3**	**1.8**	**2.1**	**2.0**	**2.1**	**2.1**
PCE Price Index	0.6	2.5	1.4	1.5	1.3	-1.6	3.7	1.5	**2.1**	**1.7**	**1.9**	**1.9**	**1.9**	**1.9**

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

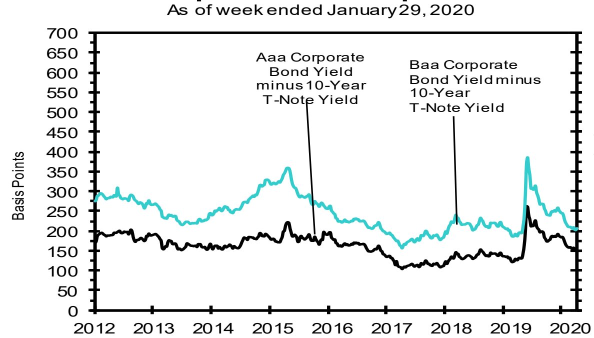
U.S. Treasury Yield Curve
Week ended January 29, 2021 & Year Ago vs. 1Q 2021 & 2Q 2022 Consensus Forecasts



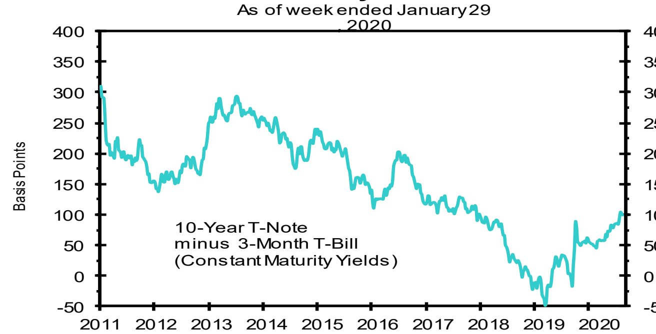
U.S. 3-Mo. T-Bills & 10-Yr. T-Note Yield
(Quarterly Average)



Corporate Bond Spreads
As of week ended January 29, 2020



U.S. Treasury Yield Curve
As of week ended January 29 , 2020



Long-Range Survey:

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

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

		Year-Over-Year, % Change					Five-Year Averages	
		2022	2023	2024	2025	2026	2022-2026	2027-2031
B. Real GDP	CONSENSUS	**3.2**	**2.5**	**2.3**	**2.2**	**2.1**	**2.4**	**2.1**
	Top 10 Average	3.8	3.0	2.6	2.5	2.4	2.9	2.4
	Bottom 10 Average	2.6	2.1	1.9	1.9	1.8	2.1	1.8
C. GDP Chained Price Index	CONSENSUS	**1.9**	**2.0**	**2.1**	**2.1**	**2.1**	**2.0**	**2.1**
	Top 10 Average	2.2	2.3	2.3	2.3	2.3	2.3	2.3
	Bottom 10 Average	1.7	1.8	1.9	1.9	1.9	1.8	1.9
D. Consumer Price Index	CONSENSUS	**2.1**	**2.2**	**2.2**	**2.1**	**2.2**	**2.1**	**2.2**
	Top 10 Average	2.4	2.4	2.4	2.4	2.4	2.4	2.4
	Bottom 10 Average	1.8	1.9	1.9	1.9	1.9	1.9	1.9
E. PCE Price Index	CONSENSUS	**1.9**	**2.0**	**2.1**	**2.1**	**2.1**	**2.0**	**2.1**
	Top 10 Average	2.2	2.2	2.2	2.2	2.3	2.2	2.4
	Bottom 10 Average	1.7	1.8	1.9	1.9	1.9	1.8	1.9

Piedmont Natural Gas 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	Results using Current Interest Rates
	Equity Risk Premium based on S&P Utility Index Holding Period Returns (1):		
1.	Historical Equity Risk Premium	4.21 %	4.21 %
2.	Regression of Historical Equity Risk Premium	6.83 (2)	7.44 (3)
3.	Forecasted Equity Risk Premium Based on PRPM (4)	5.59	5.59
4.	Forecasted Equity Risk Premium based on Projected Total Return on the S&P Utilities Index (Value Line Data)	6.80 (5)	7.52 (6)
5.	Forecasted Equity Risk Premium based on Projected Total Return on the S&P Utilities Index (Bloomberg Data)	4.11 (7)	4.82 (8)
6.	Average Equity Risk Premium (9)	5.51 %	5.92 %

Notes: (1) Based on S&P Public Utility Index monthly total returns and Moody's Public Utility Bond average monthly yields from 1928-2019. 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 - 2019 referenced in note 1 above. Using the equation generated from the regression, an expected equity risk premium is calculated using the prospective A2 rated public utility bond yield of 3.56% (from line 3, page 3 of this Schedule).

(3) 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 - 2019 referenced in note 1 above. Using the equation generated from the regression, an expected equity risk premium is calculated using the current A2 rated public utility bond yield of 2.84% (from line 4, page 3 of this Schedule).

(4) 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 - January 2021.

(5) Using data from Value Line for the S&P Utilities Index, an expected return of 10.36% was derived based on expected dividend yields and long-term growth estimates as a proxy for market appreciation. Subtracting the expected A2 rated public utility bond yield of 3.56%, calculated on line 3 of page 3 of this Schedule results in an equity risk premium of 6.80%. (10.36% - 3.56% = 6.80%)

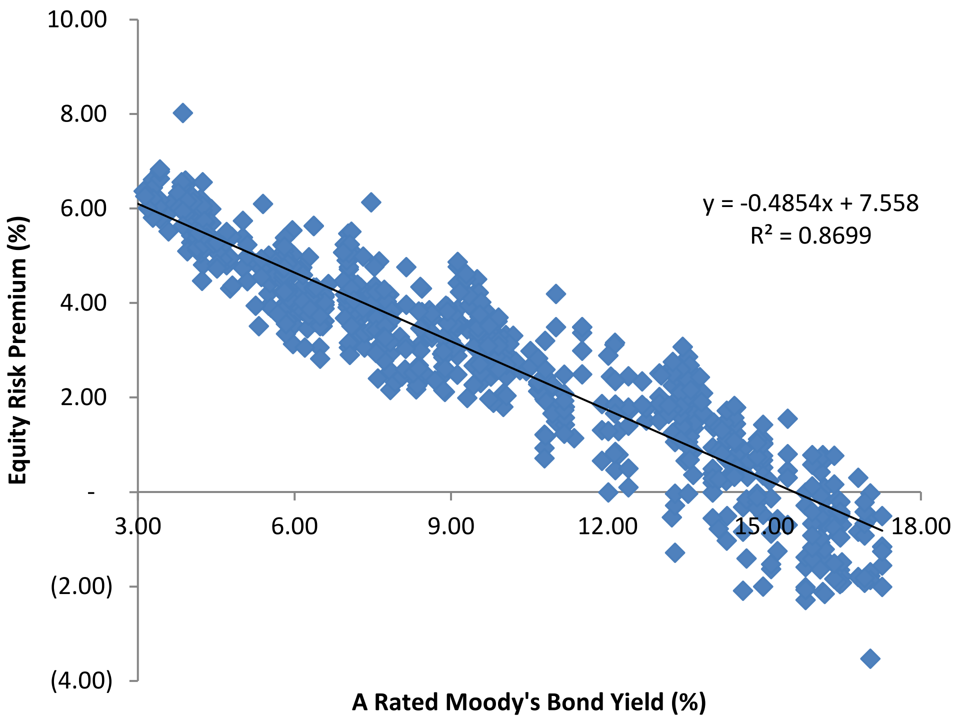
(6) Using data from Value Line for the S&P Utilities Index, an expected return of 10.36% was derived based on expected dividend yields and long-term growth estimates as a proxy for market appreciation. Subtracting the current A2 rated public utility bond yield of 2.84%, shown on line 4 of page 3 of this Schedule results in an equity risk premium of 7.52%. (10.36% - 2.84% = 7.52%)

(7) Using data from Bloomberg Professional Service for the S&P Utilities Index, an expected return of 7.67% was derived based on expected dividend yields and long-term growth estimates as a proxy for market appreciation. Subtracting the expected A2 rated public utility bond yield of 3.56%, calculated on line 3 of page 3 of this Schedule results in an equity risk premium of 4.11%. (7.67% - 3.56% = 4.11%)

(8) Using data from Bloomberg Professional Service for the S&P Utilities Index, an expected return of 7.67% was derived based on expected dividend yields and long-term growth estimates as a proxy for market appreciation. Subtracting the current A2 rated public utility bond yield of 2.84%, shown on line 4 of page 3 of this Schedule results in an equity risk premium of 4.82%. (7.67% - 2.84% = 4.82%)

(9) Average of lines 1 through 5.

Piedmont Natural Gas Company
Prediction of Equity Risk Premiums Relative to
Moody's A Rated Utility Bond Yields



Constant		Slope	Prospective A2 Rated Utility Bond (1)		Prospective Equity Risk Premium	
7.558	%	-0.4854	3.56	%	5.83	%

Constant		Slope	Current A2 Rated Utility Bond (2)		Equity Risk Premium	
7.558	%	-0.4854	2.84	%	6.18	%

Notes:
(1) From line 3 of page 3 of this Schedule.
(2) From line 4 of page 3 of this Schedule.

Source of Information: Regulatory Research Associates

Piedmont Natural Gas Company, Inc.
General Rate Case
Docket No. G-9, Sub 781

SCHEDULE DWD-4

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

Using Prospective Interest Rates

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Proxy Group of Eight Natural Gas Distribution 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 (4)
Atmos Energy Corporation	0.80	0.90	0.85	10.42 %	2.31 %	11.17 %	11.56 %	11.36 %
New Jersey Resources Corporation	0.95	0.97	0.96	10.42	2.31	12.32	12.42	12.37
NiSource, Inc.	0.85	1.00	0.93	10.42	2.31	12.00	12.19	12.09
Northwest Natural Holding Company	0.80	0.87	0.84	10.42	2.31	11.07	11.48	11.27
ONE Gas, Inc.	0.80	0.99	0.90	10.42	2.31	11.69	11.95	11.82
South Jersey Industries, Inc.	1.05	0.99	1.02	10.42	2.31	12.94	12.89	12.92
Southwest Gas Holdings, Inc.	0.95	1.10	1.03	10.42	2.31	13.05	12.97	13.01
Spire Inc.	0.85	0.97	0.91	10.42	2.31	11.79	12.03	11.91
Mean			0.93			12.00 %	12.19 %	12.09 %
Median			0.92			11.90 %	12.11 %	12.00 %
Average of Mean and Median			0.93			11.95	12.15	12.05 %

Using Current Interest Rates

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Proxy Group of Eight Natural Gas Distribution Companies	Value Line Adjusted Beta	Bloomberg Adjusted Beta	Average Beta	Market Risk Premium (1)	Risk-Free Rate (3)	Traditional CAPM Cost Rate	ECAPM Cost Rate	Indicated Common Equity Cost Rate (4)
Atmos Energy Corporation	0.80	0.90	0.85	10.83 %	1.70 %	10.91 %	11.31 %	11.11 %
New Jersey Resources Corporation	0.95	0.97	0.96	10.83	1.70	12.10	12.20	12.15
NiSource, Inc.	0.85	1.00	0.93	10.83	1.70	11.77	11.96	11.87
Northwest Natural Holding Company	0.80	0.87	0.84	10.83	1.70	10.80	11.23	11.01
ONE Gas, Inc.	0.80	0.99	0.90	10.83	1.70	11.45	11.72	11.58
South Jersey Industries, Inc.	1.05	0.99	1.02	10.83	1.70	12.75	12.69	12.72
Southwest Gas Holdings, Inc.	0.95	1.10	1.03	10.83	1.70	12.85	12.77	12.81
Spire Inc.	0.85	0.97	0.91	10.83	1.70	11.56	11.80	11.68
Mean			0.93			11.77 %	11.96 %	11.87 %
Median			0.92			11.66 %	11.88 %	11.78 %
Average of Mean and Median			0.93			11.72	11.92	11.83 %

Notes on page 2 of this Schedule.

Piedmont Natural Gas 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: Ibbotson, Value Line, and Bloomberg as illustrated below:

Historical Data MRP Estimates:	Using Prospective Interest Rates	Using Current Interest Rates
Measure 1: Ibbotson Arithmetic Mean MRP (1926-2019)		
Arithmetic Mean Monthly Returns for Large Stocks 1926-2019:	12.10 %	12.10 %
Arithmetic Mean Income Returns on Long-Term Government Bonds:	5.09	5.09
MRP based on Ibbotson Historical Data:	7.01 %	7.01 %
Measure 2: Application of a Regression Analysis to Ibbotson Historical Data (1926-2019)	9.98 %	10.59 %
Measure 3: Application of the PRPM to Ibbotson Historical Data: (January 1926 - January 2021)	10.76 %	10.76 %
Value Line MRP Estimates:		
Measure 4: Value Line Projected MRP (Thirteen weeks ending January 29, 2021)		
Total projected return on the market 3-5 years hence*:	9.83 %	9.83 %
Projected Risk-Free Rate (see note 2):	2.31	1.70
MRP based on Value Line Summary & Index:	7.52 %	8.13 %
*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:	14.10 %	14.10 %
Projected Risk-Free Rate (see note 2):	2.31	1.70
MRP based on Value Line data	11.79 %	12.40 %
Measure 6: Bloomberg Projected MRP		
Total return on the Market based on the S&P 500:	17.78 %	17.78 %
Projected Risk-Free Rate (see note 2):	2.31	1.70
MRP based on Bloomberg data	15.47 %	16.08 %
Average of Value Line, Ibbotson, and Bloomberg MRP:	10.42 %	10.83

(2) For reasons explained in the direct testimony, the appropriate risk-free rate for cost of capital purposes is the average forecast of 30 year Treasury Bonds per the consensus of nearly 50 economists reported in Blue Chip Financial Forecasts. (See pages 10 and 11 of Schedule DWD-3.) The projection of the risk-free rate is illustrated below:

First Quarter 2021	1.80 %
Second Quarter 2021	1.90
Third Quarter 2021	2.00
Fourth Quarter 2021	2.10
First Quarter 2022	2.10
Second Quarter 2022	2.20
2022-2026	2.80
2027-2031	3.60
	2.31 %

(3) Three-month average on 30-year Treasury bond yield ended January, 2021 as shown below:

Nov-20	1.62 %
Dec-20	1.67
Jan-21	1.82
	1.70 %

(4) Average of Column 6 and Column 7.

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

Piedmont Natural Gas Company, Inc.
General Rate Case
Docket No. G-9, Sub 781

SCHEDULE DWD-5

Piedmont Natural Gas Company, Inc.
Basis of Selection of the Group of Non-Price Regulated Companies
Comparable in Total Risk to the Utility Proxy Group

The criteria for selection of the proxy group of forty-seven non-price regulated companies was that the non-price regulated companies be domestic and reported in Value Line Investment Survey (Standard Edition).

The Non-Price Regulated Proxy Group were then selected based on the unadjusted beta range of 0.64 – 0.94 and residual standard error of the regression range of 2.6426 – 3.1518 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 0.1273. 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

$$\text{Thus, } 0.1273 = \frac{2.8972}{\sqrt{518}} = \frac{2.8972}{22.7596}$$

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

Piedmont Natural Gas Company
Basis of Selection of Comparable Risk
Domestic Non-Price Regulated Companies

Proxy Group of Eight Natural Gas Distribution Companies	[1] Value Line Adjusted Beta	[2] Unadjusted Beta	[3] Residual Standard Error of the Regression	[4] Standard Deviation of Beta
Atmos Energy Corporation	0.80	0.69	2.6472	0.0666
New Jersey Resources Corporation	0.95	0.90	2.9292	0.0736
NiSource, Inc.	0.85	0.72	2.5803	0.0649
Northwest Natural Holding Company	0.80	0.69	3.0008	0.0754
ONE Gas, Inc.	0.80	0.68	2.7404	0.0689
South Jersey Industries, Inc.	1.05	1.01	3.4547	0.0869
Southwest Gas Holdings, Inc.	0.95	0.90	3.0249	0.0760
Spire Inc.	0.85	0.71	2.7999	0.0704
Average	0.88	0.79	2.8972	0.0728
Beta Range (+/- 2 std. Devs. of Beta)	0.64	0.94		
2 std. Devs. of Beta	0.15			
Residual Std. Err. Range (+/- 2 std. Devs. of the Residual Std. Err.)	2.6426	3.1518		
Std. dev. of the Res. Std. Err.	0.1273			
2 std. devs. of the Res. Std. Err.	0.2546			

Source of Information: Valueline Proprietary Database, January 2021

Piedmont Natural Gas Company
Proxy Group of Non-Price Regulated Companies
Comparable in Total Risk to the
Proxy Group of Eight Natural Gas Distribution Companies

Proxy Group of Forty Seven Non-Price Regulated Companies	[1] VL Adjusted Beta	[2] Unadjusted Beta	[3] Residual Standard Error of the Regression	[4] Standard Deviation of Beta
Abbot Laboratories	0.95	0.91	2.7460	0.0690
Analog Devices	0.95	0.86	2.6778	0.0673
Assurant Inc.	0.95	0.85	2.9139	0.0733
ANSYS, Inc.	0.85	0.76	2.8279	0.0711
Smith (A.O.)	0.90	0.83	2.7524	0.0692
Booz Allen Hamilton	0.90	0.82	3.0724	0.0772
Becton, Dickinson, and Co.	0.80	0.67	2.8794	0.0724
Brown-Forman Corporation	0.85	0.76	2.6920	0.0677
Broadridge Fin'l	0.85	0.72	2.7392	0.0689
Cadence Design Sys.	0.90	0.82	2.9867	0.0751
Cerner Corp.	0.95	0.87	2.7913	0.0702
Cooper Cos.	0.95	0.92	2.7038	0.0680
CSW Industrials	0.85	0.76	2.7444	0.0690
Quest Diagnostics	0.90	0.80	2.6677	0.0671
Dolby Labs.	0.95	0.87	2.6659	0.0670
Estee Lauder	0.90	0.83	2.7514	0.0692
Exponent, Inc.	0.85	0.76	2.9154	0.0733
FirstCash, Inc.	0.85	0.72	3.1426	0.0790
Gentex Corporation	0.95	0.91	2.7484	0.0691
Hershey Co.	0.85	0.72	2.7087	0.0681
Int'l Flavors & Frag	0.90	0.81	3.1117	0.0782
Ingredion Inc.	0.90	0.78	2.9266	0.0736
Iron Mountain	0.95	0.87	3.0310	0.0762
Hunt (J.B.)	0.95	0.88	2.8114	0.0707
J & J Snack Foods Corp.	0.90	0.82	2.8400	0.0714
Jack Henry & Associates, Inc.	0.85	0.70	2.7540	0.0692
St. Joe Corp	0.90	0.84	3.0735	0.0773
ManTech Int'l 'A'	0.85	0.72	3.0697	0.0772
McCormick and Co.	0.85	0.70	2.7595	0.0694
Altria Group	0.90	0.79	2.8916	0.0727
MSCI Inc.	0.95	0.86	2.9256	0.0735
Motorola Solutions, Inc.	0.90	0.82	2.8041	0.0705
Maxim Integrated	0.95	0.85	2.9413	0.0739
Northrop Grumman	0.85	0.71	2.8969	0.0728
Old Dominion Freight	0.95	0.86	3.0843	0.0775
Progressive Corp.	0.80	0.65	2.6455	0.0665
PerkinElmer, Inc.	0.95	0.92	2.6809	0.0674
Pool Corp.	0.90	0.82	2.9389	0.0739
Post Holdings, Inc.	0.95	0.88	2.9687	0.0746
Rollins, Inc.	0.85	0.76	2.8807	0.0724
Starbucks Corporation	0.95	0.92	2.6496	0.0666
Selective Ins. Group	0.85	0.74	2.9102	0.0732
Tetra Tech	0.90	0.83	2.9490	0.0741
AMERCO	0.95	0.87	2.6739	0.0672
United Parcel Serv.	0.80	0.64	2.9674	0.0746
Waters Corp.	0.95	0.87	2.7355	0.0688
Western Union	0.80	0.68	2.7006	0.0679
Average	0.90	0.80	2.8457	0.0715
Proxy Group of Eight Natural Gas Distribution Companies	0.88	0.79	2.8972	0.0728

Source of Information: Valueline Proprietary Database, January 2021

Piedmont Natural Gas Company, Inc.
General Rate Case
Docket No. G-9, Sub 781

SCHEDULE DWD-6

Piedmont Natural Gas Company
Summary of Cost of Equity Models Applied to
Proxy Group of Forty Seven Non-Price Regulated Companies
Comparable in Total Risk to the
Proxy Group of Eight Natural Gas Distribution Companies

Principal Methods	Proxy Group of Forty Seven Non-Price Regulated Companies	Results using Current Interest Rates
Discounted Cash Flow Model (DCF) (1)	11.97 %	11.97 %
Risk Premium Model (RPM) (2)	12.82	12.43
Capital Asset Pricing Model (CAPM) (3)	12.07	11.84
Mean	12.29 %	12.08 %
Median	12.07 %	11.97 %
Average of Mean and Median	12.18 %	12.03 %

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

Schedule DWD-6
Page 2 of 7

Piedmont Natural Gas Company
DCF Results for the Proxy Group of Non-Price-Regulated Companies Comparable in Total Risk to the
Proxy Group of Eight Natural Gas Distribution Companies

Proxy Group of Forty Seven Non-Price Regulated Companies	[1] Average Dividend Yield	[2] Value Line Projected Five Year Growth in EPS	[3] Zack's Five Year Projected Growth Rate in EPS	[4] Yahoo! Finance Projected Five Year Growth in EPS	[5] Bloomberg Projected Five Year Growth in EPS	[6] Average Projected Five Year Growth Rate in EPS	[7] Adjusted Dividend Yield	[8] Indicated Common Equity Cost Rate (1)
Abbot Laboratories	1.63 %	12.00 %	12.30 %	16.34 %	15.11 %	13.94 %	1.74 %	15.68 %
Analog Devices	1.72	8.50	12.30	11.47	8.80	10.27	1.81	12.08
Assurant Inc.	1.97	6.50	NA	19.40	NA	12.95	2.10	15.05
ANSYS, Inc.	-	10.00	NA	6.39	13.60	10.00	-	NA
Smith (A.O.)	1.86	5.00	9.00	8.00	10.00	8.00	1.93	9.93
Booz Allen Hamilton	1.39	11.00	10.60	12.24	NA	11.28	1.47	12.75
Becton, Dickinson, and Co.	1.35	9.00	9.00	9.50	11.79	9.82	1.42	11.24
Brown-Forman Corporation	0.93	12.00	NA	8.81	5.57	8.79	0.97	9.76
Broadridge Fin'l	1.54	10.50	NA	10.00	7.40	9.30	1.61	10.91
Cadence Design Sys.	-	13.00	14.70	14.70	11.23	13.41	-	NA
Cerner Corp.	1.15	9.00	11.80	10.03	10.04	10.22	1.21	11.43
Cooper Cos.	0.02	14.50	11.00	10.00	10.83	11.58	0.02	11.60
CSW Industrials	0.48	8.50	NA	12.00	5.00	8.50	0.50	9.00
Quest Diagnostics	1.81	11.00	26.50	9.72	17.71	16.23	1.96	18.19
Dolby Labs.	0.97	10.50	13.00	16.00	NA	13.17	1.03	14.20
Estee Lauder	0.85	12.00	13.00	17.10	15.85	14.49	0.91	15.40
Exponent, Inc.	0.88	11.00	NA	15.00	15.00	13.67	0.94	14.61
FirstCash, Inc.	1.67	9.50	NA	(0.93)	NA	9.50	1.75	11.25
Gentex Corporation	1.43	9.50	2.60	15.00	5.86	8.24	1.49	9.73
Hershey Co.	2.15	5.00	7.70	7.78	7.07	6.89	2.22	9.11
Int'l Flavors & Frag	2.72	6.00	3.50	1.88	13.74	6.28	2.81	9.09
Ingredion Inc.	3.28	6.00	NA	1.88	8.60	5.49	3.37	8.86
Iron Mountain	8.60	8.50	1.70	1.70	2.87	3.69	8.76	12.45
Hunt (J.B.)	0.81	6.50	15.00	20.73	17.23	14.87	0.87	15.74
J & J Snack Foods Corp.	1.50	10.00	NA	6.00	NA	8.00	1.56	9.56
Jack Henry & Associates, Inc.	1.09	10.50	10.70	10.80	9.00	10.25	1.15	11.40
St. Joe Corp	0.73	16.50	NA	(28.10)	NA	16.50	0.79	17.29
ManTech Int'l 'A'	1.52	12.00	7.40	8.41	7.36	8.79	1.59	10.38
McCormick and Co.	1.46	6.50	6.50	4.80	11.07	7.22	1.51	8.73
Altria Group	8.37	6.50	4.00	4.12	3.70	4.58	8.56	13.14
MSCI Inc.	0.75	17.00	NA	13.20	11.35	13.85	0.80	14.65
Motorola Solutions, Inc.	1.67	8.00	9.00	5.88	11.10	8.50	1.74	10.24
Maxim Integrated	-	7.00	10.00	18.44	11.30	11.69	-	NA
Northrop Grumman	1.92	10.50	NA	6.04	4.61	7.05	1.99	9.04
Old Dominion Freight	0.30	9.00	15.60	15.07	11.79	12.87	0.32	13.19
Progressive Corp.	0.43	9.50	6.70	(1.61)	(1.40)	8.10	0.45	8.55
PerkinElmer, Inc.	0.20	17.50	19.50	17.20	11.07	16.32	0.22	16.54
Pool Corp.	0.65	17.50	NA	17.00	17.00	17.17	0.71	17.88
Post Holdings, Inc.	-	11.50	NA	29.70	13.15	18.12	-	NA
Rollins, Inc.	0.83	12.00	NA	8.20	NA	10.10	0.87	10.97
Starbucks Corporation	1.79	13.50	13.60	50.81	18.24	24.04	2.01	26.05 (2)
Selective Ins. Group	1.54	6.50	NA	1.88	37.89	15.42	1.66	17.08
Tetra Tech	0.56	11.00	15.00	15.00	13.65	13.66	0.60	14.26
AMERCO	-	1.50	NA	15.00	NA	8.25	-	NA
United Parcel Serv.	2.44	8.00	7.90	9.61	10.23	8.93	2.55	11.48
Waters Corp.	-	6.00	5.10	4.90	5.32	5.33	-	NA
Western Union	4.09	6.00	NA	8.88	11.90	8.93	4.27	13.20
							Mean	12.39 %
							Median	11.54 %
							Average of Mean and Median	11.97 %

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 January 29, 2021. The dividend yield is then adjusted by 1/2 the average projected growth rate in EPS, which is calculated by averaging the 5 year projected growth in EPS provided by Value Line, Bloomberg Professional Service, www.zacks.com, and www.yahoo.com (excluding any negative growth rates) and then adding that growth rate to the adjusted dividend yield.

(2) Starbucks Corporation's DCF results were excluded from the final average and median as they were more than 2 standard deviations from the proxy group's mean.

Source of Information: Value Line Investment Survey
Bloomberg Professional Service
www.zacks.com Downloaded on 01/29/2021
www.yahoo.com Downloaded on 01/29/2021

Piedmont Natural Gas Company
Indicated Common Equity Cost Rate
Through Use of a Risk Premium Model
Using an Adjusted Total Market Approach

Line No.		Proxy Group of Forty Seven Non-Price Regulated Companies	Results using Current Interest Rates
1.	Prospective Yield on Baa2 Rated Corporate Bonds (1)	4.04 %	
2.	Current Yield on Baa2 Rated Corporate Bonds (2)		3.24 %
3.	Equity Risk Premium (3)	8.78	9.19
4.	Risk Premium Derived Common Equity Cost Rate	12.82 %	12.43 %

Notes: (1) Average forecast of Baa2 corporate bonds based upon the consensus of nearly 50 economists reported in Blue Chip Financial Forecasts dated February 1, 2021 and December 1, 2020 (see pages 10 and 11 of Schedule DWD-3). The estimates are detailed below.

First Quarter 2021	3.40 %
Second Quarter 2021	3.60
Third Quarter 2021	3.70
Fourth Quarter 2021	3.80
First Quarter 2022	3.90
Second Quarter 2022	3.90
2022-2026	4.60
2027-2031	5.40
Average	4.04 %

(2) Three-month average Baa2 corporate bond yield ended January, 2021 as reported by Bloomberg Professional Services shown below:

Nov-20	3.30
Dec-20	3.16
Jan-21	3.25
Average	3.24 %

(3) From page 5 of this Schedule.

Piedmont Natural Gas Company
Comparison of Long-Term Issuer Ratings for the
Proxy Group of Forty Seven Non-Price Regulated Companies of Comparable risk to the
Proxy Group of Eight Natural Gas Distribution Companies

	Moody's Long-Term Issuer Rating January 2021		Standard & Poor's Long-Term Issuer Rating January 2021	
Proxy Group of Forty Seven Non-Price Regulated Companies	Long-Term Issuer Rating	Numerical Weighting (1)	Long-Term Issuer Rating	Numerical Weighting (1)
Abbot Laboratories	A3	7.0	A	6.0
Analog Devices	Baa1	8.0	BBB	--
Assurant Inc.	Baa3	10.0	BBB	9.0
ANSYS, Inc.	NA	--	NA	--
Smith (A.O.)	NA	--	NA	--
Booz Allen Hamilton	NA	--	NA	--
Becton, Dickinson, and Co.	Baa3	10.0	BBB	9.0
Brown-Forman Corporation	A1	5.0	A-	7.0
Broadridge Fin'l	Baa1	8.0	BBB+	8.0
Cadence Design Sys.	Baa2	9.0	BBB+	8.0
Cerner Corp.	NA	--	NA	--
Cooper Cos.	WR	--	NR	--
CSW Industrials	NA	--	NA	--
Quest Diagnostics	Baa2	9.0	BBB+	8.0
Dolby Labs.	NA	--	NA	--
Estee Lauder	A1	5.0	A+	5.0
Exponent, Inc.	NA	--	NA	--
FirstCash, Inc.	Ba1	11.0	BB	12.0
Gentex Corporation	NA	--	NA	--
Hershey Co.	A1	5.0	A	6.0
Int'l Flavors & Frag	Baa3	10.0	BBB	9.0
Ingredion Inc.	Baa1	8.0	BBB	9.0
Iron Mountain	Ba3	13.0	BB-	13.0
Hunt (J.B.)	Baa1	8.0	BBB+	8.0
J & J Snack Foods Corp.	NA	--	NA	--
Jack Henry & Associates, Inc.	NA	--	NA	--
St. Joe Corp	NA	--	NA	--
ManTech Int'l 'A'	WR	--	BB+	11.0
McCormick and Co.	Baa2	9.0	BBB	9.0
Altria Group	A3	7.0	BBB	9.0
MSCI Inc.	Ba2	12.0	BB+	11.0
Motorola Solutions, Inc.	Baa3	10.0	BBB-	10.0
Maxim Integrated	Baa1	8.0	BBB+	--
Northrop Grumman	Baa2	9.0	BBB	9.0
Old Dominion Freight	NA	--	NA	--
Progressive Corp.	A2	6.0	A	6.0
PerkinElmer, Inc.	Baa3	10.0	BBB	9.0
Pool Corp.	NA	--	NA	--
Post Holdings, Inc.	B2	15.0	B+	14.0
Rollins, Inc.	NA	--	NA	--
Starbucks Corporation	Baa1	8.0	BBB+	8.0
Selective Ins. Group	Baa2	9.0	BBB	9.0
Tetra Tech	NA	--	NA	--
AMERCO	WR	--	NR	--
United Parcel Serv.	A2	6.0	A-	7.0
Waters Corp.	NA	--	NA	--
Western Union	Baa2	9.0	BBB	9.0
Average	Baa2	8.7	BBB	8.8

Notes:
(1) From page 6 of Schedule DWD-3.

Source of Information:
Bloomberg Professional Services

Piedmont Natural Gas Company
Derivation of Equity Risk Premium Based on the Total Market Approach
Using the Beta for
Proxy Group of Forty Seven Non-Price Regulated Companies of Comparable risk to the
Proxy Group of Eight Natural Gas Distribution Companies

Line No.	Equity Risk Premium Measure	Proxy Group of Forty Seven Non-Price Regulated Companies		Results using Current Interest Rates	
1.	Ibbotson Equity Risk Premium (1)	5.78	%	5.78	%
2.	Regression on Ibbotson Risk Premium Data	9.30	(2)	10.05	(3)
3.	Ibbotson Equity Risk Premium based on PRPM (4)	9.65		9.65	
4.	Equity Risk Premium Based on Value Line Summary and Index	6.77	(5)	7.41	(6)
5	Equity Risk Premium Based on Value Line S&P 500 Companies	11.04	(7)	11.68	(8)
6.	Equity Risk Premium Based on Bloomberg S&P 500 Companies	14.72	(9)	15.36	(10)
7.	Conclusion of Equity Risk Premium	9.54	%	9.99	%
8.	Adjusted Beta (11)	0.92		0.92	
9.	Forecasted Equity Risk Premium	8.78	%	9.19	%

Notes:
(1) From note 1 of page 9 of Schedule DWD-3.
(2) From note 2 of page 9 of Schedule DWD-3.
(3) From note 3 of page 9 of Schedule DWD-3.
(4) From note 4 of page 9 of Schedule DWD-3.
(5) From note 5 of page 9 of Schedule DWD-3.
(6) From note 6 of page 9 of Schedule DWD-3.
(7) From note 7 of page 9 of Schedule DWD-3.
(8) From note 8 of page 9 of Schedule DWD-3.
(9) From note 9 of page 9 of Schedule DWD-3.
(10) From note 10 of page 9 of Schedule DWD-3.
(11) Average of mean and median beta from page 6 of this Schedule.

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

Piedmont Natural Gas Company
Traditional CAPM and ECAPM Results for the Proxy Group of Non-Price-Regulated Companies Comparable in Total Risk to the
Proxy Group of Eight Natural Gas Distribution Companies

Using Prospective Interest Rates

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Proxy Group of Forty 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 (4)
Abbot Laboratories	0.95	0.90	0.92	10.42 %	2.31 %	11.90 %	12.11 %	12.00 %
Analog Devices	0.95	1.06	1.01	10.42	2.31	12.84	12.81	12.82
Assurant Inc.	0.90	1.01	0.95	10.42	2.31	12.21	12.34	12.28
ANSYS, Inc.	0.90	0.93	0.92	10.42	2.31	11.90	12.11	12.00
Smith (A.O.)	0.90	1.01	0.96	10.42	2.31	12.32	12.42	12.37
Booz Allen Hamilton	0.90	0.90	0.90	10.42	2.31	11.69	11.95	11.82
Becton, Dickinson, and Co.	0.80	0.62	0.71	10.42	2.31	9.71	10.47	10.09 (5)
Brown-Forman Corporation	0.85	0.97	0.91	10.42	2.31	11.79	12.03	11.91
Broadridge Fin'l	0.85	0.83	0.84	10.42	2.31	11.07	11.48	11.27
Cadence Design Sys.	0.95	0.98	0.96	10.42	2.31	12.32	12.42	12.37
Cerner Corp.	0.95	0.91	0.93	10.42	2.31	12.00	12.19	12.09
Cooper Cos.	0.95	0.93	0.94	10.42	2.31	12.11	12.26	12.19
CSW Industrials	0.85	1.02	0.94	10.42	2.31	12.11	12.26	12.19
Quest Diagnostics	0.90	0.99	0.95	10.42	2.31	12.21	12.34	12.28
Dolby Labs.	0.95	0.95	0.95	10.42	2.31	12.21	12.34	12.28
Estee Lauder	0.90	0.97	0.94	10.42	2.31	12.11	12.26	12.19
Exponent, Inc.	0.85	0.91	0.88	10.42	2.31	11.48	11.79	11.64
FirstCash, Inc.	0.80	0.97	0.88	10.42	2.31	11.48	11.79	11.64
Gentex Corporation	0.95	1.05	1.00	10.42	2.31	12.73	12.73	12.73
Hershey Co.	0.85	0.83	0.84	10.42	2.31	11.07	11.48	11.27
Int'l Flavors & Frag	0.90	1.04	0.97	10.42	2.31	12.42	12.50	12.46
Ingredion Inc.	0.90	0.92	0.91	10.42	2.31	11.79	12.03	11.91
Iron Mountain	0.95	1.08	1.01	10.42	2.31	12.84	12.81	12.82
Hunt (J.B.)	0.95	0.91	0.93	10.42	2.31	12.00	12.19	12.09
J & J Snack Foods Corp.	0.90	0.78	0.84	10.42	2.31	11.07	11.48	11.27
Jack Henry & Associates, Inc.	0.85	0.90	0.87	10.42	2.31	11.38	11.72	11.55
St. Joe Corp	0.90	0.96	0.93	10.42	2.31	12.00	12.19	12.09
ManTech Int'l 'A'	0.85	1.11	0.98	10.42	2.31	12.52	12.58	12.55
McCormick and Co.	0.85	0.69	0.77	10.42	2.31	10.34	10.93	10.64 (5)
Altria Group	0.90	0.87	0.89	10.42	2.31	11.59	11.87	11.73
MSCI Inc.	0.95	0.92	0.93	10.42	2.31	12.00	12.19	12.09
Motorola Solutions, Inc.	0.90	0.94	0.92	10.42	2.31	11.90	12.11	12.00
Maxim Integrated	0.95	1.01	0.98	10.42	2.31	12.52	12.58	12.55
Northrop Grumman	0.85	0.78	0.82	10.42	2.31	10.86	11.33	11.09
Old Dominion Freight	0.95	0.98	0.96	10.42	2.31	12.32	12.42	12.37
Progressive Corp.	0.80	0.77	0.79	10.42	2.31	10.54	11.09	10.82
PerkinElmer, Inc.	0.95	0.85	0.90	10.42	2.31	11.69	11.95	11.82
Pool Corp.	0.90	0.94	0.92	10.42	2.31	11.90	12.11	12.00
Post Holdings, Inc.	0.95	0.91	0.93	10.42	2.31	12.00	12.19	12.09
Rollins, Inc.	0.85	0.67	0.76	10.42	2.31	10.23	10.86	10.54 (5)
Starbucks Corporation	0.95	1.07	1.01	10.42	2.31	12.84	12.81	12.82
Selective Ins. Group	0.85	0.97	0.91	10.42	2.31	11.79	12.03	11.91
Tetra Tech	0.90	1.02	0.96	10.42	2.31	12.32	12.42	12.37
AMERCO	0.95	1.09	1.02	10.42	2.31	12.94	12.89	12.92
United Parcel Serv.	0.80	0.85	0.82	10.42	2.31	10.86	11.33	11.09
Waters Corp.	0.95	0.84	0.90	10.42	2.31	11.69	11.95	11.82
Western Union	0.85	1.05	0.95	10.42	2.31	12.21	12.34	12.28
		Mean	0.91			11.83 %	12.05 %	12.04 %
		Median	0.93			12.00 %	12.19 %	12.09 %
		Average of Mean and Median	0.92			11.92 %	12.12 %	12.07 %

Piedmont Natural Gas Company
Traditional CAPM and ECAPM Results for the Proxy Group of Non-Price-Regulated Companies Comparable in Total Risk to the Proxy Group of Eight Natural Gas Distribution Companies

Using Current Interest Rates

Proxy Group of Forty Seven Non-Price Regulated Companies	[1] Value Line Adjusted Beta	[2] Bloomberg Beta	[3] Average Beta	[4] Market Risk Premium (1)	[5] Risk-Free Rate (3)	[6] Traditional CAPM Cost Rate	[7] ECAPM Cost Rate	[8] Indicated Common Equity Cost Rate (4)
Abbot Laboratories	0.95	0.90	0.92	10.83	1.70	11.66 %	11.88 %	11.77 %
Analog Devices	0.95	1.06	1.01	10.83	1.70	12.64	12.61	12.62
Assurant Inc.	0.90	1.01	0.95	10.83	1.70	11.99	12.12	12.06
ANSYS, Inc.	0.90	0.93	0.92	10.83	1.70	11.66	11.88	11.77
Smith (A.O.)	0.90	1.01	0.96	10.83	1.70	12.10	12.20	12.15
Booz Allen Hamilton	0.90	0.90	0.90	10.83	1.70	11.45	11.72	11.58
Becton, Dickinson, and Co.	0.80	0.62	0.71	10.83	1.70	9.39	10.17	9.78 (5)
Brown-Forman Corporation	0.85	0.97	0.91	10.83	1.70	11.56	11.80	11.68
Broadridge Fin'l	0.85	0.83	0.84	10.83	1.70	10.80	11.23	11.01
Cadence Design Sys.	0.95	0.98	0.96	10.83	1.70	12.10	12.20	12.15
Cerner Corp.	0.95	0.91	0.93	10.83	1.70	11.77	11.96	11.87
Cooper Cos.	0.95	0.93	0.94	10.83	1.70	11.88	12.04	11.96
CSW Industrials	0.85	1.02	0.94	10.83	1.70	11.88	12.04	11.96
Quest Diagnostics	0.90	0.99	0.95	10.83	1.70	11.99	12.12	12.06
Dolby Labs.	0.95	0.95	0.95	10.83	1.70	11.99	12.12	12.06
Estee Lauder	0.90	0.97	0.94	10.83	1.70	11.88	12.04	11.96
Exponent, Inc.	0.85	0.91	0.88	10.83	1.70	11.23	11.56	11.39
FirstCash, Inc.	0.80	0.97	0.88	10.83	1.70	11.23	11.56	11.39
Gentex Corporation	0.95	1.05	1.00	10.83	1.70	12.53	12.53	12.53
Hershey Co.	0.85	0.83	0.84	10.83	1.70	10.80	11.23	11.01
Int'l Flavors & Frag	0.90	1.04	0.97	10.83	1.70	12.20	12.29	12.25
Ingredion Inc.	0.90	0.92	0.91	10.83	1.70	11.56	11.80	11.68
Iron Mountain	0.95	1.08	1.01	10.83	1.70	12.64	12.61	12.62
Hunt (J.B.)	0.95	0.91	0.93	10.83	1.70	11.77	11.96	11.87
J & J Snack Foods Corp.	0.90	0.78	0.84	10.83	1.70	10.80	11.23	11.01
Jack Henry & Associates, Inc.	0.85	0.90	0.87	10.83	1.70	11.12	11.47	11.30
St. Joe Corp	0.90	0.96	0.93	10.83	1.70	11.77	11.96	11.87
ManTech Int'l 'A'	0.85	1.11	0.98	10.83	1.70	12.31	12.37	12.34
McCormick and Co.	0.85	0.69	0.77	10.83	1.70	10.04	10.66	10.35 (5)
Altria Group	0.90	0.87	0.89	10.83	1.70	11.34	11.64	11.49
MSCI Inc.	0.95	0.92	0.93	10.83	1.70	11.77	11.96	11.87
Motorola Solutions, Inc.	0.90	0.94	0.92	10.83	1.70	11.66	11.88	11.77
Maxim Integrated	0.95	1.01	0.98	10.83	1.70	12.31	12.37	12.34
Northrop Grumman	0.85	0.78	0.82	10.83	1.70	10.58	11.07	10.82
Old Dominion Freight	0.95	0.98	0.96	10.83	1.70	12.10	12.20	12.15
Progressive Corp.	0.80	0.77	0.79	10.83	1.70	10.26	10.82	10.54
PerkinElmer, Inc.	0.95	0.85	0.90	10.83	1.70	11.45	11.72	11.58
Pool Corp.	0.90	0.94	0.92	10.83	1.70	11.66	11.88	11.77
Post Holdings, Inc.	0.95	0.91	0.93	10.83	1.70	11.77	11.96	11.87
Rollins, Inc.	0.85	0.67	0.76	10.83	1.70	9.93	10.58	10.26 (5)
Starbucks Corporation	0.95	1.07	1.01	10.83	1.70	12.64	12.61	12.62
Selective Ins. Group	0.85	0.97	0.91	10.83	1.70	11.56	11.80	11.68
Tetra Tech	0.90	1.02	0.96	10.83	1.70	12.10	12.20	12.15
AMERCO	0.95	1.09	1.02	10.83	1.70	12.75	12.69	12.72
United Parcel Serv.	0.80	0.85	0.82	10.83	1.70	10.58	11.07	10.82
Waters Corp.	0.95	0.84	0.90	10.83	1.70	11.45	11.72	11.58
Western Union	0.85	1.05	0.95	10.83	1.70	11.99	12.12	12.06
		Mean	0.91			11.59 %	11.82 %	11.81 %
		Median	0.93			11.77 %	11.96 %	11.87 %
		Average of Mean and Median	0.92			11.68 %	11.89 %	11.84 %

Notes:
(1) From Schedule DWD-4, note 1.
(2) From Schedule DWD-4, note 2.
(3) From Schedule DWD-4, note 3.
(4) Average of CAPM and ECAPM cost rates.
(5) Results were excluded from the final average and median as they were more than 2 standard deviations from the proxy group's mean.

Piedmont Natural Gas Company, Inc.
General Rate Case
Docket No. G-9, Sub 781

SCHEDULE DWD-7

Piedmont Natural Gas Company
Derivation of Investment Risk Adjustment Based upon
Ibbotson Associates' Size Premia for the Decile Portfolios of the NYSE/AMEX/NASDAQ

		[1]		[2]	[3]	[4]
Line No.		Market Capitalization on January 29, 2021 (1) (millions)	(times larger)	Applicable Decile of the NYSE/AMEX/ NASDAQ (2)	Applicable Size Premium (3)	Spread from Applicable Size Premium (4)
1.	Piedmont Natural Gas Company	$ 4,004.929		5	1.10%	
2.	Proxy Group of Eight Natural Gas Distribution Companies	$ 4,505.920	1.1 x	4	0.79%	0.31%

	[A]	[B]	[C]	[D]
	Decile	Market Capitalization of Smallest Company (millions)	Market Capitalization of Largest Company (millions)	Size Premium (Return in Excess of CAPM)*
Largest	1	$ 31,090.379	$ 1,061,355.011	-0.28%
	2	13,142.606	30,542.936	0.50%
	3	6,618.604	13,100.225	0.73%
	4	4,312.546	6,614.962	0.79%
	5	2,688.889	4,311.252	1.10%
	6	1,669.856	2,685.865	1.34%
	7	993.855	1,668.282	1.47%
	8	515.621	993.847	1.59%
	9	230.024	515.602	2.22%
Smallest	10	1.973	229.748	4.99%

*From Duff & Phelps Cost of Capital Navigator

Notes:

(1) From page 2 of this Schedule.

(2) Gleaned from Columns [B] and [C] on the bottom of this page. The appropriate decile (Column [A]) corresponds to the market capitalization of the proxy group, which is found in Column [1].

(3) Corresponding risk premium to the decile is provided in Column [D] on the bottom of this page.

(4) Line No. 1 Column [3] – Line No. 2 Column [3]. For example, the 0.31% in Column [4], Line No. 2 is derived as follows 0.31% = 1.59% - 0.79%.

Piedmont Natural Gas Company
Market Capitalization of Piedmont Natural Gas Company and the
Proxy Group of Eight Natural Gas Distribution Companies

Company	Exchange	[1] Common Stock Shares Outstanding at Fiscal Year End 2019 (millions)	[2] Book Value per Share at Fiscal Year End 2019 (1)	[3] Total Common Equity at Fiscal Year End 2019 (millions)	[4] Closing Stock Market Price on January 29, 2021	[5] Market-to-Book Ratio on January 29, 2021 (2)	[6] Market Capitalization on January 29, 2021 (3) (millions)
Piedmont Natural Gas Company		NA	NA	$ 2,507.78 (4)	NA		
Based upon Proxy Group of Eight Natural Gas Distribution Companies						159.7 (5)	$ 4,004.929 (6)
Proxy Group of Eight Natural Gas Distribution Companies							
Atmos Energy Corporation	NYSE	119.339	$ 48.184	$ 5,750.223	$ 89.000	184.7 %	$ 10,621.164
New Jersey Resources Corporation	NYSE	89.338	17.369	$ 1,551.717	35.010	201.6	$ 3,127.725
NiSource, Inc.	NYSE	382.136	15.666	$ 5,986.700	22.150	141.4	$ 8,464.305
Northwest Natural Holding Company	NYSE	30.472	28.419	$ 865.999	46.710	164.4	$ 1,423.347
ONE Gas, Inc.	NYSE	52.772	40.351	$ 2,129.390	73.130	181.2	$ 3,859.198
South Jersey Industries, Inc.	NYSE	92.394	15.410	$ 1,423.785	23.100	149.9	$ 2,134.305
Southwest Gas Holdings, Inc.	NYSE	55.007	45.556	$ 2,505.914	59.960	131.6	$ 3,298.246
Spire Inc.	NYSE	50.974	49.889	$ 2,543.000	61.190	122.7	$ 3,119.069
Average		109.054	$ 32.606	$ 2,844.591	$ 51.281	159.7 %	$ 4,505.920

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 equity ratio.
(5) The market-to-book ratio of Piedmont Natural Gas Company on January 29, 2021 is assumed to be equal to the market-to-book ratio of Proxy Group of Eight Natural Gas Distribution Companies on January 29, 2021 as appropriate.
(6) Column [3] multiplied by Column [5].

Source of Information: 2019 Annual Forms 10K
yahoo.finance.com

Piedmont Natural Gas Company, Inc.
General Rate Case
Docket No. G-9, Sub 781

SCHEDULE DWD-8

Piedmont Natural Gas Company
Derivation of the Flotation Cost Adjustment to the Cost of Common Equity

Equity Issuances since 2010

		[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	Market Price per Share	Average Offering Price per Share	Market Pressure (2)	Total Offering Expense per Share	Net Proceeds per Share (3)	Gross Equity Issue before Costs (4)	Total Net Proceeds (5)	Total Flotation Costs (6)	Flotation Cost Percentage (7)
11/18/19	Equity Offering	28,750,000	$ 88.65	$ 85.99	$ 2.66	$ 0.021	$ 85.9694	$ 2,548,687,500	$ 2,471,620,500	$ 77,067,000	3.02%
03/06/18	Equity Offering	21,275,000	$ 75.86	$ 74.07	$ 1.79	$ 0.021	$ 74.0508	$ 1,613,921,500	$ 1,575,431,800	$ 38,489,700	2.38%
02/29/16	Equity Offering	10,637,500	$ 73.35	$ 69.84	$ 3.51	$ 0.038	$ 69.8024	$ 780,260,625	$ 742,523,000	$ 37,737,625	4.84%
								$ 4,942,869,625	$ 4,789,575,300	$ 153,294,325	3.10%

Flotation Cost Adjustment

	Average Dividend Yield	Average Projected EPS Growth Rate	Adjusted Dividend Yield	Average DCF Cost Rate Unadjusted for Flotation (8)	DCF Cost Rate Adjusted for Flotation (9)	Flotation Cost Adjustment (10)
Proxy Group of Eight Natural Gas Distribution Companies	3.59 %	5.90 %	3.69 %	9.59 %	9.71 %	0.12 %

See page 2 of this Schedule for notes.

Source of Information: Company SEC filings

Schedule DWD-8
Page 1 of 2

Piedmont Natural Gas Company, Inc.
Notes to Accompany the
Derivation of the Flotation Cost Adjustment to the Cost of Common Equity

(1) Company-provided.

(2) Column 2 – Column 3.

(3) Column 2 – the sum of columns 4 and 5.

(4) Column 1 * Column 2.

(5) Column1 * Column 6.

(6) Column1 * (the sum of columns 4 and 5).

(7) (Column 7 – Column 8) divided by Column 7.

(8) Using the average growth rate from Schedule DWD-2.

(9) Adjustment for flotation costs based on adjusting the average DCF constant growth cost rate in accordance with the following:

$$K = \frac{D(1+0.5g)}{P(1-F)} + g,$$

where g is the growth factor and F is the percentage of flotation costs.

(10) Flotation cost adjustment of 0.12% equals the difference between the flotation adjusted average DCF cost rate of 9.71% and the unadjusted average DCF cost rate of 9.59% of the Utility Proxy Group.

Source of Information:

Company provided information

BEFORE THE PUBLIC SERVICE COMMISSION

COMMONWEALTH OF KENTUCKY

APPLICATION OF ATMOS ENERGY	)	
	)	
CORPORATION FOR AN ADJUSTMENT	)	**Case No. 2021-00214**
	)	
OF RATES AND TARIFF MODIFICATIONS	)	

<u>DIRECT TESTIMONY OF DYLAN W. D'ASCENDIS</u>

RATE OF RETURN

TABLE OF CONTENTS

I. INTRODUCTION AND PURPOSE

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

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

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

A. I am a Partner at ScottMadden, Inc.

Q. PLEASE SUMMARIZE YOUR PROFESSIONAL EXPERIENCE AND EDUCATIONAL BACKGROUND.

A. I have offered expert testimony on behalf of investor-owned utilities before over 25 state regulatory commissions in the United States, the Federal Energy Regulatory Commission, the Alberta Utility Commission, and one American Arbitration Association panel on issues including, but not limited to, common equity cost rate, rate of return, valuation, capital structure, class cost of service, and rate design.

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

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 shown in Appendix A.

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

A. The purpose of my testimony is to present evidence and provide a recommendation regarding Atmos Energy Corporation's ("Atmos Energy" or the "Company") return on common equity ("ROE") for its natural gas distribution operations in Kentucky.

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

A. Yes. I have prepared Exhibit No. DWD-1, consisting of Schedules DWD-1 through DWD-8, which were prepared by me or under my direction.

Q. WHAT IS YOUR RECOMMENDED ROE FOR ATMOS ENERGY?

A. I recommend that the Commission authorize Atmos Energy the opportunity to earn an ROE of 10.35% on its rate base. The ratemaking capital structure and cost of long-term debt is sponsored by Company Witness Christian. The overall rate of return is summarized on page 1 of Schedule DWD-1 and in Table 1 below:

Table 1: Summary of Recommended Weighted Average Cost of Capital

Type of Capital	Ratios	Cost Rate	Weighted Cost Rate
Long-Term Debt	42.77%	4.00%	1.71%
Short-Term Debt	0.18%	25.17%	0.05%
Common Equity	57.05%	10.35%	5.90%
Total	100.00%		7.66%

II. SUMMARY OF TESTIMONY

Q. PLEASE SUMMARIZE YOUR RECOMMENDED COMMON EQUITY COST RATE.

A. My recommended common equity cost rate of 10.35% 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 not necessarily identical, risk to Atmos Energy. 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] decisions. No proxy group can be identical in risk to any single company. Consequently, there must be an evaluation of relative risk between the company and the proxy group to determine if it is appropriate to adjust the proxy group's indicated rate of return.

My recommendation results from applying 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 seven natural gas distribution utilities ("Utility Proxy Group") whose selection criteria will be discussed below. In addition, I applied the DCF model, RPM, and CAPM to a proxy group of 48 domestic, non-price regulated

1 *Federal Power Comm'n 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).

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 Rates

Discounted Cash Flow Model	9.44%
Risk Premium Model	10.96%
Capital Asset Pricing Model	11.75%
Cost of Equity Models Applied to Comparable Risk, Non-Price Regulated Companies	12.42%
Indicated Range	9.44% - 12.42%
Size Adjustment	0.20%
Credit Risk Adjustment	-0.10%
Flotation Cost Adjustment	0.04%
Recommended Range	9.58% - 12.66%
Recommended Cost of Common Equity	10.35%

The indicated range of common equity cost rates applicable to the Utility Proxy Group is between 9.44% and 12.42% before any Company-specific adjustments. As ROE models are based on market data, the indicated results of the models would reflect current and expected capital markets, including the impacts of COVID-19. I then adjusted the indicated range by 0.20% and negative 0.10% to reflect the Company's smaller relative size and lower credit risk, as compared to the Utility Proxy Group companies, and by 0.04% for flotation costs.[3] These adjustments resulted in a Company-specific indicated range of common equity cost rates between 9.58% and 12.66%.

The wide range of model results may reflect increased uncertainty related to the COVID-19 pandemic and unknown timeframe for when economic conditions

[3] *See* Section VII for a detailed discussion of my cost of common equity adjustments.

will normalize as vaccinations ramp up and the public health crises subsides. Because of this uncertainty, I recommend an ROE for the Company toward the lower end of my Company-specific range, specifically 10.35%.

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

A. The remainder of my Direct Testimony is organized as follows:

- Section III – Provides a summary of financial theory and regulatory principles pertinent to the development of the cost of common equity;
- Section IV – Explains my selection of the Utility Proxy Group used to develop my Cost of Common Equity analytical results;
- Section V – Describes the analyses on which my Cost of Common Equity recommendation is based;
- Section VI – Summarizes my common equity cost rate before adjustments to reflect Company-specific factors;
- Section VII – Explains my adjustments to my common equity cost rate to reflect Company-specific factors; and
- Section VIII – Presents my conclusions.

III. GENERAL PRINCIPLES

Q. WHAT GENERAL PRINCIPLES HAVE YOU CONSIDERED IN ARRIVING AT YOUR RECOMMENDED COMMON EQUITY COST RATE OF 10.35%?

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

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

> The rate-making process under the Act, *i.e.,* the fixing of 'just and reasonable' rates, involves a balancing of the investor and the consumer interests. Thus we stated in the Natural Gas Pipeline Co. case that 'regulation does not insure that the business shall produce net revenues.' 315 U.S. at page 590, 62 S.Ct. at page 745. But such considerations aside, the investor interest has a legitimate concern with the financial integrity of the company whose rates are being regulated. From the investor or company point of view it is important that there be enough revenue not only for operating expenses but also for the capital costs of the business. These include service on the debt and dividends on the stock. Cf. Chicago & Grand Trunk R. Co. v. Wellman, 143 U.S. 339, 345, 346 12 S.Ct. 400,402. By that standard the return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks. That return, moreover, should be sufficient to assure confidence in the financial integrity of the enterprise, so as to maintain its credit and to attract capital.[4]

Consistent with the findings in *Hope*, the Commission's decision in this proceeding 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

4 *Hope*, 320 U.S. 591 (1944), at 603.

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

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

It therefore is important that the authorized ROE reflects the risks and prospects of the utility's operations and supports the utility's financial integrity from a stand-alone perspective as measured by their combined business and financial risks. Consequently, the ROE authorized in this proceeding should be sufficient to support the operational (*i.e.*, business risk) and financing (*i.e.*, financial risk) of the Company's Kentucky utility operations on a stand-alone basis.

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, as noted earlier, the costs of the individual sources of capital are weighted by their respective book values.

The cost of capital is the return investors require to make an investment in a firm. Investors will provide funds to a firm only if the return that they *expect* is equal to, or greater than, the return that they *require* to accept the risk of providing funds to the firm.

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

Whereas the cost of debt is contractually defined and can be directly observed as the interest rate or yield on debt securities, the cost of common equity must be estimated based on market data and various financial models. Because the cost of common 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.

Q. IS THE AUTHORIZED RETURN SET IN REGULATORY PROCEEDINGS GUARANTEED?

A. No, it is not. Consistent with the *Hope* and *Bluefield* standards, the rate-setting process should provide the utility a reasonable opportunity to recover its return of, and return on, its prudently incurred investments, but it does not guarantee that return. While a utility may have control over some factors that affect the ability to earn its authorized return (*e.g.*, management performance, operating and maintenance expenses, etc.), there are several factors beyond a utility's control that affect its ability to earn its authorized return. Those may include factors such as weather, the economy, and the prevalence and magnitude of regulatory lag.

A. Business Risk

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

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

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

Examples of business risks generally faced by utilities include, but are not limited to, the regulatory environment, mandatory environmental compliance requirements, customer mix and concentration of customers, service territory economic growth, market demand, risks and uncertainties of supply, operations, capital intensity, size, the degree of operating leverage, and the like, all of which have a direct bearing on earnings. Although analysts, including rating agencies, may categorize business risks individually, as a practical matter, such risks are interrelated and not wholly distinct from one another. Therefore, it is difficult to specifically and numerically quantify the effect of any individual risk on investors' required return, *i.e.*, the cost of capital. For determining an appropriate return on common equity, the relevant issue is where investors see the subject company as falling within a spectrum of risk. To the extent investors view a company as being exposed to high risk, the required return will increase, and vice versa.

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

Because utilities invest in long-lived assets, long-term business risks are of paramount concern to equity investors. That is, the risk of not recovering the return on their investment extends far into the future. The timing and nature of events that may lead to losses, however, also are uncertain and, consequently, those risks and their implications for the required return on equity tend to be difficult to quantify. Regulatory commissions (like investors who commit their capital) must review a variety of quantitative and qualitative data and apply their reasoned judgment to determine how long-term risks weigh in their assessment of the market-required return on common equity.

B. <u>Financial Risk</u>

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

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

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

A. Yes, similar bond ratings/issuer credit ratings reflect, and are representative of, similar combined business and financial risks (*i.e.*, total risk) faced by bond investors.[5] Although specific business or financial risks may differ between

[5] Risk distinctions within S&P's bond rating categories are recognized by a plus or minus, e.g., within the A category, an S&P rating can by at A+, A, or A-. Similarly, risk distinction for

companies, the same bond/credit rating indicates that the combined risks are roughly similar from a debtholder perspective. The caveat is that these debtholder risk measures do not translate directly to risks for common equity.

Q. DO RATING AGENCIES ACCOUNT FOR COMPANY SIZE IN THEIR BOND RATINGS?

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

IV. <u>ATMOS ENERGY'S KENTUCKY OPERATIONS AND THE UTILITY PROXY GROUP</u>

Q. ARE YOU FAMILIAR WITH ATMOS ENERGY'S OPERATIONS?

A. Yes. Atmos Energy's Kentucky operations serve approximately 183,000 customers.[6] Atmos Energy's Kentucky gas operations are not publicly-traded as they comprise an operating division of Atmos Energy Corporation ("ATO" or the "Company"), which operates in eight states[7] and serves approximately 3.3 million gas[8] and is publicly-traded under symbol ATO.

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

A. The companies selected for the Utility Proxy Group met the following criteria:

Moody's ratings are distinguished by numerical rating gradations, e.g., within the A category, a Moody's rating can be A1, A2 and A3.

6 Atmos Energy Corporation, 2020 SEC Form 10-K, at 4.

7 *Ibid.*, In addition to Kentucky, ATO also serves customers in Texas, Louisiana, Mississippi, Virginia, Colorado, Kansas, and Tennessee.

8 *Ibid.*

(i) They were included in the Natural Gas Utility Group of *Value Line's Standard Edition* (*Value Line*) (May 28, 2021);

(ii) They have 60% or greater of fiscal year 2020 total operating income derived from, and 60% or greater of fiscal year 2020 total assets attributable to, regulated gas distribution 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 ended 2020 or through the time of preparation of this testimony;

(v) They have *Value Line* and Bloomberg Professional Services ("Bloomberg") adjusted betas;

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

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

The following seven companies met these criteria: Atmos Energy Corporation, New Jersey Resources Corp., Northwest Natural Holding Company, One Gas, Inc., South Jersey Industries, Inc., Southwest Gas Holdings, Inc., and Spire, Inc.

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

A. Because the Company is not publicly traded and does not have publicly traded equity securities, it is necessary to develop groups of publicly traded, comparable companies to serve as "proxies" for the Company. In addition to the analytical necessity of doing so, the use of proxy companies is consistent with the *Hope* and *Bluefield* comparable risk standards, as discussed above. I have selected two proxy groups that, in my view, are fundamentally risk-comparable to the Company: a Utility Proxy Group and a Non-Price Regulated Proxy Group, which is comparable in total risk to the Utility Proxy Group.[9]

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

V. 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

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

their capital among companies of comparable risk, they will choose a company providing a higher return over a company providing a lower return.

Q. ARE YOUR COST OF COMMON EQUITY MODELS MARKET BASED?

A. Yes. The DCF model uses market prices in developing the model's dividend yield component. The RPM uses bond ratings and expected bond yields that reflect the market's assessment of bond/credit risk. In addition, beta coefficients (β), which reflect the market/systematic risk component of equity risk premium, 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 betas). Selection criteria for comparable risk non-price regulated companies are based on regression analyses of market prices and reflect the market's assessment of total risk.

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

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

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

A. Discounted Cash Flow Model

Q. 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 the cash flows received from dividends and market price appreciation. 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 as shown below:

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

where:

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

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

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

Q. PLEASE DESCRIBE THE DIVIDEND YIELD YOU USED IN APPLYING THE CONSTANT GROWTH DCF MODEL.

A. The unadjusted dividend yields are based on the proxy companies' dividends as of May 28, 2021, divided by the average closing market price for the 60 trading days ended May 28, 2021.[10]

Q. PLEASE EXPLAIN YOUR ADJUSTMENT TO THE DIVIDEND YIELD.

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

DCF theory calls for using the full growth rate, or D_1, in calculating the model's dividend yield component. Since the companies in the Utility Proxy Group increase their quarterly dividends 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, this adjustment is a conservative approach that does not overstate the dividend yield. Therefore, the actual average dividend yields in Column 1, page 1 of Schedule DWD-2 have been adjusted upward to reflect one-half the average projected growth rate shown in Column 6.

10 *See*, column 1, page 1 of Schedule DWD-2.

Q. PLEASE EXPLAIN THE BASIS FOR THE GROWTH RATES YOU APPLY TO THE UTILITY PROXY GROUP IN YOUR CONSTANT GROWTH DCF MODEL.

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

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

Q. PLEASE SUMMARIZE THE CONSTANT GROWTH DCF MODEL RESULTS.

A. As shown on page 1 of Schedule DWD-2, for the Utility Proxy Group, the mean result of applying the single-stage DCF model is 9.57%, the median result is 9.30%, and the average of the two is 9.44%. In arriving at a conclusion for the constant growth DCF-indicated common equity cost rate for the Utility Proxy Group, I relied on an average of the mean and the median results of the DCF. This approach considers all the proxy utilities' results, while mitigating the high and low outliers of those individual results.

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 bonds to compensate them for bearing the additional risk.

While it is possible to directly observe bond returns and yields, investors' required common equity returns cannot be directly determined or observed. According to RPM theory, one can estimate a common equity risk premium over bonds (either historically or prospectively) and use that premium to derive a cost rate of common equity. The cost of common equity equals the expected cost rate for long-term debt capital, plus a risk premium over that cost rate, to compensate common shareholders for the added risk of being unsecured and last-in-line for any claim on the corporation's assets and earnings upon liquidation.

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

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

1. The Predictive Risk Premium Model

Q. PLEASE EXPLAIN THE PRPM.

A. The PRPM, published in the *Journal of Regulatory Economics,*[11] 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")".[12] Engle found that volatility changes over time and is related from one period to the next, especially in financial markets. Engle discovered that volatility of prices and returns cluster 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 predicting volatility or risk. The PRPM is not based on an estimate of investor behavior, but rather on an 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 Utility Proxy Group company minus the historical monthly yield on long-term U.S. Treasury securities through May 2021. Using a generalized form of ARCH, known as GARCH, I calculated each Utility Proxy Group company's projected equity risk premium using Eviews© statistical software. When the GARCH model is applied to the historical return data, it produces a predicted GARCH variance

11 Autoregressive conditional heteroscedasticity. See "A New Approach for Estimating the Equity Risk Premium for Public Utilities", Pauline M. Ahern, Frank J. Hanley and Richard A. Michelfelder, Ph.D. The Journal of Regulatory Economics (December 2011), 40:261-278.

12 www.nobelprize.org.

series[13] and a GARCH coefficient[14]. Multiplying the predicted monthly variance by the GARCH coefficient and then annualizing it[15] produces the predicted annual equity risk premium. I then added the forecasted 30-year U.S. Treasury bond yield of 2.88%[16] to each company's PRPM-derived equity risk premium to arrive at an indicated cost of common equity. The 30-year U.S. Treasury bond yield is a consensus forecast derived from Blue Chip Financial Forecasts (*Blue Chip)*.[17] The mean PRPM indicated common equity cost rate for the Utility Proxy Group is 11.67%, the median is 11.19%, and the average of the two is 11.43%. Consistent with my reliance on the average of the median and mean results of the DCF models, 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 11.43%.

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

A. As shown in Schedules DWD-3 and 4, the risk-free rate adopted for applications of the RPM and CAPM is 2.88%. This risk-free rate 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 2022, and long-term projections for the years 2023 to 2027 and 2028 to 2032.

[13] Illustrated on Columns 1 and 2, page 2 of Schedule DWD-3.
[14] Illustrated on Column 4, page 2 of Schedule DWD-3.
[15] Annualized Return = (1 + Monthly Return) ^12 - 1
[16] See Column 6, page 2 of Schedule DWD-3.
[17] *Blue Chip Financial Forecasts*, June 1, 2021, at page 2 and 14.

Q. WHY DO YOU USE THE PROJECTED 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 Moody's A2-rated public utility bonds; the long-term investment horizon inherent in utilities' common stocks; and the long-term life of the jurisdictional rate base to which the allowed fair rate of return (*i.e.*, cost of capital) will be applied. In contrast, short-term U.S. Treasury yields are more volatile and largely a function of Federal Reserve monetary policy.

2. The Total Market Risk Premium Approach

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, 2) an equity risk premium based on the S&P Utilities Index, and 3) an equity risk premium based on authorized ROEs for gas distribution utilities.

Q. PLEASE EXPLAIN THE BASIS OF THE EXPECTED BOND YIELD OF 3.99% 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 relied 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 2022, and *Blue Chip's* long-term projections for 2023 to 2027, and 2028 to 2032. As shown on line 1, page 3 of Schedule DWD-3, the average expected yield on Moody's Aaa-rated corporate bonds is 3.56%. To derive an expected yield on Moody's A2-rated public utility bonds, I made an upward adjustment of 0.39%, 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 A2-rated public utility bond yield.[18] Adding that recent 0.39% spread to the expected Aaa-rated corporate bond yield of 3.56% results in an expected A2-rated public utility bond yield of 3.95%.

I then reviewed the average credit rating for the Utility Proxy Group from Moody's to determine if an adjustment to the estimated A2-rated public utility bond was necessary. Since the Utility Proxy Group's average Moody's long-term issuer rating is A2/A3, another adjustment to the expected A2-rated public utility bond is needed to reflect the difference in bond ratings. An upward adjustment of 0.04%, which represents one-sixth of a recent spread between A2-rated and Baa2-rated public utility bond yields, is necessary to make the A2 prospective bond yield applicable to an A2/A3-rated public utility bond.[19] Adding the 0.04% to the 3.96% prospective A2-rated public utility bond yield results in a 3.99% expected bond yield applicable to the Utility Proxy Group.

[18] As shown on line 2 and explained in note 2, page 3 of Schedule DWD-3.

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

Table 3: Summary of the Calculation of the Utility Proxy Group Projected Bond Yield[20]

Prospective Yield on Moody's Aaa-Rated Corporate Bonds (*Blue Chip)*	3.56%
Adjustment to Reflect Yield Spread Between Moody's Aaa-Rated Corporate Bonds and Moody's A2-Rated Utility Bonds	0.39%
Adjustment to Reflect the Utility Proxy Group's Average Moody's Bond Rating of A2/A3	0.04%
Prospective Bond Yield Applicable to the Utility Proxy Group	3.99%

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.

a. The Beta-Derived Risk Premium

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

A. The components of the beta-derived risk premium model are: 1) an expected market equity risk premium over corporate bonds, and 2) the beta coefficient. The derivation of the beta-derived equity risk premium that I applied to the Utility Proxy Group is shown on lines 1 through 9, page 8 of Schedule DWD-3. The total beta-derived equity risk premium I applied is based on an average of three historical market data-based equity risk premiums, two *Value Line*-based equity risk premiums, and a Bloomberg-based equity risk premium. Each of these is described below.

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

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) Yearbook 2021 (SBBI - 2021)[21] less the average historical yield on Moody's Aaa/Aa-rated corporate bonds for the period 1928 to 2020. Using holding period returns over a very long 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 11.94%, and the long-term arithmetic mean monthly yield on Moody's Aaa/Aa-rated corporate bonds was 6.02%.[22] As shown on line 1, page 8 of Schedule DWD-3, subtracting the mean monthly bond yield from the total return on large company stocks results in a long-term historical equity risk premium of 5.92%.

I used the arithmetic mean monthly total return rates for the large company stocks and yields (income returns) for the Moody's Aaa/Aa corporate bonds, because they are appropriate for the purpose of estimating the cost of capital as noted in SBBI - 2021.[23] Using the arithmetic mean return rates and yields is appropriate because historical total returns and equity risk premiums provide insight into the variance and standard deviation of returns needed by investors in

[21] SBBI Appendix A Tables: Morningstar Stocks, Bonds, Bills, & Inflation 1926-2020.
[22] As explained in note 1, page 9 of Schedule DWD-3.
[23] SBBI - 2021, at 10-22 and 10-23.

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-based market equity risk premium of 8.69% shown on line 2, page 8 of Schedule DWD-3, 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. I modeled the relationship between interest rates and the market equity risk premium 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 then 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 THE PRPM EQUITY RISK PREMIUM.

A. I used the same PRPM approach described above to the PRPM equity risk premium. The inputs to the model are the historical monthly returns on large company common stocks minus the monthly yields on Moody's Aaa/Aa-rated corporate bonds during the period from January 1928 through May 2021.[24] 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 a market equity risk premium of 9.02%.[25]

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

A. As noted above, 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, page 9 of Schedule DWD-3. Consistent with my calculation of the dividend yield component in my DCF analysis, this prospective market equity risk premium is derived from an average of the three- to five-year median market price appreciation potential by *Value Line* for the 13 weeks ended May 28, 2021, 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*.[26]

The average median expected price appreciation is 28%, which translates to a 6.37% annual appreciation, and, when added to the average of *Value Line's* median expected dividend yields of 1.79%, equates to a forecasted annual total return rate on the market of 8.16%. The forecasted Moody's Aaa-rated corporate bond yield of 3.56% is deducted from the total market return of 8.16%, resulting in an equity risk premium of 4.60%, as shown on line 4, page 8 of Schedule DWD-3.

[24] Data from January 1928 to December 2020 is from SBBI - 2021. Data from January 2021 to May 2021 is from Bloomberg.
[25] Shown on line 3, page 8 of Schedule DWD-3.
[26] As explained in detail in note 1, page 2 of Schedule DWD-4.

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 companies 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 14.32%. Subtracting the prospective yield on Moody's Aaa-rated corporate bonds of 3.56% results in an 10.76% 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 return for the S&P 500 is 16.34%. Subtracting the prospective yield on Moody's Aaa-rated corporate bonds of 3.56% results in a 12.78% 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 all six equity risk premiums based on each source - historical, *Value Line*, and Bloomberg - in arriving at a 8.63% equity risk premium.

Table 4: Summary of the Calculation of the Equity Risk Premium Using Total Market Returns[27]

Historical Spread Between Total Returns of Large Stocks and Aaa and Aa2-Rated Corporate Bond Yields (1928 – 2020)	5.92%
Regression Analysis on Historical Data	8.69%
PRPM Analysis on Historical Data	9.02%
Prospective Equity Risk Premium using Total Market Returns from *Value Line* Summary & Index less Projected Aaa Corporate Bond Yields	4.60%
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	10.76%
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	12.78%
Average	8.63%

After calculating the average market equity risk premium of 8.63%, I adjusted it by the beta coefficient to account for the risk of the Utility Proxy Group. As discussed below, the beta coefficient is a meaningful measure of prospective relative risk to the market as a whole, and is a logical way to allocate a company's, or proxy group's, share of the market's total equity risk premium relative to corporate bond yields. As shown on page 1 of Schedule DWD-4, the average of the mean and median beta coefficient for the Utility Proxy Group is 0.93. Multiplying the 0.93 average by the market equity risk premium of 8.63% results in a beta-adjusted equity risk premium for the Utility Proxy Group of 8.03%.

27 As shown on page 8 of Schedule DWD-3.

b. The S&P Utility Index Derived Risk Premium

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

A. I estimated three equity risk premiums based on S&P Utility Index holding period 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 10.65%, and monthly Moody's A-rated public utility bond yields of 6.49% from 1928 to 2020, to arrive at an equity risk premium of 4.16%.[28] I then used the same historical data to derive an equity risk premium of 6.37% 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 May 2021 to arrive at a PRPM-derived equity risk premium of 5.41% for the S&P Utility Index.

I then derived expected total returns on the S&P Utilities Index of 11.40% and 9.77% using data from *Value Line* and Bloomberg, respectively, and subtracted the prospective Moody's A2-rated public utility bond yield of 3.95%[29], which resulted in equity risk premiums of 7.45% and 5.82%, respectively. As with the market equity risk premiums, I averaged each risk premium based on each source

[28] As shown on line 1, page 12 of Schedule DWD-3.
[29] Derived on line 3, page 3 of Schedule DWD-3.

(*i.e.*, historical, *Value Line*, and Bloomberg) to arrive at my utility-specific equity risk premium of 5.84%.

Table 5: Summary of the Calculation of the Equity Risk Premium Using S&P Utility Index Holding Returns[30]

Historical Spread Between Total Returns of the S&P Utilities Index and A2-Rated Utility Bond Yields (1928 – 2020)	4.16%
Regression Analysis on Historical Data	6.37%
PRPM Analysis on Historical Data	5.41%
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	7.45%
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	5.82%
Average	5.84%

c. Authorized Return-Derived Equity Risk Premium

Q. HOW DID YOU DERIVE AN EQUITY RISK PREMIUM OF 5.64% BASED ON AUTHORIZED ROES FOR GAS DISTRIBUTION UTILITIES?

A. The equity risk premium of 5.64% shown on line 3, page 7 of Schedule DWD-3 is the result of a regression analysis based on regulatory awarded ROEs related to the yields on Moody's A-rated public utility bonds. That analysis is shown on page 13 of Schedule DWD-3 which contains the graphical results of a regression analysis of 800 rate cases for gas distribution utilities which were fully litigated during the period from January 1, 1980 through May 28, 2021. It shows the implicit equity risk premium relative to the yields on A-rated public utility bonds immediately prior to the issuance of each regulatory decision. It is readily discernible that there is an inverse relationship between the yield on A-rated public utility bonds and equity risk premiums. In other words, as interest rates decline, the equity risk premium

[30] As shown on page 12 of Schedule DWD-3.

rises and vice versa, a result consistent with financial literature on the subject.[31] I used the regression results to estimate the equity risk premium applicable to the projected yield on Moody's A2-rated public utility bonds of 3.95%. Given the expected A-rated utility bond yield of 3.95%, it can be calculated that the indicated equity risk premium applicable to that bond yield is 5.64%, which is shown on line 3, page 7 of Schedule DWD-3.

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 apply to the Utility Proxy Group is 6.50%, which is the average of the beta-adjusted equity risk premium for the Utility Proxy Group, the S&P Utilities Index, and the authorized return utility equity risk premiums of 8.03%, 5.84%, and 5.64%, respectively.[32]

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

A. As shown on line 7, page 3 of Schedule DWD-3, I calculated a common equity cost rate of 10.49% for the Utility Proxy Group based on the total market approach RPM.

Table 6: Summary of the Total Market Return Risk Premium Model[33]

Prospective Moody's A2/A3-Rated Utility Bond Applicable to the Utility Proxy Group	3.99%
Prospective Equity Risk Premium	6.50%
Indicated Cost of Common Equity	10.49%

31 *See*, *e.g.*, Robert S. Harris and Felicia C. Marston, *The Market Risk Premium: Expectational Estimates Using Analysts' Forecasts*, Journal of Applied Finance, Vol. 11, No. 1, 2001, at pages 11 to 12; Eugene F. Brigham, Dilip K. Shome, and Steve R. Vinson, *The Risk Premium Approach to Measuring a Utility's Cost of Equity*, Financial Management, Spring 1985, at pages 33 to 45.

32 As shown on page 7 of Schedule DWD-3.

33 As shown on page 3 of Schedule DWD-3.

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-3, the indicated RPM-derived common equity cost rate is 10.96%, which gives equal weight to the PRPM (11.43%) and the adjusted-market approach results (10.49%).

C. <u>The Capital Asset Pricing Model</u>

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 the beta coefficient (β). A beta coefficient less than 1.0 indicates lower variability than the market as a whole, while a beta coefficient greater than 1.0 indicates greater variability than the market.

The CAPM assumes that all non-market or unsystematic risk can be eliminated through diversification. The risk that cannot be eliminated through diversification is called market, or systematic, risk. In addition, the CAPM presumes that investors only require compensation 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 the beta coefficient. 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

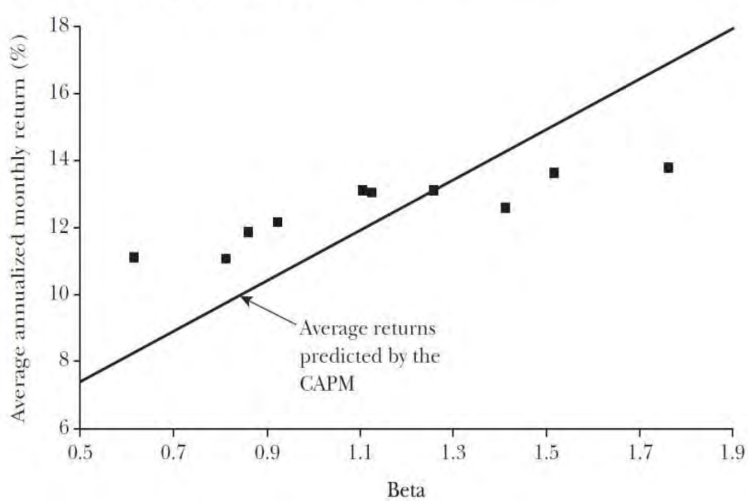
β = Adjusted beta coefficient (volatility of the security relative to the market as a whole)

Numerous tests of the CAPM have measured the extent to which security returns and beta coefficients 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 the beta coefficient 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.[34]

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." [35]

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



[34] Roger A. Morin, New Regulatory Finance (Public Utility Reports, Inc., 2006), at 175. (Morin)

[35] 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).

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.[36]
>
> * * *
>
> Therefore, the empirical evidence suggests that the expected return on a security is related to its risk by the following approximation:
>
> $$K = R_F + x\,\beta(R_M - R_F) + (1-x)\,\beta(R_M - R_F)$$
>
> where x is a fraction to be determined empirically. The value of x that best explains the observed relationship [is] Return = 0.0829 + 0.0520 β is between 0.25 and 0.30. If x = 0.25, the equation becomes:
>
> $$K = R_F + 0.25(R_M - R_F) + 0.75\,\beta(R_M - R_F)$$ [37]

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

> The early tests firmly reject the Sharpe-Lintner version of the CAPM. There is a positive relation between beta and average return, but it is too 'flat.'… The regressions consistently find that the intercept is greater than the average risk-free rate… and the coefficient on beta is less than the average excess market return… This is true in the early tests… as well as in more recent cross-section regressions tests, like Fama and French (1992).[38]

Finally, Fama and French further note:

> Confirming earlier evidence, the relation between beta and average return for the ten portfolios is much flatter than the Sharpe-Linter CAPM predicts. The returns on low beta portfolios are too high, and the returns on the high beta portfolios are too low. For example, the predicted return on the portfolio with the lowest beta is 8.3 percent per year; the actual return as 11.1 percent. The predicted return on the portfolio with the t beta is 16.8 percent per year; the actual is 13.7 percent.[39]

[36] Morin, at 175.
[37] Morin, at 190.
[38] Fama & French, at 32.
[39] *Ibid.,* at 33.

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

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

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

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

A. As discussed previously, the risk-free rate adopted for both applications of the CAPM is 2.88%. This risk-free rate 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 2022, and long-term projections for the years 2023 to 2027 and 2028 to 2032.

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 Schedule DWD-4. As discussed above, the market risk premium is derived from an average of three historical data-based market risk premiums, two *Value Line* data-based market risk premiums, and one Bloomberg data-based market risk premium.

The long-term income return on U.S. Government securities of 5.05% was deducted from the SBBI - 2021 monthly historical total market return of 12.20%, which results in an historical market equity risk premium of 7.15%.[40] I applied a linear OLS regression to the monthly annualized historical returns on the S&P 500 relative to historical yields on long-term U.S. Government securities from SBBI - 2021. That regression analysis yielded a market equity risk premium of 9.39%. The PRPM market equity risk premium is 10.04% and is derived using the PRPM relative to the yields on long-term U.S. Treasury securities from January 1926 through May 2021.

The *Value Line*-derived forecasted total market equity risk premium is derived by deducting the forecasted risk-free rate of 2.88%, discussed above, from the *Value Line* projected total annual market return of 8.16%, resulting in a forecasted total market equity risk premium of 5.28%. The S&P 500 projected market equity risk premium using *Value Line* data is derived by subtracting the projected risk-free rate of 2.88% from the projected total return of the S&P 500 of 14.32%. The resulting market equity risk premium is 11.44%.

[40] SBBI - 2021, at Appendix A-1 (1) through A-1 (3) and Appendix A-7 (19) through A-7 (21).

The S&P 500 projected market equity risk premium using Bloomberg data is derived by subtracting the projected risk-free rate of 2.88% from the projected total return of the S&P 500 of 16.34%. The resulting market equity risk premium is 13.46%. These six measures, when averaged, result in an average total market equity risk premium of 9.46%.

Table 7: Summary of the Calculation of the Market Risk Premium for Use in the CAPM[41]

Historical Spread Between Total Returns of Large Stocks and Long-Term Government Bond Yields (1926 – 2020)	7.15%
Regression Analysis on Historical Data	9.39%
PRPM Analysis on Historical Data	10.04%
Prospective Equity Risk Premium using Total Market Returns from *Value Line* Summary & Index less Projected 30-Year Treasury Bond Yields	5.28%
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	11.44%
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	13.46%
Average	9.46%

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-4, the mean result of my CAPM/ECAPM analyses is 11.81%, the median is 11.68%, and the average of the two is 11.75%. 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 11.75%.

41 As shown on page 2 of Schedule DWD-4.

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 DO 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 marketplace competition, non-price regulated firms operating in the competitive marketplace make an excellent proxy group if they are comparable in total risk to the Utility Proxy Group being used to estimate the cost of common equity. The selection of such domestic, non-price regulated competitive firms theoretically and empirically results in a proxy group which is comparable in total risk to the Utility Proxy Group, since all of these companies compete for capital in the exact same markets.

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

A. In order to select a proxy group of domestic, non-price regulated companies similar in total risk to the Utility Proxy Group, I relied on the beta coefficients and related statistics derived from *Value Line* regression analyses of weekly market prices over the most recent 260 weeks (*i.e.*, five years). These selection criteria resulted in a proxy group of 48 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 selecting the domestic, non-price regulated firms was:

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

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

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

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

Beta coefficients measure market, or systematic, risk, which is not diversifiable. The residual standard errors of the regressions measure each firm's company-specific, diversifiable risk. Companies that have similar beta coefficients <u>and</u> similar residual standard errors resulting from the same regression analyses have similar total investment risk.

Q. HAVE YOU PREPARED AN SCHEDULE WHICH SHOWS THE DATA FROM WHICH YOU SELECTED THE 48 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-5.

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

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

Page 2 of Schedule DWD-6 derives the constant growth DCF model common equity cost rate. As shown, the indicated common equity cost rate, using the constant growth DCF for the Non-Price Regulated Proxy Group comparable in total risk to the Utility Proxy Group, is 12.83%.

Pages 3 through 5 of Schedule DWD-6 contain the data and calculations that support the 12.49% RPM common equity cost rate. As shown on line 1, page 3 of Schedule DWD-6, the consensus prospective yield on Moody's Baa-rated corporate bonds for the six quarters ending in the third quarter of 2022, and for the years 2023 to 2027 and 2028 to 2032, is 4.46%.[42]

When the beta-adjusted risk premium of 8.03%[43] relative to the Non-Price Regulated Proxy Group is added to the prospective Baa2-rated corporate bond yield of 4.46%, the indicated RPM common equity cost rate is 12.49%.

Page 6 of Schedule DWD-6 contains the inputs and calculations that support my indicated CAPM/ECAPM common equity cost rate of 11.69%.

Q. HOW 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-6, the results of the common equity models applied to the Non-Price Regulated Proxy Group -- which group is comparable in

[42] *Blue Chip Financial Forecasts*, June 1, 2021, at page 2 and 14.
[43] Derived on page 5 of Schedule DWD-6.

total risk to the Utility Proxy Group -- are as follows: 12.83% (DCF), 12.49% (RPM), and 11.69% (CAPM). The average of the mean and median of these models is 12.42%, which I used as the indicated common equity cost rates for the Non-Price Regulated Proxy Group.

VI. CONCLUSION OF COMMON EQUITY COST RATE BEFORE ADJUSTMENTS

Q. WHAT ARE THE INDICATED COMMON EQUITY COST RATES BEFORE ADJUSTMENTS?

A. By applying multiple cost of common equity models to the Utility Proxy Group and the Non-Price Regulated Proxy Group, the indicated range of common equity cost rates before any relative risk adjustment is between 9.44% and 12.42%. The spread between the high and low values in the range (298 basis points) indicates that there is still a fair amount of uncertainty around the recovery from the COVID-19 pandemic. 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 to the exclusion of other theoretically sound models. Using multiple models adds reliability to the estimated common equity cost rate, with the prudence of using multiple cost of common equity models supported in both the financial literature and regulatory precedent.

VII. ADJUSTMENTS TO THE COMMON EQUITY COST RATE

A. Size Adjustment

Q. DOES ATMOS ENERGY'S SMALLER SIZE RELATIVE TO THE UTILITY PROXY GROUP COMPANIES INCREASE ITS BUSINESS RISK?

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

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

As further evidence that smaller firms are riskier, investors generally demand greater returns from smaller firms to compensate for less marketability and liquidity of their securities. Duff & Phelps <u>2020 Valuation Handbook Guide to Cost of Capital - Market Results through 2019 (D&P - 2020)</u> 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," <u>D&P - 2020</u> 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)[44]

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

> . . . the higher average returns on small stocks and high book-to-market stocks reflect unidentified state variables that produce undiversifiable risks (covariances) in returns not captured in the market return and are priced separately from market betas.[45]

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

Also, it is a basic financial principle that the use of funds invested, and not the source of funds, is what gives rise to the risk of any investment.[46] Eugene Brigham, a well-known authority, states:

> A number of researchers have observed that portfolios of small-firms (sic) have earned consistently higher average returns than those of large-firm stocks; this is called the "small-firm effect." On the surface, it would seem to be advantageous to the small firms to provide average returns in a stock market that are higher than those of larger firms. In reality, it is bad news for the small firm; **what the small-firm effect means is that the capital market demands higher returns on stocks of small firms than on otherwise similar stocks of the large firms**. (emphasis added)[47]

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

[45] Eugene F. Fama and Kenneth R. French, "The Capital Asset Pricing Model: Theory and Evidence," *Journal of Economic Perspectives*, Volume 18, Number 3, Summer 2004, at 25-43.

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

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

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 unique risks of Atmos Energy, 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 ATMOS ENERGY'S SMALL SIZE RELATIVE TO THE UTILITY PROXY GROUP?

A. Yes. Atmos Energy has greater relative risk than the average utility in the Utility Proxy Group because of its smaller size compared with the utilities in that group, as measured by an estimated market capitalization of common equity for Atmos Energy.

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

	Market Capitalization* ($ Millions)	Times Greater than The Company
Atmos Energy	$597.101	
Utility Proxy Group	$4,615.314	7.7x

*From page 1 of Schedule DWD-7.

Atmos Energy's estimated market capitalization was $597.101 million as of May 28, 2021,[48] compared with the market capitalization of the average company

48 $597.101 (company-provided forecasted rate base at Twelve Months Ended December 31, 2022) * requested equity ratio of 57.05% * 175.6% (market-to-book ratio of the Utility Proxy Group) as demonstrated on page 2 of Schedule DWD-7.

in the Utility Proxy Group of \$4.6 billion as of May 28, 2021. The average company in the Utility Proxy Group has a market capitalization 7.7 times the size of Atmos Energy's estimated market capitalization.

As a result, it is necessary to upwardly adjust the range of indicated common equity cost rates between 9.44% to 12.42% to reflect Atmos Energy's greater risk due to their smaller relative size. The determination is based on the size premiums for portfolios of New York Stock Exchange, American Stock Exchange, and NASDAQ listed companies ranked by deciles for the 1926 to 2020 period. The average size premium for the Utility Proxy Group with a market capitalization of \$4.6 billion falls in the 4th decile, while the Company's estimated market capitalization of \$597.101 million places it in the 8th decile. The size premium spread between the 4th decile and the 8th decile is 0.71%. Even though a 0.71% upward size adjustment is indicated, I applied a size premium of 0.20% to the Company's range of indicated common equity cost rates.

Q. SINCE ATMOS ENERGY IS A DIVISION OF ATO, WHY IS THE SIZE OF THE TOTAL COMPANY NOT MORE APPROPRIATE TO USE WHEN DETERMINING THE SIZE ADJUSTMENT?

A. As discussed previously, rates are set using the stand-alone principle, which maintains that the utility operations of a diversified firm should be regulated as though they were independent (*i.e.*, without subsidies to or from affiliated companies). Because of this, the return derived in this proceeding will not apply to ATO as a whole, but only Atmos Energy's Kentucky gas distribution operations. ATO is the sum of its constituent parts, including those constituent parts' ROEs.

Potential investors in the Company are aware that it is a combination of operations in each state, and that each state's operations experience the operating risks specific to their jurisdiction. The market's expectation of ATO's return is commensurate with the realities of its composite operations in each of the states in which it operates.

B. Credit Risk Adjustment

Q. PLEASE DISCUSS YOUR PROPOSED CREDIT RISK ADJUSTMENT.

ATO's long-term issuer ratings are A1 and A from Moody's Investors Services and S&P, respectively, which are less risky than the average long-term issuer ratings for the Utility Proxy Group of A2/A3 and A-, respectively.[49] Hence, a downward credit risk adjustment is necessary to reflect the less risky credit rating, *i.e.,* A1, of Atmos Energy relative to the A2/A3 average Moody's bond rating of the Utility Proxy Group.[50]

An indication of the magnitude of the necessary downward adjustment to reflect the lower credit risk inherent in an A1 bond rating is one-third of a recent three-month average spread between Moody's A- and Aa-rated public utility bond yields and one-sixth of a recent spread between A- and Baa-rated public utility bonds, shown on page 4 of Schedule DWD-3, or 0.10%.[51]

[49] Source of Information: S&P Global Market Intelligence.
[50] As shown on page 5 of Schedule DWD-3.
[51] 1/3 * 0.17% = 0.06% + 1/6 * 0.26% = 0.04%. 0.06% + 0.04% = 0.10%.

C. Flotation Cost Adjustment

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 mandatory unavoidable costs of issuance (*e.g.*, underwriting fees and out-of-pocket costs for printing, legal, registration, etc.). For every dollar raised through debt or equity offerings, the Company receives less than one full dollar in financing.

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 can be recognized and recovered. Because these costs are real, necessary, and legitimate, recovery of these costs should be permitted. 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.[52]

Q. SHOULD FLOTATION COSTS BE RECOGNIZED ONLY IF THERE WAS AN ISSUANCE DURING THE TEST YEAR OR THERE IS AN IMMINENT POST-TEST YEAR ISSUANCE OF ADDITIONAL COMMON STOCK?

A. No. As noted above, there is no mechanism to recapture such costs in the ratemaking paradigm other than an adjustment to the allowed common equity cost

[52] Morin, at p. 321.

rate. Flotation costs are charged to capital accounts and are not expensed on a utility's income statement. As such, flotation costs are analogous to capital investments, albeit negative, 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.

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. Since these expenses are charged to capital accounts and not expensed on the income statement, 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 assume no transaction costs. The literature is quite clear that these costs are not reflected in the market prices paid for common stocks. For example, Brigham and Daves confirm this and provide the methodology utilized to calculate the flotation adjustment.[53] In addition, Morin confirms the need for such an adjustment even when no new equity issuance is imminent.[54] Consequently, it is proper to include a flotation cost adjustment when using cost of common equity models to estimate the common equity cost rate.

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 actual costs of issuing equity that were incurred by ATO in its last four equity issuances. Based on the issuance costs shown on page 1 of Schedule DWD-8, an adjustment of 0.04% is required to reflect the flotation costs applicable to the Utility Proxy Group.

[53] Eugene F. Brigham and Phillip R. Daves, Intermediate Financial Management, 9th Edition, Thomson/Southwestern, at p. 342.
[54] Morin, at pp. 327-30.

VIII. CONCLUSION

Q. WHAT IS YOUR RECOMMENDED ROE FOR ATMOS ENERGY?

A. Given the indicated ROE range applicable to the Utility Proxy Group of 9.44% to 12.42% and the Company-specific ROE range of 9.58% to 12.42%, I conclude that an appropriate ROE for the Company is 10.35%.

Q. IN YOUR OPINION, IS YOUR PROPOSED ROE OF 10.35% FAIR AND REASONABLE TO ATMOS ENERGY AND ITS CUSTOMERS?

A. Yes, it is.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes, it does.

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

IN THE MATTER OF	)	
RATE APPLICATION OF	)	Case No. 2021-00214
ATMOS ENERGY CORPORATION	)	

CERTIFICATE AND AFFIDAVIT

The Affiant, Dylan W. D'Ascendis, being duly sworn, deposes and states that the prepared testimony attached hereto and made a part hereof, constitutes the prepared direct testimony of this affiant in Case No. 2021-00214, in the Matter of the Rate Application of Atmos Energy Corporation, and that if asked the questions propounded therein, this affiant would make the answers set forth in the attached prepared direct pre-filed testimony.

Dylan W. D'Ascendis

STATE OF NEW JERSEY

COUNTY OF BURLINGTON

SUBSCRIBED AND SWORN to before me by Dylan W. D'Ascendis on this the 14th day of June, 2021.

Margaret A Clancy
Notary Public of New Jersey
My Commission Expires 6/9/2024

Margaret A Clancy
Notary Public

My Commission Expires: 6/9/2024

Appendix A - Resume & Testimony Listing of:
Dylan W. D'Ascendis, CRRA, CVA
Partner

Summary

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

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

Areas of Specialization

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

Recent Expert Testimony Submission/Appearances

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

Recent Assignments

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

Recent Publications and Speeches

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

Resume & Testimony Listing of:
Dylan W. D'Ascendis, CRRA, CVA
Partner

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

Resume & Testimony Listing of:
Dylan W. D'Ascendis, CRRA, CVA
Partner

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

Sponsor	Date	Case/Applicant	Docket No.	Subject
Raccoon Creek Utility Operating Company, Inc.	09/16	Raccoon Creek Utility Operating Company, Inc.	Docket No. SR-2016-0202	Rate of Return
Public Utilities Commission of Nevada				
Southwest Gas Corporation	08/20	Southwest Gas Corporation	Docket No. 20-02023	Return on Equity
New Hampshire Public Utilities Commission				
Aquarion Water Company of New Hampshire, Inc.	12/20	Aquarion Water Company of New Hampshire, Inc.	Docket No. DW 20-184	Rate of Return
New Jersey Board of Public Utilities				
Middlesex Water Company	05/21	Middlesex Water Company	Docket No. WR21050813	Rate of Return
Atlantic City Electric Company	12/20	Atlantic City Electric Company	Docket No. ER20120746	Return on Equity
FirstEnergy	02/20	Jersey Central Power & Light Co.	Docket No. ER20020146	Rate of Return
Aqua New Jersey, Inc.	12/18	Aqua New Jersey, Inc.	Docket No. WR18121351	Rate of Return
Middlesex Water Company	10/17	Middlesex Water Company	Docket No. WR17101049	Rate of Return
Middlesex Water Company	03/15	Middlesex Water Company	Docket No. WR15030391	Rate of Return
The Atlantic City Sewerage Company	10/14	The Atlantic City Sewerage Company	Docket No. WR14101263	Cost of Service / Rate Design
Middlesex Water Company	11/13	Middlesex Water Company	Docket No. WR1311059	Capital Structure
New Mexico Public Regulation Commission				
Southwestern Public Service Company	01/21	Southwestern Public Service Company	Case No. 20-00238-UT	Return on Equity
North Carolina Utilities Commission				
Piedmont Natural Gas Co.Inc.	03/21	Piedmont Natural Gas Co., Inc.	Docket No. G-9, Sub 781	Return on Equity
Duke Energy Carolinas, LLC	07/20	Duke Energy Carolinas, LLC	Docket No. E-7, Sub 1214	Return on Equity
Duke Energy Progress, LLC	07/20	Duke Energy Progress, LLC	Docket No. E-2, Sub 1219	Return on Equity
Aqua North Carolina, Inc.	12/19	Aqua North Carolina, Inc.	Docket No. W-218 Sub 526	Rate of Return
Carolina Water Service, Inc.	06/19	Carolina Water Service, Inc.	Docket No. W-354 Sub 364	Rate of Return
Carolina Water Service, Inc.	09/18	Carolina Water Service, Inc.	Docket No. W-354 Sub 360	Rate of Return
Aqua North Carolina, Inc.	07/18	Aqua North Carolina, Inc.	Docket No. W-218 Sub 497	Rate of Return
North Dakota Public Service Commission				
Northern States Power Company	11/20	Northern States Power Company	Case No. PU-20-441	Rate of Return
Public Utilities Commission of Ohio				
Aqua Ohio, Inc.	05/16	Aqua Ohio, Inc.	Docket No. 16-0907-WW-AIR	Rate of Return
Pennsylvania Public Utility Commission				
Vicinity Energy Philadelphia, Inc.	04/21	Vicinity Energy Philadelphia, Inc.	Docket No. R-2021-3024060	Rate of Return
Delaware County Regional Water Control Authority	02/20	Delaware County Regional Water Control Authority	Docket No. A-2019-3015173	Valuation
Valley Energy, Inc.	07/19	C&T Enterprises	Docket No. R-2019-3008209	Rate of Return
Wellsboro Electric Company	07/19	C&T Enterprises	Docket No. R-2019-3008208	Rate of Return
Citizens' Electric Company of Lewisburg	07/19	C&T Enterprises	Docket No. R-2019-3008212	Rate of Return
Steelton Borough Authority	01/19	Steelton Borough Authority	Docket No. A-2019-3006880	Valuation
Mahoning Township, PA	08/18	Mahoning Township, PA	Docket No. A-2018-3003519	Valuation

SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
SUEZ Water Pennsylvania Inc.	04/18	SUEZ Water Pennsylvania Inc.	Docket No. R-2018-000834	Rate of Return
Columbia Water Company	09/17	Columbia Water Company	Docket No. R-2017-2598203	Rate of Return
Veolia Energy Philadelphia, Inc.	06/17	Veolia Energy Philadelphia, Inc.	Docket No. R-2017-2593142	Rate of Return
Emporium Water Company	07/14	Emporium Water Company	Docket No. R-2014-2402324	Rate of Return
Columbia Water Company	07/13	Columbia Water Company	Docket No. R-2013-2360798	Rate of Return
Penn Estates Utilities, Inc.	12/11	Penn Estates, Utilities, Inc.	Docket No. R-2011-2255159	Capital Structure / Long-Term Debt Cost Rate
South Carolina Public Service Commission				
Blue Granite Water Co.	12/19	Blue Granite Water Company	Docket No. 2019-292-WS	Rate of Return
Carolina Water Service, Inc.	02/18	Carolina Water Service, Inc.	Docket No. 2017-292-WS	Rate of Return
Carolina Water Service, Inc.	06/15	Carolina Water Service, Inc.	Docket No. 2015-199-WS	Rate of Return
Carolina Water Service, Inc.	11/13	Carolina Water Service, Inc.	Docket No. 2013-275-WS	Rate of Return
United Utility Companies, Inc.	09/13	United Utility Companies, Inc.	Docket No. 2013-199-WS	Rate of Return
Utility Services of South Carolina, Inc.	09/13	Utility Services of South Carolina, Inc.	Docket No. 2013-201-WS	Rate of Return
Tega Cay Water Services, Inc.	11/12	Tega Cay Water Services, Inc.	Docket No. 2012-177-WS	Capital Structure
Tennessee Public Utility Commission				
Piedmont Natural Gas Company	07/20	Piedmont Natural Gas Company	Docket No. 20-00086	Return on Equity
Public Utility Commission of Texas				
Southwestern Public Service Company	02/21	Southwestern Public Service Company	Docket No. 51802	Return on Equity
Southwestern Electric Power Company	10/20	Southwestern Electric Power Company	Docket No. 51415	Rate of Return
Virginia State Corporation Commission				
Virginia Natural Gas, Inc.	04/21	Virginia Natural Gas, Inc.	PUR-2020-00095	Return on Equity
Massanutten Public Service Corporation	12/20	Massanutten Public Service Corporation	PUE-2020-00039	Return on Equity
Aqua Virginia, Inc.	07/20	Aqua Virginia, Inc.	PUR-2020-00106	Rate of Return
WGL Holdings, Inc.	07/18	Washington Gas Light Company	PUR-2018-00080	Rate of Return
Atmos Energy Corporation	05/18	Atmos Energy Corporation	PUR-2018-00014	Rate of Return
Aqua Virginia, Inc.	07/17	Aqua Virginia, Inc.	PUR-2017-00082	Rate of Return
Massanutten Public Service Corp.	08/14	Massanutten Public Service Corp.	PUE-2014-00035	Rate of Return / Rate Design

Exhibit DWD-1
Schedule DWD-1.1

Atmos Energy Corporation
Recommended Capital Structure and Cost Rates
for Ratemaking Purposes

Type Of Capital	Ratios (1)	Cost Rate		Weighted Cost Rate
Long-Term Debt	42.77%	4.00%	(1)	1.71%
Short-Term Debt	0.18%	25.17%	(1)	0.05%
Common Equity	57.05%	10.35%	(2)	5.90%
Total	100.00%			7.66%

Notes:

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

Exhibit DWD-1
Schedule DWD-1.2

Atmos Energy Corporation
Brief Summary of Common Equity Cost Rate

Line No.	Principal Methods	Proxy Group of Seven Natural Gas Distribution Companies
1.	Discounted Cash Flow Model (DCF) (1)	9.44%
2.	Risk Premium Model (RPM) (2)	10.96%
3.	Capital Asset Pricing Model (CAPM) (3)	11.75%
4.	Market Models Applied to Comparable Risk, Non-Price Regulated Companies (4)	12.42%
5.	Range of Common Equity Model Results	9.44% - 12.42%
6.	Size Risk Adjustment (5)	0.20%
7.	Credit Risk Adjustment (6)	-0.10%
8.	Flotation Cost Adjustment (7)	0.04%
9.	Indicated Range of Common Equity Cost Rates after Adjustment	9.58% - 12.66%
10.	Recommended Common Equity Cost Rate	10.35%

Notes:
(1) From page 1 of Schedule DWD-2.
(2) From page 1 of Schedule DWD-3.
(3) From page 1 of Schedule DWD-4.
(4) From page 1 of Schedule DWD-6.
(5) Adjustment to reflect the Company's greater business risk due to its smaller size relative to the Utility Proxy Group as detailed in Mr. D'Ascendis' direct testimony.
(6) Company-specific risk adjustment to reflect Atmos Energy's lower risk due to a higher long-term issuer rating relative to the proxy group as detailed in Mr. D'Ascendis' direct testimony.
(7) From page 1 of Schedule DWD-8.

Atmos Energy Corporation
Indicated Common Equity Cost Rate Using the Discounted Cash Flow Model for the
Proxy Group of Seven Natural Gas Distribution Companies

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Proxy Group of Seven Natural Gas Distribution Companies	Average Dividend Yield (1)	Value Line Projected Five Year Growth in EPS (2)	Zack's Five Year Projected Growth Rate in EPS	Bloomberg'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)
Atmos Energy Corporation	2.54 %	7.00 %	7.30 %	7.10 %	7.17 %	7.14 %	2.63 %	9.77 %
New Jersey Resources Corporation	3.19	2.00	7.10	7.33	6.00	5.61	3.28	8.89
Northwest Natural Holding Company	3.57	5.50	3.90	4.42	3.80	4.41	3.65	8.06
ONE Gas, Inc.	3.02	6.50	5.00	5.67	5.00	5.54	3.10	8.64
South Jersey Industries, Inc.	4.84	11.50	5.40	4.93	4.80	6.66	5.00	11.66
Southwest Gas Holdings, Inc.	3.45	9.00	5.50	4.50	4.00	5.75	3.55	9.30
Spire Inc.	3.49	10.00	5.50	5.33	7.31	7.04	3.61	10.65
							Average	9.57 %
							Median	9.30 %
							Average of Mean and Median	9.44 %

NA= Not Available
NMF= Not Meaningful Figure

Notes:

(1) Indicated dividend at 05/28/2021 divided by the average closing price of the last 60 trading days ending 05/28/2021 for each company.

(2) From pages 2 through 8 of this Schedule.

(3) Average of columns 2 through 5 excluding negative growth rates.

(4) This reflects a growth rate component equal to one-half the conclusion of growth rate (from column 6) x column 1 to reflect the periodic payment of dividends (Gordon Model) as opposed to the continuous payment. Thus, for Atmos Energy Corporation, 2.54% x (1+(1/2 x 7.14%)) = 2.63%.

(5) Column 6 + column 7.

Source of Information:

Value Line Investment Survey
www.zacks.com Downloaded on 05/28/2021
www.yahoo.com Downloaded on 05/28/2021
Bloomberg Professional Services

Exhibit DWD-1
Schedule DWD-3.1

Atmos Energy Corporation
Summary of Risk Premium Models for the
Proxy Group of Seven Natural Gas Distribution Companies

	Proxy Group of Seven Natural Gas Distribution Companies
Predictive Risk Premium Model (PRPM) (1)	11.43 %
Risk Premium Using an Adjusted Total Market Approach (2)	10.49 %
Average	10.96 %

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

Exhibit DWD-1
Schedule DWD-3.2

Atmos Energy Corporation
Indicated ROE
Derived by the Predictive Risk Premium Model (1)

	[1]	[2]	[3]	[4]	[5]	[6]	[7]
Proxy Group of Seven Natural Gas Distribution Companies	LT Average Predicted Variance	Spot Predicted Variance	Recommended Variance (2)	GARCH Coefficient	Predicted Risk Premium (3)	Risk-Free Rate (4)	Indicated ROE (5)
Atmos Energy Corporation	0.33%	0.48%	0.41%	2.2565	11.58%	2.88%	14.46%
New Jersey Resources Corporation	0.38%	0.34%	0.36%	2.0814	9.43%	2.88%	12.31%
Northwest Natural Holding Company	0.32%	0.38%	0.35%	1.5413	6.68%	2.88%	9.56%
ONE Gas, Inc.	0.30%	0.43%	0.37%	4.0633	19.39%	2.88%	NMF
South Jersey Industries, Inc.	0.39%	0.69%	0.54%	1.6346	11.03%	2.88%	13.91%
Southwest Gas Holdings, Inc.	0.43%	0.38%	0.41%	1.3628	6.84%	2.88%	9.72%
Spire Inc.	0.71%	0.52%	0.61%	0.9445	7.18%	2.88%	10.06%
						Average	11.67%
						Median	11.19%
						Average of Mean and Median	11.43%

Notes:
(1) The Predictive Risk Premium Model uses historical data to generate a predicted variance and a GARCH coefficient. The historical data used are the equity risk premiums for the first available trading month as reported by Bloomberg Professional Service.
(2) Given current market conditions, I recommend using average of the the long-term average predicted variance and the spot variance.
(3) $(1+(\text{Column [3]} * \text{Column [4]})^{12}) - 1$.
(4) From note 2 on page 2 of Schedule DWD-4.
(5) Column [5] + Column [6].

Atmos Energy Corporation
Indicated Common Equity Cost Rate
Through Use of a Risk Premium Model
Using an Adjusted Total Market Approach

Line No.		Proxy Group of Seven Natural Gas Distribution Companies	
1.	Prospective Yield on Aaa Rated Corporate Bonds (1)	3.56	%
2.	Adjustment to Reflect Yield Spread Between Aaa Rated Corporate Bonds and A2 Rated Public Utility Bonds	0.39	(2)
3.	Adjusted Prospective Yield on A2 Rated Public Utility Bonds	3.95	%
4.	Adjustment to Reflect Bond Rating Difference of Proxy Group	0.04	(3)
5.	Adjusted Prospective Bond Yield	3.99	%
6.	Equity Risk Premium (4)	6.50	
7.	Risk Premium Derived Common Equity Cost Rate	10.49	%

Notes: (1) Consensus forecast of Moody's Aaa Rated Corporate bonds from Blue Chip Financial Forecasts (see pages 10 and 11 of this Schedule).

(2) The average yield spread of A2 rated public utility bonds over Aaa rated corporate bonds of 0.39% from page 4 of this Schedule.

(3) Adjustment to reflect the A2/A3 Moody's LT issuer rating of the Utility Proxy Group as shown on page 5 of this Schedule. The 0.04% upward adjustment is derived by taking 1/6 of the spread between A2 and Baa2 Public Utility Bonds (1/6 * 0.26% = 0.04%) as derived from page 4 of this Schedule.

(4) From page 7 of this Schedule.

Atmos Energy Corporation
Interest Rates and Bond Spreads for
Moody's Corporate and Public Utility Bonds

Selected Bond Yields - Moody's

	[1] Aaa Rated Corporate Bond	[2] Aa2 Rated Public Utility Bond	[3] A2 Rated Public Utility Bond	[4] Baa2 Rated Public Utility Bond
May-2021	2.96 %	3.17 %	3.33 %	3.58 %
Apr-2021	2.90	3.13	3.30	3.57
Mar-2021	3.04	3.27	3.44	3.72
Average	2.97 %	3.19 %	3.36 %	3.62 %

Selected Bond Spreads

A2 Rated Public Utility Bonds Over Aaa Rated Corporate Bonds:	0.39 % (1)
Baa2 Rated Public Utility Bonds Over A2 Rated Public Utility Bonds:	0.26 % (2)
A2 Rated Public Utility Bonds Over Aa2 Rated Public Utility Bonds:	0.17 % (3)

Notes:
(1) Column [3] - Column [1].
(2) Column [4] - Column [3].
(3) Column [3] - Column [2].

Source of Information:
Bloomberg Professional Service

Exhibit DWD-1
Schedule DWD-3.5

Atmos Energy Corporation
Comparison of Long-Term Issuer Ratings for
Proxy Group of Seven Natural Gas Distribution Companies

Proxy Group of Seven Natural Gas Distribution Companies	Moody's Long-Term Issuer Rating May 2021		Standard & Poor's Long-Term Issuer Rating May 2021	
	Long-Term Issuer Rating (1)	Numerical Weighting (2)	Long-Term Issuer Rating (1)	Numerical Weighting (2)
Atmos Energy Corporation	A1	5.0	A-	7.0
New Jersey Resources Corporation	A1	5.0	NR	- -
Northwest Natural Holding Company	Baa1	8.0	A+	5.0
ONE Gas, Inc.	A3	7.0	BBB+	8.0
South Jersey Industries, Inc.	A3	7.0	BBB	9.0
Southwest Gas Holdings, Inc.	Baa1	8.0	A-	7.0
Spire Inc.	A1/A2	5.5	A-	7.0
Average	A2/A3	6.5	A-	7.2

Notes:

(1) Ratings are that of the average of each company's utility operating subsidiaries.
(2) From page 6 of this Schedule.

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

Exhibit DWD-1
Schedule DWD-3.6

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-

Exhibit DWD-1
Schedule DWD-3.7

Atmos Energy Corporation
Judgment of Equity Risk Premium for
Proxy Group of Seven Natural Gas Distribution Companies

Line No.		Proxy Group of Seven Natural Gas Distribution Companies
1.	Calculated equity risk premium based on the total market using the beta approach (1)	8.03 %
2.	Mean equity risk premium based on a study using the holding period returns of public utilities with A rated bonds (2)	5.84
3.	Predicted Equity Risk Premium Based on Regression Analysis of 800 Fully-Litigated Natural Gas Utility Rate Cases	5.64
4.	Average equity risk premium	6.50 %

Notes: (1) From page 8 of this Schedule.
(2) From page 12 of this Schedule.
(3) From page 13 of this Schedule.

Exhibit DWD-1
Schedule DWD-3.8-3.9

Atmos Energy Corporation
Derivation of Equity Risk Premium Based on the Total Market Approach
Using the Beta for the
Proxy Group of Seven Natural Gas Distribution Companies

Line No.	Equity Risk Premium Measure	Proxy Group of Seven Natural Gas Distribution Companies
	Ibbotson-Based Equity Risk Premiums:	
1.	Ibbotson Equity Risk Premium (1)	5.92 %
2.	Regression on Ibbotson Risk Premium Data (2)	8.69
3.	Ibbotson Equity Risk Premium based on PRPM (3)	9.02
4.	Equity Risk Premium Based on Value Line Summary and Index (4)	4.60
5.	Equity Risk Premium Based on Value Line S&P 500 Companies (5)	10.76
6.	Equity Risk Premium Based on Bloomberg S&P 500 Companies (6)	12.78
7.	Conclusion of Equity Risk Premium	8.63 %
8.	Adjusted Beta (7)	0.93
9.	Forecasted Equity Risk Premium	8.03 %

Notes provided on page 9 of this Schedule.

Atmos Energy Corporation
Derivation of Equity Risk Premium Based on the Total Market Approach
Using the Beta for the
Proxy Group of Seven Natural Gas Distribution Companies

Notes:

(1) Based on the arithmetic mean historical monthly returns on large company common stocks from Duff & Phelps 2021 SBBI® Yearbook minus the arithmetic mean monthly yield of Moody's average Aaa and Aa corporate bonds from 1928-2020.

(2) This equity risk premium is based on a regression of the monthly equity risk premiums of large company common stocks relative to Moody's average Aaa and Aa rated corporate bond yields from 1928-2020 referenced in Note 1 above.

(3) The Predictive Risk Premium Model (PRPM) is discussed in the accompanying direct testimony. The Ibbotson equity risk premium based on the PRPM is derived by applying the PRPM to the monthly risk premiums between Ibbotson large company common stock monthly returns and average Aaa and Aa corporate monthly bond yields, from January 1928 through March 2021.

(4) The equity risk premium based on the Value Line Summary and Index is derived by subtracting the average consensus forecast of Aaa corporate bonds of 3.56% (from page 3 of this Schedule) from the projected 3-5 year total annual market return of 8.16% (described fully in note 1 on page 2 of Schedule DWD-4).

(5) Using data from Value Line for the S&P 500, an expected total return of 14.32% was derived based upon expected dividend yields and long-term earnings growth estimates as a proxy for capital appreciation. Subtracting the average consensus forecast of Aaa corporate bonds of 3.56% results in an expected equity risk premium of 10.76%.

(6) Using data from the Bloomberg Professional Service for the S&P 500, an expected total return of 16.34% was derived based upon expected dividend yields and long-term earnings growth estimates as a proxy for capital appreciation. Subtracting the average consensus forecast of Aaa corporate bonds of 3.56% results in an expected equity risk premium of 12.78%.

(7) Average of mean and median beta from Schedule DWD-4.

Sources of Information:

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

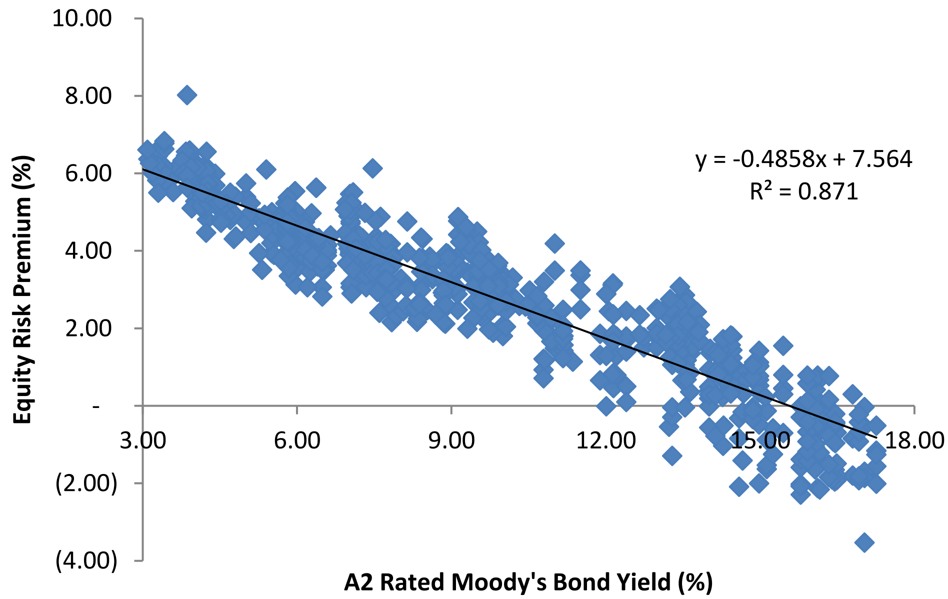
Atmos Energy Corporation
Derivation of Mean Equity Risk Premium Based Studies
Using Holding Period Returns and
Projected Market Appreciation of the S&P Utility Index

Line No.		Implied Equity Risk Premium
	Equity Risk Premium based on S&P Utility Index Holding Period Returns (1):	
1.	Historical Equity Risk Premium	4.16 %
2.	Regression of Historical Equity Risk Premium (2)	6.37
3.	Forecasted Equity Risk Premium Based on PRPM (3)	5.41
4.	Forecasted Equity Risk Premium based on Projected Total Return on the S&P Utilities Index (Value Line Data) (4)	7.45
5.	Forecasted Equity Risk Premium based on Projected Total Return on the S&P Utilities Index (Bloomberg Data) (5)	5.82
6.	Average Equity Risk Premium (6)	5.84 %

Notes:
(1) Based on S&P Public Utility Index monthly total returns and Moody's Public Utility Bond average monthly yields from 1928-2020. Holding period returns are calculated based upon income received (dividends and interest) plus the relative change in the market value of a security over a one-year holding period.
(2) This equity risk premium is based on a regression of the monthly equity risk premiums of the S&P Utility Index relative to Moody's A2 rated public utility bond yields from 1928 - 2020 referenced in note 1 above.
(3) The Predictive Risk Premium Model (PRPM) is applied to the risk premium of the monthly total returns of the S&P Utility Index and the monthly yields on Moody's A2 rated public utility bonds from January 1928 - May 2021.
(4) Using data from Value Line for the S&P Utilities Index, an expected return of 11.40% was derived based on expected dividend yields and long-term growth estimates as a proxy for market appreciation. Subtracting the expected A2 rated public utility bond yield of 3.95%, calculated on line 3 of page 3 of this Schedule results in an equity risk premium of 7.45%. (11.40% - 3.95% = 7.45%)
(5) Using data from Bloomberg Professional Service for the S&P Utilities Index, an expected return of 9.77% was derived based on expected dividend yields and long-term growth estimates as a proxy for market appreciation. Subtracting the expected A2 rated public utility bond yield of 3.95%, calculated on line 3 of page 3 of this Schedule results in an equity risk premium of 5.82%. (9.77% - 3.95% = 5.82%)
(6) Average of lines 1 through 5.

Exhibit DWD-1
Schedule DWD-3.13

Atmos Energy Corporation
Prediction of Equity Risk Premiums Relative to
Moody's A2 Rated Utility Bond Yields



Constant	Slope	Prospective A2 Rated Utility Bond (1)	Prospective Equity Risk Premium
7.564001 %	-0.48585	3.95 %	5.64 %

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

Source of Information:
Regulatory Research Associates
Bloomberg Professional Services

Exhibit DWD-1
Schedule DWD-4.1

Atmos Energy Corporation
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 Seven Natural Gas Distribution 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)
Atmos Energy Corporation	0.80	0.91	0.86	9.46 %	2.88 %	11.02 %	11.35 %	11.18 %
New Jersey Resources Corporation	1.00	0.97	0.98	9.46	2.88	12.15	12.20	12.17
Northwest Natural Holding Company	0.85	0.85	0.85	9.46	2.88	10.92	11.28	11.10
ONE Gas, Inc.	0.80	1.00	0.90	9.46	2.88	11.39	11.63	11.51
South Jersey Industries, Inc.	1.05	0.98	1.02	9.46	2.88	12.53	12.48	12.51
Southwest Gas Holdings, Inc.	0.95	1.09	1.02	9.46	2.88	12.53	12.48	12.51
Spire Inc.	0.85	1.00	0.92	9.46	2.88	11.58	11.77	11.68
Mean			0.94			11.73 %	11.88 %	11.81 %
Median			0.92			11.58 %	11.77 %	11.68 %
Average of Mean and Median			0.93			11.66 %	11.83 %	11.75 %

Notes on page 2 of this Schedule.

Atmos Energy Corporation
Notes to Accompany the Application of the CAPM and ECAPM

Notes:

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

Historical Data MRP Estimates:

Measure 1: Ibbotson Arithmetic Mean MRP (1926-2020)

Arithmetic Mean Monthly Returns for Large Stocks 1926-2020:	12.20	%
Arithmetic Mean Income Returns on Long-Term Government Bonds:	5.05	
MRP based on Ibbotson Historical Data:	7.15	%

Measure 2: Application of a Regression Analysis to Ibbotson Historical Data (1926-2020) 9.39 %

Measure 3: Application of the PRPM to Ibbotson Historical Data: (January 1926 - May 2021) 10.04 %

Value Line MRP Estimates:

Measure 4: Value Line Projected MRP (Thirteen weeks ending May 28, 2021)

Total projected return on the market 3-5 years hence*:	8.16	%
Projected Risk-Free Rate (see note 2):	2.88	
MRP based on Value Line Summary & Index:	5.28	%

*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:	14.32	%
Projected Risk-Free Rate (see note 2):	2.88	
MRP based on Value Line data	11.44	%

Measure 6: Bloomberg Projected MRP

Total return on the Market based on the S&P 500:	16.34	%
Projected Risk-Free Rate (see note 2):	2.88	
MRP based on Bloomberg data	13.46	%
Average of Value Line, Ibbotson, and Bloomberg MRP:	9.46	%

(2) For reasons explained in the direct testimony, the appropriate risk-free rate for cost of capital purposes is the average forecast of 30 year Treasury Bonds per the consensus of nearly 50 economists reported in Blue Chip Financial Forecasts. (See pages 10 and 11 of Schedule DWD-3.) The projection of the risk-free rate is illustrated below:

Second Quarter 2021	2.40	%
Third Quarter 2021	2.50	
Fourth Quarter 2021	2.60	
First Quarter 2022	2.60	
Second Quarter 2022	2.70	
Third Quarter 2022	2.80	
2023-2027	3.50	
2028-2032	3.90	
	2.88	%

(3) Average of Column 6 and Column 7.

Sources of Information:
- Value Line Summary and Index
- Blue Chip Financial Forecasts, June 1, 2021
- Stocks, Bonds, Bills, and Inflation - 2021 SBBI Yearbook, John Wiley & Sons, Inc.
- Bloomberg Professional Services

Exhibit DWD-1
Schedule DWD-5.2

Atmos Energy Corporation
Basis of Selection of Comparable Risk
Domestic Non-Price Regulated Companies

	[1]	[2]	[3]	[4]
Proxy Group of Seven Natural Gas Distribution Companies	Value Line Adjusted Beta	Unadjusted Beta	Residual Standard Error of the Regression	Standard Deviation of Beta
Atmos Energy Corporation	0.80	0.66	2.7453	0.0685
New Jersey Resources Corporation	0.95	0.92	3.0205	0.0754
Northwest Natural Holding Company	0.80	0.69	3.1454	0.0785
ONE Gas, Inc.	0.80	0.67	2.7077	0.0676
South Jersey Industries, Inc.	1.05	1.00	3.4767	0.0868
Southwest Gas Holdings, Inc.	0.95	0.88	3.0244	0.0755
Spire Inc.	0.85	0.71	2.8287	0.0706
Average	0.89	0.79	2.9927	0.0747

Beta Range (+/- 2 std. Devs. of Beta)	0.64	0.94
2 std. Devs. of Beta	0.15	
Residual Std. Err. Range (+/- 2 std. Devs. of the Residual Std. Err.)	2.7297	3.2557
Std. dev. of the Res. Std. Err.	0.1315	
2 std. devs. of the Res. Std. Err.	0.2630	

Source of Information: Valueline Proprietary Database, March 2021

Atmos Energy Corporation
Proxy Group of Non-Price Regulated Companies
Comparable in Total Risk to the
Proxy Group of Seven Natural Gas Distribution Companies

Proxy Group of Forty-Eight Non-Price Regulated Companies	[1] VL Adjusted Beta	[2] Unadjusted Beta	[3] Residual Standard Error of the Regression	[4] Standard Deviation of Beta
Apple Inc.	0.90	0.81	3.1746	0.0792
Abbott Labs.	0.95	0.88	2.7401	0.0684
Assurant Inc.	0.90	0.84	2.9537	0.0737
ANSYS, Inc.	0.85	0.74	2.8841	0.0720
Booz Allen Hamilton	0.90	0.82	3.0468	0.0760
Becton, Dickinson	0.80	0.66	2.8952	0.0722
Brown-Forman 'B'	0.90	0.77	2.7453	0.0685
Broadridge Fin'l	0.85	0.70	2.7332	0.0682
Brady Corp.	1.00	0.93	3.0007	0.0749
CACI Int'l	0.95	0.86	3.1684	0.0791
Casey's Gen'l Stores	0.90	0.78	3.2522	0.0812
Cadence Design Sys.	0.90	0.79	3.0338	0.0757
Cerner Corp.	0.90	0.84	2.7309	0.0681
CSW Industrials	0.90	0.81	2.8884	0.0721
Quest Diagnostics	0.85	0.75	2.7411	0.0684
Lauder (Estee)	0.95	0.85	2.8216	0.0704
Exponent, Inc.	0.90	0.79	2.9131	0.0727
Fastenal Co.	0.90	0.85	3.2203	0.0804
Gentex Corp.	0.95	0.91	2.7546	0.0687
Int'l Flavors & Frag	0.95	0.87	3.2238	0.0804
Ingredion Inc.	0.90	0.78	2.8793	0.0718
Iron Mountain	0.90	0.82	3.0897	0.0771
Hunt (J.B.)	0.95	0.86	2.8344	0.0707
J&J Snack Foods	0.90	0.84	2.9208	0.0729
Henry (Jack) & Assoc	0.85	0.71	2.7734	0.0692
ManTech Int'l 'A'	0.85	0.77	3.0653	0.0765
McCormick & Co.	0.80	0.66	2.7887	0.0696
Altria Group	0.90	0.83	2.9215	0.0729
MSA Safety	1.00	0.94	3.0076	0.0750
MSCI Inc.	0.95	0.87	2.9662	0.0740
Motorola Solutions	0.90	0.80	2.7926	0.0697
Vail Resorts	0.95	0.88	3.1939	0.0797
Maxim Integrated	0.95	0.87	2.9404	0.0734
Northrop Grumman	0.85	0.71	2.9032	0.0724
Old Dominion Freight	0.90	0.83	3.0708	0.0766
PerkinElmer Inc.	0.95	0.86	2.8896	0.0721
Philip Morris Int'l	0.95	0.88	3.2481	0.0811
Pool Corp.	0.85	0.75	3.2001	0.0799
Post Holdings	0.95	0.86	3.0105	0.0751
RLI Corp.	0.80	0.64	2.9883	0.0746
Rollins, Inc.	0.85	0.73	2.9697	0.0741
Selective Ins. Group	0.85	0.77	3.0004	0.0749
Sirius XM Holdings	0.95	0.91	2.7995	0.0699
Bio-Techne Corp.	0.80	0.67	3.2475	0.0810
Tetra Tech	0.90	0.84	3.0245	0.0755
Waters Corp.	0.95	0.86	2.7531	0.0687
West Pharmac. Svcs.	0.85	0.70	3.1887	0.0796
Western Union	0.80	0.67	2.7346	0.0682
Average	0.90	0.80	2.9609	0.0739
Proxy Group of Seven Natural Gas Distribution Companies	0.89	0.79	2.9927	0.0747

Source of Information: Valueline Proprietary Database, March 2021

Exhibit DWD-1
Schedule DWD-6.1

Atmos Energy Corporation
Summary of Cost of Equity Models Applied to
Proxy Group of Forty-Eight Non-Price Regulated Companies
Comparable in Total Risk to the
Proxy Group of Seven Natural Gas Distribution Companies

Principal Methods	Proxy Group of Forty-Eight Non-Price Regulated Companies
Discounted Cash Flow Model (DCF) (1)	12.83 %
Risk Premium Model (RPM) (2)	12.49
Capital Asset Pricing Model (CAPM) (3)	11.69
	12.34 %
	12.49 %
	12.42 %

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

Exhibit DWD-1
Schedule DWD-6.2

Atmos Energy Corporation
DCF Results for the Proxy Group of Non-Price-Regulated Companies Comparable in Total Risk to the
Proxy Group of Seven Natural Gas Distribution Companies

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Proxy Group of Forty-Eight Non-Price Regulated Companies	Average Dividend Yield	Value Line Projected Five Year Growth in EPS	Zack's Five Year Projected Growth Rate in EPS	Bloomberg'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)
Apple Inc.	0.69 %	14.50 %	12.50 %	12.10 %	17.93 %	14.26 %	0.74 %	15.00 %
Abbott Labs.	1.51	11.50	13.80	13.63	16.49	13.86	1.61	15.47
Assurant Inc.	1.76	11.50	17.50	17.50	17.50	16.00	1.90	17.90
ANSYS, Inc.	-	8.00	12.30	12.58	10.74	10.90	-	NA
Booz Allen Hamilton	1.80	10.50	10.60	13.00	9.67	10.94	1.90	12.84
Becton, Dickinson	1.35	7.50	8.90	8.30	11.85	9.14	1.41	10.55
Brown-Forman 'B'	0.97	11.00	NA	5.39	7.40	7.93	1.01	8.94
Broadridge Fin'l	1.48	8.50	NA	12.30	11.60	10.80	1.56	12.36
Brady Corp.	1.59	7.50	7.00	9.00	7.00	7.63	1.65	9.28
CACI Int'l	-	13.50	13.10	12.06	13.68	13.08	-	NA
Casey's Gen'l Stores	0.63	8.00	NA	15.81	7.85	10.55	0.66	11.21
Cadence Design Sys.	-	9.50	14.40	11.60	14.40	12.48	-	NA
Cerner Corp.	1.18	8.00	12.30	10.46	11.63	10.60	1.24	11.84
CSW Industrials	0.45	8.50	NA	12.00	12.00	10.83	0.47	11.30
Quest Diagnostics	1.91	10.00	26.50	(5.40)	3.26	13.25	2.04	15.29
Lauder (Estee)	0.71	11.00	10.70	18.20	27.18	16.77	0.77	17.54
Exponent, Inc.	0.83	12.50	NA	13.30	15.00	13.60	0.89	14.49
Fastenal Co.	2.21	8.00	9.00	8.70	7.95	8.41	2.30	10.71
Gentex Corp.	1.35	10.50	10.10	13.15	15.80	12.39	1.43	13.82
Int'l Flavors & Frag	2.20	7.50	9.80	21.48	7.72	11.63	2.33	13.96
Ingredion Inc.	2.76	7.50	NA	11.00	1.90	6.80	2.85	9.65
Iron Mountain	6.32	11.50	1.70	0.66	1.70	3.89	6.44	10.33
Hunt (J.B.)	0.71	8.00	15.00	15.00	21.53	14.88	0.76	15.64
J&J Snack Foods	1.55	10.00	NA	NA	6.00	8.00	1.61	9.61
Henry (Jack) & Assoc	1.18	9.00	10.90	12.47	10.64	10.75	1.24	11.99
ManTech Int'l 'A'	1.79	9.00	5.10	5.53	3.87	5.88	1.84	7.72
McCormick & Co.	1.53	5.50	6.70	5.87	6.00	6.02	1.58	7.60
Altria Group	6.94	6.00	4.00	4.35	4.35	4.68	7.10	11.78
MSA Safety	1.10	6.50	NA	9.00	18.00	11.17	1.16	12.33
MSCI Inc.	0.69	16.00	NA	15.00	15.31	15.44	0.74	16.18
Motorola Solutions	1.49	7.00	9.00	12.20	7.37	8.89	1.56	10.45
Vail Resorts	-	9.50	NA	87.08	72.95	56.51	-	NA
Maxim Integrated	-	8.00	10.00	11.95	21.91	12.97	-	NA
Northrop Grumman	1.84	7.00	NA	5.67	5.77	6.15	1.90	8.05
Old Dominion Freight	0.32	9.00	17.20	18.98	18.93	16.03	0.35	16.38
PerkinElmer Inc.	0.21	11.00	37.90	5.66	37.90	23.11	0.23	23.34
Philip Morris Int'l	5.19	6.50	8.70	10.75	12.75	9.67	5.44	15.11
Pool Corp.	0.83	15.00	NA	NA	17.00	16.00	0.90	16.90
Post Holdings	-	11.00	NA	20.30	31.20	20.83	-	NA
RLI Corp.	0.89	12.50	NA	NA	9.80	11.15	0.94	12.09
Rollins, Inc.	0.91	11.50	NA	NA	8.20	9.85	0.95	10.80
Selective Ins. Group	1.33	8.50	9.50	9.51	5.10	8.15	1.38	9.53
Sirius XM Holdings	0.96	35.50	12.70	40.32	10.10	24.66	1.08	25.74
Bio-Techne Corp.	0.32	12.50	14.00	19.03	15.00	15.13	0.34	15.47
Tetra Tech	0.62	13.50	15.00	13.85	15.00	14.34	0.66	15.00
Waters Corp.	-	6.00	7.10	8.19	7.77	7.26	-	NA
West Pharmac. Svcs.	0.22	17.00	25.80	18.55	25.80	21.79	0.24	22.03
Western Union	3.74	6.00	NA	4.57	9.19	6.59	3.86	10.45
							Mean	13.33 %
							Median	12.33 %
							Average of Mean and Median	12.83 %

NA= Not Available

(1) The application of the DCF model to the domestic, non-price regluated comparable risk companies is identical to the application of the DCF to the Utility Proxy Group. The dividend yield is derived by using the 60 day average price and the spot indicated dividend as of May 28, 2021. The dividend yield is then adjusted by 1/2 the average projected growth rate in EPS, which is calculated by averaging the 5 year projected growth in EPS provided by Value Line, www.zacks.com, Bloomberg Professional Services, and www.yahoo.com (excluding any negative growth rates) and then adding that growth rate to the adjusted dividend yield.

Source of Information: Value Line Investment Survey
www.zacks.com Downloaded on 05/28/2021
www.yahoo.com Downloaded on 05/28/2021
Bloomberg Professional Services

Exhibit DWD-1
Schedule DWD-6.3

Atmos Energy Corporation
Indicated Common Equity Cost Rate
Through Use of a Risk Premium Model
Using an Adjusted Total Market Approach

Line No.		Proxy Group of Forty-Eight Non-Price Regulated Companies
1.	Prospective Yield on Baa2 Rated Corporate Bonds (1)	4.46 %
2.	Equity Risk Premium (2)	8.03
3.	Risk Premium Derived Common Equity Cost Rate	12.49 %

Notes: (1) Average forecast of Baa2 corporate bonds based upon the consensus of nearly 50 economists reported in Blue Chip Financial Forecasts dated June 1, 2021 (see pages 10 and 11 of Schedule DWD-3). The estimates are detailed below.

Second Quarter 2021	3.80 %
Third Quarter 2021	4.00
Fourth Quarter 2021	4.10
First Quarter 2022	4.20
Second Quarter 2022	4.20
Third Quarter 2022	4.30
2023-2027	5.30
2028-2032	5.80
Average	4.46 %

(2) From page 5 of this Schedule.

Exhibit DWD-1
Schedule DWD-6.4

Atmos Energy Corporation
Comparison of Long-Term Issuer Ratings for the
Proxy Group of Forty-Eight Non-Price Regulated Companies of Comparable risk to the
Proxy Group of Seven Natural Gas Distribution Companies

	Moody's Long-Term Issuer Rating May 2021		Standard & Poor's Long-Term Issuer Rating May 2021	
Proxy Group of Forty-Eight Non-Price Regulated Companies	Long-Term Issuer Rating	Numerical Weighting (1)	Long-Term Issuer Rating	Numerical Weighting (1)
Apple Inc.	Aa1	2.0	AA+	2.0
Abbott Labs.	A2	6.0	A+	5.0
Assurant Inc.	Baa3	10.0	BBB	9.0
ANSYS, Inc.	NA	--	NA	--
Booz Allen Hamilton	NA	--	NA	--
Becton, Dickinson	Baa3	10.0	BBB	9.0
Brown-Forman 'B'	A1	5.0	A-	7.0
Broadridge Fin'l	Baa1	8.0	BBB+	8.0
Brady Corp.	NA	--	NA	--
CACI Int'l	NA	--	BB+	11.0
Casey's Gen'l Stores	NA	--	NA	--
Cadence Design Sys.	Baa2	9.0	BBB+	8.0
Cerner Corp.	NA	--	NA	--
CSW Industrials	NA	--	NA	--
Quest Diagnostics	Baa2	9.0	BBB+	8.0
Lauder (Estee)	A1	5.0	A+	5.0
Exponent, Inc.	NA	--	NA	--
Fastenal Co.	NA	--	NA	--
Gentex Corp.	NA	--	NA	--
Int'l Flavors & Frag	Baa3	10.0	BBB	9.0
Ingredion Inc.	Baa1	8.0	BBB	9.0
Iron Mountain	Ba3	13.0	BB-	13.0
Hunt (J.B.)	Baa1	8.0	BBB+	8.0
J&J Snack Foods	NA	--	NA	--
Henry (Jack) & Assoc	NA	--	NA	--
ManTech Int'l 'A'	WR	--	BB+	11.0
McCormick & Co.	Baa2	9.0	BBB	9.0
Altria Group	A3	7.0	BBB	9.0
MSA Safety	NA	--	NA	--
MSCI Inc.	Ba1	11.0	BB+	11.0
Motorola Solutions	Baa3	10.0	BBB-	10.0
Vail Resorts	B2	15.0	BB	12.0
Maxim Integrated	Baa1	8.0	BBB+	8.0
Northrop Grumman	Baa2	9.0	BBB+	8.0
Old Dominion Freight	NA	--	NA	--
PerkinElmer Inc.	Baa3	10.0	BBB	9.0
Philip Morris Int'l	A2	6.0	A	6.0
Pool Corp.	NA	--	NA	--
Post Holdings	B2	15.0	B+	14.0
RLI Corp.	Baa2	9.0	BBB	9.0
Rollins, Inc.	NA	--	NA	--
Selective Ins. Group	Baa2	9.0	BBB	9.0
Sirius XM Holdings	NA	--	BB	12.0
Bio-Techne Corp.	NA	--	NA	--
Tetra Tech	NA	--	NA	--
Waters Corp.	NA	--	NA	--
West Pharmac. Svcs.	NA	--	NA	--
Western Union	Baa2	9.0	BBB	9.0
Average	Baa2	8.8	BBB	8.9

Notes:
(1) From page 6 of Schedule DWD-3.

Source of Information:
Bloomberg Professional Services

Atmos Energy Corporation
Derivation of Equity Risk Premium Based on the Total Market Approach
Using the Beta for
Proxy Group of Forty-Eight Non-Price Regulated Companies of Comparable risk to the
Proxy Group of Seven Natural Gas Distribution Companies

Line No.	Equity Risk Premium Measure	Proxy Group of Forty-Eight Non-Price Regulated Companies
	Ibbotson-Based Equity Risk Premiums:	
1.	Ibbotson Equity Risk Premium (1)	5.92 %
2.	Regression on Ibbotson Risk Premium Data (2)	8.69
3.	Ibbotson Equity Risk Premium based on PRPM (3)	9.02
4.	Equity Risk Premium Based on Value Line Summary and Index (4)	4.60
5	Equity Risk Premium Based on Value Line S&P 500 Companies (5)	10.76
6.	Equity Risk Premium Based on Bloomberg S&P 500 Companies (6)	12.78
7.	Conclusion of Equity Risk Premium	8.63 %
8.	Adjusted Beta (7)	0.93
9.	Forecasted Equity Risk Premium	8.03 %

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

Sources of Information:
Stocks, Bonds, Bills, and Inflation - 2021 SBBI Yearbook, John Wiley & Sons, Inc.
Value Line Summary and Index
Blue Chip Financial Forecasts, June 1, 2021
Bloomberg Professional Services

Exhibit DWD-1
Schedule DWD-6.6

Atmos Energy Corporation
Traditional CAPM and ECAPM Results for the Proxy Group of Non-Price-Regulated Companies Comparable in Total Risk to the
Proxy Group of Seven Natural Gas Distribution Companies

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Proxy Group of Forty-Eight 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)
Apple Inc.	0.90	1.01	0.96	9.46 %	2.88 %	11.96 %	12.06 %	12.01 %
Abbott Labs.	0.90	0.85	0.88	9.46	2.88	11.20	11.49	11.35
Assurant Inc.	0.90	1.00	0.95	9.46	2.88	11.87	11.99	11.93
ANSYS, Inc.	0.85	0.97	0.91	9.46	2.88	11.49	11.70	11.59
Booz Allen Hamilton	0.90	0.92	0.91	9.46	2.88	11.49	11.70	11.59
Becton, Dickinson	0.80	0.58	0.69	9.46	2.88	9.41	10.14	9.77
Brown-Forman 'B'	0.90	0.97	0.94	9.46	2.88	11.77	11.91	11.84
Broadridge Fin'l	0.80	0.84	0.82	9.46	2.88	10.64	11.06	10.85
Brady Corp.	1.00	1.05	1.02	9.46	2.88	12.53	12.48	12.51
CACI Int'l	0.95	1.01	0.98	9.46	2.88	12.15	12.20	12.17
Casey's Gen'l Stores	0.90	0.91	0.91	9.46	2.88	11.49	11.70	11.59
Cadence Design Sys.	0.90	0.98	0.94	9.46	2.88	11.77	11.91	11.84
Cerner Corp.	0.90	0.89	0.90	9.46	2.88	11.39	11.63	11.51
CSW Industrials	0.90	1.05	0.97	9.46	2.88	12.06	12.13	12.09
Quest Diagnostics	0.85	0.96	0.91	9.46	2.88	11.49	11.70	11.59
Lauder (Estee)	0.95	1.00	0.98	9.46	2.88	12.15	12.20	12.17
Exponent, Inc.	0.90	0.94	0.92	9.46	2.88	11.58	11.77	11.68
Fastenal Co.	0.90	0.95	0.92	9.46	2.88	11.58	11.77	11.68
Gentex Corp.	0.95	1.06	1.01	9.46	2.88	12.43	12.41	12.42
Int'l Flavors & Frag	0.95	1.08	1.02	9.46	2.88	12.53	12.48	12.51
Ingredion Inc.	0.90	0.92	0.91	9.46	2.88	11.49	11.70	11.59
Iron Mountain	0.90	1.02	0.96	9.46	2.88	11.96	12.06	12.01
Hunt (J.B.)	0.95	0.91	0.93	9.46	2.88	11.68	11.84	11.76
J&J Snack Foods	0.90	0.77	0.84	9.46	2.88	10.83	11.20	11.02
Henry (Jack) & Assoc	0.85	0.89	0.87	9.46	2.88	11.11	11.42	11.26
ManTech Int'l 'A'	0.85	1.11	0.98	9.46	2.88	12.15	12.20	12.17
McCormick & Co.	0.80	0.70	0.75	9.46	2.88	9.97	10.57	10.27
Altria Group	0.90	0.88	0.89	9.46	2.88	11.30	11.56	11.43
MSA Safety	1.00	0.99	1.00	9.46	2.88	12.34	12.34	12.34
MSCI Inc.	0.95	0.94	0.94	9.46	2.88	11.77	11.91	11.84
Motorola Solutions	0.90	0.96	0.93	9.46	2.88	11.68	11.84	11.76
Vail Resorts	0.95	1.14	1.05	9.46	2.88	12.81	12.69	12.75
Maxim Integrated	0.95	0.99	0.97	9.46	2.88	12.06	12.13	12.09
Northrop Grumman	0.85	0.80	0.83	9.46	2.88	10.73	11.13	10.93
Old Dominion Freight	0.95	0.97	0.96	9.46	2.88	11.96	12.06	12.01
PerkinElmer Inc.	0.90	0.84	0.87	9.46	2.88	11.11	11.42	11.26
Philip Morris Int'l	0.95	0.91	0.93	9.46	2.88	11.68	11.84	11.76
Pool Corp.	0.85	0.95	0.90	9.46	2.88	11.39	11.63	11.51
Post Holdings	0.95	0.90	0.93	9.46	2.88	11.68	11.84	11.76
RLI Corp.	0.80	0.90	0.85	9.46	2.88	10.92	11.28	11.10
Rollins, Inc.	0.85	0.69	0.77	9.46	2.88	10.16	10.71	10.44
Selective Ins. Group	0.85	0.97	0.91	9.46	2.88	11.49	11.70	11.59
Sirius XM Holdings	0.95	1.10	1.02	9.46	2.88	12.53	12.48	12.51
Bio-Techne Corp.	0.80	0.93	0.86	9.46	2.88	11.02	11.35	11.18
Tetra Tech	0.95	1.06	1.00	9.46	2.88	12.34	12.34	12.34
Waters Corp.	0.95	0.86	0.91	9.46	2.88	11.49	11.70	11.59
West Pharmac. Svcs.	0.80	0.75	0.78	9.46	2.88	10.26	10.78	10.52
Western Union	0.80	1.05	0.93	9.46	2.88	11.68	11.84	11.76
		Mean	0.92			11.55 %	11.75 %	11.65 %
		Median	0.93			11.63 %	11.81 %	11.72 %
		Average of Mean and Median	0.93			11.59 %	11.78 %	11.69 %

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

Atmos Energy Corporation
Derivation of Investment Risk Adjustment Based upon
Ibbotson Associates' Size Premia for the Decile Portfolios of the NYSE/AMEX/NASDAQ

Line No.		[1] Market Capitalization on May 28, 2021 (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.	Atmos Energy Corporation	$ 597.101		8	1.46%	
2.	Proxy Group of Seven Natural Gas Distribution Companies	$ 4,615.314	7.7 x	4	0.75%	0.71%

	[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	$ 29,025.803	$ 1,966,078.882	-0.22%
	2	13,178.743	28,808.073	0.49%
	3	6,743.361	13,177.828	0.71%
	4	3,861.858	6,710.676	0.75%
	5	2,445.693	3,836.536	1.09%
	6	1,591.865	2,444.745	1.37%
	7	911.586	1,591.765	1.54%
	8	451.955	911.103	1.46%
	9	190.019	451.800	2.29%
Smallest	10	2.194	189.831	5.01%

*From 2021 Duff & Phelps Cost of Capital Navigator

Notes:

(1) From page 2 of this Schedule.

(2) Gleaned from Columns [B] and [C] on the bottom of this page. The appropriate decile (Column [A]) corresponds to the market capitalization of the proxy group, which is found in Column [1].

(3) Corresponding risk premium to the decile is provided in Column [D] on the bottom of this page.

(4) Line No. 1 Column [3] – Line No. 2 Column [3]. For example, the 0.71% in Column [4], Line No. 2 is derived as follows 0.71% = 1.46% - 0.75%.

Atmos Energy Corporation
Market Capitalization of Atmos Energy Corporation and the
Proxy Group of Seven Natural Gas Distribution Companies

Company	Exchange	[1] Common Stock Shares Outstanding at Fiscal Year End 2020 (millions)	[2] Book Value per Share at Fiscal Year End 2020 (1)	[3] Total Common Equity at Fiscal Year End 2020 (millions)	[4] Closing Stock Market Price on May 28, 2021	[5] Market-to-Book Ratio on May 28, 2021 (2)	[6] Market Capitalization on May 28, 2021 (3) (millions)
Atmos Energy Corporation		NA	NA	340.035 (4)	NA		
Based upon Proxy Group of Seven Natural Gas Distribution Companies						175.6 (5)	$ 597.101 (6)
Proxy Group of Seven Natural Gas Distribution Companies							
Atmos Energy Corporation	NYSE	$ 125.882	$ 53.949	$ 6,791.203	$ 99.170	183.8 %	$ 12,483.765
New Jersey Resources Corporation	NYSE	95.949	19.226	1,844.692	42.720	222.2	4,098.949
Northwest Natural Holding Company	NYSE	30.589	29.054	888.733	52.880	182.0	1,617.546
ONE Gas, Inc.	NYSE	53.167	42.006	2,233.311	74.320	176.9	3,951.352
South Jersey Industries, Inc.	NYSE	100.592	16.571	1,666.876	26.660	160.9	2,681.781
Southwest Gas Holdings, Inc.	NYSE	57.193	46.771	2,674.953	66.010	141.1	3,775.305
Spire Inc.	NYSE	51.612	44.182	2,280.300	71.660	162.2	3,698.501
Average		$ 73.569	$ 35.966	$ 2,625.724	$ 61.917	175.6 %	$ 4,615.314

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 the initial requested common equity ratio.
(5) The market-to-book ratio of Atmos Energy Corporation on May 28, 2021 is assumed to be equal to the market-to-book ratio of Proxy Group of Seven Natural Gas Distribution Companies on May 28, 2021 as appropriate.
(6) Column [3] multiplied by Column [5].

Source of Information: 2020 Annual Forms 10K
yahoo.finance.com
Bloomberg Professional

Exhibit DWD-1
Schedule DWD-8.1

Atmos Energy Corporation
Derivation of the Flotation Cost Adjustment to the Cost of Common Equity

Equity Issuances and Flotation Costs for FY 2019, 2018, 2017, and 2016

		[Column 1]	[Column 2]	[Column 3]	[Column 4]	[Column 5]	[Column 6]	[Column 7]
Fiscal Year	Transaction (1)	Shares Issued	Average Offering Price per Share (2)	Net Proceeds per Share (3)	Gross Equity Issue before Costs	Total Net Proceeds	Total Flotation Costs (4)	Flotation Cost Percentage (5)
2019	At the Market Equity Offering	5,390,836	$ 92.7500	$ 91.6555	$ 500,000,000	$ 494,100,000	$ 5,900,000	1.18%
2018	At the Market Equity Offering	4,558,404	$ 87.7500	$ 86.6751	$ 400,000,000	$ 395,100,000	$ 4,900,000	1.23%
2017	At the Market Equity Offering	1,303,494	$ 76.7169	$ 75.7963	$ 100,000,000	$ 98,800,000	$ 1,200,000	1.20%
2016	At the Market Equity Offering	1,360,756	$ 73.4886	$ 72.4597	$ 100,000,000	$ 98,600,000	$ 1,400,000	1.40%
					$ 1,100,000,000	$ 1,086,600,000	$ 13,400,000	1.22%

Flotation Cost Adjustment

	Average Dividend Yield	Average Projected EPS Growth Rate	Adjusted Dividend Yield	Average DCF Cost Rate Unadjusted for Flotation (6)	DCF Cost Rate Adjusted for Flotation (7)	Flotation Cost Adjustment (8)
Proxy Group of Seven Natural Gas Distribution Companies	3.44 %	6.02 %	3.54 %	9.56 %	9.60 %	0.04 %

See page 2 of this Schedule for notes.

Source of Information: Company SEC filings

Duke Energy Kentucky, Inc.
Derivation of Investment Risk Adjustment Based upon
Ibbotson Associates' Size Premia for the Decile Portfolios of the NYSE/AMEX/NASDAQ

		[1]		[2]	[3]	[4]
Line No.		Market Capitalization on September 30, 2020 (1)		Applicable Decile of the NYSE/AMEX/ NASDAQ (2)	Applicable Size Premium (3)	Spread from Applicable Size Premium (4)
		(millions)	(times larger)			
1.	Atmos Energy Corporation	$ 12,443.483	0.4 x	3	0.71%	-0.04%
2.	New Jersey Resources Corporation	$ 3,825.494	1.2 x	5	1.09%	0.34%
3.	Northwest Natural Holding Company	$ 1,650.277	2.8 x	6	1.37%	0.62%
4.	ONE Gas, Inc.	$ 4,089.053	1.1 x	4	0.75%	0.00%
5.	South Jersey Industries, Inc.	$ 2,271.366	2.0 x	6	1.37%	0.62%
6.	Southwest Gas Holdings, Inc.	$ 3,929.726	1.2 x	4	0.75%	0.00%
7.	Spire Inc.	$ 3,813.595	1.2 x	5	1.09%	0.34%
8.	Proxy Group of Seven Natural Gas Distribution Companies	$ 4,574.713		4	0.75%	

	[A]	[B]	[C]	[D]
	Decile	Market Capitalization of Smallest Company (millions)	Market Capitalization of Largest Company (millions)	Size Premium (Return in Excess of CAPM)*
Largest	1	$ 29,025.803	$ 1,966,078.882	-0.22%
	2	13,178.743	28,808.073	0.49%
	3	6,743.361	13,177.828	0.71%
	4	3,861.858	6,710.676	0.75%
	5	2,445.693	3,836.536	1.09%
	6	1,591.865	2,444.745	1.37%
	7	911.586	1,591.765	1.54%
	8	451.955	911.103	1.46%
	9	190.019	451.800	2.29%
Smallest	10	2.194	189.831	5.01%

*From 2021 Duff & Phelps Cost of Capital Navigator

Notes:

(1) From page 2 of this Attachment.

(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 -0.04% in Column [4], Line No. 2 is derived as follows -0.04% = 0.71% - 0.75%.

Duke Energy Kentucky, Inc.
Market Capitalization of Duke Energy Kentucky, Inc. and the
Proxy Group of Seven Natural Gas Distribution Companies

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Exchange	Common Stock Shares Outstanding at Fiscal Year End 2020 (millions)	Book Value per Share at Fiscal Year End 2020 (1)	Total Common Equity at Fiscal Year End 2020 (millions)	Closing Stock Market Price on March 31, 2021	Market-to-Book Ratio on March 31, 2021 (2)	Market Capitalization on March 31, 2021 (3) (millions)
Proxy Group of Seven Natural Gas Distribution Companies							
Atmos Energy Corporation	NYSE	$ 125.882	$ 53.949	$ 6,791.203	$ 98.850	183.2 %	$ 12,443.483
New Jersey Resources Corporation	NYSE	95.949	19.226	1,844.692	39.870	207.4	3,825.494
Northwest Natural Holding Company	NYSE	30.589	29.054	888.733	53.950	185.7	1,650.277
ONE Gas, Inc.	NYSE	53.167	42.006	2,233.311	76.910	183.1	4,089.053
South Jersey Industries, Inc.	NYSE	100.592	16.571	1,666.876	22.580	136.3	2,271.366
Southwest Gas Holdings, Inc.	NYSE	57.193	46.771	2,674.953	68.710	146.9	3,929.726
Spire Inc.	NYSE	51.612	44.182	2,280.300	73.890	167.2	3,813.595
Average		$ 73.569	$ 35.966	$ 2,625.724	$ 62.109	172.8 %	$ 4,574.713

NA= Not Available

Notes: (1) Column 3 / Column 1.
(2) Column 4 / Column 2.
(3) Column 1 * Column 4.

Source of Information: 2020 Annual Forms 10K
yahoo.finance.com
Bloomberg Professional

Tickers		ATO	NJR	NWN	OGS	SJI	SWX	SR
PX_LAST		ATO US Equity	NJR US Equity	NWN US Equ	OGS US Equi	SJI US Equity	SWX US Equi	SR US Equity
1	3/31/2021	98.85	39.87	53.95	76.91	22.58	68.71	73.89
2	3/30/2021	98.89	40.50	53.69	76.06	22.94	69.10	73.88
3	3/29/2021	98.85	40.66	53.88	76.27	22.67	69.33	73.62
4	3/26/2021	97.24	39.77	52.63	74.99	22.25	67.26	74.05
5	3/25/2021	97.08	40.12	52.70	75.22	22.58	68.51	72.99
6	3/24/2021	95.85	39.97	53.11	74.47	22.41	68.56	72.26
7	3/23/2021	94.18	39.38	51.23	73.31	22.56	67.22	71.60
8	3/22/2021	93.54	40.51	50.05	73.11	22.79	66.50	72.35
9	3/19/2021	94.09	41.61	52.96	74.74	22.57	67.80	73.74
10	3/18/2021	93.53	40.25	51.44	74.71	21.51	67.12	74.10
11	3/17/2021	92.43	39.48	50.57	74.77	22.50	66.07	73.48
12	3/16/2021	93.80	42.14	53.36	77.53	27.82	67.26	75.53
13	3/15/2021	93.19	42.42	54.15	77.03	28.64	66.27	74.64
14	3/12/2021	91.42	41.48	53.22	75.13	27.93	65.33	75.13
15	3/11/2021	89.88	40.69	52.12	73.75	27.46	65.51	72.87
16	3/10/2021	90.81	40.86	53.01	74.44	28.80	67.95	72.47
17	3/9/2021	89.34	40.24	52.25	73.39	28.05	68.69	71.97
18	3/8/2021	91.64	41.05	53.74	75.02	28.34	71.08	72.77
19	3/5/2021	91.71	40.22	51.71	73.60	26.68	69.28	70.92
20	3/4/2021	88.90	39.27	48.57	68.79	25.11	65.17	67.98
21	3/3/2021	88.45	39.65	47.47	68.77	26.23	63.73	67.28
22	3/2/2021	87.24	39.39	47.80	68.78	25.87	63.38	66.81
23	3/1/2021	85.75	40.29	48.25	69.55	25.61	63.64	66.97
24	2/26/2021	84.61	39.29	47.99	66.97	25.11	62.35	66.42
25	2/25/2021	88.23	39.48	48.79	69.01	25.51	64.11	67.94
26	2/24/2021	88.67	39.14	49.16	69.85	25.25	65.01	68.06
27	2/23/2021	89.63	39.31	49.06	70.01	25.37	65.86	68.69
28	2/22/2021	89.41	39.26	47.69	70.02	24.50	64.26	66.74
29	2/19/2021	93.56	39.60	48.88	74.06	24.26	64.80	67.67
30	2/18/2021	93.69	38.97	48.22	73.58	23.92	64.34	67.61
31	2/17/2021	92.43	38.87	47.82	72.97	23.94	63.66	66.47
32	2/16/2021	91.13	37.81	46.83	72.23	23.55	62.36	64.81
33	2/12/2021	91.05	36.62	46.32	72.69	23.66	61.83	63.97
34	2/11/2021	91.04	37.18	47.32	73.35	23.49	62.53	63.82
35	2/10/2021	91.85	37.38	46.67	73.73	23.48	61.73	63.22
36	2/9/2021	89.60	37.21	46.71	72.54	23.60	61.25	64.24
37	2/8/2021	89.08	36.30	45.79	72.55	22.76	61.39	64.75
38	2/5/2021	89.05	36.62	46.14	72.90	23.04	62.55	65.10
39	2/4/2021	88.78	36.05	45.09	72.41	22.76	61.91	64.02
40	2/3/2021	87.05	35.57	43.75	71.91	22.36	60.51	62.26
41	2/2/2021	88.66	35.94	44.38	73.46	22.64	60.62	62.97
42	2/1/2021	88.65	35.66	45.26	73.83	23.06	60.76	62.35
43	1/29/2021	89.00	35.01	46.71	73.13	23.10	59.96	61.19
44	1/28/2021	88.57	34.91	44.17	73.05	22.15	60.33	60.46
45	1/27/2021	90.83	35.46	46.50	74.60	23.08	60.42	60.89
46	1/26/2021	90.95	35.26	45.16	72.31	22.05	60.85	60.32
47	1/25/2021	90.44	35.80	44.40	72.48	22.66	60.56	61.59
48	1/22/2021	89.09	35.43	43.24	70.79	21.64	58.62	61.75
49	1/21/2021	89.45	34.96	42.92	70.62	21.10	57.55	61.09
50	1/20/2021	90.09	35.72	42.44	71.00	21.20	58.27	60.75
51	1/19/2021	90.08	36.52	43.49	71.35	21.96	58.89	61.16
52	1/15/2021	90.03	37.73	44.71	71.99	22.72	60.11	61.65
53	1/14/2021	87.64	37.74	44.40	71.46	22.52	59.89	61.21
54	1/13/2021	88.46	37.38	44.50	71.49	22.02	59.60	61.54
55	1/12/2021	87.62	36.84	43.64	71.56	21.95	59.79	61.01
56	1/11/2021	87.67	35.78	43.87	71.92	21.86	58.11	60.95
57	1/8/2021	89.26	35.44	43.93	72.61	21.61	58.51	62.13
58	1/7/2021	89.77	35.34	43.85	74.41	21.63	59.22	62.24
59	1/6/2021	93.71	35.63	45.27	77.49	22.06	60.96	63.74
60	1/5/2021	92.61	33.67	43.96	74.88	21.08	58.92	62.39

Ticker
ATO

Atmos Energy
CAPITALIZATION AND FINANCIAL STATISTICS (1)
2015 - 2020, Inclusive

	FYE: 9/30/2020	2020	2019	2018	2017	2016	2015
Capital Structure.							
Long Term Debt	LTDEBT	4,531,779,165.000	3,529,452,000.000	3,068,665,000.000	3,067,045,000.000	2,438,779,000.000	2,455,388,000.000
Preferred Stock	PFD	0.000	0.000	0.000	0.000	0.000	0.000
Common Shares Outst.	Input Data	125,882,477.000	119,338,925.000	111,273,683.000	106,104,634.000	103,930,560.000	101,478,818.000
Common Equity	TOTEQ	6,791,203,000.000	5,750,223,000.000	4,769,951,000.000	3,898,666,000.000	3,463,059,000.000	3,194,797,000.000
Sinking Fund Requirements	Input Data	0.000	0.000	0.000	0.000	0.000	0.000
Short Term Debt	STDEBT	0.000	464,915,000.000	575,780,000.000	447,745,000.000	829,811,000.000	457,927,000.000
EPS excluding extra	EPSAPPCOMM	4.890	4.350	5.430	3.600	3.380	3.090
Price - High	Bloomberg	120.570	114.650	94.770	88.690	81.320	58.810
Price - Low	Bloomberg	80.500	89.330	78.030	68.960	57.820	47.350
DPS by payable date	Bloomberg	2.300	2.100	1.940	1.800	1.680	1.560
AFUDC	AFUDC	31,929,000.00	18,808,000.00	6,800,000.000	2,500,000.000	2,800,000.000	0.000
Total Interest	INTEXP	84,474,000.00	103,153,000.00	106,646,000.000	120,182,000.000	115,948,000.000	116,241,000.000
Net Income before Extra.	NETINC	601,443,000.00	511,406,000.00	603,064,000.000	396,421,000.000	350,104,000.000	315,075,000.000
CE Income before Extra.	INCAVAILCOMM	601,443,000.00	511,406,000.00	603,064,000.000	396,421,000.000	350,104,000.000	315,075,000.000
Preferred Stock Dividends	PFDDIV	0.000	0.000	0.000	0.000	0.000	0.000
Common Dividends	COMDIVS1	282,444,000.000	245,717,000.000	214,906,000.000	191,931,000.000	175,126,000.000	160,018,000.000
Income Bef Extra Items-S&U	INCBEFEXT	601,443,000.000	511,406,000.000	603,064,000.000	396,421,000.000	350,104,000.000	315,075,000.000
Net Operating Cash Flow	NETOPGFC	1,037,999,000.000	968,769,000.000	1,124,662,000.000	867,090,000.000	794,990,000.000	836,519,000.000
Change in op'g Assets + Liabilities	CHGOPASLIAB	-133,676,000.000	-76,686,000.000	134,861,000.000	-73,177,000.000	-63,212,000.000	-19,990,000.000
Depreciation & Amortization	DEPAMORT	429,828,000.000	391,456,000.000	361,083,000.000	319,448,000.000	293,096,000.000	274,796,000.000
Income Tax Expense	INCTAX	145,353,000.000	138,903,000.000	8,080,000.000	221,383,000.000	200,373,000.000	195,690,000.000
Calculations							
Com Eq / Shares Out.	calc	53.949	48.184	42.867	36.744	33.321	31.482
Total Permanent Capital	calc	11,322,982,165.000	9,279,675,000.000	7,838,616,000.000	6,965,711,000.000	5,901,838,000.000	5,650,185,000.000
Average Price	calc	100.535	101.990	86.400	78.825	69.570	53.080
Total Debt		4,531,779,165.000	3,994,367,000.000	3,644,445,000.000	3,514,790,000.000	3,268,590,000.000	2,913,315,000.000
Total Capital	calc	11,322,982,165.000	9,744,590,000.000	8,414,396,000.000	7,413,456,000.000	6,731,649,000.000	6,108,112,000.000
Preferred Stk + Sink Fund Req	calc	0.000	0.000	0.000	0.000	0.000	0.000
NETOPGFC + CHGOPASLIAB - AFUDC	calc	872,394,000.000	873,275,000.000	1,252,723,000.000	791,413,000.000	728,978,000.000	816,529,000.000
EBITDA	calc	1,261,098,000.000	1,144,918,000.000	1,078,873,000.000	1,057,434,000.000	959,521,000.000	901,802,000.000

Atmos Energy
CAPITALIZATION AND FINANCIAL STATISTICS (1)
2015 - 2020, Inclusive

	2020	2019	2018	2017	2016	5 YEAR AVERAGE
			(MILLIONS OF DOLLARS)			
CAPITALIZATION STATISTICS						
AMOUNT OF CAPITAL EMPLOYED						
TOTAL PERMANENT CAPITAL	$11,322.982	$9,279.675	$7,838.616	$6,965.711	$5,901.838	
SHORT-TERM DEBT	$0.000	$464.915	$575.780	$447.745	$829.811	
TOTAL CAPITAL EMPLOYED	$11,322.982	$9,744.590	$8,414.396	$7,413.456	$6,731.649	
INDICATED AVERAGE CAPITAL COST RATES (2)						
TOTAL DEBT	1.98 %	2.70 %	2.98 %	3.54 %	3.75 %	
PREFERRED STOCK						
CAPITAL STRUCTURE RATIOS						
BASED ON TOTAL PERMANENT CAPITAL:						
LONG-TERM DEBT	40.02 %	38.03 %	39.15 %	44.03 %	41.32 %	40.51 %
PREFERRED STOCK	0.00	0.00	0.00	0.00	0.00	0.00
COMMON EQUITY	59.98	61.97	60.85	55.97	58.68	59.49
TOTAL	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
BASED ON TOTAL CAPITAL:						
TOTAL DEBT, INCLUDING SHORT-TERM	40.02 %	40.99 %	43.31 %	47.41 %	48.56 %	44.06 %
PREFERRED STOCK	0.00	0.00	0.00	0.00	0.00	0.00
COMMON EQUITY	59.98	59.01	56.69	52.59	51.44	55.94
TOTAL	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
FINANCIAL STATISTICS						
FINANCIAL RATIOS - MARKET BASED						
EARNINGS / PRICE RATIO	4.86 %	4.27 %	6.28 %	4.57 %	4.86 %	4.97 %
MARKET / AVERAGE BOOK RATIO	196.87	224.03	217.06	225.01	214.71	215.54
DIVIDEND YIELD	2.29	2.06	2.25	2.28	2.41	2.26
DIVIDEND PAYOUT RATIO	46.96	48.05	35.64	48.42	50.02	45.82
RATE OF RETURN ON AVERAGE BOOK COMMON EQUITY	9.59 %	9.72 %	13.91 %	10.77 %	10.52 %	10.90 %
TOTAL DEBT / EBITDA (3)	3.59 x	3.49 x	3.38 x	3.32 x	3.41 x	3.44 x
FUNDS FROM OPERATIONS / TOTAL DEBT (4)	19.25 %	21.86 %	34.37 %	22.52 %	22.30 %	24.06 %
TOTAL DEBT / TOTAL CAPITAL	40.02 %	40.99 %	43.31 %	47.41 %	48.56 %	44.06 %

Ticker
NJR

New Jersey Resources
CAPITALIZATION AND FINANCIAL STATISTICS (1)
2015 - 2020, Inclusive

	FYE: 09/30/2020	2020	2019	2018	2017	2016	2015
Capital Structure:							
Long Term Debt	LTDEBT	2,286,702,000.00	1,558,596,000.000	1,304,164,000.000	1,162,455,000.000	1,125,002,000.000	854,733,000.000
Preferred Stock	PFD	0.000	0.000	0.000	0.000	0.000	0.000
Common Shares Outst.	Input Data	95,949,183.00	89,338,054.000	86,107,943.000	86,555,507.000	86,086,355.000	85,531,423.000
Common Equity	TOTEQ	1,844,692,000.00	1,551,717,000.000	1,418,978,000.000	1,236,643,000.000	1,166,591,000.000	1,106,956,000.000
Sinking Fund Requirements	Input Data	0.000	0.000	0.000	0.000	0.000	0.000
Short Term Debt	STDEBT	125,350,000.00	25,450,000.000	151,950,000.000	266,000,000.000	121,700,000.000	66,350,000.000
EPS excluding extra	EPSAPPCOMM	2.040	1.890	2.640	1.520	1.520	2.100
Price - High	Bloomberg	45.460	51.130	47.550	44.250	38.710	33.475
Price - Low	Bloomberg	24.610	43.820	36.250	31.070	28.140	24.805
DPS by payable date	Bloomberg	1.270	1.190	1.110	1.038	0.975	0.915
AFUDC	AFUDC	19,733,000.000	10,202,000.000	7,510,000.000	5,178,000.000	9,384,000.000	6,297,000.000
Total Interest	INTEXP	67,597,000.000	47,082,000.000	46,286,000.000	44,886,000.000	31,044,000.000	27,721,000.000
Net Income before Extra.	NETINC	193,919,000.000	169,505,000.000	233,436,000.000	132,065,000.000	131,672,000.000	180,960,000.000
CE Income before Extra.	INCAVAILCOMM	193,919,000.000	169,505,000.000	233,436,000.000	132,065,000.000	131,672,000.000	180,960,000.000
Preferred Stock Dividends	PFDDIV	0.000	0.000	0.000	0.000	0.000	0.000
Common Dividends	COMDIVS1	117,804,000.000	104,059,000.000	95,835,000.000	87,988,000.000	82,445,000.000	76,532,000.000
Income Bef Extra Items-S&U	INCBEFEXT	193,919,000.000	169,505,000.000	233,436,000.000	132,065,000.000	131,672,000.000	180,960,000.000
Net Operating Cash Flow	NETOPGFC	213,481,000.000	189,350,000.000	398,286,000.000	248,046,000.000	142,630,000.000	387,920,000.000
Change in op'g Assets + Liabilities	CHGOPASLIAB	-8,096,000.000	-27,759,000.000	97,004,000.000	17,081,000.000	-123,325,000.000	76,753,000.000
Depreciation & Amortization	DEPAMORT	119,894,000.000	91,730,000.000	85,701,000.000	81,841,000.000	72,748,000.000	61,399,000.000
Income Tax Expense	INCTAX	-6,944,000.000	-37,751,000.000	-53,785,000.000	18,343,000.000	23,530,000.000	59,724,000.000
Calculations							
Com Eq / Shares Out	calc	19.226	17.369	16.479	14.287	13.551	12.942
Total Permanent Capital	calc	4,131,394,000.000	3,110,313,000.000	2,723,142,000.000	2,399,098,000.000	2,291,593,000.000	1,961,689,000.000
Average Price	calc	35.035	47.475	41.900	37.660	33.425	29.140
Total Debt		2,412,052,000.000	1,584,046,000.000	1,456,114,000.000	1,428,455,000.000	1,246,702,000.000	921,083,000.000
Total Capital	calc	4,256,744,000.000	3,135,763,000.000	2,875,092,000.000	2,665,098,000.000	2,413,293,000.000	2,028,039,000.000
Preferred Stk + Sink Fund Req.	calc	0.000	0.000	0.000	0.000	0.000	0.000
NETOPGFC + CHGOPASLIAB - AFUDC	calc	185,652,000.000	151,389,000.000	487,780,000.000	259,949,000.000	9,921,000.000	458,376,000.000
EBITDA	calc	374,466,000.000	270,566,000.000	311,638,000.000	277,135,000.000	258,994,000.000	329,804,000.000

New Jersey Resources
CAPITALIZATION AND FINANCIAL STATISTICS (1)
2015 - 2020, Inclusive

	2020	2019	2018 (MILLIONS OF DOLLARS)	2017	2016	5 YEAR AVERAGE
CAPITALIZATION STATISTICS						
AMOUNT OF CAPITAL EMPLOYED						
TOTAL PERMANENT CAPITAL	$4,131.394	$3,110.313	$2,723.142	$2,399.098	$2,291.593	
SHORT-TERM DEBT	$125.350	$25.450	$151.950	$266.000	$121.700	
TOTAL CAPITAL EMPLOYED	$4,256.744	$3,135.763	$2,875.092	$2,665.098	$2,413.293	
INDICATED AVERAGE CAPITAL COST RATES (2)						
TOTAL DEBT	3.38 %	3.10 %	3.21 %	3.36 %	2.86 %	
PREFERRED STOCK						
CAPITAL STRUCTURE RATIOS						
BASED ON TOTAL PERMANENT CAPITAL:						
LONG-TERM DEBT	55.35 %	50.11 %	47.89 %	48.45 %	49.09 %	50.18 %
PREFERRED STOCK	0.00	0.00	0.00	0.00	0.00	0.00
COMMON EQUITY	44.65	49.89	52.11	51.55	50.91	49.82
TOTAL	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
BASED ON TOTAL CAPITAL:						
TOTAL DEBT, INCLUDING SHORT-TERM	56.66 %	50.52 %	50.65 %	53.60 %	51.66 %	52.62 %
PREFERRED STOCK	0.00	0.00	0.00	0.00	0.00	0.00
COMMON EQUITY	43.34	49.48	49.35	46.40	48.34	47.38
TOTAL	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
FINANCIAL STATISTICS						
FINANCIAL RATIOS - MARKET BASED						
EARNINGS / PRICE RATIO	5.82 %	3.98 %	6.30 %	4.04 %	4.55 %	4.94 %
MARKET / AVERAGE BOOK RATIO	191.48	280.52	272.38	270.56	252.33	253.45
DIVIDEND YIELD	3.62	2.51	2.65	2.75	2.92	2.89
DIVIDEND PAYOUT RATIO	60.75	61.39	41.05	66.62	62.61	58.48
RATE OF RETURN ON AVERAGE BOOK COMMON EQUITY	11.42 %	11.41 %	17.58 %	10.99 %	11.58 %	12.60 %
TOTAL DEBT / EBITDA (3)	6.44 x	5.85 x	4.67 x	5.15 x	4.81 x	5.38 x
FUNDS FROM OPERATIONS / TOTAL DEBT (4)	7.70 %	9.56 %	33.50 %	18.20 %	0.80 %	13.95 %
TOTAL DEBT / TOTAL CAPITAL	56.66 %	50.52 %	50.65 %	53.60 %	51.66 %	52.62 %

Ticker
NWN

Northwest Nat. Gas
CAPITALIZATION AND FINANCIAL STATISTICS (1)
2015 - 2020, Inclusive

	FYE: 12/31/2020	2020	2019	2018	2017	2016	2015
Capital Structure.							
Long Term Debt	LTDEBT	955,425,000.000	881,064,000.000	736,236,000.000	779,887,000.000	719,323,000.000	601,700,000.000
Preferred Stock	PFD	0.000	0.000	0.000	0.000	0.000	0.000
Common Shares Outst.	Input Data	30,589,000.000	30,472,000.000	28,880,000.000	28,736,000.000	28,630,000.000	27,427,000.000
Common Equity	TOTEQ	888,733,000.000	865,999,000.000	762,634,000.000	742,776,000.000	850,497,000.000	780,972,000.000
Sinking Fund Requirements	Input Data	0.000	0.000	0.000	0.000	0.000	0.000
Short Term Debt	STDEBT	304,525,000.000	149,100,000.000	217,620,000.000	54,200,000.000	53,300,000.000	270,035,000.000
EPS excluding extra	EPSAPPCOMM	2.510	2.070	2.240	-1.940	2.120	1.960
Price - High	Bloomberg	76.900	73.860	70.710	69.150	65.600	51.980
Price - Low	Bloomberg	43.410	57.460	51.950	56.850	49.440	42.180
DPS by payable date	Bloomberg	1.910	1.900	1.890	1.883	1.873	1.863
AFUDC	AFUDC	0.000	700,000.000	4,100,000.000	5,298,000.000	0.000	0.000
Total Interest	INTEXP	43,052,000.000	42,685,000.000	37,059,000.000	38,501,000.000	39,128,000.000	42,539,000.000
Net Income before Extra	NETINC	76,781,000.000	61,735,000.000	64,569,000.000	-55,623,000.000	58,895,000.000	53,703,000.000
CE Income before Extra.	INCAVAILCOMM	76,781,000.000	61,735,000.000	64,569,000.000	-55,623,000.000	58,895,000.000	53,703,000.000
Preferred Stock Dividends	PFDDIV	0.000	0.000	0.000	0.000	0.000	0.000
Common Dividends	COMDIVS1	58,708,000.000	56,833,000.000	54,736,000.000	53,957,000.000	51,508,000.000	49,243,000.000
Income Bef Extra Items-S&U	INCBEFEXT	76,781,000.000	61,735,000.000	64,569,000.000	-55,623,000.000	58,895,000.000	53,703,000.000
Net Operating Cash Flow	NETOPGFC	143,020,000.000	185,298,000.000	168,771,000.000	206,704,000.000	222,147,000.000	184,688,000.000
Change in op'g Assets + Liabilities	CHGOPASLIAB	-24,567,000.000	-35,408,000.000	-10,041,000.000	30,696,000.000	33,237,000.000	-7,190,000.000
Depreciation & Amortization	DEPAMORT	103,683,000.000	91,496,000.000	85,156,000.000	85,578,000.000	82,289,000.000	80,923,000.000
Income Tax Expense	INCTAX	21,082,000.000	12,642,000.000	24,191,000.000	-30,757,000.000	40,714,000.000	35,753,000.000
Calculations							
Com Eq / Shares Out.	calc	29.054	28.419	26.407	25.848	29.706	28.475
Total Permanent Capital	calc	1,844,158,000.000	1,747,063,000.000	1,498,870,000.000	1,522,663,000.000	1,569,820,000.000	1,382,672,000.000
Average Price	calc	60.155	65.660	61.330	63.000	57.520	47.080
Total Debt		1,259,950,000.000	1,030,164,000.000	953,856,000.000	834,087,000.000	772,623,000.000	871,735,000.000
Total Capital	calc	2,148,683,000.000	1,896,163,000.000	1,716,490,000.000	1,576,863,000.000	1,623,120,000.000	1,652,707,000.000
Preferred Stk + Sink Fund Req.	calc	0.000	0.000	0.000	0.000	0.000	0.000
NETOPGFC + CHGOPASLIAB - AFUDC	calc	118,453,000.000	149,190,000.000	154,630,000.000	232,102,000.000	255,384,000.000	177,498,000.000
EBITDA	calc	244,598,000.000	208,558,000.000	210,975,000.000	37,699,000.000	221,026,000.000	212,918,000.000

Northwest Nat. Gas

CAPITALIZATION AND FINANCIAL STATISTICS (1)

2015 - 2020, Inclusive

	2020	2019	2018	2017	2016	5 YEAR AVERAGE
			(MILLIONS OF DOLLARS)			
CAPITALIZATION STATISTICS						
AMOUNT OF CAPITAL EMPLOYED						
TOTAL PERMANENT CAPITAL	$1,844.158	$1,747.063	$1,498.870	$1,522.663	$1,569.820	
SHORT-TERM DEBT	$304.525	$149.100	$217.620	$54.200	$53.300	
TOTAL CAPITAL EMPLOYED	$2,148.683	$1,896.163	$1,716.490	$1,576.863	$1,623.120	
INDICATED AVERAGE CAPITAL COST RATES (2)						
TOTAL DEBT	3.76 %	4.30 %	4.15 %	4.79 %	4.76 %	
PREFERRED STOCK						
CAPITAL STRUCTURE RATIOS						
BASED ON TOTAL PERMANENT CAPITAL:						
LONG-TERM DEBT	51.81 %	50.43 %	49.12 %	51.22 %	45.82 %	49.68 %
PREFERRED STOCK	0.00	0.00	0.00	0.00	0.00	0.00
COMMON EQUITY	48.19	49.57	50.88	48.78	54.18	50.32
TOTAL	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
BASED ON TOTAL CAPITAL:						
TOTAL DEBT, INCLUDING SHORT-TERM	58.64 %	54.33 %	55.57 %	52.90 %	47.60 %	53.81 %
PREFERRED STOCK	0.00	0.00	0.00	0.00	0.00	0.00
COMMON EQUITY	41.36	45.67	44.43	47.10	52.40	46.19
TOTAL	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
FINANCIAL STATISTICS						
FINANCIAL RATIOS - MARKET BASED						
EARNINGS / PRICE RATIO	4.17 %	3.15 %	3.65 %	-3.08 %	3.69 %	2.32 %
MARKET / AVERAGE BOOK RATIO	209.33	239.52	234.73	226.80	197.73	221.62
DIVIDEND YIELD	3.18	2.89	3.08	2.99	3.26	3.08
DIVIDEND PAYOUT RATIO	76.46	92.06	84.77	-97.00	87.46	48.75
RATE OF RETURN ON AVERAGE BOOK COMMON EQUITY	8.75 %	7.58 %	8.58 %	-6.98 %	7.22 %	5.03 %
TOTAL DEBT / EBITDA (3)	5.15 x	4.94 x	4.52 x	22.12 x	3.50 x	8.05 x
FUNDS FROM OPERATIONS / TOTAL DEBT (4)	9.40 %	14.48 %	16.21 %	27.83 %	33.05 %	20.19 %
TOTAL DEBT / TOTAL CAPITAL	58.64 %	54.33 %	55.57 %	52.90 %	47.60 %	53.81 %

Ticker
OGS

ONE Gas Inc
CAPITALIZATION AND FINANCIAL STATISTICS (1)
2015 - 2020, Inclusive

	FYE: 12/31/2020	2020	2019	2018	2017	2016	2015
Capital Structure:							
Long Term Debt	LTDEBT	1,601,300,000.000	1,286,064,000.000	1,285,483,000.000	1,193,257,000.000	1,192,453,000.000	1,201,312,000.000
Preferred Stock	PFD	0.000	0.000	0.000	0.000	0.000	0.000
Common Shares Outst.	Input Data	53,166,733.000	52,771,749.000	52,564,902.000	52,312,516.000	52,598,005.000	52,259,224.000
Common Equity	TOTEQ	2,233,311,000.000	2,129,390,000.000	2,042,656,000.000	1,960,209,000.000	1,888,280,000.000	1,841,555,000.000
Sinking Fund Requirements	Input Data	0.000	0.000	0.000	0.000	0.000	0.000
Short Term Debt	STDEBT	418,225,000.000	516,500,000.000	299,500,000.000	357,215,000.000	145,000,000.000	12,500,000.000
EPS excluding extra	EPSAPPCOMM	3.680	3.510	3.250	3.080	2.650	2.240
Price - High	Bloomberg	96.690	96.270	87.030	79.250	66.590	51.340
Price - Low	Bloomberg	66.550	76.130	62.750	62.300	48.400	39.380
DPS by payable date	Bloomberg	2.160	2.000	1.840	1.680	1.400	1.200
AFUDC	AFUDC	4,200,000.000	4,600,000.000	3,400,000.000	3,000,000.000	3,600,000.000	2,600,000.000
Total Interest	INTEXP	62,505,000.000	62,681,000.000	51,305,000.000	46,065,000.000	43,739,000.000	44,570,000.000
Net Income before Extra.	NETINC	196,412,000.000	186,749,000.000	172,234,000.000	162,995,000.000	140,095,000.000	119,030,000.000
CE Income before Extra.	INCAVAILCOMM	196,412,000.00	186,749,000.000	172,234,000.000	162,995,000.000	140,095,000.000	119,030,000.000
Preferred Stock Dividends	PFDDIV	0.00	0.000	0.000	0.000	0.000	0.000
Common Dividends	COMDIVS1	114,372,000.00	105,424,000.000	96,594,000.000	87,951,000.000	73,209,000.000	62,826,000.000
Income Bef Extra Items-S&U	INCBEFEXT	196,412,000.000	186,749,000.000	172,234,000.000	162,995,000.000	140,095,000.000	119,030,000.000
Net Operating Cash Flow	NETOPGFC	364,500,000.000	310,345,000.000	467,694,000.000	253,800,000.000	281,567,000.000	394,207,000.000
Change in op'g Assets + Liabilities	CHGOPASLIAB	-70,531,000.000	-88,414,000.000	65,431,000.000	-18,108,000.000	-30,653,000.000	41,327,000.000
Depreciation & Amortization	DEPAMORT	194,881,000.000	180,395,000.000	160,086,000.000	151,889,000.000	143,829,000.000	133,023,000.000
Income Tax Expense	INCTAX	41,579,000.000	42,852,000.000	53,531,000.000	93,143,000.000	85,243,000.000	72,979,000.000
Calculations							
Com Eq / Shares Out	calc	42.006	40.351	38.860	37.471	35.900	35.239
Total Permanent Capital	calc	3,834,611,000.000	3,415,454,000.000	3,328,139,000.000	3,153,466,000.000	3,080,733,000.000	3,042,867,000.000
Average Price	calc	81.620	86.200	74.890	70.775	57.495	45.360
Total Debt		2,019,525,000.000	1,802,564,000.000	1,584,983,000.000	1,550,472,000.000	1,337,453,000.000	1,213,812,000.000
Total Capital	calc	4,252,836,000.000	3,931,954,000.000	3,627,639,000.000	3,510,681,000.000	3,225,733,000.000	3,055,367,000.000
Preferred Stk + Sink Fund Req.	calc	0.000	0.000	0.000	0.000	0.000	0.000
NETOPGFC + CHGOPASLIAB - AFUDC	calc	289,769,000.000	217,331,000.000	529,725,000.000	232,692,000.000	247,314,000.000	432,934,000.000
EBITDA	calc	495,377,000.000	472,677,000.000	437,156,000.000	454,092,000.000	412,906,000.000	369,602,000.000

ONE Gas, Inc.
CAPITALIZATION AND FINANCIAL STATISTICS (1)
2015 - 2020, Inclusive

	2020	2019	2018	2017	2016	5 YEAR AVERAGE
	(MILLIONS OF DOLLARS)					
CAPITALIZATION STATISTICS						
AMOUNT OF CAPITAL EMPLOYED						
TOTAL PERMANENT CAPITAL	$3,834.611	$3,415.454	$3,328.139	$3,153.466	$3,080.733	
SHORT-TERM DEBT	$418.225	$516.500	$299.500	$357.215	$145.000	
TOTAL CAPITAL EMPLOYED	$4,252.836	$3,931.954	$3,627.639	$3,510.681	$3,225.733	
INDICATED AVERAGE CAPITAL COST RATES (2)						
TOTAL DEBT	3.27 %	3.70 %	3.27 %	3.19 %	3.43 %	
PREFERRED STOCK						
CAPITAL STRUCTURE RATIOS						
BASED ON TOTAL PERMANENT CAPITAL:						
LONG-TERM DEBT	41.76 %	37.65 %	38.62 %	37.84 %	38.71 %	38.92 %
PREFERRED STOCK	0.00	0.00	0.00	0.00	0.00	0.00
COMMON EQUITY	58.24	62.35	61.38	62.16	61.29	61.08
TOTAL	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
BASED ON TOTAL CAPITAL:						
TOTAL DEBT, INCLUDING SHORT-TERM	47.49 %	45.84 %	43.69 %	44.16 %	41.46 %	44.53 %
PREFERRED STOCK	0.00	0.00	0.00	0.00	0.00	0.00
COMMON EQUITY	52.51	54.16	56.31	55.84	58.54	55.47
TOTAL	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
FINANCIAL STATISTICS						
FINANCIAL RATIOS - MARKET BASED						
EARNINGS / PRICE RATIO	4.51 %	4.07 %	4.34 %	4.35 %	4.61 %	4.38 %
MARKET / AVERAGE BOOK RATIO	198.21	217.65	196.22	192.92	161.64	193.33
DIVIDEND YIELD	2.65	2.32	2.46	2.37	2.43	2.45
DIVIDEND PAYOUT RATIO	58.23	56.45	56.08	53.96	52.26	55.40
RATE OF RETURN ON AVERAGE BOOK COMMON EQUITY	9.00 %	8.95 %	8.61 %	8.47 %	7.51 %	8.51 %
TOTAL DEBT / EBITDA (3)	4.08 x	3.81 x	3.63 x	3.41 x	3.24 x	3.63 x
FUNDS FROM OPERATIONS / TOTAL DEBT (4)	14.35 %	12.06 %	33.42 %	15.01 %	18.49 %	18.67 %
TOTAL DEBT / TOTAL CAPITAL	47.49 %	45.84 %	43.69 %	44.16 %	41.46 %	44.53 %

Ticker
SJI

South Jersey Industries, Inc
CAPITALIZATION AND FINANCIAL STATISTICS (1)
2015 - 2020, Inclusive

	FYE: 12/31/2020	2020	2019	2018	2017	2016	2015
Capital Structure:							
Long Term Debt	LTDEBT	2,919,201,000.000	2,537,995,000.000	2,840,772,000.000	1,186,808,000.000	1,039,914,000.000	1,035,848,000.000
Preferred Stock	PFD	0.000	0.000	0.000	0.000	0.000	0.000
Common Shares Outst.	Input Data	100,591,940.000	92,394,155.000	85,506,218.000	79,549,080.000	79,478,055.000	70,965,622.000
Common Equity	TOTEQ	1,666,876,000.000	1,423,785,000.000	1,267,022,000.000	1,192,409,000.000	1,289,240,000.000	1,037,539,000.000
Sinking Fund Requirements	Input Data	0.000	0.000	0.000	0.000	0.000	0.000
Short Term Debt	STDEBT	596,400,000.000	848,700,000.000	270,500,000.000	346,400,000.000	296,100,000.000	431,700,000.000
EPS excluding extra	EPSAPPCOMM	1.620	0.840	0.210	-0.040	1.560	1.520
Price - High	Yahoo	33.210	34.270	36.130	38.120	34.680	30.295
Price - Low	Yahoo	18.480	26.890	26.110	30.780	22.630	21.370
DPS by payable date	Yahoo	1.190	1.160	1.130	1.100	1.070	1.018
AFUDC	AFUDC	1,901,000.000	1,546,000.000	1,835,000.000	3,094,000.000	7,500,000.000	1,109,000.000
Total Interest	INTEXP	118,534,000.000	114,477,000.000	90,296,000.000	54,019,000.000	31,449,000.000	31,622,000.000
Net Income before Extra.	NETINC	157,042,000.000	76,917,000.000	17,663,000.000	-3,404,000.000	119,061,000.000	105,107,000.000
CE Income before Extra.	INCAVAILCOMM	157,084,000.000	76,917,000.000	17,663,000.000	-3,404,000.000	119,061,000.000	105,107,000.000
Preferred Stock Dividends	PFDDIV	0.000	0.000	0.000	0.000	0.000	0.000
Common Dividends	COMDIVS1	114,643,000.000	106,938,000.000	94,756,000.000	87,308,000.000	82,380,000.000	70,158,000.000
Income Bef Extra Items-S&U	INCBEFEXT	157,042,000.000	76,917,000.000	17,663,000.000	-3,404,000.000	119,061,000.000	105,610,000.000
Net Operating Cash Flow	NETOPGFC	311,639,000.000	121,052,000.000	143,583,000.000	190,321,000.000	262,240,000.000	186,794,000.000
Change in op'g Assets + Liabilities	CHGOPASLIAB	-16,175,000.000	-91,396,000.000	281,000.000	35,102,000.000	60,492,000.000	10,893,000.000
Depreciation & Amortization	DEPAMORT	170,647,000.000	133,385,000.000	132,914,000.000	109,818,000.000	91,042,000.000	91,042,000.000
Income Tax Expense	INCTAX	22,664,000.000	21,061,000.000	561,000.000	-24,937,000.000	54,151,000.000	1,360,000.000
Calculations							
Com Eq / Shares Out	calc	16.571	15.410	14.818	14.990	16.221	14.620
Total Permanent Capital	calc	4,586,077,000.000	3,961,780,000.000	4,107,794,000.000	2,379,217,000.000	2,329,154,000.000	2,073,387,000.000
Average Price	calc	25.845	30.580	31.120	34.450	28.655	25.833
Total Debt		3,515,601,000.000	3,386,695,000.000	3,111,272,000.000	1,533,208,000.000	1,336,014,000.000	1,467,548,000.000
Total Capital	calc	5,182,477,000.000	4,810,480,000.000	4,378,294,000.000	2,725,617,000.000	2,625,254,000.000	2,505,087,000.000
Preferred Stk + Sink Fund Req.	calc	0.000	0.000	0.000	0.000	0.000	0.000
NETOPGFC + CHGOPASLIAB - AFUDC	calc	293,563,000.000	28,110,000.000	142,029,000.000	222,329,000.000	315,232,000.000	196,578,000.000
EBITDA	calc	468,887,000.000	345,840,000.000	241,434,000.000	135,496,000.000	295,703,000.000	229,634,000.000

South Jersey Industries, Inc.
CAPITALIZATION AND FINANCIAL STATISTICS (1)
2015 - 2020, Inclusive

	2020	2019	2018	2017	2016	5 YEAR AVERAGE
			(MILLIONS OF DOLLARS)			
CAPITALIZATION STATISTICS						
AMOUNT OF CAPITAL EMPLOYED						
TOTAL PERMANENT CAPITAL	$4,586.077	$3,961.780	$4,107.794	$2,379.217	$2,329.154	
SHORT-TERM DEBT	$596.400	$848.700	$270.500	$346.400	$296.100	
TOTAL CAPITAL EMPLOYED	$5,182.477	$4,810.480	$4,378.294	$2,725.617	$2,625.254	
INDICATED AVERAGE CAPITAL COST RATES (2)						
TOTAL DEBT	3.43 %	3.52 %	3.89 %	3.77 %	2.24 %	
PREFERRED STOCK						
CAPITAL STRUCTURE RATIOS						
BASED ON TOTAL PERMANENT CAPITAL:						
LONG-TERM DEBT	63.65 %	64.06 %	69.16 %	49.88 %	44.65 %	58.28 %
PREFERRED STOCK	0.00	0.00	0.00	0.00	0.00	0.00
COMMON EQUITY	36.35	35.94	30.84	50.12	55.35	41.72
TOTAL	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
BASED ON TOTAL CAPITAL:						
TOTAL DEBT, INCLUDING SHORT-TERM	67.84 %	70.40 %	71.06 %	56.25 %	50.89 %	63.29 %
PREFERRED STOCK	0.00	0.00	0.00	0.00	0.00	0.00
COMMON EQUITY	32.16	29.60	28.94	43.75	49.11	36.71
TOTAL	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
FINANCIAL STATISTICS						
FINANCIAL RATIOS - MARKET BASED						
EARNINGS / PRICE RATIO	6.27 %	2.75 %	0.67 %	-0.12 %	5.44 %	3.00 %
MARKET / AVERAGE BOOK RATIO	161.63	202.33	208.81	220.76	185.82	195.87
DIVIDEND YIELD	4.60	3.79	3.63	3.19	3.73	3.79
DIVIDEND PAYOUT RATIO	72.98	139.03	536.47	NA	69.19	204.42
RATE OF RETURN ON AVERAGE BOOK COMMON EQUITY	10.17 %	5.72 %	1.44 %	-0.27 %	10.23 %	5.46 %
TOTAL DEBT / EBITDA (3)	7.50 x	9.79 x	12.89 x	11.32 x	4.52 x	9.20 x
FUNDS FROM OPERATIONS / TOTAL DEBT (4)	8.35 %	0.83 %	4.56 %	14.50 %	23.59 %	10.37 %
TOTAL DEBT / TOTAL CAPITAL	67.84 %	70.40 %	71.06 %	56.25 %	50.89 %	63.29 %

Ticker
SWX

Southwest Gas
CAPITALIZATION AND FINANCIAL STATISTICS (1)
2015 - 2020, Inclusive

	FYE: 12/31/2020	2020	2019	2018	2017	2016	2015
Capital Structure:							
Long Term Debt	LTDEBT	2,772,633,000.00	2,463,994,000.000	2,140,318,000.000	1,773,230,000.000	1,600,084,000.000	1,570,679,000.000
Preferred Stock	PFD	0.000	0.000	0.000	0.000	0.000	0.000
Common Shares Outst	Input Data	57,192,925.00	55,007,433.000	53,026,848.000	48,090,470.000	47,482,068.000	47,377,575.000
Common Equity	TOTEQ	2,674,953,000.00	2,505,914,000.000	2,251,590,000.000	1,812,403,000.000	1,661,273,000.000	1,594,408,000.000
Sinking Fund Requirements	Input Data	0.000	0.000	0.000	0.000	0.000	0.000
Short Term Debt	STDEBT	107,000,000.00	211,000,000.000	152,000,000.000	214,500,000.000	0.000	18,000,000.000
EPS excluding extra	EPSAPPCOMM	4.140	3.940	3.680	4.040	3.180	2.920
Price - High	Bloomberg	79.950	92.140	84.770	86.270	78.830	63.380
Price - Low	Bloomberg	52.270	73.920	64.140	72.830	53.860	50.780
DPS by payable date	Bloomberg	2.280	2.180	2.080	2.100	1.800	1.620
AFUDC	AFUDC	7,926,000.000	8,719,000.000	6,891,000.000	3,962,000.000	3,464,000.000	3,008,000.000
Total Interest	INTEXP	111,477,000.000	109,226,000.000	96,671,000.000	78,064,000.000	73,660,000.000	71,879,000.000
Net Income before Extra	NETINC	238,985,000.000	216,647,000.000	181,652,000.000	193,942,000.000	153,055,000.000	138,317,000.000
CE Income before Extra	INCAVAILCOMM	238,985,000.000	216,647,000.000	182,277,000.000	193,481,000.000	152,041,000.000	138,317,000.000
Preferred Stock Dividends	PFDDIV	0.000	0.000	0.000	0.000	0.000	99,000.000
Common Dividends	COMDIVS1	125,504,000.00	116,127,000.000	100,240,000.000	92,130,000.000	83,317,000.000	74,248,000.000
Income Bef Extra Items-S&U	INCBEFEXT	238,985,000.000	216,647,000.000	182,277,000.000	193,481,000.000	152,041,000.000	138,317,000.000
Net Operating Cash Flow	NETOPGFC	626,080,000.000	500,372,000.000	528,856,000.000	369,955,000.000	598,389,000.000	547,147,000.000
Change in op'g Assets + Liabilities	CHGOPASLIAB	99,071,000.000	-37,121,000.000	13,462,000.000	-124,685,000.000	92,938,000.000	-88,821,000.000
Depreciation & Amortization	DEPAMORT	332,027,000.000	303,237,000.000	249,212,000.000	250,951,000.000	289,132,000.000	270,111,000.000
Income Tax Expense	INCTAX	65,753,000.000	56,023,000.000	61,684,000.000	65,088,000.000	78,468,000.000	79,902,000.000
Calculations							
Com Eq / Shares Out	calc	46.771	45.556	42.461	37.687	34.987	33.653
Total Permanent Capital	calc	5,447,586,000.000	4,969,908,000.000	4,391,908,000.000	3,585,633,000.000	3,261,357,000.000	3,165,087,000.000
Average Price	calc	66.110	83.030	74.455	79.550	66.345	57.080
Total Debt		2,879,633,000.000	2,674,994,000.000	2,292,318,000.000	1,987,730,000.000	1,600,084,000.000	1,588,679,000.000
Total Capital	calc	5,554,586,000.000	5,180,908,000.000	4,543,908,000.000	3,800,133,000.000	3,261,357,000.000	3,183,087,000.000
Preferred Stk + Sink Fund Req.	calc	0.000	0.000	0.000	0.000	0.000	0.000
NETOPGFC + CHGOPASLIAB - AFUDC	calc	717,225,000.000	454,532,000.000	535,427,000.000	241,308,000.000	687,863,000.000	455,318,000.000
EBITDA	calc	748,242,000.000	685,133,000.000	589,844,000.000	587,584,000.000	593,301,000.000	560,209,000.000

Southwest Gas
CAPITALIZATION AND FINANCIAL STATISTICS (1)
2015 - 2020, Inclusive

	2020	2019	2018	2017	2016	5 YEAR AVERAGE
			(MILLIONS OF DOLLARS)			
CAPITALIZATION STATISTICS						
AMOUNT OF CAPITAL EMPLOYED						
TOTAL PERMANENT CAPITAL	$5,447.586	$4,969.908	$4,391.908	$3,585.633	$3,261.357	
SHORT-TERM DEBT	$107.000	$211.000	$152.000	$214.500	$0.000	
TOTAL CAPITAL EMPLOYED	$5,554.586	$5,180.908	$4,543.908	$3,800.133	$3,261.357	
INDICATED AVERAGE CAPITAL COST RATES (2)						
TOTAL DEBT	4.01 %	4.40 %	4.52 %	4.35 %	4.62 %	
PREFERRED STOCK						
CAPITAL STRUCTURE RATIOS						
BASED ON TOTAL PERMANENT CAPITAL:						
LONG-TERM DEBT	50.90 %	49.58 %	48.73 %	49.45 %	49.06 %	49.54 %
PREFERRED STOCK	0.00	0.00	0.00	0.00	0.00	0.00
COMMON EQUITY	49.10	50.42	51.27	50.55	50.94	50.46
TOTAL	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
BASED ON TOTAL CAPITAL:						
TOTAL DEBT, INCLUDING SHORT-TERM	51.84 %	51.63 %	50.45 %	52.31 %	49.06 %	51.06 %
PREFERRED STOCK	0.00	0.00	0.00	0.00	0.00	0.00
COMMON EQUITY	48.16	48.37	49.55	47.69	50.94	48.94
TOTAL	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
FINANCIAL STATISTICS						
FINANCIAL RATIOS - MARKET BASED						
EARNINGS / PRICE RATIO	6.26 %	4.75 %	4.94 %	5.08 %	4.79 %	5.16 %
MARKET / AVERAGE BOOK RATIO	143.21	188.67	185.79	218.92	193.31	185.98
DIVIDEND YIELD	3.45	2.63	2.79	2.64	2.71	2.84
DIVIDEND PAYOUT RATIO	52.52	53.60	54.99	47.62	54.80	52.71
RATE OF RETURN ON AVERAGE BOOK COMMON EQUITY	9.23 %	9.11 %	8.97 %	11.14 %	9.34 %	9.56 %
TOTAL DEBT / EBITDA (3)	3.85 x	3.90 x	3.89 x	3.38 x	2.70 x	3.54 x
FUNDS FROM OPERATIONS / TOTAL DEBT (4)	24.91 %	16.99 %	23.36 %	12.14 %	42.99 %	24.08 %
TOTAL DEBT / TOTAL CAPITAL	51.84 %	51.63 %	50.45 %	52.31 %	49.06 %	51.06 %

Ticker
SR

Spire Inc
CAPITALIZATION AND FINANCIAL STATISTICS (1)
2015 - 2020, Inclusive

	FYE: 9/30/2020	2020	2019	2018	2017	2016	2015
Capital Structure:							
Long Term Debt	LTDEBT	2,484,100,000.000	2,122,600,000.000	1,917,600,000.000	2,095,000,000.000	2,083,700,000.000	1,851,500,000.000
Preferred Stock	PFD	242,000,000.000	242,000,000.000	0.000	0.000	0.000	0.000
Common Shares Outst.	Input Data	51,611,789.000	50,973,515.000	50,671,903.000	48,263,243.000	45,650,642.000	43,335,012.000
Common Equity	TOTEQ	2,280,300,000.000	2,301,000,000.000	2,255,400,000.000	1,991,300,000.000	1,768,200,000.000	1,573,600,000.000
Sinking Fund Requirements	Input Data	0.000	0.000	0.000	0.000	0.000	0.000
Short Term Debt	STDEBT	648,000,000.000	743,200,000.000	553,600,000.000	477,300,000.000	398,700,000.000	338,000,000.000
EPS excluding extra	EPSAPPCOMM	1.440	3.520	4.330	3.430	3.240	3.160
Price - High	Bloomberg	87.600	87.240	82.250	77.400	70.840	56.020
Price - Low	Bloomberg	51.520	71.150	61.300	59.970	54.580	46.150
DPS by payable date	Bloomberg	2.490	2.370	2.250	2.100	1.960	1.840
AFUDC	AFUDC	0.000	0.000	0.000	0.000	0.000	0.000
Total Interest	INTEXP	105,500,000.000	104,400,000.000	98,400,000.000	89,100,000.000	77,200,000.000	74,600,000.000
Net Income before Extra.	NETINC	88,600,000.000	184,600,000.000	214,200,000.000	161,600,000.000	144,200,000.000	136,900,000.000
CE Income before Extra.	INCAVAILCOMM	73,700,000.000	178,900,000.000	213,700,000.000	161,600,000.000	144,200,000.000	136,900,000.000
Preferred Stock Dividends	PFDDIV	14,800,000.000	3,400,000.000	0.000	0.000	0.000	0.000
Common Dividends	COMDIVS1	128,000,000.000	119,000,000.000	112,100,000.000	96,200,000.000	85,200,000.000	79,000,000.000
Income Bef Extra Items-S&U	INCBEFEXT	88,600,000.000	184,600,000.000	214,200,000.000	161,600,000.000	144,200,000.000	136,900,000.000
Net Operating Cash Flow	NETOPGFC	469,900,000.000	450,900,000.000	456,600,000.000	288,300,000.000	328,300,000.000	322,400,000.000
Change in op'g Assets + Liabilities	CHGOPASLIAB	14,400,000.000	21,800,000.000	58,500,000.000	-104,400,000.000	-27,100,000.000	10,800,000.000
Depreciation & Amortization	DEPAMORT	197,300,000.000	181,700,000.000	168,400,000.000	154,100,000.000	137,500,000.000	130,800,000.000
Income Tax Expense	INCTAX	12,400,000.000	34,500,000.000	-26,500,000.000	77,600,000.000	69,500,000.000	62,200,000.000
Calculations							
Com Eq / Shares Out	calc	44.182	45.141	44.510	41.259	38.733	36.312
Total Permanent Capital	calc	5,006,400,000.000	4,665,600,000.000	4,173,000,000.000	4,086,300,000.000	3,851,900,000.000	3,425,100,000.000
Average Price	calc	69.560	79.195	71.775	68.685	62.710	51.085
Total Debt		3,132,100,000.000	2,865,800,000.000	2,471,200,000.000	2,572,300,000.000	2,482,400,000.000	2,189,500,000.000
Total Capital	calc	5,654,400,000.000	5,408,800,000.000	4,726,600,000.000	4,563,600,000.000	4,250,600,000.000	3,763,100,000.000
Preferred Stk + Sink Fund Req.	calc	242,000,000.000	242,000,000.000	0.000	0.000	0.000	0.000
NETOPGFC + CHGOPASLIAB - AFUDC	calc	484,300,000.000	472,700,000.000	515,100,000.000	183,900,000.000	301,200,000.000	333,200,000.000
EBITDA	calc	403,800,000.000	505,200,000.000	454,500,000.000	482,400,000.000	428,400,000.000	404,500,000.000

Spire Inc.
CAPITALIZATION AND FINANCIAL STATISTICS (1)
2015 - 2020, Inclusive

	2020	2019	2018	2017	2016	5 YEAR AVERAGE
	(MILLIONS OF DOLLARS)					
CAPITALIZATION STATISTICS						
AMOUNT OF CAPITAL EMPLOYED						
TOTAL PERMANENT CAPITAL	$5,006.400	$4,665.600	$4,173.000	$4,086.300	$3,851.900	
SHORT-TERM DEBT	$648.000	$743.200	$553.600	$477.300	$398.700	
TOTAL CAPITAL EMPLOYED	$5,654.400	$5,408.800	$4,726.600	$4,563.600	$4,250.600	
INDICATED AVERAGE CAPITAL COST RATES (2)						
TOTAL DEBT	3.52 %	3.91 %	3.90 %	3.53 %	3.30 %	
PREFERRED STOCK	6.12	2.81				
CAPITAL STRUCTURE RATIOS						
BASED ON TOTAL PERMANENT CAPITAL:						
LONG-TERM DEBT	49.62 %	45.49 %	45.95 %	51.27 %	54.10 %	49.29 %
PREFERRED STOCK	4.83	5.19	0.00	0.00	0.00	2.00
COMMON EQUITY	45.55	49.32	54.05	48.73	45.90	48.71
TOTAL	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
BASED ON TOTAL CAPITAL:						
TOTAL DEBT, INCLUDING SHORT-TERM	55.39 %	52.98 %	52.28 %	56.37 %	58.40 %	55.08 %
PREFERRED STOCK	4.28	4.48	0.00	0.00	0.00	1.75
COMMON EQUITY	40.33	42.54	47.72	43.63	41.60	43.17
TOTAL	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
FINANCIAL STATISTICS						
FINANCIAL RATIOS - MARKET BASED						
EARNINGS / PRICE RATIO	2.07 %	4.44 %	6.03 %	4.99 %	5.17 %	4.54 %
MARKET / AVERAGE BOOK RATIO	155.75	176.67	167.37	171.73	167.12	167.73
DIVIDEND YIELD	3.58	2.99	3.13	3.06	3.13	3.18
DIVIDEND PAYOUT RATIO	173.68	66.52	52.46	59.53	59.08	82.25
RATE OF RETURN ON AVERAGE BOOK COMMON EQUITY	3.22 %	7.85 %	10.06 %	8.60 %	8.63 %	7.67 %
TOTAL DEBT / EBITDA (3)	7.76 x	5.67 x	5.44 x	5.33 x	5.79 x	6.00 x
FUNDS FROM OPERATIONS / TOTAL DEBT (4)	15.46 %	16.49 %	20.84 %	7.15 %	12.13 %	14.41 %
TOTAL DEBT / TOTAL CAPITAL	55.39 %	52.98 %	52.28 %	56.37 %	58.40 %	55.08 %

Duke Energy Kentucky, Inc.
Interest Rates and Bond Spreads for
Moody's Corporate and Public Utility Bonds

Selected Bond Yields - Moody's

	[1]	[2]	[3]	[4]
	Aaa Rated Corporate Bond	Aa2 Rated Public Utility Bond	A2 Rated Public Utility Bond	Baa2 Rated Public Utility Bond
Mar-2021	3.04 %	3.27	3.44 %	3.72 %
Feb-2021	2.70	2.93	3.09	3.37
Jan-2021	2.45	2.73	2.91	3.18
Average	2.73 %	2.98 %	3.15 %	3.42 %

Selected Bond Spreads

A2 Rated Public Utility Bonds Over Aaa Rated Corporate Bonds:	0.42 % (1)
Baa2 Rated Public Utility Bonds Over A2 Rated Public Utility Bonds:	0.27 % (2)
A2 Rated Public Utility Bonds Over Aa2 Rated Public Utility Bonds:	0.17 % (3)

Notes:
(1) Column [3] - Column [1].
(2) Column [4] - Column [3].
(3) Column [3] - Column [2].

Source of Information:
Bloomberg Professional Service

Duke Energy Kentucky, Inc.
Comparison of Long-Term Issuer Ratings for
Proxy Group of Seven Natural Gas Distribution Companies

Proxy Group of Seven Natural Gas Distribution Companies	Moody's Long-Term Issuer Rating March 2021		
	Long-Term Issuer Rating (1)	Numerical Weighting (2)	Credit Risk Adjustment
Atmos Energy Corporation	A1	5.0	-0.10%
New Jersey Resources Corporation	A1	5.0	-0.10%
Northwest Natural Holding Company	Baa1	8.0	0.14%
ONE Gas, Inc.	A3	7.0	0.05%
South Jersey Industries, Inc.	A3	7.0	0.05%
Southwest Gas Holdings, Inc.	Baa1	8.0	0.14%
Spire Inc.	A1/A2	5.5	-0.07%
Average	A2/A3	6.5	
Duke Energy Kentucky, Inc.	Baa1	8.0	0.14%

Notes:

(1) Ratings are that of the average of each company's utility operating
(2) From page 6 of this Attachment.

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-

STAFF-DR-03-011

REQUEST:

Refer to Duke Kentucky's Response to Staff's Second Request, Item 24. Provide the expert testimony and exhibits regarding return on equity for the cases in attachments 1, 2, and 3 in PDF format.

RESPONSE:

Please see STAFF-DR-03-011 Attachments 1 through 3.

PERSON RESPONSIBLE: Dylan W. D'Ascendis

STATE OF NORTH CAROLINA
UTILITIES COMMISSION
RALEIGH

DOCKET NO. W-354, SUB 364

In the Matter of		
Application of Carolina Water Service, Inc. of North Carolina for Adjustment of Rates and Charges, Approval of a Conservation Rate Pilot Program, and Modifications to Certain Terms and Conditions for the Provision of Water and Sewer Service.	))))))	DIRECT TESTIMONY OF DYLAN W. D'ASCENDIS ON BEHALF OF CAROLINA WATER SERVICE, INC. OF NORTH CAROLINA

APPENDIX 12
SCHEDULE G-5

June 28, 2019

TABLE OF CONTENTS

I. INTRODUCTION

A. Witness Identification

Q. Please state your name and business address.

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

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

A. I am a Director at ScottMadden, Inc.

B. Background and Qualifications

Q. Please summarize your professional experience and educational background.

A. I offer expert testimony on behalf of investor-owned utilities on rate of return issues and class cost of service issues. I also assist in the preparation of rate filings, including but not limited to revenue requirements and original cost and lead/lag studies. I am a graduate of the University of Pennsylvania, where I received a Bachelor of Arts degree in Economic History. I also hold a Masters of Business Administration from Rutgers University with a concentration in Finance and International Business, which was conferred with high honors. I am a Certified Rate of Return Analyst ("CRRA") and a Certified Valuation Analyst ("CVA"). My full professional qualifications are provided in Appendix A.

II. PURPOSE OF TESTIMONY

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

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

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

A. Yes. I have prepared D'Ascendis Exhibit No. 1, which consists of Schedules DWD-1 through DWD-8.

Q. What is your recommended cost of capital for CWSNC?

A. I recommend the North Carolina Utilities Commission (the "Commission") authorize the Company the opportunity to earn an overall rate of return of 8.07% based on a test year ending March 31, 2019. The ratemaking capital structure consists of 52.04% long-term debt at an embedded debt cost rate of 5.59%, and 47.96% common equity at my recommended common equity cost rate of 10.75%. 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	52.04%	5.59%	2.91%
Common Equity	47.96%	10.75%	5.16%
Total	100.00%		8.07%

III. SUMMARY

Q. Please summarize your recommended common equity cost rate.

A. My recommended common equity cost rate of 10.75% 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 not necessarily identical, risk to CWSNC. Using companies of relatively comparable risk as proxies is consistent with the principles of fair rate of return established in the *Hope*[1] and *Bluefield*[2] cases. 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 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 six water companies ("Non-Price Regulated Proxy Group").

The results derived from each are as follows:

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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).

Table 2: Summary of Common Equity Cost Rate

	Utility Proxy Group
Discounted Cash Flow Model	8.70%
Risk Premium Model	10.62
Capital Asset Pricing Model	10.21
Cost of Equity Models Applied to Comparable Risk, Non-Price Regulated Companies	11.78
Indicated Common Equity Cost Rate Before Adjustment	10.35%
Size Adjustment	0.40
Recommended Common Equity Cost Rate After Adjustment	10.75%

After analyzing the indicated common equity cost rates derived through these models, I conclude that a common equity cost rate of 10.35% for the Company is indicated before any Company-specific adjustments. The indicated common equity cost rate was then adjusted upward by 0.40% to reflect CWSNC's smaller relative size as compared with the members of the Utility Proxy Group, resulting in a size-adjusted indicated common equity cost rate of 10.75%, which is my recommendation.

IV. GENERAL PRINCIPLES

Q. What general principles have you considered in arriving at your recommended common equity cost rate of 10.75%?

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

A. Business Risk

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 general business risks faced by all utilities (*i.e.*, 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 Safe Water Drinking Act and response to continuous monitoring by the Environmental Protection Agency ("EPA") and state and local governments of the water supply for potential contaminants and their resultant regulations. This, plus aging infrastructure, necessitate additional capital investment in the distribution and treatment of water, exacerbating the pressure on free cash flows arising from increased capital expenditures for infrastructure repair and replacement. The significant amount of capital investment and, hence, high capital intensity, is a major risk factor for the water and wastewater utility industry.

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

> Following years of neglect, water utilities have been spending heavily to upgrade the nation's deteriorating pipelines over the past decade. According to the American Society of Civil Engineers ("ACSE"), most

> pipes in America were laid early to mid-20th century, with an average lifespan of between 75 and 100 years. Many of these assets are currently in great need of repair or replacement. Indeed, the ASCE estimates that almost six billion gallons of water are lost per day as a result of leaky pipes. In other terms, this is 14%-18% of the amount of water treated daily.
>
> State regulatory commissions are extremely important because they literally set the rate of return that a utility is allowed to earn on its investment. No matter how well run a company is, harsh treatment by authorities is nearly impossible to overcome. Fortunately, regulators have [sic] utilities have been successfully working together. They realize that many [sic] of the water infrastructure in the U.S. need to be upgraded and that the task will require a lot of money. Thus, states are permitting the utilities to make a decent return on their assets. [3] (emphasis added)

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

Substantial capital expenditures, as noted by *Value Line,* will require significant financing. The three sources of financing typically used are debt, equity (common and preferred), and cash flow. All three are intricately linked to the opportunity to earn a sufficient rate of return as well as the

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3 *Value Line Investment Survey*, April 12, 2019.

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,[4] 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 nearly impossible for the utility to attract the needed capital for new infrastructure investment necessary to ensure quality service to its customers. An insufficient rate of return can be financially devastating for utilities as well as a public safety issue for their customers.

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

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

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.[5] 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, as the purpose of the bond/credit rating process is to assess credit quality or credit risk and not common equity risk.

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

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. <u>CAPITAL STRUCTURE</u>

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 52.04% long-term debt and 47.96% common equity as shown on page 1 of Schedule DWD-1. This capital structure is based on a test year capital structure for CWSNC, ending March 31, 2019.

Q. How does your proposed ratemaking common equity ratio of 47.96% for CWSNC compare with the total equity ratios maintained by the companies in your Utility Proxy Group?

A. My proposed ratemaking common equity ratio of 47.96% for CWSNC is reasonable and consistent with the range of common equity ratios maintained, on average, by the companies in the Utility Proxy Group on which I base my recommended common equity cost rate. As shown on page 2 of Schedule DWD-2, the common equity ratios of the Utility Proxy Group range from 43.40% to 63.46%, with a midpoint of 53.43% and an average of 54.75% in 2018. The equity ratio, on average, maintained by the Utility Proxy Group is higher than the equity ratio requested by the Company.

In my opinion, a capital structure consisting of 52.04% long-term debt and 47.96% common equity is appropriate for ratemaking purposes for CWSNC in the current proceeding because it is comparable, but conservative, to the average capital structure ratios (based on total permanent capital) maintained by the water companies in the Utility Proxy Group on whose market data I base my recommended common equity cost rate.

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

A. A long-term debt cost rate of 5.59% is reasonable and appropriate as it is based on a test year of the Company's long-term debt outstanding ending March 31, 2019.

VI. <u>CWSNC AND THE UTILITY PROXY GROUP</u>

Q. Are you familiar with the operations of CWSNC?

A. Yes. CWSNC is headquartered in Charlotte, North Carolina, and its operations span the state from Bear Paw to Corolla. CWSNC serves approximately 35,000 water customers and 15,000 sewer customers. CWSNC is not publicly-traded.

Q. Please explain how you chose your proxy group of six water companies.

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 or Small and Midcap Editions* (April 12, 2019);

(ii) They have 70% or greater of 2018 total operating income and 70% or greater of 2018 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 2018 or through the time of the preparation of this testimony;

(v) They have *Value Line* and Bloomberg adjusted betas;

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

(vii) They have *Value Line*, Reuters, Zacks, or Yahoo! Finance 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., Artesian Resources, Inc., California Water Service Group, Middlesex Water Co., and York Water Co.

Q. Please describe schedule DWD-2, page 1.

A. Page 1 of Schedule DWD-2 contains comparative capitalization and financial statistics for the six water companies identified above for the years 2014 to 2018.

During the five-year period ending 2018, the historically achieved average earnings rate on book common equity for the group averaged 10.17%. The average common equity ratio based on total permanent capital (excluding short-term debt) was 55.57%, and the average dividend payout ratio was 60.28%.

Total debt to earnings before interest, taxes, depreciation, and amortization ("EBITDA") for the years 2014 to 2018 ranges between 3.42 and 3.98, with an average of 3.56. Funds from operations to total debt range from 23.84% to 26.23%, with an average of 25.11%.

VII. COMMON EQUITY COST RATE MODELS

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 coefficients (β) to determine the equity risk premium reflects the market's assessment of market/systematic risk, since beta coefficients 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 coefficients). 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 do you use?

A. I use 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 30, 2019, divided by the average of closing market prices for the 60 trading days ending April 30, 2019.[6]

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 twelve-month period, my adjustment is a conservative approach that does not overstate the dividend yield. Therefore, the actual average dividend yields in Column 1 on page 1 of Schedule DWD-3 have been adjusted upward to reflect one-half the average projected growth rate shown in Column 6.

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

Q. Please explain the basis of the growth rates you apply to the Utility Proxy Group in your DCF model.

A. Investors with more limited resources than institutional investors are likely to rely on widely available financial information services, such as *Value Line*, Reuters, 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 use 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-3, the mean result of the application of the single-stage DCF model is 8.68%, the median result is 8.71%, and the average of the two is 8.70% for the Utility Proxy Group. In arriving at a conclusion for the DCF-indicated common equity cost rate for the Utility Proxy Group, I have relied on an average of the mean and the median results of the DCF. This approach takes into consideration all the proxy companies' results, while mitigating the high and low outliers of those individual results.

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.

Q. Please explain the PRPM.

A. The PRPM, published in the *Journal of Regulatory Economics,*[7] 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")".[8] 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 estimate of investor behavior, but rather on the evaluation of the results of that behavior (*i.e.*, the variance of historical equity risk premiums).

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7 Autoregressive conditional heteroscedasticity. See "A New Approach for Estimating the Equity Risk Premium for Public Utilities", Pauline M. Ahern, Frank J. Hanley and Richard A. Michelfelder, Ph.D. The Journal of Regulatory Economics (December 2011), 40:261-278.

8 www.nobelprize.org.

The inputs to the model are the historical returns on the common shares of each company in the Utility Proxy Group minus the historical monthly yield on long-term U.S. Treasury securities through April 2019. Using a generalized form of ARCH, known as GARCH, I calculated each Utility Proxy Group company's projected equity risk premium using Eviews© statistical software. When the GARCH Model is applied to the historical return data, it produces a predicted GARCH variance series[9] and a GARCH coefficient[10]. Multiplying the predicted monthly variance by the GARCH coefficient, then annualizing it[11] produces the predicted annual equity risk premium. I then added the forecasted 30-year U.S. Treasury Bond yield, 3.33%[12], 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")*[13]. The mean PRPM indicated common equity cost rate for the Utility Proxy Group is 11.15%, the median is 11.25%, and the average of the two is 11.20%. Consistent with my reliance on the average of the median and mean results of the DCF, I will rely on the average of the mean and median results of the Utility Proxy Group PRPM to calculate a cost of common equity rate of 11.20%.

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9 Illustrated on Columns 1 and 2 of page 2 of Schedule DWD-4. In this instance, I have selected the lower predicted variance in order to be conservative.

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

11 Annualized Return = (1+Monthly Return)^12 - 1

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

13 *Blue Chip Financial Forecasts*, December 1, 2018 at p. 14 and May 1, 2019 at p. 2.

Q. Have you reviewed the Commission's Order[14] regarding the PRPM in the Company's last rate case?

A. I have. The Commission expressed a concern regarding the use of a specific statistical package to produce the results of the PRPM and were skeptical that investors would place significant weight on the model given that assumption. To clarify, the GARCH methodology, which has been in the public domain since the 1980's as discussed above, is available in various statistical packages such as EViews®, SAS, RATS, S-Plus and JMulti, which are not cost-prohibitive and provide instructions for using the various statistical methodologies in their software. The software that I used in this proceeding currently costs approximately $1,500 for a single user commercial license. In fact, JMulti is a free downloadable software with GARCH estimation applications. In providing this additional information, it is my hope that the Commission will revisit this concern in its Order in this rate case.

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.

[14] State of North Carolina Utilities Commission, Docket No. W-354, Sub 360, Order approving joint settlement agreement and stipulation, granting partial rate increase, and requiring customer notice, February 23, 2019, at 84-85.

Q. Please explain the basis of the expected bond yield of 4.74% 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 2020 and the long-term projections for 2020 to 2024, and 2025 to 2029 from Blue Chip. As shown on Line No. 1 of page 3 of Schedule DWD-4, the average expected yield on Moody's Aaa-rated corporate bonds is 4.25%. In order to derive an expected yield on A2 rated-public utility bonds, I make an upward adjustment of 0.41%, which represents a recent spread between Aaa corporate bonds and A2-rated public utility bonds, in order to adjust the expected Aaa corporate bond yield to an equivalent Moody's A2-rated public utility bond.[15] Adding that recent 0.41% spread to the expected Aaa corporate bond yield of 4.25% results in an expected A2 public utility bond of 4.66%.

Since the Utility Proxy Group's average Moody's long-term issuer rating is A2/A3, another adjustment to the expected A2 public utility bond yield is needed to reflect the difference in bond ratings. An upward adjustment of 0.08%, which represents one-sixth of a recent spread

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

between A2 and A3 public utility bond yields, is necessary to make the A2 prospective bond yield applicable to an A2/A3 public utility bond.[16] Adding the 0.08% to the 4.66% prospective A2 public utility bond yield results in a 4.74% expected bond yield for the Utility Proxy Group.

Q. Please explain how the beta-derived equity risk premium is determined.

A. The components of the beta-derived risk premium model are 1) an expected market equity risk premium over corporate bonds, and 2) the beta coefficient. The derivation of the beta-derived equity risk premium that I apply to the Utility Proxy Group is shown on lines 1 through 9 of page 8 of Schedule DWD-4. The total beta-derived equity risk premium I apply is 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") 2019 Yearbook ("SBBI – 2019")[17] less the average historical yield on Moody's Aaa/Aa-rated corporate bonds for the period 1928 to 2018. The use of holding period

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[16] As shown on Line No. 4 and explained in Note 3 on page 3 of Schedule DWD-4.
[17] SBBI Appendix A Tables: Morningstar Stocks, Bonds, Bills, & Inflation 1926-2018.

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 11.62% and the long-term arithmetic mean monthly yield on Moody's Aaa/Aa-rated corporate bonds was 6.08%.[18] As shown on line 1 of page 8 of Schedule DWD-4, subtracting the mean monthly bond yield from the total return on large company stocks results in a long-term historical equity risk premium of 5.54%.

I used the arithmetic mean monthly total return rates for the large company stocks and yields (income returns) for the Moody's Aaa/Aa corporate bonds, because they are appropriate for the purpose of estimating the cost of capital as noted in SBBI – 2019.[19] 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.

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18 As explained in Note 1 on page 9 of Schedule DWD-4.
19 SBBI – 2019, at 10-22.

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 7.93%, shown on line 2 of page 8 of Schedule DWD-4, I used the same monthly annualized total returns on large company common stocks relative to the monthly annualized yields on Moody's Aaa/Aa corporate bonds as mentioned above. The relationship between interest rates and the market equity risk premium was modeled using the observed monthly market equity risk premium as the dependent variable, and the monthly yield on Moody's Aaa/Aa 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 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 corporate bonds during the period from January 1928 through April 2019.[20] Using the previously discussed generalized form of ARCH, known as GARCH, the projected equity risk premium is determined using

[20] Data from January 1926-December 2018 is from SBBI – 2019. Data from January – April 2019 is from Bloomberg Professional Services.

Eviews© statistical software. The resulting PRPM predicted market equity risk premium is 8.32%.[21]

Q. Please explain the derivation of a projected equity risk premium based on *Value Line* 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-4. Consistent with my calculation of the dividend yield component in my DCF analysis, this prospective market equity risk premium is derived from an average of the three- to five-year median market price appreciation potential by *Value Line* for the thirteen weeks ending May 3, 2019, 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.[22]

The average median expected price appreciation is 55%, which translates to an 11.58% annual appreciation, and, when added to the average of *Value Line's* median expected dividend yields of 2.24%, equates to a forecasted annual total return rate on the market of 13.82%. The forecasted Aaa bond yield of 4.25% is deducted from the total market return of 13.82%, resulting in an equity risk premium of 9.57%, shown on page 8, line 4 of Schedule DWD-4.

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21 Shown on Line No. 3 on page 8 of Schedule DWD-4.
22 As explained in detail in page 2, Note 1 of Schedule DWD-5.

Q. Please explain the derivation of an equity risk premium based on the S&P 500 companies.

A. Using data from *Value Line*, I calculate 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 16.03%. Subtracting the prospective yield on Aaa Corporate bonds of 4.25% results in an 11.78% projected equity risk premium.

Q. Please explain the derivation of an equity risk premium based on Bloomberg data.

A. Using data from Bloomberg Professional Services, I calculate 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 return for the S&P 500 is 13.35%. Subtracting the prospective yield on Aaa Corporate bonds of 4.25% results in a 9.10% projected equity risk premium.

Q. What is your conclusion of a beta-derived equity risk premium for use in your RPM analysis?

A. I give equal weight to the six equity risk premiums in arriving at my conclusion of 8.71%.[23]

After calculating the average market equity risk premium of 8.71%, I adjust it by beta to account for the risk of the Utility Proxy Group. As discussed below, the beta coefficient is a meaningful measure of

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

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, share of the market's total equity risk premium relative to corporate bond yields. As shown on page 1 of Schedule DWD-5, the average of the mean and median beta coefficient for the Utility Proxy Group is 0.67. Multiplying the beta coefficient of the Utility Proxy Group of 0.67 by the market equity risk premium of 8.71% results in a beta-adjusted equity risk premium of 5.84% 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 10.56% and monthly A-rated public utility bond yields of 6.56% from 1928 to 2018 to arrive at an equity risk premium of 4.00%.[24] I then used the same historical data to derive an equity risk premium of 5.72% 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

[24] As shown on Line No. 1 on page 12 of Schedule DWD-4.

to April 2019 to arrive at a PRPM-derived equity risk premium of 3.93% for the S&P Utility Index.

I then derived expected total returns on the S&P Utilities Index of 10.33% and 9.01% using data from *Value Line* and Bloomberg Professional Services, respectively, and subtracted the prospective A2-rated public utility bond yield (4.66%[25]), which results in risk premiums of 5.67% and 4.35%, respectively. As with the market equity risk premiums, I averaged each risk premium to arrive at my utility-specific equity risk premium of 4.73%.

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 5.29%, which is the average of the beta-derived and the S&P utility equity risk premiums of 5.84% and 4.73%, respectively.[26]

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

A. As shown on Line No. 7 of Schedule DWD-4, page 3, I calculate a common equity cost rate of 10.03% for the Utility Proxy Group based on the total market approach of the RPM.

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[25] Derived on Line No. 3 of page 3 of Schedule DWD-4.
[26] As shown on page 7 of Schedule DWD-4.

Q. What are the results of your application of the PRPM and the total market approach RPM?

A. As shown on page 1 of Schedule DWD-4, the indicated RPM-derived common equity cost rate is 10.62%, which gives equal weight to the PRPM (11.20%) and the adjusted market approach results (10.03%).

C. <u>The Capital Asset Pricing Model</u>

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 the beta coefficient (β). A beta coefficient less than 1.0 indicates lower variability than the market as a whole, while a beta coefficient 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 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 the beta coefficient. 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

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

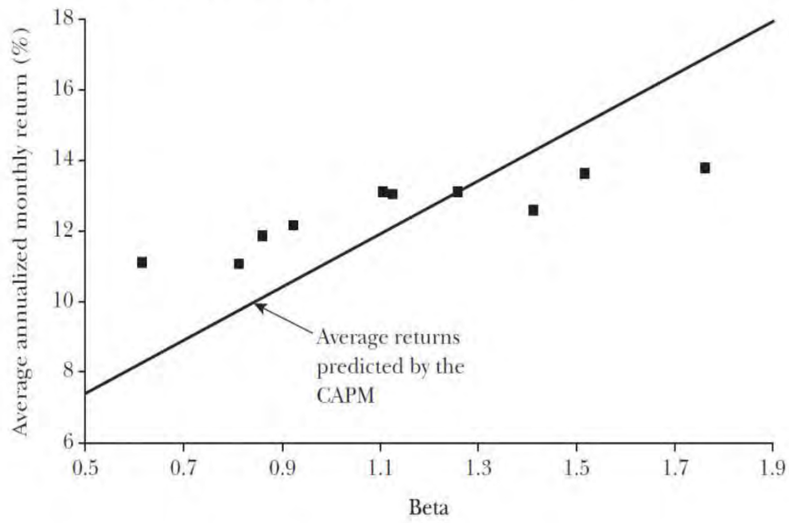
Numerous tests of the CAPM have measured the extent to which security returns and beta coefficients are related as predicted by the CAPM, confirming its validity. The empirical CAPM ("ECAPM") reflects the reality that while the results of these tests support the notion that the beta coefficient is related to security returns, the empirical Security Market Line ("SML") described by the CAPM formula is not as steeply sloped as the predicted SML.[27] 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." [28]

27 Roger A. Morin, New Regulatory Finance (Public Utility Reports, Inc., 2006), at p. 175.

28 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".

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.[29]
>
> * * *
>
> Therefore, the empirical evidence suggests that the expected return on a security is related to its risk by the following approximation:
>
> $$K = R_F + x\,\beta(R_M - R_F) + (1-x)\ \beta(R_M - R_F)$$
>
> where x is a fraction to be determined empirically. The value of x that best explains the observed relationship [is] Return =

29 Morin, at 175.

0.0829 + 0.0520 β is between 0.25 and 0.30. If x = 0.25, the equation becomes:

$$K = R_F + 0.25(R_M - R_F) + 0.75\,\beta(R_M - R_F)^{30}$$

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

> The early tests firmly reject the Sharpe-Lintner version of the CAPM. There is a positive relation between beta and average return, but it is too 'flat.'… The regressions consistently find that the intercept is greater than the average risk-free rate… and the coefficient on beta is less than the average excess market return… This is true in the early tests… as well as in more recent cross-section regressions tests, like Fama and French (1992).[31]

Finally, Fama and French further note:

> Confirming earlier evidence, the relation between beta and average return for the ten portfolios is much flatter than the Sharpe-Linter CAPM predicts. The returns on low beta portfolios are too high, and the returns on the high beta portfolios are too low. For example, the predicted return on the portfolio with the lowest beta is 8.3 percent per year; the actual return as 11.1 percent. The predicted return on the portfolio with the t beta is 16.8 percent per year; the actual is 13.7 percent.[32]

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.

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30 Morin, at 190.
31 Fama & French, at 32.
32 *Ibid.,* at 33.

Q. Have you reviewed the Commission's Order[33] regarding the ECAPM in the Company's last rate case?

A. I have. The Commission's concern regarding the ECAPM was that I did not provide enough evidence why the ECAPM was superior to the CAPM in my testimony. The additional language provided above attempts to address the Commission's concerns.

Q. What Beta coefficients did you use in your CAPM analysis?

A. With respect to the Beta coefficient, I considered two methods of calculation: the average of the Beta coefficients of the Utility Proxy Group companies reported by Bloomberg Professional Services and the average of the Beta coefficients of the Utility Proxy Group companies as reported by *Value Line*. While both of those services adjust their calculated (or "raw") Beta coefficients to reflect the tendency of the Beta coefficient to regress to the market mean of 1.00, *Value Line* calculates the Beta coefficient 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 shown in Column 5 on page 1 of Schedule DWD-5, the risk-free rate adopted for both applications of the CAPM is 3.33%. This risk-free rate of 3.33% is based on the average of the *Blue Chip* consensus forecast of the

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33 State of North Carolina Utilities Commission, Docket No. W-354, Sub 360, Order approving joint settlement agreement and stipulation, granting partial rate increase, and requiring customer notice, February 23, 2019, at 84-85.

expected yields on 30-year U.S. Treasury bonds for the six quarters ending with the third calendar quarter of 2020 and long-term projections for the years 2020 to 2024 and 2025 to 2029.

Q. Why is the yield on long-term U.S. Treasury Bonds appropriate for use as the risk-free rate?

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 A-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.

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 Schedule DWD-5. As discussed previously, the market risk premium is derived from an average of:

(i) Ibbotson-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 5.12% was deducted from the SBBI - 2019 monthly historical total market return of 11.89%, which results in an historical market equity risk premium of 6.77%.[34] I applied a linear OLS regression to the monthly annualized historical returns on the S&P 500 relative to historical yields on long-term U.S. Government Securities from SBBI - 2019. That regression analysis yielded a market equity risk premium of 9.00%. The PRPM market equity risk premium is 9.40%, and is derived using the PRPM relative to the yields on long-term U.S. Treasury securities from January 1926 through April 2019.

The *Value Line*-derived forecasted total market equity risk premium is derived by deducting the forecasted risk-free rate of 3.33%, discussed above, from the *Value Line* projected total annual market return of 13.82%, resulting in a forecasted total market equity risk premium of 10.49%. The S&P 500 projected market equity risk premium using *Value Line* data is derived by subtracting the projected risk-free rate of 3.33% from the projected total return of the S&P 500 of 16.03%. The resulting market equity risk premium is 12.70%.

The S&P 500 projected market equity risk premium using Bloomberg data is derived by subtracting the projected risk-free rate of 3.33% from the projected total return of the S&P 500 of 13.35%. The resulting market equity risk premium is 10.02%.

These six market risk premiums, when averaged, result in an average total market equity risk premium of 9.73%.

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34 SBBI – 2019, at Appendix A-1 (1) through .A-1 (3) and Appendix A-7 (19) through A-7 (21).

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

A. As shown on page 1 of Schedule DWD-5, the mean result of my CAPM/ECAPM analyses is 10.25%, the median is 10.17%, and the average of the two is 10.21%. Consistent with my reliance on the average of mean and median DCF results discussed above, the indicated common equity cost rate using the CAPM/ECAPM is 10.21%.

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 do 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 results in a proxy group which is comparable in total risk to the Utility Proxy Group.

Q. How did you select unregulated companies that are comparable in total risk to the regulated public Utility Proxy Group?

A. In order to select a proxy group of domestic, non-price regulated companies similar in total risk to the Utility Proxy Group, I relied on the beta coefficients 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 eleven 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 Investment Survey* (Standard Edition);

(ii) They must be domestic, non-price regulated companies, *i.e.*, non-utilities;

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

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

Beta coefficients 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 beta coefficients and similar residual standard errors resulting from the same regression analyses have similar total investment risk.

Q. Have you prepared a schedule which shows the data from which you selected the eleven domestic, non-price regulated companies that are comparable in total risk to the Utility Proxy Group?

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

Q. Did you review the Commission's Order[35] regarding the use of a Non-Price Regulated Proxy Group in the Company's last rate case?

A. I have. Regarding the use of a Non-Price Regulated Proxy Group, the Commission's conclusion that, since the market model results were different than the results of those same models applied to the Utility Proxy Group, the two groups could not be similar in risk. In order to provide more information to show similarity between the Utility and Non-Price Regulated Proxy Groups, I have analyzed the coefficients of variation ("CoV")[36] of net profit for each group and the results of that study are shown on page 4 of

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35 State of North Carolina Utilities Commission, Docket No. W-354, Sub 360, Order approving joint settlement agreement and stipulation, granting partial rate increase, and requiring customer notice, February 23, 2019, at 84-85.

36 The coefficient of variation is used by investors and economists to determine volatility.

Schedule DWD-6. As shown, the mean and median CoV of net profit for the Non-Price Regulated Proxy Group are within the range of CoVs of net profit set by the Utility Proxy Group companies. With this additional information, I would hope that the Commission revisit this argument in its Order in this case.

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-7 contains the derivation of the DCF cost rates. As shown, the indicated common equity cost rate using the DCF for the Non-Price Regulated Proxy Group comparable in total risk to the Utility Proxy Group, is 11.88%.

Pages 3 through 5 contain the data and calculations that support the 12.00% RPM cost rate. As shown on Line No. 1 of page 3 of Schedule DWD-7, the consensus prospective yield on Moody's Baa rated corporate bonds for the six quarters ending in the third quarter of 2020, and for the years 2020 to 2024 and 2025 to 2029, is 5.21%.[37]

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[37] *Blue Chip Financial Forecasts*, December 1, 2018, at p. 14 and May 1, 2019, at p. 2.

When the beta-adjusted risk premium of 6.79%[38] relative to the Non-Price Regulated Proxy Group is added to the prospective Baa2 rated corporate bond yield of 5.21%, the indicated RPM cost rate is 12.00%.

Page 6 contains the inputs and calculations that support my indicated CAPM/ECAPM cost rate of 11.17%.

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

A. As shown on page 1 of Schedule DWD-7, the results of the DCF, RPM, and CAPM applied to the Non-Price Regulated Proxy Group comparable in total risk to the Utility Proxy Group are 11.88%, 12.00%, and 11.19%, respectively. The average of the mean and median of these models is 11.79%, which I use as the indicated common equity cost rate for the Non-Price Regulated Proxy Group.

VIII. CONCLUSION OF COMMON EQUITY COST RATE BEFORE ADJUSTMENT

Q. What is the indicated common equity cost rate 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 cost of equity before adjustment is 10.35%. I use multiple cost of common equity models as primary tools in arriving at my recommended common equity cost rate, because no single model is so

[38] Derived on page 5 of Schedule DWD-7.

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.

Based on these common equity cost rate results, I conclude that a common equity cost rate of 10.35% is reasonable, appropriate and indicated for the Company before any adjustment for relative risk between the Company and the Utility Proxy Group is made. The 10.35% indicated ROE is the approximate average of the mean and median results produced by my application of the models as explained above.

IX. <u>ADJUSTMENTS TO THE COMMON EQUITY COST RATE</u>

A. <u>Size Adjustment</u>

Q. Is there a way to quantify a relative risk adjustment due to CWSNC's small size relative to the proxy group?

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

Table 5: Size as Measured by Market Capitalization for the Company and the Utility Proxy Group

	Market Capitalization* ($ Millions)	Times Greater than the Company
CWSNC	$217.491	
Utility Proxy Group	$4,385.585	20.2x

*From page 1 of Schedule DWD-8.

The Company's estimated market capitalization was at $217.491 million as of April 30, 2019, compared with the market capitalization of the average water company in the Utility Proxy Group of $4.386 billion as of April 30, 2019. The Utility Proxy Group's market capitalization is 20.2 times the size of CWSNC's estimated market capitalization.

Q. Please explain why size has a bearing on business risk.

A. Company size is a significant element of business risk for which investors expect to be compensated through higher returns. Generally, smaller companies are less able to cope with significant events that affect sales, revenues, and earnings. For example, smaller companies face more risk exposure to business cycles and economic conditions, both nationally and locally. Additionally, the loss of revenues from a few larger customers would have a greater effect on a small company than on a much larger company with a larger, more diverse, customer base.

Further evidence of the risk effects of size include the fact that investors demand greater returns to compensate for the lack of marketability and liquidity of the securities of smaller firms. For these reasons, the Commission should authorize a cost of common equity in this proceeding that reflects CWSNC's relevant risk, including the impact of its small size.

As a result, it is necessary to upwardly adjust the indicated common equity cost rate of 10.35% to reflect CWSNC's greater risk due to its smaller relative size. The determination is based on the size premiums for portfolios of New York Stock Exchange, American Stock Exchange, and NASDAQ listed companies ranked by deciles for the 1926 to 2018 period. The average size premium for the Utility Proxy Group with a market capitalization of $4.386 billion falls in the 5th decile, while CWSNC's market capitalization of $217.491 million places the Company in the 10th decile. The size premium spread between the 5th decile and the 10th decile is 3.94%. Even though a 3.94% upward size adjustment is indicated, I apply a size premium of 0.40% to CWSNC's indicated common equity cost rate.

Q. What is the indicated cost of common equity after adjustment for size?

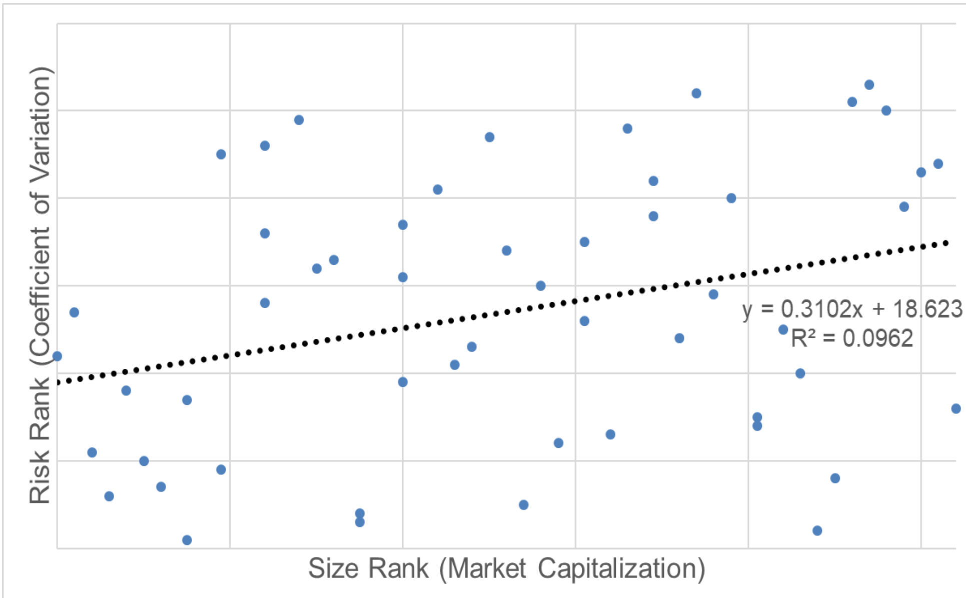
A. After applying the 0.40% size adjustment to the indicated cost of common equity of 10.35%, a size-adjusted cost of common equity of 10.75% results.

Q. Have you reviewed the Commission's Order[39] regarding the size adjustment in the Company's last rate case?

A. I have. The Commission's concerns regarding the size adjustment were that whether the size studies presented in the record were applicable to utilities, and that the selection of a 40 basis point adjustment from an indicated 461 basis point risk premium was rather arbitrary. In order to provide more information to the Commission in this case, I conducted a study on whether or not the size effect is in fact applicable to utilities. My study included the universe of water, gas, and electric companies included in *Value Line Standard Edition.* From each of the utilities' *Value Line Ratings & Reports*, I calculated the 10-year CoV of net profit (a measure of risk) and current market capitalization (a measure of size) for each company. After ranking the companies by size (largest to smallest) and risk (least risky to most risky), I made a scatter plot of the data, as shown on Chart 1, below:

[39] State of North Carolina Utilities Commission, Docket No. W-354, Sub 360, Order approving joint settlement agreement and stipulation, granting partial rate increase, and requiring customer notice, February 23, 2019, at 84-85.

<u>Chart 1: Relationship between Size and Risk for the *Value Line* Universe of Utility Companies</u>



As shown in Chart 1 above, as company size decreases (increasing size rank), the CoV increases, linking size and risk for utilities. The R-Squared of 0.0962 means that approximately 10% of the change in risk rank is explained by the size rank. While a 0.0962 R-Squared does not appear to have strong explanatory power, the average R-Squared of the Utility Proxy Group's beta coefficient is 0.0794.[40] The selection of a 40 basis point upward adjustment based on its difference in size given an indicated risk premium of approximately 400 basis points is consistent with the approximate 0.10 R-Squared of the size study applicable to utilities. With

40 An R-Squared of 0.794 indicates that only approximately 8.0%of the change in risk is explained by beta.

this additional information, I would hope that the Commission revisit this concern in its Order in this case.

X. ECONOMIC CONDITIONS IN NORTH CAROLINA

Q. Did you consider the economic conditions in North Carolina in arriving at your recommended cost of common equity?

A. Yes, I did. As the Commission has stated, it "…is and must always be mindful of the North Carolina Supreme Court's command that the Commission's task is to set rates as low as possible consistent with the dictates of the United States and North Carolina Constitutions."[41] In that regard, the cost of common equity should be neither excessive nor confiscatory; it should be the minimum amount needed to meet the *Hope* and *Bluefield* Comparable Risk, Capital Attraction, and Financial Integrity standards.

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

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

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41 State of North Carolina Utilities Commission, Docket No. E-7, Sub 1026, Order Granting General Rate Increase, Sept. 24, 2013 at 24; see also DEC Remand Order at 40 ("the Commission in every case seeks to comply with the North Carolina Supreme Court's mandate that the Commission establish rates as low as possible within Constitutional limits.").

> accord with the "end result" test of Hope. This the Commission has done.[42]

The Supreme Court agreed, and upheld the Commission's Order on Remand.[43] The NC Supreme Court also made clear, however, that "in retail electric service rate cases the Commission must make findings of fact regarding the impact of changing economic conditions on customers when determining the proper ROE for a public utility."[44] The Commission made such additional findings of fact in its Order on Remand.[45] In light of the 2013 Cooper I decision, I present measures of economic conditions in the state and in the nation for the Commission to consider.

Q. What specific measures of economic conditions have you reviewed?

A. I have reviewed the following:

(i) Unemployment rates from the United States, North Carolina, and the counties comprising CWSNC's service territory;

(ii) The growth in Gross National Product ("GDP") in both the United States and North Carolina;

(iii) Median household income in the United States and in North Carolina; and

(iv) National income and consumption trends.

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

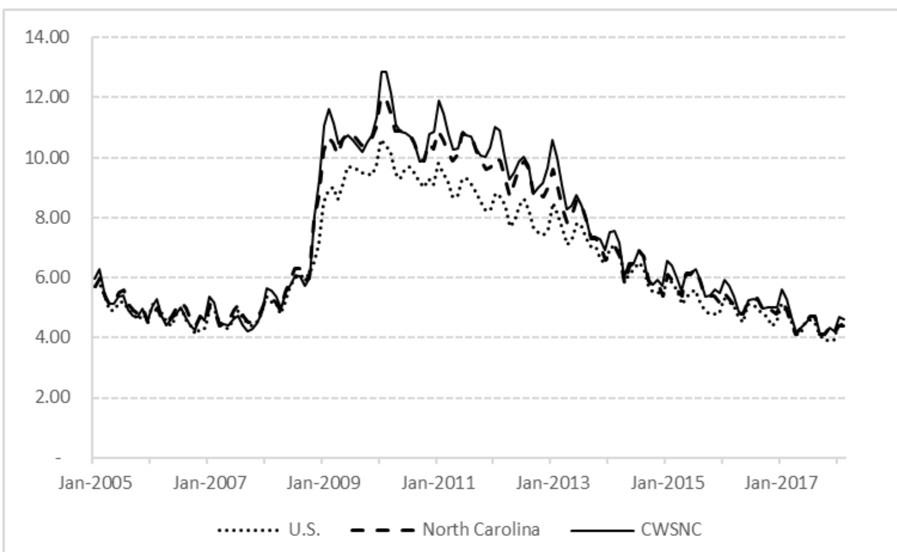
43 State ex rel. Utils. Comm'n v. Cooper, 366 N.C. 484, 739 S.E.2d 541 (2013) (Cooper I)).

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

45 State of North Carolina Utilities Commission, Docket No. E-22, Sub 479, Order on Remand, July 23, 2015, at 4-10.

Turning first to the rate of unemployment, it has fallen substantially in North Carolina and the U.S. since late 2009 and early 2010, when the rates peaked at 10.00% and 12.00%, respectively. Although the unemployment rate in North Carolina rather exceeded the national rate during and after the 2008/2009 financial crisis, by late 2013, the two were largely consistent. By April 2019, the unemployment rate had fallen to less than one-half of the 2008/2009 peak levels: 3.30% nationally; and 3.60% in North Carolina. (*see* Chart 2, below).

Chart 2: Unemployment Rate: U.S. North Carolina, and CWSNC[46]



Since the conclusion of the Company's last rate filing in February 2019, the unemployment rate in North Carolina has decreased from 4.20% to 3.60%. That 0.60% decrease is slightly lower than the U.S.

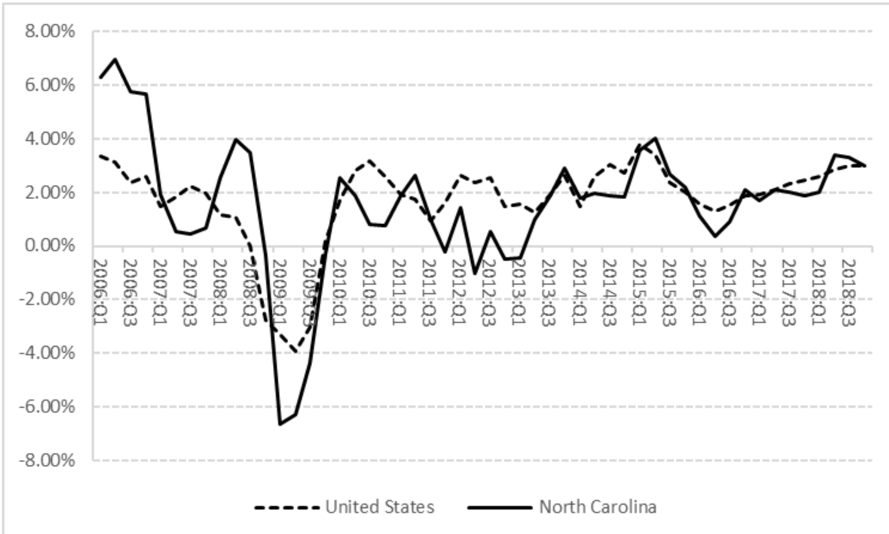
[46] Source of Information: Bureau of Labor Statistics.

unemployment rate which has decreased 0.80% over that same period. Still, over the entire period of 2005 through 2018, the correlation between North Carolina's unemployment rate and the national rate was approximately 99%.

I was also able to review unemployment rates (seasonally unadjusted) in the counties served by CWSNC. At its peak, which occurred in late 2009 into early 2010, the unemployment rate in those counties reached an average 12.86% (86 basis points higher than the state-wide average); by April 2019 it had fallen to 3.68% (only 8 basis points higher than the state-wide average). Since the conclusion of the Company's last rate filing in February 2019, the counties' unemployment has also fallen, from 4.49% to 3.68%. From 2005 through 2018, the correlation in unemployment rates between the counties served by CWSNC, and the U.S. and North Carolina, were also approximately 99%. In summary, although it remains slightly higher than national and state-wide averages, county-level unemployment has fallen considerably since its peak in early 2010.

Looking to real Gross Domestic Product ("GDP") growth, there also has been a relatively strong correlation between North Carolina and the national economy (approximately 69%). Since the financial crisis, the national rate of growth at times (during portions of 2010 and 2012) outpaced North Carolina. Since the second quarter of 2015, however, growth in the state's real GDP has consistently exceeded the national growth rate.

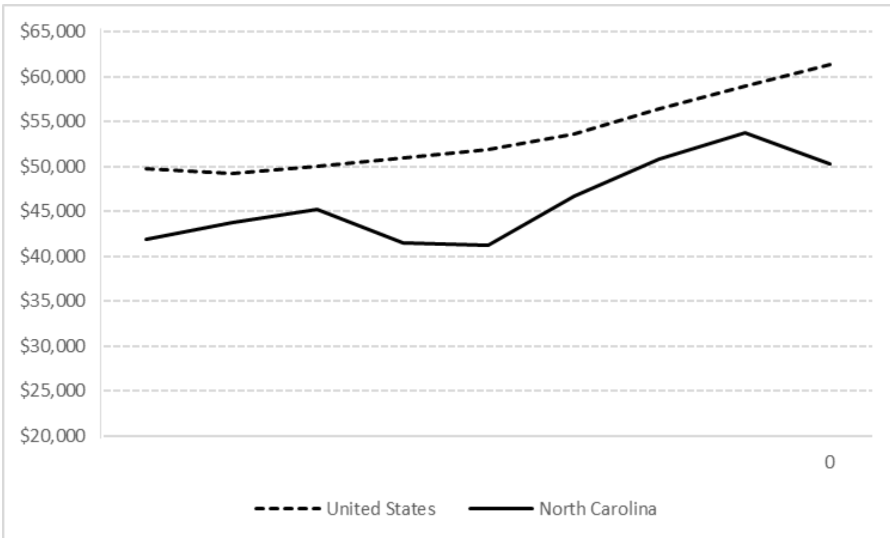
Chart 3: Real Gross Domestic Product Growth Rate[47]



As to median household income, the correlation between North Carolina and the U.S. is relatively strong (approximately 87% from 2005 through 2018). Since 2009 (the years subsequent to the financial crisis), median household income in North Carolina has grown at a similar annual rate as the national median income (2.32% vs. 2.65%; *see* Chart 4, below). To put household income in perspective, the Missouri Economic Research and Information Center reports that in 2018, North Carolina had the 19th lowest cost of living index among the 50 states and the District of Columbia.[48]

[47] Source: Bureau of Economic Analysis.
[48] Source: https://www.missourieconomy.org/indicators/cost_of_living/ Accessed 6/4/2019.

Chart 4: Median Household Income[49]



Q. Please summarize your analyses and conclusions.

A. In its Order on Remand in Docket No. E-22, Sub 479, the Commission observed that economic conditions in North Carolina were highly correlated with national conditions, such that they were reflected in the analyses used to determine the cost of common equity.[50] Those relationships still hold: economic conditions in North Carolina continue to improve from the recession following the 2008/2009 financial crisis, and they continue to be strongly correlated to conditions in the U.S., generally. In particular, unemployment, at both the state and county level, continues to fall and remains highly correlated with national rates of unemployment; real Gross Domestic Product recently has grown faster in North Carolina than the

49 Source of Information: U.S. Census data.

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

national rate of growth, although the two remain fairly well correlated; and median household income also has grown faster in North Carolina than the rest of the Country, and remains strongly correlated with national levels. In sum, the correlations between state-wide measures of economic conditions noted by the Commission in Docket No. E-22, Sub 479 remain in place and, as such, they continue to be reflected in the models and data used to estimate the cost of common equity.

XI. CONCLUSION OF COMMON EQUITY COST RATE

Q. What is your recommended cost of common equity for CWSNC?

A. Given the indicated cost of common equity of 10.35%, and the size-adjusted cost of common equity of 10.75%, I conclude that a cost of common equity cost rates for the Company of 10.75% is appropriate.

Q. In your opinion, is your proposed cost of common equity cost rate of 10.75% fair and reasonable to CWSNC, its shareholders, and its customers, considering the above economic conditions?

A. Yes, it is.

Q. Does this conclude your direct testimony?

A. Yes, it does.

scottmadden
MANAGEMENT CONSULTANTS

Appendix A
Professional Qualifications of
Dylan W. D'Ascendis, CRRA, CVA

Summary

Dylan is an experienced consultant and a Certified Rate of Return Analyst (CRRA) and Certified Valuation Analyst (CVA). He has served as a consultant for investor-owned and municipal utilities and authorities for 10 years. Dylan has extensive experience in rate of return analyses, class cost of service, rate design, and valuation for regulated public utilities. He has testified as an expert witness in the subjects of rate of return, cost of service, rate design, and valuation before 17 regulatory commissions in the U.S. and an American Arbitration Association panel.

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

Areas of Specialization

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

Recent Expert Testimony Submission/Appearances

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

Recent Assignments

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

Recent Publications and Speeches

- Co-Author of: "The Impact of Decoupling on the Cost of Capital of Public Utilities", co-authored with Richard A. Michelfelder, Ph.D., Rutgers University and Pauline M. Ahern. (Forthcoming)
- "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 ModelTM, 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.

scottmadden MANAGEMENT CONSULTANTS

Appendix A
Professional Qualifications of
Dylan W. D'Ascendis, CRRA, CVA

SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
Regulatory Commission of Alaska				
Alaska Power Company	07/16	Alaska Power Company	Docket No. TA857-2	Rate of Return
Arizona Corporation Commission				
Arizona Water Company	08/18	Arizona Water Company	Docket No. W01445A-18-0164	Rate of Return
Colorado Public Utilities Commission				
Summit Utilities, Inc.	04/18	Colorado Natural Gas Company	Docket No. 18AL-0305G	Return on Equity
Atmos Energy Corporation	06/17	Atmos Energy Corporation	Docket No. 17AL-0429G	Return on Equity
Delaware Public Service Commission				
Tidewater Utilities, Inc.	11/13	Tidewater Utilities, Inc.	Docket No. 13-466	Capital Structure
Hawaii Public Utilities Commission				
Kaupulehu Water Company	02/18	Kaupulehu Water Company	Docket No. 2016-0363	Rate of Return
Aqua Engineers, LLC	05/17	Puhi Sewer & Water Company	Docket No. 2017-0118	Cost of Service / Rate Design
Hawaii Resources, Inc.	09/16	Laie Water Company	Docket No. 2016-0229	Cost of Service / Rate Design
Illinois Commerce Commission				
Utility Services of Illinois, Inc.	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
Louisiana Public Service Commission				
Louisiana Water Service, Inc.	06/13	Louisiana Water Service, Inc.	Docket No. U-32848	Rate of Return
Maryland Public Service Commission				
FirstEnergy, Inc.	08/18	Potomac Edison Company	Case No. 9490	Rate of Return
Massachusetts Department of Public Utilities				
Liberty Utilities	07/15	Liberty Utilities d/b/a New England Natural Gas Company	Docket No. 15-75	Rate of Return
Mississippi Public Service Commission				
Atmos Energy	03/19	Atmos Energy	Docket No. 2015-UN-049	Capital Structure
Atmos Energy	07/18	Atmos Energy	Docket No. 2015-UN-049	Capital Structure

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Appendix A
Professional Qualifications of
Dylan W. D'Ascendis, CRRA, CVA

SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
Missouri Public Service Commission				
Indian Hills Utility Operating Company, Inc.	10/17	Indian Hills Utility Operating Company, Inc.	Case No. SR-2017-0259	Rate of Return
Raccoon Creek Utility Operating Company, Inc.	09/16	Raccoon Creek Utility Operating Company, Inc.	Docket No. SR-2016-0202	Rate of Return
New Jersey Board of Public Utilities				
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
North Carolina Utilities Commission				
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
Public Utilities Commission of Ohio				
Aqua Ohio, Inc.	05/16	Aqua Ohio, Inc.	Docket No. 16-0907-WW-AIR	Rate of Return
Pennsylvania Public Utility Commission				
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				
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

Appendix A
Professional Qualifications of
Dylan W. D'Ascendis, CRRA, CVA

SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
United Utility Companies, Inc.	09/13	United Utility Companies, Inc.	Docket No. 2013-199-WS	Rate of Return
Utility Services of South Carolina, Inc.	09/13	Utility Services of South Carolina, Inc.	Docket No. 2013-201-WS	Rate of Return
Tega Cay Water Services, Inc.	11/12	Tega Cay Water Services, Inc.	Docket No. 2012-177-WS	Capital Structure
Virginia State Corporation Commission				
WGL Holdings, Inc.	7/18	Washington Gas Light Company	PUR-2018-00080	Rate of Return
Atmos Energy Corporation	5/18	Atmos Energy Corporation	PUR-2018-00014	Rate of Return
Aqua Virginia, Inc.	7/17	Aqua Virginia, Inc.	PUR-2017-00082	Rate of Return
Massanutten Public Service Corp.	08/14	Massanutten Public Service Corp.	PUE-2014-00035	Rate of Return / Rate Design

Carolina Water Service, Inc. of North Carolina
Table of Contents
to D'Ascendis Direct Exhibit No. 1

Carolina Water Service, Inc. of North Carolina
Recommended Capital Structure and Cost Rates
for Ratemaking Purposes
at March 31, 2019

Type Of Capital	Ratios (1)	Cost Rate	Weighted Cost Rate
Long-Term Debt	52.04%	5.59% (1)	2.91%
Common Equity	47.96%	10.75% (2)	5.16%
Total	100.00%		8.07%

Notes:

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

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

Line No.	Principal Methods	Proxy Group of Six Water Companies
1.	Discounted Cash Flow Model (DCF) (1)	8.70%
2.	Risk Premium Model (RPM) (2)	10.62%
3.	Capital Asset Pricing Model (CAPM) (3)	10.21%
4.	Market Models Applied to Comparable Risk, Non-Price Regulated Companies (4)	11.78%
5.	Indicated Common Equity Cost Rate before Adjustment for Size Risk	10.35%
6.	Size Risk Adjustment (5)	0.40%
7.	Recommended Common Equity Cost Rate after Adjustment for Size Risk	10.75%

Notes:
(1) From Schedule DWD-3.
(2) From page 1 of Schedule DWD-4.
(3) From page 1 of Schedule DWD-5.
(4) From page 1 of Schedule DWD-7.
(5) From Schedule DWD-8.

Proxy Group of Six Water Companies
CAPITALIZATION AND FINANCIAL STATISTICS (1)
2014 - 2018, Inclusive

	2018	2017	2016	2015	2014	5 YEAR AVERAGE
			(MILLIONS OF DOLLARS)			
CAPITALIZATION STATISTICS						
AMOUNT OF CAPITAL EMPLOYED						
TOTAL PERMANENT CAPITAL	$2,806.355	$2,520.354	$2,397.831	$2,285.766	$2,178.876	
SHORT-TERM DEBT	$198.340	$212.952	$175.872	$117.184	$94.428	
TOTAL CAPITAL EMPLOYED	$3,004.695	$2,733.306	$2,573.703	$2,402.950	$2,273.304	
INDICATED AVERAGE CAPITAL COST RATES (2)						
TOTAL DEBT	4.852 %	4.97 %	5.182 %	5.248 %	5.393 %	
PREFERRED STOCK	5.92 %	5.91 %	5.91 %	5.91 %	5.67 %	
CAPITAL STRUCTURE RATIOS						
BASED ON TOTAL PERMANENT CAPITAL:						
LONG-TERM DEBT	45.14 %	43.47 %	44.03 %	44.81 %	44.08 %	44.31 %
PREFERRED STOCK	0.11	0.12	0.13	0.13	0.14	0.12
COMMON EQUITY	54.75	56.41	55.84	55.06	55.78	55.57
TOTAL	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
BASED ON TOTAL CAPITAL:						
TOTAL DEBT, INCLUDING SHORT-TERM	48.62 %	47.48 %	46.82 %	46.30 %	46.28 %	47.10 %
PREFERRED STOCK	0.10	0.11	0.12	0.13	0.14	0.12
COMMON EQUITY	51.28	52.41	53.06	53.57	53.58	52.78
TOTAL	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
FINANCIAL STATISTICS						
FINANCIAL RATIOS - MARKET BASED						
EARNINGS / PRICE RATIO	3.56 %	3.46 %	3.73 %	4.55 %	4.84 %	4.03 %
MARKET / AVERAGE BOOK RATIO	307.51	303.79	271.29	219.78	202.93	261.06
DIVIDEND YIELD	2.05	2.06	2.31	2.83	3.00	2.45
DIVIDEND PAYOUT RATIO	57.39	59.63	61.35	61.54	61.49	60.28
RATE OF RETURN ON AVERAGE BOOK COMMON EQUITY	10.83 %	10.43 %	9.97 %	9.90 %	9.74 %	10.17 %
TOTAL DEBT / EBITDA (3)	3.98 x	3.43 x	3.42 x	3.46 x	3.54 x	3.56 x
FUNDS FROM OPERATIONS / TOTAL DEBT (4)	23.84 %	25.57 %	23.90 %	26.23 %	26.00 %	25.11 %
TOTAL DEBT / TOTAL CAPITAL	48.62 %	47.48 %	46.82 %	46.30 %	46.28 %	47.10 %

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

D'Ascendis Exhibit No. 1
Schedule DWD-2
Page 2 of 2

Capital Structure Based upon Total Permanent Capital for the
Proxy Group of Six Water Companies
2014 - 2018, Inclusive

	2018	2017	2016	2015	2014	5 YEAR AVERAGE
American States Water Co.						
Long-Term Debt	36.54 %	37.75 %	39.40 %	41.15 %	39.15 %	38.80 %
Preferred Stock	0.00	0.00	0.00	0.00	0.00	0.00
Common Equity	63.46	62.25	60.60	58.85	60.85	61.20
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
American Water Works Company Inc						
Long-Term Debt	56.55 %	55.81 %	54.74 %	53.89 %	52.70 %	54.74 %
Preferred Stock	0.05	0.07	0.09	0.11	0.15	0.09
Common Equity	43.40	44.12	45.17	46.00	47.15	45.17
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
Artesian Resources Corporation						
Long-Term Debt	43.42 %	42.17 %	42.71 %	44.23 %	45.81 %	43.67 %
Preferred Stock	0.00	0.00	0.00	0.00	0.00	0.00
Common Equity	56.58	57.83	57.29	55.77	54.19	56.33
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
California Water Service Group						
Long-Term Debt	52.74 %	43.40 %	45.83 %	44.69 %	40.46 %	45.42 %
Preferred Stock	0.00	0.00	0.00	0.00	0.00	0.00
Common Equity	47.26	56.60	54.17	55.31	59.54	54.58
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
Middlesex Water Co.						
Long-Term Debt	38.94 %	38.65 %	38.91 %	40.44 %	41.55 %	39.70 %
Preferred Stock	0.59	0.64	0.68	0.69	0.71	0.66
Common Equity	60.47	60.71	60.41	58.87	57.74	59.64
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
York Water Co.						
Long-Term Debt	42.68 %	43.02 %	42.60 %	44.46 %	44.81 %	43.51 %
Preferred Stock	0.00	0.00	0.00	0.00	0.00	0.00
Common Equity	57.32	56.98	57.40	55.54	55.19	56.49
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
Proxy Group of Six Water Companies						
Long-Term Debt	45.14 %	43.47 %	44.03 %	44.81 %	44.08 %	44.31 %
Preferred Stock	0.11	0.12	0.13	0.13	0.14	0.12
Common Equity	54.75	56.41	55.84	55.06	55.78	55.57
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %

Source of Information
Annual Forms 10-K

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

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Proxy Group of Six Water Companies	Average Dividend Yield (1)	Value Line Projected Five Year Growth in EPS (2)	Reuters Mean Consensus Projected Five Year Growth Rate in EPS	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 Co.	1.57 %	8.00 %	6.00 %	6.00 %	6.00 %	6.50 %	1.62 %	8.12 %
American Water Works Company Inc	1.95	9.50	10.60	8.10	8.20	9.10	2.04	11.14
Artesian Resources Corporation	2.61	NA	NA	NA	4.00	4.00	2.66	6.66
California Water Service Group	1.52	8.50	NA	7.00	9.80	8.43	1.58	10.01
Middlesex Water Co.	1.70	7.50	NA	NA	2.70	5.10	1.74	6.84
York Water Co.	2.02	9.50	NA	NA	4.90	7.20	2.09	9.29
							Average	8.68 %
							Median	8.71 %
							Average of Mean and Median	8.70 %

NA= Not Available

Notes:
(1) Indicated dividend at 04/30/2019 divided by the average closing price of the last 60 trading days ending 04/30/2019 for each company.
(2) From pages 2 through 7 of this Schedule.
(3) Average of columns 2 through 5 excluding negative growth rates.
(4) This reflects a growth rate component equal to one-half the conclusion of growth rate (from column 6) x column 1 to reflect the periodic payment of dividends (Gordon Model) as opposed to the continuous payment. Thus, for American States Water Co., 1.57% x (1+(1/2 x 6.50%)) = 1.62%.
(5) Column 6 + column 7.

Source of Information:
Value Line Investment Survey
www.reuters.com Downloaded on 04/30/2019
www.zacks.com Downloaded on 04/30/2019
www.yahoo.com Downloaded on 04/30/2019

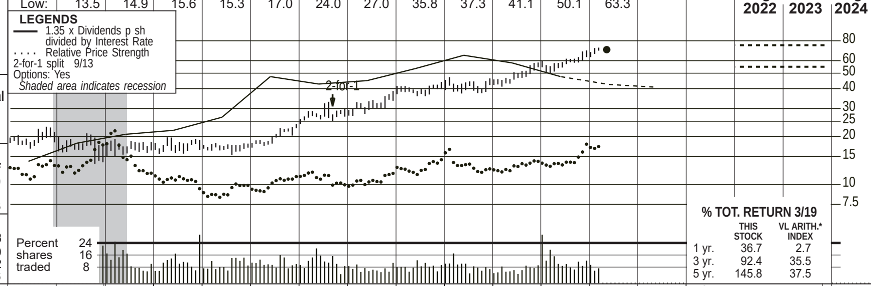
AMER. STATES WATER NYSE-AWR

RECENT PRICE **70.31** | P/E RATIO **37.6** (Trailing: 40.9 Median: 21.0) | RELATIVE P/E RATIO **2.16** | DIV'D YLD **1.6%** | **VALUE LINE**

TIMELINESS 1 Raised 4/12/19
SAFETY 2 Raised 7/20/12
TECHNICAL 2 Lowered 2/22/19
BETA .70 (1.00 = Market)

High:	21.0	19.4	19.8	18.2	24.1	33.1	38.7	44.1	47.2	58.4	69.6	72.5
Low:	13.5	14.9	15.6	15.3	17.0	24.0	27.0	35.8	37.3	41.1	50.1	63.3

Target Price Range 2022 | 2023 | 2024



2022-24 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	75	(+5%)	4%
Low	55	(-20%)	-3%

Insider Decisions

	J	J	A	S	O	N	D	J	F
to Buy	0	0	0	0	0	0	0	0	0
Options	0	2	0	4	0	2	3	12	1
to Sell	1	2	3	4	1	3	3	2	3

Institutional Decisions

	2Q2018	3Q2018	4Q2018
to Buy	105	107	140
to Sell	95	109	102
Hld's(000)	27202	26103	26276

% TOT. RETURN 3/19

	THIS STOCK	VL ARITH.* INDEX
1 yr.	36.7	2.7
3 yr.	92.4	35.5
5 yr.	145.8	37.5

2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	© VALUE LINE PUB. LLC	22-24
6.99	6.81	7.03	7.88	8.75	9.21	9.74	10.71	11.12	12.12	12.19	12.17	12.56	11.92	12.01	11.88	*12.20*	*12.45*	Revenues per sh	*15.75*
1.04	1.11	1.32	1.45	1.65	1.69	1.70	2.11	2.13	2.48	2.65	2.67	2.81	2.70	2.96	2.84	*3.05*	*3.25*	"Cash Flow" per sh	*4.00*
.39	.53	.66	.67	.81	.78	.81	1.11	1.12	1.41	1.61	1.57	1.61	1.62	1.88	1.72	*1.90*	*2.05*	Earnings per sh A	*2.75*
.44	.44	.45	.46	.48	.50	.51	.52	.55	.64	.76	.83	.87	.91	.99	1.06	*1.14*	*1.22*	Div'd Decl'd per sh B■	*1.70*
1.88	2.51	2.12	1.95	1.45	2.23	2.09	2.12	2.13	1.77	2.52	1.89	2.39	3.55	3.08	3.44	*3.45*	*3.50*	Cap'l Spending per sh	*3.25*
6.98	7.51	7.86	8.32	8.77	8.97	9.70	10.13	10.84	11.80	12.72	13.24	12.77	13.52	14.45	15.19	*15.85*	*16.60*	Book Value per sh D	*19.35*
30.42	33.50	33.60	34.10	34.46	34.60	37.06	37.26	37.70	38.53	38.72	38.29	36.50	36.57	36.68	36.76	*36.90*	*37.00*	Common Shs Outst'g C	*37.50*
31.9	23.2	21.9	27.7	24.0	22.6	21.2	15.7	15.4	14.3	17.2	20.1	24.6	25.6	25.7	34.0	*Bold figures are*		Avg Ann'l P/E Ratio	*23.5*
1.82	1.23	1.17	1.50	1.27	1.36	1.41	1.00	.97	.91	.97	1.06	1.24	1.34	1.29	1.83	*Value Line*		Relative P/E Ratio	*1.30*
3.5%	3.6%	3.1%	2.5%	2.5%	2.9%	2.9%	3.0%	3.2%	3.1%	2.7%	2.6%	2.2%	2.2%	2.0%	1.8%	*estimates*		Avg Ann'l Div'd Yield	*2.6%*

CAPITAL STRUCTURE as of 12/31/18
Total Debt $416.9 mill. **Due in 5 Yrs** $100.7 mill.
LT Debt $376.6 mill. **LT Interest** $21.5 mill.
(40% of Cap'l)

Leases, Uncapitalized: Annual rentals $2.6 mill.
Pension Assets-12/18 $162.5 mill. **Oblig.** $196.1 mill.

Pfd Stock None

Common Stock 36,774,205 shs. **as of 2/12/19**

MARKET CAP: $2.6 billion (Mid Cap)

2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020		22-24
361.0	398.9	419.3	466.9	472.1	465.8	458.6	436.1	440.6	436.8	*450*	*460*	Revenues ($mill)	*590*
29.5	41.4	42.0	54.1	62.7	61.1	60.5	59.7	69.4	63.9	*70.0*	*76.0*	Net Profit ($mill)	*103*
38.9%	43.2%	41.7%	39.9%	36.3%	38.4%	38.4%	36.8%	36.0%	22.0%	*23.0%*	*23.0%*	Income Tax Rate	*23.0%*
3.2%	5.8%	2.0%	2.5%	- -	- -	- -	- -	2.5%	- -	*Nil*	*1.0%*	AFUDC % to Net Profit	*1.0%*
45.9%	44.3%	45.4%	42.2%	39.8%	39.1%	41.1%	39.4%	38.0%	40.5%	*42.0%*	*45.0%*	Long-Term Debt Ratio	*46.0%*
54.1%	55.7%	54.6%	57.8%	60.2%	60.9%	58.9%	60.6%	62.0%	59.5%	*58.0%*	*55.0%*	Common Equity Ratio	*54.0%*
665.0	677.4	749.1	787.0	818.4	832.6	791.5	815.3	854.9	938.4	*1010*	*1115*	Total Capital ($mill)	*1350*
866.4	855.0	896.5	917.8	981.5	1003.5	1060.8	1150.9	1205.0	1296.3	*1360*	*1435*	Net Plant ($mill)	*1650*
5.9%	7.6%	7.1%	8.3%	8.9%	8.6%	9.0%	8.6%	9.3%	7.9%	*8.0%*	*8.0%*	Return on Total Cap'l	*9.0%*
8.2%	11.0%	10.3%	11.9%	12.7%	12.0%	13.0%	12.1%	13.1%	11.4%	*12.0%*	*12.5%*	Return on Shr. Equity	*14.0%*
8.2%	11.0%	10.3%	11.9%	12.7%	12.0%	13.0%	12.1%	13.1%	11.4%	*12.0%*	*12.5%*	Return on Com Equity	*14.0%*
3.2%	5.8%	5.3%	6.6%	6.8%	5.7%	6.0%	5.3%	6.2%	4.5%	*5.0%*	*5.0%*	Retained to Com Eq	*5.5%*
61%	47%	49%	45%	47%	53%	54%	56%	52%	61%	*60%*	*60%*	All Div'ds to Net Prof	*62%*

CURRENT POSITION ($MILL.)	2016	2017	12/31/18
Cash Assets	.4	.2	7.1
Accts Receivable	20.0	26.1	23.4
Other	146.5	129.2	101.0
Current Assets	166.9	155.5	131.5
Accts Payable	43.7	51.0	59.5
Debt Due	90.3	59.3	40.3
Other	43.9	46.4	46.8
Current Liab.	177.9	156.7	146.6

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '16-'18 to '22-'24
Revenues	3.5%	- -	*4.5%*
"Cash Flow"	6.0%	3.0%	*6.0%*
Earnings	9.0%	4.5%	*8.0%*
Dividends	7.5%	9.0%	*9.5%*
Book Value	5.0%	4.0%	*5.0%*

Cal-endar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2016	93.5	112.0	123.8	106.8	436.1
2017	98.8	113.2	124.4	104.2	440.6
2018	94.7	106.9	124.2	111.0	436.8
2019	*97.0*	*115*	*130*	*108*	*450*
2020	*100*	*118*	*132*	*115*	*465*

Cal-endar	EARNINGS PER SHARE A Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2016	.28	.45	.59	.30	1.62
2017	.34	.62	.57	.35	1.88
2018	.29	.44	.62	.37	1.72
2019	*.30*	*.55*	*.65*	*.40*	*1.90*
2020	*.33*	*.61*	*.69*	*.42*	*2.05*

Cal-endar	QUARTERLY DIVIDENDS PAID B■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2015	.213	.213	.224	.224	.87
2016	.224	.224	.224	.242	.91
2017	.242	.242	.255	.255	.99
2018	.255	.255	.275	.275	1.06
2019	.275				

BUSINESS: American States Water Co. operates as a holding company. Through its principal subsidiary, Golden State Water Co., it supplies water to 259,919 customers in 70 cities in 10 counties. Service areas include the metropolitan areas of Los Angeles and Orange Counties. The company also provides electricity to 24,353 customers in Big Bear Lake and San Bernardino Cnty. Provides water & wastewater services to U.S. military bases through its ASUS sub. Sold Chaparral City Wtr. of AZ. (6/11). Employs 817. BlackRock, Inc. owns 11.7% of out. shares; Vanguard, 9.5%; off. & dir. 1.5%. (4/18 Proxy). Chairman: Lloyd Ross. Pres. & CEO: Robert Sprowls. Inc: CA. Addr.: 630 East Foothill Blvd., San Dimas, CA 91773. Tel: 909-394-3600. Internet: www.aswater.com.

American States Water recorded solid results in the fourth quarter. Share earnings were $0.37, or 6% higher than the previous year's figure. This comparison was accomplished even though profits dipped slightly in the company's core water utility business. The ASUS unit, which provides water services to American army bases, contributed $0.18 to share earnings, versus $0.11 in the year-earlier period. Most of the gains were due to the commencement of operations at Fort Riley, increases in earnings from the Elgin Air Force base, and higher activity at Fort Bragg. The armed services are in the process of privatizing water services to many compounds via 50-year contracts. We expect ASUS to win a fair share of the remaining facilities that will eventually seek market bids. American States can augment its earning growth in this segment because it generates a higher return on its investment here as regulators do not set the allowed return on equity.

A major rate case is still pending. In California, water utilities file for rate relief triennially. For the 2018-2021 period, authorities tentatively agreed to a settlement with the Golden State subsidiary last year, but the agreement hasn't been approved by the California Public Utility Commission. When the deal is finalized, the utility will be allowed to recoup certain expenses incurred in 2018.

Earnings momentum should continue through next year. With the utility being able to implement higher rates sometime in 2019, American States' earnings per share may well rise 10% to $1.90. In 2020, we think the bottom line will have another good showing, and earnings per share could reach $2.05.

These timely shares are only for short-term investors. American States Water is a well-run company, but its stock price is expensive by most key financial metrics. For starters, this income equity now has a yield that is lower than the *Value Line* median. Moreover, three-to five-year total return potential is well-below average. Conservative investors may find the stock's low volatility and well-defined prospects appealing. However, we think these positives are already factored into the price of the stock.

James A. Flood *April 12, 2019*

(A) Primary earnings. Excludes nonrecurring gains/(losses): '04, 7¢; '05, 13¢; '06, 3¢; '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 12/31/18; $1.1 million/$0.03 a share.

Company's Financial Strength	A
Stock's Price Stability	85
Price Growth Persistence	80
Earnings Predictability	85

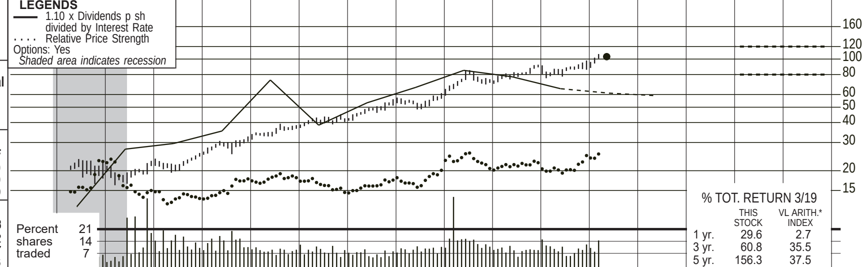
AMERICAN WATER NYSE-AWK

RECENT PRICE **103.71** | P/E RATIO **32.7** (Trailing: 32.9 Median: 19.0) | RELATIVE P/E RATIO **1.88** | DIV'D YLD **1.9%** | VALUE LINE

TIMELINESS 1 Raised 4/5/19
SAFETY 3 New 7/25/08
TECHNICAL 3 Raised 4/12/19
BETA .60 (1.00 = Market)

High:	23.7	23.0	25.8	32.8	39.4	45.1	56.2	61.2	85.2	92.4	98.2	107.7
Low:	16.5	16.2	19.4	25.2	31.3	37.0	41.1	48.4	58.9	70.0	76.0	88.0

Target Price Range 2022 | 2023 | 2024



2022-24 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	120	(+15%)	6%
Low	80	(-25%)	-3%

Insider Decisions

	J	J	A	S	O	N	D	J	F
to Buy	0	0	0	0	0	2	0	0	0
Options	0	0	1	1	0	0	0	7	9
to Sell	0	0	1	1	0	0	0	0	0

Institutional Decisions

	2Q2018	3Q2018	4Q2018
to Buy	307	290	362
to Sell	289	309	287
Hld's(000)	151828	154530	155716

% TOT. RETURN 3/19

	THIS STOCK	VL ARITH.* INDEX
1 yr.	29.6	2.7
3 yr.	60.8	35.5
5 yr.	156.3	37.5

2003	2004	2005	2006	2007E	2008E	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	© VALUE LINE PUB. LLC	22-24
- -	- -	- -	13.08	13.84	14.61	13.98	15.49	15.18	16.25	16.28	16.78	17.72	18.54	18.81	19.04	*19.95*	*20.95*	Revenues per sh	*23.80*
- -	- -	- -	.65	d.47	2.87	2.89	3.56	3.73	4.27	4.36	4.75	5.13	5.26	5.14	6.15	*6.75*	*7.05*	"Cash Flow" per sh	*8.30*
- -	- -	- -	d.97	d2.14	1.10	1.25	1.53	1.72	2.11	2.06	2.39	2.64	2.62	2.38	3.15	*3.60*	*3.85*	Earnings per sh A	*4.70*
- -	- -	- -	- -	- -	.40	.82	.86	.90	1.21	.84	1.21	1.33	1.47	1.62	1.78	*1.94*	*2.10*	Div'd Decl'd per sh B■	*2.75*
- -	- -	- -	4.31	4.74	6.31	4.50	4.38	5.27	5.25	5.50	5.33	6.51	7.36	8.04	8.78	*9.15*	*9.15*	Cap'l Spending per sh	*9.00*
- -	- -	- -	23.86	28.39	25.64	22.91	23.59	24.11	25.11	26.52	27.39	28.25	29.24	30.13	32.42	*34.55*	*36.55*	Book Value per sh D	*41.25*
- -	- -	- -	160.00	160.00	160.00	174.63	175.00	175.66	176.99	178.25	179.46	178.28	178.10	178.44	180.68	*181.00*	*182.00*	Common Shs Outst'g C	*189.00*
- -	- -	- -	- -	- -	18.9	15.6	14.6	16.8	16.7	19.9	20.0	20.5	27.7	33.8	27.3	*Bold figures are*	*Value Line*	Avg Ann'l P/E Ratio	*21.5*
- -	- -	- -	- -	- -	1.14	1.04	.93	1.05	1.06	1.12	1.05	1.03	1.45	1.70	1.47	*estimates*		Relative P/E Ratio	*1.20*
- -	- -	- -	- -	- -	1.9%	4.2%	3.8%	3.1%	3.4%	2.0%	2.5%	2.5%	2.0%	2.0%	2.1%			Avg Ann'l Div'd Yield	*2.8%*

CAPITAL STRUCTURE as of 12/31/18
Total Debt $8604.0 mil. **Due in 5 Yrs** $1555.0 mil.
LT Debt $7569.0 mil. **LT Interest** $328.0 mil.
(56% of Cap'l)

Leases, Uncapitalized: Annual rentals $17.0 mill.
Pension Assets12/18 $1499.0 mill
Oblig. $1892.0 mill.
Pfd Stock $7.0 mill. **Pfd Div'd** $.4 mill

Common Stock 180,751,697 shs.
as of 2/14/19

MARKET CAP: $18.7 billion (Large Cap)

2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020		22-24
2440.7	2710.7	2666.2	2876.9	2901.9	3011.3	3159.0	3302.0	3357.0	3440.0	*3615*	*3815*	Revenues ($mill)	*4500*
209.9	267.8	304.9	374.3	369.3	429.8	476.0	468.0	426.0	567.0	*650*	*700*	Net Profit ($mill)	*890*
37.9%	40.4%	39.5%	40.7%	39.1%	39.4%	39.1%	39.2%	53.3%	28.2%	*21.0%*	*21.0%*	Income Tax Rate	*21.0%*
- -	- -	- -	6.2%	5.1%	- -	- -	- -	5.1%	4.0%	*5.0%*	*5.0%*	AFUDC % to Net Profit	*5.0%*
56.9%	56.8%	55.7%	53.9%	52.4%	52.4%	53.7%	52.4%	54.7%	56.3%	*57.0%*	*58.0%*	Long-Term Debt Ratio	*59.0%*
43.1%	43.2%	44.2%	46.1%	47.6%	47.4%	46.2%	47.5%	45.3%	43.6%	*43.0%*	*42.0%*	Common Equity Ratio	*41.0%*
9289.0	9561.3	9580.3	9635.5	9940.7	10364	10911	10967	11875	13433	*14600*	*15700*	Total Capital ($mill)	*18800*
10524	11059	11021	11739	12391	12900	13933	14992	16246	17409	*18500*	*19500*	Net Plant ($mill)	*22500*
3.8%	4.4%	4.8%	5.4%	5.1%	5.5%	5.7%	5.6%	4.9%	5.4%	*5.5%*	*5.5%*	Return on Total Cap'l	*6.0%*
5.2%	6.5%	7.2%	8.4%	7.8%	8.7%	9.4%	9.0%	7.9%	9.7%	*10.5%*	*10.5%*	Return on Shr. Equity	*11.5%*
5.2%	6.5%	7.2%	8.4%	7.8%	8.7%	9.4%	9.0%	7.9%	9.7%	*10.5%*	*10.5%*	Return on Com Equity	*11.5%*
1.8%	2.8%	3.5%	3.6%	4.7%	4.3%	4.7%	4.0%	2.5%	4.2%	*5.0%*	*5.0%*	Retained to Com Eq	*5.0%*
65%	56%	52%	57%	40%	50%	50%	56%	68%	56%	*54%*	*55%*	All Div'ds to Net Prof	*59%*

CURRENT POSITION ($MILL.)	2016	2017	12/31/18
Cash Assets	75.0	82.0	158.0
Accts Receivable	269.0	272.0	301.0
Other	440.0	366.0	322.0
Current Assets	784.0	720.0	781.0
Accts Payable	154.0	195.0	175.0
Debt Due	1423.0	1227.0	1035.0
Other	815.0	903.0	884.0
Current Liab.	2392.0	2325.0	2094.0

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '16-'18 to '22-'24
Revenues	3.0%	3.5%	*4.0%*
"Cash Flow"	18.5%	6.0%	*7.0%*
Earnings	- -	6.5%	*9.5%*
Dividends	- -	10.5%	*9.0%*
Book Value	1.5%	4.0%	*5.0%*

Cal-endar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2016	743.0	827.0	930.0	802.0	3302.0
2017	756.0	844.0	936.0	821.0	3357.0
2018	761.0	853.0	976.0	850.0	3440.0
2019	*785*	*900*	*1030*	*900*	*3615*
2020	*835*	*950*	*1080*	*950*	*3815*

Cal-endar	EARNINGS PER SHARE A Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2016	.46	.77	.83	.57	2.62
2017	.52	.73	1.12	.01	2.38
2018	.59	.91	1.03	.62	3.15
2019	*.52*	*.83*	*1.20*	*1.05*	*3.60*
2020	*.60*	*.88*	*1.25*	*1.12*	*3.85*

Cal-endar	QUARTERLY DIVIDENDS PAID B■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2015	.31	.34	.34	.34	1.33
2016	.34	.375	.375	.375	1.47
2017	.375	.415	.415	.415	1.62
2018	.415	.455	.455	.455	1.78
2019	.455				

BUSINESS: American Water Works Company, Inc. is the largest investor-owned water and wastewater utility in the U.S., providing services to more than 14 million people in 46 states and Ontario, Canada. Nonregulated business assists municipalities and military bases with the maintenance and upkeep as well. Regulated operations made up 87% of 2018 revenues. New Jersey is its largest market accounting for 24% of regulated revenues; Pennsylvania, 23%. Has 7,100 employees. The Vanguard Grp, owns 11.0% of outstanding shares; BlackRock, Inc., 7.9%; officers & directors, less than 1.0%. (3/19 Proxy). President & CEO: Susan N. Story. Chairman: George MacKenzie. Address: 1025 Laurel Oak Road, Voorhees, NJ 08043. Tel.: 856-346-8200. Internet: www.amwater.com.

Shares of American Water Works continue to turn in an impressive showing. When the stock market slumped double digits in last year's fourth quarter, the equity managed to post positive returns. In the recent March period, the S&P 500 rose about 13%, or about 100 basis points less than AWK. Despite being considered a defensive stock, over the past one-, three-, and five-year periods, AWK has easily outperformed the market indices.

Has the equity peaked? Not according to our ranking system, which believes AWK will do better than the market in the year ahead. Using other financial metrics, however, and a solid case can be made against AWK. Even assuming a healthy dividend increase in May of 7%-10%, the stock's yield is still below 2%. This compares unfavorably to both the *Value Line* median and short-term Treasury notes. Indeed, an investor can get almost a 2.4% yield on a three-month note, without almost no risk. Moreover, AWK has well-below-average total return prospects through 2022-2024, as the current quote is well within our projected Target Price Range.

Much of the company's success is due to its acquisition and cost control strategy. The utility has managed to grow by purchasing many local municipally-owned water districts. (The domestic market consists of over 50,000 separate water districts, with most them small and undercapitalized.) This industry has proven that cost synergies are inherent in most consolidations, so we look for this trend to continue.

Prospects are bright. We think that the company's earnings and dividends can grow 7%-10% over the next five years, a rate much higher than its peers.

Finances are adequate. As part of the large program under way to replace aging pipelines, American Water will spend $8 billion to $8.6 billion on capital expenditures through 2023. This will require the need for external financing. The utility doesn't issue many new shares, so it will likely rely more on new debt. We expect the long-term debt-to-total capital ratio to increase from the current 54%, to 59% by early next decade. Still, not bad considering the size of the capital budget.

James A. Flood *April 12, 2019*

(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. Next earnings report due mid-May. Quarterly earnings do not sum in '16 due to rounding.
(B) Dividends paid in March, June, September, and December. ■ Div. reinvestment available.
(C) In millions. **(D)** Includes intangibles. On 12/31/18: $1.659 billion, $9.18/share.
(E) Pro forma numbers for '06 & '07.

Company's Financial Strength	B+
Stock's Price Stability	100
Price Growth Persistence	85
Earnings Predictability	85

ARTESIAN RES. CORP. NDQ--ARTNA

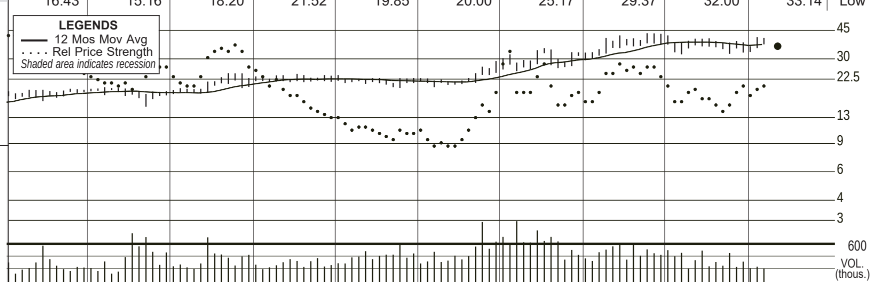
RECENT PRICE **35.94** | TRAILING P/E RATIO **23.3** | RELATIVE P/E RATIO **1.38** | DIV'D YLD **2.7%** | **VALUE LINE**

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
High	19.59	19.99	24.43	24.27	23.82	29.16	35.00	43.22	41.92	40.97
Low	16.43	15.16	18.20	21.52	19.85	20.00	25.17	29.37	32.00	33.14

RANKS

PERFORMANCE	2	Above Average
Technical	1	Highest
SAFETY	3	Average
BETA .65		(1.00 = Market)

Financial Strength	B
Price Stability	65
Price Growth Persistence	45
Earnings Predictability	80



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019/2020
SALES PER SH	8.48	7.56	8.10	7.82	8.13	8.50	8.67	8.92	8.69	
"CASH FLOW" PER SH	1.92	1.64	2.04	1.87	2.04	2.22	2.43	2.55	2.66	
EARNINGS PER SH	1.00	.83	1.13	.94	1.07	1.26	1.41	1.51	1.54	NA/NA
DIV'DS DECL'D PER SH	.75	.76	.79	.82	.85	.87	.90	.93	.96	
CAP'L SPENDING PER SH	2.57	1.83	2.36	2.40	2.66	2.28	3.10	4.46	5.30	
BOOK VALUE PER SH	12.44	13.12	13.57	13.80	14.09	14.61	15.23	15.91	16.57	
COMMON SHS OUTST'G (MILL)	7.65	8.61	8.71	8.83	8.91	9.06	9.13	9.22	9.25	
AVG ANN'L P/E RATIO	18.2	22.5	18.3	23.9	20.5	18.0	20.9	24.2	23.9	NA/NA
RELATIVE P/E RATIO	1.16	1.41	1.17	1.34	1.08	.93	1.14	1.21	1.35	
AVG ANN'L DIV'D YIELD	4.1%	4.1%	3.8%	3.7%	3.9%	3.8%	3.1%	2.5%	2.6%	
SALES ($MILL)	64.9	65.1	70.6	69.1	72.5	77.0	79.1	82.2	80.4	
OPERATING MARGIN	46.5%	45.5%	48.7%	47.0%	48.8%	43.0%	44.4%	44.6%	46.1%	
DEPRECIATION ($MILL)	7.0	7.4	7.9	8.3	8.7	8.8	9.2	9.6	10.3	
NET PROFIT ($MILL)	7.6	6.7	9.8	8.3	9.5	11.3	13.0	14.0	14.3	
INCOME TAX RATE	40.0%	40.8%	40.2%	40.2%	40.1%	--	--	--	--	
NET PROFIT MARGIN	11.7%	10.4%	14.0%	12.0%	13.1%	14.7%	16.4%	17.0%	17.8%	
WORKING CAP'L ($MILL)	d27.9	d11.4	d11.4	d12.3	d13.5	d8.8	d4.7	d9.5	d21.6	
LONG-TERM DEBT ($MILL)	105.1	106.5	106.3	105.5	105.0	103.6	102.3	105.6	115.9	
SHR. EQUITY ($MILL)	95.1	113.0	118.2	121.8	125.6	132.3	139.0	146.6	153.3	
RETURN ON TOTAL CAP'L	5.6%	4.6%	5.9%	5.1%	5.5%	6.3%	6.7%	6.8%	6.5%	
RETURN ON SHR. EQUITY	8.0%	6.0%	8.3%	6.8%	7.6%	8.5%	9.3%	9.5%	9.3%	
RETAINED TO COM EQ	2.0%	.5%	2.5%	.9%	1.6%	2.6%	3.4%	3.7%	3.6%	
ALL DIV'DS TO NET PROF	75%	92%	70%	87%	79%	69%	63%	61%	62%	

Bold figures are consensus earnings estimates and, using the recent prices, P/E ratios.

Note: No analyst estimates available.

ANNUAL RATES

of change (per share)	5 Yrs.	1 Yr.
Sales	2.5%	-2.5%
"Cash Flow"	6.5%	4.0%
Earnings	9.0%	2.0%
Dividends	3.0%	3.0%
Book Value	3.5%	4.0%

Fiscal Year	QUARTERLY SALES ($mill.) 1Q	2Q	3Q	4Q	Full Year
12/31/16	18.5	19.4	21.8	19.4	79.1
12/31/17	19.2	20.5	22.3	20.2	82.2
12/31/18	18.9	20.2	21.9	19.4	80.4
12/31/19					

Fiscal Year	EARNINGS PER SHARE 1Q	2Q	3Q	4Q	Full Year
12/31/15	.28	.36	.41	.21	1.26
12/31/16	.30	.33	.48	.30	1.41
12/31/17	.34	.35	.42	.40	1.51
12/31/18	.38	.42	.42	.32	1.54
12/31/19					

Cal-endar	QUARTERLY DIVIDENDS PAID 1Q	2Q	3Q	4Q	Full Year
2016	.222	.225	.225	.228	.90
2017	.228	.232	.232	.235	.93
2018	.235	.239	.239	.242	.96
2019	.242				

INSTITUTIONAL DECISIONS

	2Q'18	3Q'18	4Q'18
to Buy	32	40	38
to Sell	33	26	27
Hld's(000)	3514	3582	3846

ASSETS ($mill.)	2016	2017	12/31/18
Cash Assets	.2	1.0	.3
Receivables	7.8	8.9	8.2
Inventory	1.6	1.5	1.5
Other	5.0	7.6	6.1
Current Assets	14.6	19.0	16.1
Property, Plant & Equip, at cost	539.7	582.0	629.4
Accum Depreciation	110.3	117.6	126.9
Net Property	429.4	464.4	502.5
Other	7.0	11.2	11.2
Total Assets	451.0	494.6	529.8
LIABILITIES ($mill.)			
Accts Payable	5.6	9.2	8.3
Debt Due	8.4	11.0	17.7
Other	5.3	8.3	11.7
Current Liab	19.3	28.5	37.7

LONG-TERM DEBT AND EQUITY as of 12/31/18

Total Debt $133.5 mill. **Due in 5 Yrs.** $24.4 mill.
LT Debt $115.9 mill.
Including Cap. Leases None
(43% of Cap'l)
Leases, Uncapitalized Annual rentals $.1 mill.

Pension Liability None in '18 vs. None in '17

Pfd Stock None **Pfd Div'd Paid** None

Common Stock 9,250,000 shares
(57% of Cap'l)

INDUSTRY: Water Utility

BUSINESS: Artesian Resources Corp. operates as the holding company of nine wholly-owned subsidiaries offering water, wastewater and other services in Delaware, Maryland and Pennsylvania. Artesian Water, its principal subsidiary, distributes and sells water to residential, commercial, industrial, governmental, municipal, and utility customers throughout Delaware. In addition, Artesian Water provides services to other water utilities, including operations and billing functions, and has contract operation agreements with private and municipal water providers. It also provide water for public and private fire protection to customers in service territories. Artesian Water produced approximately 90% of 2018 consolidated operating revenues. Artesian supplies 7.9 billion gallons of water per year through 1,311 miles of main to over 300,000 people. Has 241 employees. Chairman, C.E.O. & President: Dian C. Taylor. Address: 664 Churchmans Rd. , Newark, DE 19702. Tel.: (302) 453-6900. Internet: www.artesianresources.com.

E.B.

April 12, 2019

TOTAL SHAREHOLDER RETURN
Dividends plus appreciation as of 3/31/2019

3 Mos.	6 Mos.	1 Yr.	3 Yrs.	5 Yrs.
7.60%	2.68%	4.84%	44.72%	94.42%

CALIFORNIA WATER NYSE-CWT

RECENT PRICE **52.41** | P/E RATIO **32.8** (Trailing: 41.6 / Median: 20.0) | RELATIVE P/E RATIO **1.89** | DIV'D YLD **1.5%** | VALUE LINE

TIMELINESS 1 Raised 3/8/19
SAFETY 3 Lowered 7/27/07
TECHNICAL 2 Raised 4/12/19
BETA .70 (1.00 = Market)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
High:	23.3	24.1	19.8	19.4	19.3	23.4	26.4	26.0	36.8	46.2	49.1	55.0
Low:	13.8	16.7	16.9	16.7	16.8	18.4	20.3	19.5	22.5	32.4	35.3	44.6

2022-24 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	55	(+5%)	*3%*
Low	35	(-35%)	*-7%*

Insider Decisions

	J	J	A	S	O	N	D	J	F
to Buy	0	0	0	0	0	0	0	0	0
Options	0	0	1	0	0	0	0	0	0
to Sell	0	0	0	1	0	1	0	0	0

Institutional Decisions

	2Q2018	3Q2018	4Q2018
to Buy	87	104	126
to Sell	91	77	76
Hld's(000)	35009	35103	35160

% TOT. RETURN 3/19

	THIS STOCK	VL ARITH.* INDEX
1 yr.	48.3	2.7
3 yr.	115.4	35.5
5 yr.	154.6	37.5

2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	© VALUE LINE PUB. LLC	22-24
8.18	8.59	8.72	8.10	8.88	9.90	10.82	11.05	12.00	13.34	12.23	12.50	12.29	12.70	13.89	14.38	*14.65*	*14.90*	Revenues per sh	*15.50*
1.26	1.42	1.52	1.36	1.56	1.86	1.93	1.93	2.07	2.32	2.21	2.47	2.22	2.34	3.00	2.99	*3.30*	*3.40*	"Cash Flow" per sh	*3.60*
.61	.73	.74	.67	.75	.95	.98	.91	.86	1.02	1.02	1.19	.94	1.01	1.40	1.26	*1.65*	*1.75*	Earnings per sh A	*2.00*
.56	.57	.57	.58	.58	.59	.59	.60	.62	.63	.64	.65	.67	.69	.72	.75	*.79*	*.82*	Div'd Decl'd per sh B ■	*1.05*
2.19	1.87	2.01	2.14	1.84	2.41	2.66	2.97	2.83	3.04	2.58	2.76	3.69	4.77	5.40	4.35	*3.95*	*4.00*	Cap'l Spending per sh	*3.65*
7.22	7.83	7.90	9.07	9.25	9.72	10.13	10.45	10.76	11.28	12.54	13.11	13.41	13.75	14.44	15.19	*15.45*	*15.80*	Book Value per sh C	*17.00*
33.86	36.73	36.78	41.31	41.33	41.45	41.53	41.67	41.82	41.98	47.74	47.81	47.88	47.97	48.01	48.07	*48.50*	*49.00*	Common Shs Outst'g D	*50.00*
22.1	20.1	24.9	29.2	26.1	19.8	19.7	20.3	21.3	17.9	20.1	19.7	24.8	29.6	26.9	32.7	*Bold figures are*		Avg Ann'l P/E Ratio	*23.0*
1.26	1.06	1.33	1.58	1.39	1.19	1.31	1.29	1.34	1.14	1.13	1.04	1.25	1.55	1.35	1.77	*Value Line*		Relative P/E Ratio	*1.25*
4.2%	3.9%	3.1%	2.9%	3.0%	3.1%	3.1%	3.2%	3.4%	3.5%	3.1%	2.8%	2.9%	2.3%	1.9%	1.8%	*estimates*		Avg Ann'l Div'd Yield	*2.5%*

CAPITAL STRUCTURE as of 12/31/18
Total Debt $880.0 mill. **Due in 5 Yrs** $430.1 mill.
LT Debt $710.0 mill. **LT Interest** $40.0 mill.
(49% of Cap'l)

Pension Assets-12/18 $469.7 mill.
Oblig. $639.9 mill.

Pfd Stock None

Common Stock 48,065,000 shs.

MARKET CAP: $2.5 billion (Mid Cap)

2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020		22-24
449.4	460.4	501.8	560.0	584.1	597.5	588.4	609.4	666.9	691.2	*710*	*730*	Revenues ($mill) E	*775*
40.6	37.7	36.1	42.6	47.3	56.7	45.0	48.7	67.2	60.5	*80.0*	*85.5*	Net Profit ($mill)	*100*
40.3%	39.5%	40.5%	37.5%	30.3%	33.0%	36.0%	35.5%	30.1%	21.0%	*21.0%*	*21.0%*	Income Tax Rate	*21.0%*
7.6%	4.2%	7.6%	8.0%	4.3%	2.7%	4.3%	6.1%	3.5%	5.0%	*5.0%*	*5.0%*	AFUDC % to Net Profit	*5.0%*
47.1%	52.4%	51.7%	47.8%	41.6%	40.1%	44.4%	44.6%	42.7%	49.3%	*46.5%*	*43.5%*	Long-Term Debt Ratio	*38.0%*
52.9%	47.6%	48.3%	52.2%	58.4%	59.9%	55.6%	55.4%	57.3%	50.7%	*53.5%*	*56.5%*	Common Equity Ratio	*62.0%*
794.9	914.7	931.5	908.2	1024.9	1045.9	1154.4	1191.2	1209.3	1440.2	*1400*	*1375*	Total Capital ($mill)	*1375*
1198.1	1294.3	1381.1	1457.1	1515.8	1590.4	1701.8	1859.3	2048.0	2232.7	*2300*	*2385*	Net Plant ($mill)	*2500*
6.5%	5.5%	5.5%	6.3%	6.0%	6.3%	5.2%	5.5%	7.1%	5.5%	*6.5%*	*7.5%*	Return on Total Cap'l	*8.5%*
9.6%	8.6%	8.0%	9.0%	7.9%	9.1%	7.0%	7.4%	9.7%	8.3%	*10.5%*	*11.0%*	Return on Shr. Equity	*12.0%*
9.6%	8.6%	8.0%	9.0%	7.9%	9.1%	7.0%	7.4%	9.7%	8.3%	*10.5%*	*11.0%*	Return on Com Equity	*12.0%*
3.8%	3.0%	2.3%	3.4%	3.4%	4.1%	2.0%	2.4%	4.7%	3.3%	*5.5%*	*6.0%*	Retained to Com Eq	*5.5%*
60%	66%	71%	62%	56%	55%	71%	68%	51%	60%	*48%*	*47%*	All Div'ds to Net Prof	*53%*

CURRENT POSITION ($MILL.)	2016	2017	12/31/18
Cash Assets	25.5	94.8	47.2
Other	116.6	133.1	141.5
Current Assets	142.1	227.9	188.7
Accts Payable	77.8	94.0	95.6
Debt Due	123.3	291.0	170.0
Other	49.1	106.0	55.6
Current Liab.	250.2	491.0	321.2

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '15-'17 to '22-'24
Revenues	4.0%	1.5%	*2.5%*
"Cash Flow"	5.5%	3.5%	*5.0%*
Earnings	4.5%	4.0%	*8.5%*
Dividends	2.0%	2.5%	*6.0%*
Book Value	4.5%	5.0%	*3.0%*

Cal-endar	QUARTERLY REVENUES ($ mill.) E Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2016	121.7	152.4	184.3	151.0	609.4
2017	122.1	171.1	211.7	162.0	666.9
2018	132.2	172.6	219.0	167.4	691.2
2019	*135*	*180*	*225*	*170*	*710*
2020	*140*	*185*	*230*	*175*	*730*

Cal-endar	EARNINGS PER SHARE A Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2016	d.02	.24	.48	.31	1.01
2017	.02	.39	.70	.29	1.40
2018	d.05	.27	.72	.32	1.26
2019	*.11*	*.40*	*.77*	*.37*	*1.65*
2020	*.13*	*.42*	*.80*	*.40*	*1.75*

Cal-endar	QUARTERLY DIVIDENDS PAID B ■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2015	.1675	.1675	.1675	.1675	.67
2016	.1725	.1725	.1725	.1725	.69
2017	.18	.18	.18	.18	.72
2018	.1875	.1875	.1875	.1875	.75
2019	.1975				

BUSINESS: California Water Service Group provides regulated and nonregulated water service to 486,900 customers in 100 communities in the state of California. Accounts for over 94% of total customers. Also operates in Washington, New Mexico, and Hawaii. Main service areas: San Francisco Bay area, Sacramento Valley, Salinas Valley, San Joaquin Valley & parts of Los Angeles. Acquired Rio Grande Corp; West Hawaii Utilities (9/08). Revenue breakdown, '18: residential, 67%; business, 19%; industrial, 5%; public authorities, 5%; other 4%. Off. and dir. own 1% of common stock (4/18 proxy). Has 1,184 employees. Pres. and CEO: Martin A. Kropelnicki. Inc.: DE. Addr.: 1720 North First St., San Jose, CA 95112-4598. Tel.: 408-367-8200. Internet: www.calwatergroup.com.

California Water Service Group stock is trading at an all-time high price. Shares are up almost 15% in value since our January review, which comes off the heels of a 10% rise three months prior. There is clear market support for CWT shares at present, partly owing to improving top-line results, quarter over quarter. Moreover, California's unsuccessful pursuit of SJW Group is now in the rearview mirror, which should allow the company to refocus its resources and energy on operational improvements.

The company boosted its quarterly dividend payment 5 to about 0.20 a share. Indeed, the raise is a good sign, and suggests the company is fundamentally sound. Too, we think additional payout increases are in the cards further out. That said, at current levels, the yield significantly lags both its peer group and the broader market, leaving income-seeking accounts little to get excited about.

Capital investments and rate hikes are apt to be the norm going forward. The majority of CWT's aging infrastructure is still in need of replacement, even after the company spent more than $270 million on upgrades in 2018 (the bulk of which focused on trichloropropane treatment in order to meet new California standards). Over the next several years, through its previously mapped-out investment program, CWT aims to spend upward of $800 million on new water pipes and treatment plant upgrades. Because of this, periodic base-rate hikes are likely to ensue. For example, the company's subsidiary, Hawaii Water Service, recently filed for a rate revision with their Public Utilities Commission, given the magnitude of upgrades over the past few years. Too, CWT has its own proposal in the works.

Shares of California Water garner our Highest rank 1 for Timeliness. The issue is pegged to outperform the broader market averages over the coming six to 12 months and, thus, will appeal to investors with a shorter investment horizon. However, we do not recommend this equity for accounts with a holding period out to 2022-2024. Shares of CWT are currently trading above the upper boundary of our Target Price Range due to its multiyear price ascent.

Nicholas P. Patrikis *April 12, 2019*

(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 '18 : $24.7 mill., $0.51/sh.
(D) In millions, adjusted for splits.
(E) Excludes non-reg. rev.

Company's Financial Strength	B++
Stock's Price Stability	80
Price Growth Persistence	45
Earnings Predictability	65

MIDDLESEX WATER NDQ-MSEX

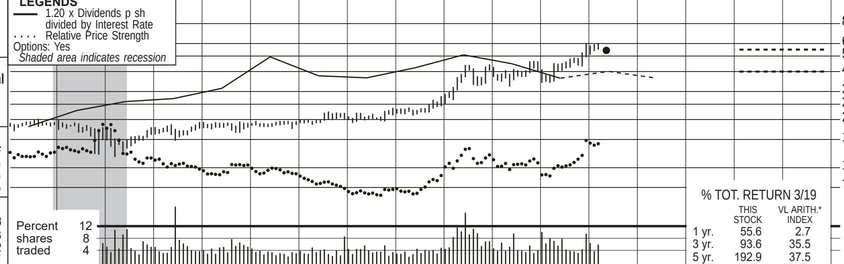
RECENT PRICE 54.37 | P/E RATIO 26.8 (Trailing: 27.7 / Median: 21.0) | RELATIVE P/E RATIO 1.54 | DIV'D YLD 1.8% | VALUE LINE

TIMELINESS 3 Lowered 1/4/19
SAFETY 2 New 10/21/11
TECHNICAL 1 Raised 4/12/19
BETA .75 (1.00 = Market)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
High:	19.8	17.9	19.3	19.4	19.6	22.5	23.7	28.0	44.5	46.7	60.3	60.5
Low:	12.0	11.6	14.7	16.5	17.5	18.6	19.1	21.2	25.0	32.2	34.0	51.0

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

Target Price Range 2022 | 2023 | 2024



2022-24 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	55	(Nil)	3%
Low	40	(-25%)	-5%

Insider Decisions

	J	J	A	S	O	N	D	J	F
to Buy	0	0	0	0	0	0	0	0	0
Options	0	0	0	0	0	0	0	0	0
to Sell	1	1	1	0	1	0	0	1	0

Institutional Decisions

	2Q2018	3Q2018	4Q2018
to Buy	54	54	76
to Sell	48	50	52
Hld's(000)	8732	9294	9247

% TOT. RETURN 3/19

	THIS STOCK	VL ARITH.* INDEX
1 yr.	55.6	2.7
3 yr.	93.6	35.5
5 yr.	192.9	37.5

2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	© VALUE LINE PUB. LLC	22-24
6.12	6.25	6.44	6.16	6.50	6.79	6.75	6.60	6.50	6.98	7.19	7.26	7.77	8.16	8.00	8.42	***8.65***	***8.85***	**Revenues per sh**	***9.70***
1.15	1.28	1.33	1.33	1.49	1.53	1.40	1.55	1.46	1.56	1.72	1.84	1.97	2.17	2.24	2.89	***2.95***	***3.05***	**"Cash Flow" per sh**	***3.45***
.61	.73	.71	.82	.87	.89	.72	.96	.84	.90	1.03	1.13	1.22	1.38	1.38	1.96	***2.05***	***2.15***	**Earnings per sh A**	***2.40***
.65	.66	.67	.68	.69	.70	.71	.72	.73	.74	.75	.76	.78	.81	.86	.91	***.97***	***1.00***	**Div'd Decl'd per sh B■**	***1.15***
1.87	2.54	2.18	2.31	1.66	2.12	1.49	1.90	1.50	1.36	1.26	1.40	1.59	2.91	3.08	4.40	***3.50***	***3.50***	**Cap'l Spending per sh**	***3.50***
7.60	8.02	8.26	9.52	10.05	10.03	10.33	11.13	11.27	11.48	11.82	12.24	12.74	13.40	14.02	15.17	***15.75***	***16.10***	**Book Value per sh**	***17.65***
10.48	11.36	11.58	13.17	13.25	13.40	13.52	15.57	15.70	15.82	15.96	16.12	16.23	16.30	16.35	16.40	***16.50***	***16.75***	**Common Shs Outst'g C**	***17.00***
30.0	26.4	27.4	22.7	21.6	19.8	21.0	17.8	21.7	20.8	19.7	18.5	19.1	25.6	28.4	22.2	*Bold figures are*		**Avg Ann'l P/E Ratio**	***21.0***
1.71	1.39	1.46	1.23	1.15	1.19	1.40	1.13	1.36	1.32	1.11	.97	.96	1.34	1.43	1.20	*Value Line*		**Relative P/E Ratio**	***1.15***
3.5%	3.4%	3.5%	3.7%	3.7%	4.0%	4.7%	4.2%	4.0%	4.0%	3.7%	3.7%	3.3%	2.3%	2.2%	2.1%	*estimates*		**Avg Ann'l Div'd Yield**	***2.4%***

CAPITAL STRUCTURE as of 12/31/18
Total Debt $208.7 mill. **Due in 5 Yrs** $55.8 mill.
LT Debt $152.9 mill. **LT Interest** $6.8 mill.
(Total interest coverage: 7.8x)
(38% of Cap'l)

Pension Assets-12/18 $66.8 mill.
Oblig. $83.9 mill.
Pfd Stock $2.4 mill. **Pfd Div'd:** $.1 mill.

Common Stock 16,403,000 shs.

MARKET CAP: $900 million (Small Cap)

2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	© VALUE LINE PUB. LLC	22-24
91.2	102.7	102.1	110.4	114.8	117.1	126.0	132.9	130.8	138.1	***143***	***148***	**Revenues ($mill)**	***165***
10.0	14.3	13.4	14.4	16.6	18.4	20.0	22.7	22.8	32.5	***34.0***	***36.0***	**Net Profit ($mill)**	***41.0***
34.1%	32.1%	32.7%	33.9%	34.1%	35.0%	34.5%	34.0%	32.7%	2.8%	***21.0%***	***21.0%***	**Income Tax Rate**	***21.0%***
- -	6.8%	6.1%	3.4%	1.9%	1.7%	1.9%	2.7%	3.1%	1.4%	***2.0%***	***2.0%***	**AFUDC % to Net Profit**	***2.5%***
46.6%	43.1%	42.3%	41.5%	40.4%	40.5%	39.4%	37.9%	37.5%	37.8%	***37.0%***	***36.5%***	**Long-Term Debt Ratio**	***36.0%***
52.1%	55.8%	56.6%	57.4%	58.7%	58.8%	59.8%	61.5%	61.8%	61.6%	***62.5%***	***63.0%***	**Common Equity Ratio**	***63.5%***
267.9	310.5	312.5	316.5	321.4	335.8	345.4	355.4	370.7	404.1	***415***	***425***	**Total Capital ($mill)**	***475***
376.5	405.9	422.2	435.2	446.5	465.4	481.9	517.8	557.2	618.5	***625***	***635***	**Net Plant ($mill)**	***650***
5.0%	5.7%	5.2%	5.4%	5.9%	6.3%	6.6%	7.1%	6.9%	8.9%	***9.0%***	***9.0%***	**Return on Total Cap'l**	***9.0%***
7.0%	8.1%	7.5%	7.8%	8.7%	9.2%	9.6%	10.3%	9.8%	12.9%	***13.0%***	***13.5%***	**Return on Shr. Equity**	***13.5%***
7.0%	8.2%	7.5%	7.8%	8.7%	9.3%	9.6%	10.3%	9.9%	13.0%	***13.0%***	***13.5%***	**Return on Com Equity**	***13.5%***
.1%	2.1%	1.0%	1.4%	2.4%	3.1%	3.5%	4.3%	3.8%	7.0%	***7.0%***	***7.0%***	**Retained to Com Eq**	***7.0%***
98%	75%	87%	83%	73%	67%	63%	58%	62%	46%	***47%***	***47%***	**All Div'ds to Net Prof**	***48%***

CURRENT POSITION ($MILL.)	2016	2017	12/31/18
Cash Assets	3.9	4.9	3.7
Other	22.8	24.3	27.1
Current Assets	26.7	29.2	30.8
Accts Payable	12.3	13.9	19.3
Debt Due	18.2	34.9	55.8
Other	16.6	15.7	19.3
Current Liab.	47.1	64.5	94.4

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '16-'18 to '22-'24
Revenues	2.5%	3.5%	*3.0%*
"Cash Flow"	5.5%	9.0%	*6.0%*
Earnings	6.0%	11.0%	*7.5%*
Dividends	2.0%	3.0%	*5.0%*
Book Value	3.5%	4.5%	*3.5%*

Cal-endar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2016	30.6	32.7	37.8	31.8	132.9
2017	30.1	33.0	36.2	31.5	130.8
2018	31.2	34.9	38.7	33.3	138.1
2019	***33.0***	***36.0***	***40.0***	***34.0***	***143***
2020	***34.0***	***37.0***	***42.0***	***35.0***	***148***

Cal-endar	EARNINGS PER SHARE A Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2016	.29	.36	.54	.19	1.38
2017	.27	.33	.46	.32	1.38
2018	.27	.52	.74	.43	1.96
2019	***.32***	***.53***	***.75***	***.45***	***2.05***
2020	***.35***	***.55***	***.77***	***.48***	***2.15***

Cal-endar	QUARTERLY DIVIDENDS PAID B■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2015	.1925	.1925	.1925	.19875	.78
2016	.19875	.19875	.19875	.21125	.81
2017	.21125	.21125	.21125	.22375	.86
2018	.22375	.22375	.22375	.24	.91
2019	.24				

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 2018, the Middlesex System accounted for 59% of operating revenues. At 12/31/18, the company had 330 employees. Incorporated: NJ. President, CEO, and Chairman: Dennis W. Doll. Officers & directors own 3.5% of the common stock; BlackRock Institutional Trust Co., 6.4% (4/18 proxy). Add.: 1500 Ronson Road, Iselin, NJ 08830. Tel.: 732-634-1500. Internet: www.middlesexwater.com.

Middlesex Water delivered solid financial results to round out 2018. The New Jersey-based regulated water and wastewater provider generated revenues of $33.3 million in the December period, or 6% better than its previous-year haul. The improvement was underpinned by higher water demand from contract customers; strong growth from its Delaware subsidiary, Tidewater Utilities; as well as recently increased base rates across New Jersey operations. Likewise, earnings of $0.43 a share came in $0.06 ahead of our estimate, thanks largely to a lower effective tax rate and the aforementioned top-line gains. Notably, Middlesex continues to post impressive bottom-line results, even amidst a challenging cost environment (rising water production and labor expenses, higher employee healthcare premiums, and increased regulatory costs).

We are introducing our 2020 financial projections. Our model calls for revenues of $148 million and earnings of $2.15 a share next year.

Share-net growth three to five years out ought to be supported by capital spending initiatives. Via its Water For Tomorrow program, roughly $150 million of investable capital has been earmarked through 2020 for major infrastructure upgrades and more-efficient water delivery systems. It is probable, in our view, that these advancements will help lower operating expenses.

The current yield leaves much to be desired. Traditionally, water utilities are considered somewhat of a safe haven for conservative investors looking to generate above-average annual income. However, in recent years, MSEX shares have been significantly bid up, thus limiting their appeal as a pure-play income option at the moment. Nonetheless, we think annual payout hikes are likely to support modest yield expansion over the pull to next decade.

This issue is ranked to move in line with the year-ahead broader market averages. In addition to a subpar yield, most of the gains we envision over the 2022-2024 timeframe appear to already be baked into the share price. Overall, Middlesex stock is not presently on our recommend list.

Nicholas P. Patrikis *April 12, 2019*

(A) Diluted earnings. Next earnings report due early May.
(B) Dividends historically paid in mid-Feb., May, Aug., and November.■ Div'd reinvestment plan available.
(C) In millions.

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

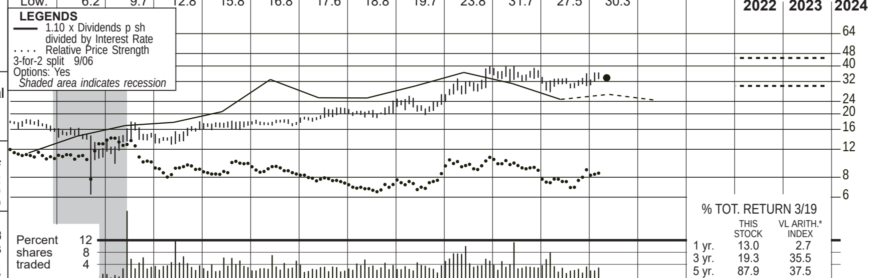
YORK WATER NDQ-YORW

RECENT PRICE **33.69** | P/E RATIO **29.6** (Trailing: 32.4 / Median: 25.0) | RELATIVE P/E RATIO **1.70** | DIV'D YLD **2.0%** | VALUE LINE

TIMELINESS 3 Raised 1/25/19
SAFETY 3 Lowered 7/17/15
TECHNICAL 1 Raised 4/12/19
BETA .75 (1.00 = Market)

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
High:	16.5	18.0	18.0	18.1	18.5	22.0	24.3	26.7	39.8	39.9	36.1	36.5
Low:	6.2	9.7	12.8	15.8	16.8	17.6	18.8	19.7	23.8	31.7	27.5	30.3

Target Price Range 2022 | 2023 | 2024



2022-24 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	45	(+35%)	9%
Low	30	(-10%)	Nil

Insider Decisions

	J	J	A	S	O	N	D	J	F
to Buy	2	14	2	2	14	2	3	14	2
Options	0	0	0	0	0	0	0	0	0
to Sell	0	0	1	0	0	0	0	0	0

Institutional Decisions

	2Q2018	3Q2018	4Q2018
to Buy	39	42	43
to Sell	33	36	41
Hld's(000)	4448	4539	4765

% TOT. RETURN 3/19

	THIS STOCK	VL ARITH.* INDEX
1 yr.	13.0	2.7
3 yr.	19.3	35.5
5 yr.	87.9	37.5

2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	© VALUE LINE PUB. LLC	22-24
2.17	2.18	2.58	2.56	2.79	2.89	2.95	3.07	3.18	3.21	3.27	3.58	3.68	3.70	3.77	3.74	**3.85**	**3.95**	Revenues per sh	**5.10**
.65	.65	.79	.77	.86	.88	.95	1.07	1.09	1.12	1.19	1.36	1.45	1.42	1.53	1.58	**1.75**	**1.85**	"Cash Flow" per sh	**2.50**
.47	.49	.56	.58	.57	.57	.64	.71	.71	.72	.75	.89	.97	.92	1.01	1.04	**1.15**	**1.25**	Earnings per sh A	**1.70**
.37	.39	.42	.45	.48	.49	.51	.52	.53	.54	.55	.57	.60	.63	.65	.67	**.70**	**.73**	Div'd Decl'd per sh B	**.95**
1.07	2.50	1.69	1.85	1.69	2.17	1.18	.83	.74	.94	.76	1.10	1.11	1.03	1.95	1.95	**2.00**	**2.00**	Cap'l Spending per sh	**1.85**
4.06	4.65	4.85	5.84	5.97	6.14	6.92	7.19	7.45	7.73	7.98	8.15	8.51	8.88	9.28	9.75	**10.75**	**11.25**	Book Value per sh	**12.10**
9.63	10.33	10.40	11.20	11.27	11.37	12.56	12.69	12.79	12.92	12.98	12.83	12.81	12.85	12.87	12.94	**13.00**	**12.90**	Common Shs Outst'g C	**12.80**
24.5	25.7	26.3	31.2	30.3	24.6	21.9	20.7	23.9	24.4	26.3	23.1	23.5	32.8	34.6	30.3	*Bold figures are*	*Value Line*	Avg Ann'l P/E Ratio	**22.5**
1.40	1.36	1.40	1.68	1.61	1.48	1.46	1.32	1.50	1.55	1.48	1.22	1.18	1.72	1.74	1.63	*estimates*		Relative P/E Ratio	**1.25**
3.2%	3.1%	2.9%	2.5%	2.8%	3.5%	3.6%	3.5%	3.1%	3.1%	2.8%	2.8%	2.6%	2.1%	1.9%	2.1%			Avg Ann'l Div'd Yield	**2.5%**

CAPITAL STRUCTURE as of 12/31/18
Total Debt $94.3 mill. **Due in 5 Yrs** $42.5 mill.
LT Debt $93.3 mill. **LT Interest** $5.5 mill.
(42% of Cap'l)

Pension Assets12/18 $40.6 mill. **Oblig.** $41.5 mill.

Pfd Stock None

Common Stock 12,943,536 shs.

MARKET CAP: $425 million (Small Cap)

2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020		22-24
37.0	39.0	40.6	41.4	42.4	45.9	47.1	47.6	48.6	48.4	**50.0**	**51.0**	Revenues ($mill)	**65.0**
7.5	8.9	9.1	9.3	9.7	11.5	12.5	11.8	13.0	13.4	**15.0**	**16.0**	Net Profit ($mill)	**21.5**
37.9%	38.5%	35.3%	37.6%	37.6%	29.8%	27.5%	31.3%	25.9%	15.7%	**21.0%**	**21.0%**	Income Tax Rate	**21.0%**
- -	1.2%	1.1%	1.1%	.8%	1.8%	1.6%	1.9%	6.7%	1.7%	**2.0%**	**1.5%**	AFUDC % to Net Profit	**1.5%**
45.7%	48.3%	47.1%	46.0%	45.1%	44.8%	44.4%	42.6%	43.0%	42.5%	**36.5%**	**35.0%**	Long-Term Debt Ratio	**34.0%**
54.3%	51.7%	52.9%	54.0%	54.9%	55.2%	55.6%	57.4%	57.0%	57.5%	**63.5%**	**65.0%**	Common Equity Ratio	**66.0%**
160.1	176.4	180.2	184.8	188.4	189.4	196.3	198.7	209.5	219.5	**220**	**220**	Total Capital ($mill)	**235**
222.0	228.4	233.0	240.3	244.2	253.2	261.4	270.9	288.8	299.2	**305**	**315**	Net Plant ($mill)	**325**
6.2%	6.5%	6.4%	6.4%	6.5%	7.4%	7.6%	7.2%	7.5%	7.3%	**8.0%**	**8.5%**	Return on Total Cap'l	**10.5%**
8.6%	9.8%	9.5%	9.3%	9.3%	11.0%	11.5%	10.4%	10.9%	10.6%	**10.5%**	**11.0%**	Return on Shr. Equity	**14.0%**
8.6%	9.8%	9.5%	9.3%	9.3%	11.0%	11.5%	10.4%	10.9%	10.6%	**10.5%**	**11.0%**	Return on Com Equity	**14.0%**
1.9%	2.7%	2.5%	2.4%	2.4%	3.9%	4.4%	3.4%	4.0%	3.8%	**4.0%**	**4.5%**	Retained to Com Eq	**6.0%**
78%	72%	73%	74%	74%	64%	62%	67%	63%	64%	**61%**	**58%**	All Div'ds to Net Prof	**56%**

CURRENT POSITION ($MILL.)	2016	2017	12/31/18
Cash Assets	4.2	- -	- -
Accounts Receivable	4.3	4.5	4.8
Inventory (Avg. Cost)	.7	.9	.9
Other	3.4	3.2	3.3
Current Assets	12.6	8.6	9.0
Accts Payable	3.7	3.1	3.0
Debt Due	- -	- -	1.0
Other	4.5	6.0	6.8
Current Liab.	8.2	9.1	10.8

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '16-'18 to '22-'24
Revenues	3.0%	3.0%	*5.5%*
"Cash Flow"	6.0%	6.0%	*9.0%*
Earnings	5.5%	6.5%	*9.5%*
Dividends	3.5%	4.0%	*6.5%*
Book Value	4.5%	4.0%	*4.5%*

Cal-endar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2016	11.3	11.8	12.6	11.9	47.6
2017	11.3	12.3	12.7	12.3	48.6
2018	11.6	12.0	12.7	12.1	48.4
2019	***12.0***	***12.5***	***13.0***	***12.5***	***50.0***
2020	***12.2***	***12.7***	***13.3***	***12.8***	***51.0***

Cal-endar	EARNINGS PER SHARE A Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2016	.19	.23	.27	.23	.92
2017	.20	.23	.31	.27	1.01
2018	.20	.26	.29	.29	1.04
2019	***.24***	***.28***	***.33***	***.30***	***1.15***
2020	***.26***	***.31***	***.35***	***.33***	***1.25***

Cal-endar	QUARTERLY DIVIDENDS PAID B Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2015	.1495	.1495	.1495	.1555	.604
2016	.1555	.1555	.1555	.1602	.627
2017	.1602	.1602	.1602	.1666	.647
2018	.1666	.1666	.1666	.1733	.673
2019	.1733				

BUSINESS: The York Water Company is the oldest investor-owned regulated water utility in the United States. It has operated continuously since 1816. As of December 31, 2018, the company's average daily availability was 35.4 million gallons and its service territory had an estimated population of 199,000. Has more than 69,000 customers. Residential customers accounted for 65% of 2018 revenues; commercial and industrial (28%); other (7%). It also provides sewer billing services. Incorporated: PA. York had 109 full-time employees at 12/31/18. President/CEO: Jeffrey R. Hines. Officers/directors own 1.1% of the common stock (3/18 proxy). Address: 130 East Market Street, York, Pennsylvania 17401. Telephone: (717) 845-3601. Internet: www.yorkwater.com.

York Water Company posted a surprise bottom-line beat to conclude 2018. Fourth-quarter earnings of $0.29 a share came in $0.04 above our expectation. Lower income taxes from a greater volume of eligible asset improvements were the primary contributor to the outperformance. Nevertheless, on a full-year basis, profitability jumped roughly 3% versus our previous call for a modest year-over-year contraction, while revenues of $48.4 million registered a slight dip. The latter was adversely impacted by a ruling from the Pennsylvania Public Utility Commission, which passes some tax reduction benefits along to the consumer in the form of lower rates.

Earnings growth ought to outpace revenue expansion this year and next. Further tax benefits for York should continue to be reflected in customer water rates, thus keeping the lid on revenue growth. Despite this, we think share net is poised to rise 10% in 2019, followed by an 8% advance in 2020.

A plethora of improvements and upgrades are on the horizon. This means that, as expected, York's capital spending budget is likely to remain elevated. In 2018, the company laid out $16.9 million on capital projects, including the completion of an additional untreated water pumping station and numerous infrastructure upgrades. Meanwhile, York anticipates that 2019 and 2020 will be a bit more capital intensive, as initial spending projections clock in at $21.5 million and $21.2 million, respectively. Specifically, management's plan includes spillway improvements, water storage tank replacements, wastewater treatment plant expansion, and service line and pipe upgrades, to name a few.

Shares of York Water are up one spot on our Timeliness Ranking Scale but are only ranked 3 Average and do not make an overly compelling case for near-term oriented subscribers. Similarly, buy-and-hold accounts should note that, at recent levels, capital appreciation potential is limited over the pull to 2022-2024. Finally, the dividend yield, which is hovering around 2.0%, is about 20 basis points shy of *The Value Line In est- ment Sur e* median.

Nicholas P. Patrikis *April 12, 2019*

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

Company's Financial Strength	B+
Stock's Price Stability	60
Price Growth Persistence	55
Earnings Predictability	95

Carolina Water Service, Inc. of North Carolina
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)	11.20 %
Risk Premium Using an Adjusted Total Market Approach (2)	10.03 %
Average	10.62 %

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

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

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 Co.	0.38%	0.30%	0.30%	1.92108	7.05%	3.33%	10.38%
American Water Works Company Inc	NMF	NMF	NMF	6.25441	NMF	3.33%	NMF
Artesian Resources Corporation	0.33%	0.34%	0.33%	2.10682	8.63%	3.33%	11.96%
California Water Service Group	0.32%	0.26%	0.26%	2.00786	6.45%	3.33%	9.78%
Middlesex Water Co.	0.30%	0.38%	0.30%	2.10636	7.92%	3.33%	11.25%
York Water Co.	0.45%	0.36%	0.36%	2.01388	9.03%	3.33%	12.36%
						Average	11.15%
						Median	11.25%
						Average of Mean and Median	11.20%

NMF = Not Meaningful Figure

Notes:
(1) The Predictive Risk Premium Model uses historical data to generate a predicted variance and a GARCH coefficient. The historical data used are the equity risk premiums for the first available trading month as reported by Bloomberg Professional Service.

(2) Due to current market conditions, I have selected the lower value between the two predicted variances at this time.

(3) $(1+(\text{Column [3]} * \text{Column [4]})^{12}) - 1$.
(4) From note 2 on page 2 of Schedule DWD-5.
(5) Column [5] + Column [6].

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

Line No.		Proxy Group of Six Water Companies	
1.	Prospective Yield on Aaa Rated Corporate Bonds (1)	4.25	%
2.	Adjustment to Reflect Yield Spread Between Aaa Rated Corporate Bonds and A Rated Public Utility Bonds	0.41	(2)
3.	Adjusted Prospective Yield on A Rated Public Utility Bonds	4.66	%
4.	Adjustment to Reflect Bond Rating Difference of Proxy Group	0.08	(3)
5.	Adjusted Prospective Bond Yield	4.74	%
6.	Equity Risk Premium (4)	5.29	
7.	Risk Premium Derived Common Equity Cost Rate	10.03	%

Notes:
(1) Consensus forecast of Moody's Aaa Rated Corporate bonds from Blue Chip Financial Forecasts (see pages 10-11 of this Schedule).
(2) The average yield spread of A rated public utility bonds over Aaa rated corporate bonds of 0.41% from page 4 of this Schedule.
(3) Adjustment to reflect the A2 / A3 Moody's LT issuer rating of the Proxy Group of Six Water Companies as shown on page 5 of this Schedule. The 0.08% upward adjustment is derived by taking 1/6 of the spread between A2 and Baa2 Public Utility Bonds (1/6 * 0.49% = 0.08%) as derived from page 4 of this Schedule.
(4) From page 7 of this Schedule.

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

Selected Bond Yields

	[1] Aaa Rated Corporate Bond	[2] A Rated Public Utility Bond	[3] Baa Rated Public Utility Bond
Apr-2019	3.69 %	4.08 %	4.55 %
Mar-2019	3.77	4.16	4.65
Feb-2019	3.79	4.25	4.76
Average	3.75 %	4.16 %	4.65 %

Selected Bond Spreads

A Rated Public Utility Bonds Over Aaa Rated Corporate Bonds: 0.41 % (1)

Baa Rated Public Utility Bonds Over A Rated Public Utility Bonds: 0.49 % (2)

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

Source of Information:
Bloomberg Professional Service

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

Proxy Group of Six Water Companies	Moody's Long-Term Issuer Rating April 2019: Long-Term Issuer Rating	Moody's Long-Term Issuer Rating April 2019: Numerical Weighting (1)	Standard & Poor's Long-Term Issuer Rating April 2019: Long-Term Issuer Rating	Standard & Poor's Long-Term Issuer Rating April 2019: Numerical Weighting(1)
American States Water Co. (2)	A2	6.0	A+	5.0
American Water Works Company Inc (3)	A3	7.0	A	6.0
Artesian Resources Corporation	NR	- -	NR	- -
California Water Service Group (4)	NR	- -	A+	5.0
Middlesex Water Co.	NR	- -	A	6.0
York Water Co.	NR	- -	A-	7.0
Average	A2 / A3	6.5	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 and Pennsylvania American Water Companies.
(4) Ratings that of California Water Service Company.

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

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

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

Carolina Water Service, Inc. of North Carolina
Judgment of Equity Risk Premium for
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)	5.84 %
2.	Mean equity risk premium based on a study using the holding period returns of public utilities with A rated bonds (2)	4.73
3.	Average equity risk premium	5.29 %

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

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

Line No.	Equity Risk Premium Measure	Proxy Group of Six Water Companies
	Ibbotson-Based Equity Risk Premiums:	
1.	Ibbotson Equity Risk Premium (1)	5.54 %
2.	Regression on Ibbotson Risk Premium Data (2)	7.93
3.	Ibbotson Equity Risk Premium based on PRPM (3)	8.32
4.	Equity Risk Premium Based on Value Line Summary and Index (4)	9.57
5.	Equity Risk Premium Based on Value Line S&P 500 Companies (5)	11.78
6.	Equity Risk Premium Based on Bloomberg S&P 500 Companies (6)	9.10
7.	Conclusion of Equity Risk Premium	8.71 %
8.	Adjusted Beta (7)	0.67
9.	Forecasted Equity Risk Premium	5.84 %

Notes provided on page 9 of this Schedule.

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

Notes:

(1) Based on the arithmetic mean historical monthly returns on large company common stocks from Ibbotson® SBBI® 2019 Market Report minus the arithmetic mean monthly yield of Moody's average Aaa and Aa corporate bonds from 1926-2018.

(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 Aa rated corporate bond yields from 1928-2018 referenced in Note 1 above.

(3) The Predictive Risk Premium Model (PRPM) is discussed in the accompanying direct testimony. The Ibbotson equity risk premium based on the PRPM is derived by applying the PRPM to the monthly risk premiums between Ibbotson large company common stock monthly returns and average Aaa and Aa corporate monthly bond yields, from January 1928 through April 2019.

(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 4.25% (from page 3 of this Schedule) from the projected 3-5 year total annual market return of 13.82% (described fully in note 1 on page 2 of Schedule DWD-5).

(5) Using data from Value Line for the S&P 500, an expected total return of 16.03% 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 4.25% results in an expected equity risk premium of 11.78%.

(6) Using data from the Bloomberg Professional Service for the S&P 500, an expected total return of 13.35% 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 4.25% results in an expected equity risk premium of 9.10%.

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

Sources of Information:

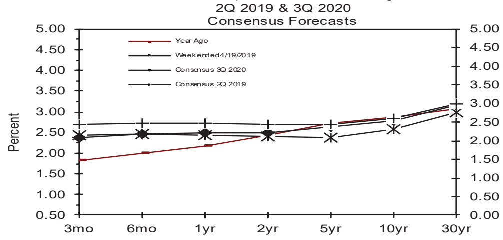
Stocks, Bonds, Bills, and Inflation - 2019 SBBI Yearbook, John Wiley & Sons, Inc.
Industrial Manual and Mergent Bond Record Monthly Update.
Value Line Summary and Index
Blue Chip Financial Forecasts, May 1, 2019 and December 1, 2018
Bloomberg Professional Service

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

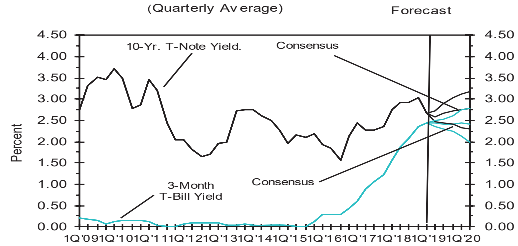
	History								Consensus Forecasts-Quarterly Avg.					
	Average For Week Ending				Average For Month			Latest Qtr	2Q	3Q	4Q	1Q	2Q	3Q
Interest Rates	Apr 19	Apr 12	Apr 5	Mar 29	Mar	Feb	Jan	Q1 2019	2019	2019	2019	2020	2020	2020
Federal Funds Rate	2.41	2.41	2.42	2.41	2.41	2.40	2.40	2.40	**2.4**	**2.4**	**2.4**	**2.4**	**2.4**	**2.4**
Prime Rate	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	**5.5**	**5.5**	**5.5**	**5.5**	**5.5**	**5.5**
LIBOR, 3-mo.	2.59	2.59	2.60	2.60	2.61	2.68	2.77	2.69	**2.6**	**2.7**	**2.7**	**2.7**	**2.7**	**2.7**
Commercial Paper, 1-mo.	2.45	2.43	2.46	2.46	2.44	2.43	2.48	2.45	**2.5**	**2.4**	**2.5**	**2.5**	**2.5**	**2.5**
Treasury bill, 3-mo.	2.43	2.43	2.43	2.44	2.45	2.44	2.42	2.44	**2.4**	**2.4**	**2.4**	**2.4**	**2.4**	**2.4**
Treasury bill, 6-mo.	2.47	2.47	2.46	2.46	2.51	2.50	2.51	2.51	**2.5**	**2.5**	**2.5**	**2.5**	**2.5**	**2.5**
Treasury bill, 1 yr.	2.44	2.43	2.41	2.41	2.49	2.55	2.58	2.54	**2.5**	**2.5**	**2.5**	**2.5**	**2.5**	**2.5**
Treasury note, 2 yr.	2.40	2.35	2.33	2.24	2.41	2.50	2.54	2.48	**2.4**	**2.5**	**2.5**	**2.5**	**2.5**	**2.5**
Treasury note, 5 yr.	2.39	2.32	2.31	2.20	2.37	2.49	2.54	2.47	**2.4**	**2.5**	**2.6**	**2.6**	**2.6**	**2.6**
Treasury note, 10 yr.	2.58	2.52	2.50	2.41	2.57	2.68	2.71	2.65	**2.6**	**2.7**	**2.7**	**2.8**	**2.8**	**2.8**
Treasury note, 30 yr.	2.98	2.93	2.91	2.84	2.98	3.02	3.04	3.01	**3.0**	**3.0**	**3.1**	**3.1**	**3.1**	**3.2**
Corporate Aaa bond	3.88	3.86	3.86	3.79	3.95	3.98	4.12	4.01	**3.8**	**3.9**	**4.0**	**4.0**	**4.1**	**4.1**
Corporate Baa bond	4.60	4.61	4.65	4.60	4.76	4.84	5.02	4.87	**4.8**	**4.9**	**4.9**	**5.0**	**5.1**	**5.1**
State & Local bonds	3.50	3.50	3.50	3.48	3.55	3.62	3.67	3.61	**3.6**	**3.7**	**3.8**	**3.8**	**3.9**	**3.9**
Home mortgage rate	4.17	4.12	4.08	4.06	4.27	4.37	4.46	4.37	**4.3**	**4.4**	**4.4**	**4.5**	**4.5**	**4.6**
	History								Consensus Forecasts-Quarterly					
	2Q	3Q	4Q	1Q	2Q	3Q	*4Q*	*1Q*	2Q	3Q	4Q	1Q	2Q	3Q
Key Assumptions	2017	2017	2017	2018	2018	2018	*2018*	*2019*	2019	2019	2019	2020	2020	2020
Fed's AFE $ Index	111.1	105.6	106.2	102.9	105.5	107.8	109.4	109.4	**108.7**	**108.8**	**108.8**	**108.5**	**108.2**	**107.9**
Real GDP	3.0	2.8	2.3	2.2	4.2	3.4	2.2	3.2	**2.5**	**2.1**	**2.0**	**1.7**	**1.7**	**1.7**
GDP Price Index	1.2	2.2	2.5	2.0	3.0	1.8	1.7	0.9	**2.3**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**
Consumer Price Index	0.4	2.2	3.1	3.2	2.1	2.0	1.5	0.9	**2.9**	**2.3**	**2.1**	**2.1**	**2.1**	**2.1**

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

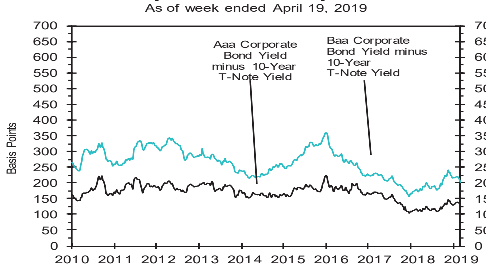
U.S. Treasury Yield Curve
Week ended April 19, 2019 & Year Ago vs.
2Q 2019 & 3Q 2020
Consensus Forecasts



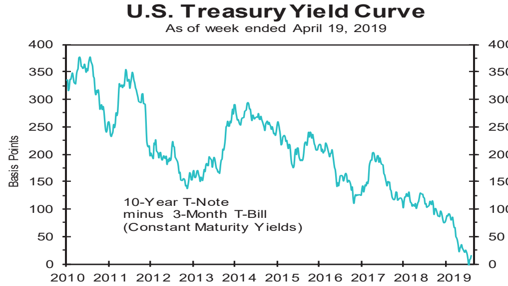
U.S. 3-Mo. T-Bills & 10-Yr. T-Note Yield
(Quarterly Average) Forecast



Corporate Bond Spreads
As of week ended April 19, 2019



U.S. Treasury Yield Curve
As of week ended April 19, 2019



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 2020 through 2024 and averages for the five-year periods 2020-2024 and 2025-2029. 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	
Interest Rates		2020	2021	2022	2023	2024	2020-2024	2025-2029
1. Federal Funds Rate	CONSENSUS	2.9	2.8	2.8	3.0	3.0	2.9	3.1
	Top 10 Average	3.5	3.6	3.6	3.6	3.6	3.6	3.6
	Bottom 10 Average	2.1	1.9	2.0	2.3	2.5	2.2	2.6
2. Prime Rate	CONSENSUS	5.9	5.8	5.9	6.0	6.1	5.9	6.1
	Top 10 Average	6.5	6.6	6.6	6.6	6.6	6.6	6.6
	Bottom 10 Average	5.2	4.9	5.1	5.4	5.6	5.2	5.7
3. LIBOR, 3-Mo.	CONSENSUS	3.3	3.2	3.2	3.5	3.5	3.3	3.5
	Top 10 Average	3.9	4.0	4.0	4.2	4.2	4.0	4.0
	Bottom 10 Average	2.7	2.5	2.5	2.8	2.9	2.7	3.1
4. Commercial Paper, 1-Mo.	CONSENSUS	3.0	2.9	3.0	3.1	3.1	3.0	3.1
	Top 10 Average	3.5	3.6	3.6	3.6	3.6	3.6	3.6
	Bottom 10 Average	2.5	2.3	2.3	2.6	2.6	2.4	2.6
5. Treasury Bill Yield, 3-Mo.	CONSENSUS	2.9	2.8	2.8	3.0	3.0	2.9	3.1
	Top 10 Average	3.5	3.6	3.6	3.6	3.6	3.6	3.6
	Bottom 10 Average	2.1	1.9	2.0	2.3	2.5	2.1	2.6
6. Treasury Bill Yield, 6-Mo.	CONSENSUS	3.0	2.9	3.0	3.1	3.2	3.1	3.2
	Top 10 Average	3.6	3.7	3.7	3.7	3.8	3.7	3.7
	Bottom 10 Average	2.4	2.1	2.2	2.5	2.7	2.4	2.8
7. Treasury Bill Yield, 1-Yr.	CONSENSUS	3.1	3.1	3.1	3.2	3.3	3.2	3.4
	Top 10 Average	3.7	3.8	3.8	3.8	3.8	3.8	3.9
	Bottom 10 Average	2.5	2.3	2.3	2.6	2.8	2.5	2.9
8. Treasury Note Yield, 2-Yr.	CONSENSUS	3.2	3.2	3.2	3.3	3.4	3.3	3.5
	Top 10 Average	3.8	3.9	3.9	3.9	4.0	3.9	4.0
	Bottom 10 Average	2.5	2.4	2.4	2.7	2.8	2.6	2.9
10. Treasury Note Yield, 5-Yr.	CONSENSUS	3.4	3.3	3.4	3.5	3.5	3.4	3.6
	Top 10 Average	4.0	4.0	4.1	4.1	4.1	4.1	4.2
	Bottom 10 Average	2.7	2.7	2.6	2.8	2.9	2.7	3.0
11. Treasury Note Yield, 10-Yr.	CONSENSUS	3.5	3.5	3.5	3.6	3.7	3.6	3.8
	Top 10 Average	4.2	4.2	4.3	4.3	4.3	4.3	4.4
	Bottom 10 Average	2.9	2.9	2.8	3.0	3.0	2.9	3.2
12. Treasury Bond Yield, 30-Yr.	CONSENSUS	3.8	3.8	3.9	4.0	4.0	3.9	4.2
	Top 10 Average	4.5	4.5	4.6	4.7	4.7	4.6	4.9
	Bottom 10 Average	3.2	3.2	3.2	3.3	3.4	3.2	3.5
13. Corporate Aaa Bond Yield	CONSENSUS	4.9	4.9	4.9	5.0	5.1	5.0	5.1
	Top 10 Average	5.6	5.7	5.8	5.8	5.8	5.7	5.9
	Bottom 10 Average	4.2	4.1	4.1	4.2	4.3	4.2	4.4
13. Corporate Baa Bond Yield	CONSENSUS	5.8	5.8	5.9	5.9	6.0	5.9	6.0
	Top 10 Average	6.5	6.6	6.8	6.8	6.8	6.7	6.9
	Bottom 10 Average	5.2	5.1	5.1	5.2	5.3	5.2	5.3
14. State & Local Bonds Yield	CONSENSUS	4.6	4.5	4.5	4.5	4.6	4.5	4.7
	Top 10 Average	5.1	5.0	5.0	5.0	5.1	5.1	5.2
	Bottom 10 Average	4.2	4.0	3.9	4.0	4.0	4.0	4.1
15. Home Mortgage Rate	CONSENSUS	5.2	5.2	5.2	5.3	5.4	5.3	5.5
	Top 10 Average	5.8	5.8	5.9	6.0	6.0	5.9	6.1
	Bottom 10 Average	4.6	4.5	4.5	4.7	4.8	4.6	4.9
A. FRB - Major Currency Index	CONSENSUS	90.1	89.7	89.4	90.0	89.8	89.8	89.9
	Top 10 Average	94.6	94.6	94.4	94.2	94.0	94.3	93.9
	Bottom 10 Average	85.5	84.8	84.2	85.8	85.6	85.2	85.8
		Year-Over-Year, % Change					Five-Year Averages	
		2020	2021	2022	2023	2024	2020-2024	2025-2029
B. Real GDP	CONSENSUS	1.8	1.8	2.1	2.2	2.1	2.0	2.1
	Top 10 Average	2.4	2.3	2.4	2.6	2.5	2.5	2.5
	Bottom 10 Average	1.3	1.3	1.7	1.8	1.7	1.6	1.8
C. GDP Chained Price Index	CONSENSUS	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	Top 10 Average	2.4	2.4	2.3	2.4	2.3	2.3	2.3
	Bottom 10 Average	1.9	1.8	1.9	1.9	1.9	1.9	1.9
D. Consumer Price Index	CONSENSUS	2.1	2.1	2.2	2.2	2.2	2.2	2.2
	Top 10 Average	2.5	2.5	2.5	2.5	2.4	2.5	2.4
	Bottom 10 Average	1.7	1.8	1.9	2.0	1.9	1.9	2.0

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

Line No.		Implied Equity Risk Premium
	Equity Risk Premium based on S&P Utility Index Holding Period Returns (1):	
1.	Historical Equity Risk Premium	4.00 %
2.	Regression of Historical Equity Risk Premium (2)	5.72
3.	Forecasted Equity Risk Premium Based on PRPM (3)	3.93
4.	Forecasted Equity Risk Premium based on Projected Total Return on the S&P Utilities Index (Value Line Data) (4)	5.67
5.	Forecasted Equity Risk Premium based on Projected Total Return on the S&P Utilities Index (Bloomberg Data) (5)	4.35
6.	Average Equity Risk Premium (6)	4.73 %

Notes: (1) Based on S&P Public Utility Index monthly total returns and Moody's Public Utility Bond average monthly yields from 1928-2018. 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 A rated public utility bond yields from 1928 - 2018 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 A rated public utility bonds from January 1928 - April 2019.

(4) Using data from Value Line for the S&P Utilities Index, an expected return of 10.33% was derived based on expected dividend yields and long-term growth estimates as a proxy for market appreciation. Subtracting the expected A rated public utility bond yield of 4.66%, calculated on line 3 of page 3 of this Schedule results in an equity risk premium of 5.67%. (10.33% - 4.66% = 5.67%)

(5) Using data from Bloomberg Professional Service for the S&P Utilities Index, an expected return of 9.01% was derived based on expected dividend yields and long-term growth estimates as a proxy for market appreciation. Subtracting the expected A rated public utility bond yield of 4.66%, calculated on line 3 of page 3 of this Schedule results in an equity risk premium of 4.35%. (9.01% - 4.66% = 4.35%)

(6) Average of lines 1 through 5.

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

Proxy Group of Six Water Companies	[1] Value Line Adjusted Beta	[2] Bloomberg Adjusted Beta	[3] Average Beta	[4] Market Risk Premium (1)	[5] Risk-Free Rate (2)	[6] Traditional CAPM Cost Rate	[7] ECAPM Cost Rate	[8] Indicated Common Equity Cost Rate (3)
American States Water Co.	0.70	0.57	0.64	9.73 %	3.33 %	9.56 %	10.43 %	10.00 %
American Water Works Company Inc	0.60	0.62	0.61	9.73	3.33	9.27	10.21	9.74
Artesian Resources Corporation	0.65	0.57	0.61	9.73	3.33	9.27	10.21	9.74
California Water Service Group	0.70	0.66	0.68	9.73	3.33	9.95	10.72	10.34
Middlesex Water Co.	0.75	0.76	0.76	9.73	3.33	10.72	11.31	11.02
York Water Co.	0.75	0.68	0.72	9.73	3.33	10.34	11.02	10.68
Mean			0.67			9.85 %	10.65 %	10.25 %
Median			0.66			9.75 %	10.58 %	10.17 %
Average of Mean and Median			0.67			9.80	10.62	10.21 %

Notes on page 2 of this Schedule.

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

Notes:

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

Historical Data MRP Estimates:

Measure 1: Ibbotson Arithmetic Mean MRP (1926-2018)

Arithmetic Mean Monthly Returns for Large Stocks 1926-2018:	11.89	%
Arithmetic Mean Income Returns on Long-Term Government Bonds:	5.12	
MRP based on Ibbotson Historical Data:	6.77	%

Measure 2: Application of a Regression Analysis to Ibbotson Historical Data (1926-2017)	9.00	%
Measure 3: Application of the PRPM to Ibbotson Historical Data: (January 1926 - April 2019)	9.40	%

Value Line MRP Estimates:

Measure 4: Value Line Projected MRP (Thirteen weeks ending May 03, 2019)

Total projected return on the market 3-5 years hence*:	13.82	%
Projected Risk-Free Rate (see note 2):	3.33	
MRP based on Value Line Summary & Index:	10.49	%

*Forcasted 3-5 year capital appreciation plus expected dividend yield

Measure 5: Value Line Projected Return on the Market based on the S&P 500

Total return on the Market based on the S&P 500:	16.03	%
Projected Risk-Free Rate (see note 2):	3.33	
MRP based on Value Line data	12.70	%

Measure 6: Bloomberg Projected MRP

Total return on the Market based on the S&P 500:	13.35	%
Projected Risk-Free Rate (see note 2):	3.33	
MRP based on Bloomberg data	10.02	%
Average of Value Line, Ibbotson, and Bloomberg MRP:	9.73	%

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

Second Quarter 2019	3.00	%
Third Quarter 2019	3.00	
Fourth Quarter 2019	3.10	
First Quarter 2020	3.10	
Second Quarter 2020	3.10	
Third Quarter 2020	3.20	
2020-2024	3.90	
2025-2029	4.20	
	3.33	%

(3) Average of Column 6 and Column 7.

Sources of Information:

Value Line Summary and Index
Blue Chip Financial Forecasts, May 1, 2019 and December 1, 2018
Stocks, Bonds, Bills, and Inflation - 2019 SBBI Yearbook, John Wiley & Sons, Inc.
Bloomberg Professional Services

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

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

The Non-Price Regulated Proxy Group was then selected based on the unadjusted beta range of 0.29 – 0.71 and residual standard error of the regression range of 2.7224 – 3.2468 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 0.1070. 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

$$\text{Thus, } 0.1070 = \frac{2.9846}{\sqrt{518}} = \frac{2.9846}{22.7596}$$

Source of Information: Value Line, Inc., March 2019
Value Line Investment Survey (Standard Edition)

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

	[1]	[2]	[3]	[4]
Proxy Group of Six Water Companies	Value Line Adjusted Beta	Unadjusted Beta	Residual Standard Error of the Regression	Standard Deviation of Beta
American States Water Co.	0.70	0.51	2.7757	0.0995
American Water Works Company Inc	0.60	0.38	2.1299	0.0763
Artesian Resources Corporation	0.65	0.39	3.3738	0.1209
California Water Service Group	0.70	0.51	2.9311	0.1051
Middlesex Water Co.	0.75	0.60	3.2488	0.1164
York Water Co.	0.75	0.59	3.4482	0.1236
Average	0.69	0.50	2.9846	0.1070

Beta Range (+/- 2 std. Devs. of Beta)	0.29	0.71
2 std. Devs. of Beta	0.21	
Residual Std. Err. Range (+/- 2 std. Devs. of the Residual Std. Err.)	2.7224	3.2468
Std. dev. of the Res. Std. Err.	0.1311	
2 std. devs. of the Res. Std. Err.	0.2622	

Source of Information: Valueline Proprietary Database, March 2019

Carolina Water Service, Inc. of North Carolina
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 Eleven Non-Price Regulated Companies	VL Adjusted Beta	Unadjusted Beta	Residual Standard Error of the Regression	Standard Deviation of Beta
AutoZone Inc.	0.80	0.63	2.8677	0.1028
Cheesecake Factory	0.75	0.57	2.8706	0.1029
Casey's Gen'l Stores	0.75	0.56	3.0452	0.1091
Cboe Global Markets	0.75	0.58	2.8746	0.1030
Cracker Barrel	0.75	0.55	2.9858	0.1070
Dollar General	0.80	0.68	3.0342	0.1088
Dunkin' Brands Group	0.70	0.48	2.8579	0.1024
Darden Restaurants	0.80	0.66	2.9476	0.1057
Integra LifeSciences	0.80	0.67	3.1668	0.1135
Viad Corp.	0.80	0.62	3.1016	0.1112
Valvoline Inc.	0.80	0.66	2.9495	0.1832
Average	0.77	0.61	2.9700	0.1100
Proxy Group of Six Water Companies	0.69	0.50	2.9846	0.1070

Source of Information: Valueline Proprietary Database, March 2019

Carolina Water Service, Inc. of North Carolina
Coefficients of Variation of the
Proxy Group of Six Water Companies
and the Proxy Group of Eleven Non-Price Regulated Companies

Net Profit (millions)

Proxy Group of Six Water Companies	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Standard Deviation	Mean	Coefficient of Variation
American States Water Co.	$ 29.5	$ 41.4	$ 42.0	$ 54.1	$ 62.7	$ 61.1	$ 60.5	$ 59.7	$ 69.4	$ 63.9	$ 12.0	$ 54.4	0.2203
American Water Works Company Inc	209.9	267.8	304.9	374.3	369.3	429.8	476.0	468.0	426.0	567.0	101.5	389.3	0.2607
Artesian Resources Corporation	7.3	7.6	6.7	9.8	8.3	9.5	11.3	13.0	14.0	14.3	2.7	10.2	0.2635
California Water Service Group	40.6	37.7	36.1	42.6	47.3	56.7	45.0	48.7	67.2	60.5	9.7	48.2	0.2012
Middlesex Water Co.	10.0	14.3	13.4	14.4	16.6	18.4	20.0	22.7	22.8	32.5	6.1	18.5	0.3289
York Water Co.	7.5	8.9	9.1	9.3	9.7	11.5	12.5	11.8	13.0	13.4	1.9	10.7	0.1794
												Mean	0.2423
												Median	0.2405

Net Profit (millions)

Proxy Group of Eleven Non-Price Regulated Companies	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Standard Deviation	Mean	Coefficient of Variation
AutoZone Inc.	$ 657.1	$ 738.3	$ 849.0	$ 930.4	$ 1,016.5	$ 1,069.7	$ 1,160.2	$ 1,241.0	$ 1,280.9	$ 1,406.3	$ 231.2	$ 1,034.9	0.2234
Cheesecake Factory	58.8	86.1	95.1	103.8	114.0	101.7	120.1	139.6	125.1	**113.0**	21.4	105.7	0.2022
Casey's Gen'l Stores	117.0	94.6	116.8	110.6	134.5	183.0	226.0	177.5	143.0	**195.0**	40.9	149.8	0.2732
Cboe Global Markets	107.8	99.4	139.4	157.4	176.0	189.7	205.0	185.7	400.6	425.2	107.3	208.6	0.5146
Cracker Barrel	66.0	85.3	91.1	107.9	119.0	135.1	163.9	189.3	201.9	222.2	50.9	138.2	0.3684
Dollar General	339.4	627.9	766.7	952.7	1,025.1	1,065.3	1,165.1	1,251.1	1,228.2	1,589.5	335.6	1,001.1	0.3352
Dunkin' Brands Group	NA	95.9	101.7	149.7	165.8	186.4	188.0	208.7	223.8	246.3	48.6	174.0	0.2792
Darden Restaurants	381.5	414.2	478.7	476.5	412.6	183.2	342.9	456.6	504.5	606.2	106.3	425.7	0.2498
Integra LifeSciences	63.5	89.9	82.2	87.2	70.6	34.0	6.9	74.6	64.7	**62.0**	24.2	63.6	0.3808
Viad Corp.	(2.2)	3.6	11.3	22.0	25.5	32.1	29.4	48.9	53.5	47.7	18.2	27.2	0.6699
Valvoline Inc.	NA	NA	NA	NA	NA	NA	NA	273.0	283.0	254.0	12.0	270.0	0.0445
												Mean	0.3219
												Median	0.2792

NA = Not Availabile
Bold figures indicate estimates

Source of Information:
Value Line Investment Survey

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

Principal Methods	Proxy Group of Eleven Non-Price Regulated Companies	
Discounted Cash Flow Model (DCF) (1)	11.88	%
Risk Premium Model (RPM) (2)	12.00	
Capital Asset Pricing Model (CAPM) (3)	11.17	
Mean	11.68	%
Median	11.88	%
Average of Mean and Median	11.78	%

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

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

Proxy Group of Eleven Non-Price Regulated Companies	[1] Average Dividend Yield	[2] Value Line Projected Five Year Growth in EPS	[3] Reuters Mean Consensus Projected Five Year Growth Rate in EPS	[4] Zack's Five Year Projected Growth Rate in EPS	[5] Yahoo! Finance Projected Five Year Growth in EPS	[6] Average Projected Five Year Growth Rate in EPS	[7] Adjusted Dividend Yield	[8] Indicated Common Equity Cost Rate (1)
AutoZone Inc.	- %	13.50 %	12.48 %	12.00 %	12.48 %	12.62 %	- %	NA %
Cheesecake Factory	2.80	6.50	8.60	13.00	8.60	9.18	2.93	12.11
Casey's Gen'l Stores	0.88	8.00	16.03	10.00	16.03	12.52	0.94	13.46
Cboe Global Markets	1.29	14.50	0.72	6.60	0.72	5.64	1.33	6.97
Cracker Barrel	3.10	10.00	2.40	10.00	2.40	6.20	3.20	9.40
Dollar General	1.07	13.00	11.43	12.50	11.43	12.09	1.13	13.22
Dunkin' Brands Group	2.07	10.50	7.25	10.70	7.25	8.93	2.16	11.09
Darden Restaurants	2.63	12.00	12.95	10.30	12.95	12.05	2.79	14.84
Integra LifeSciences	-	24.00	13.25	12.80	13.20	15.81	-	NA
Viad Corp.	0.71	11.00	NA	NA	14.00	12.50	0.75	13.25
Valvoline Inc.	2.24	7.50	7.50	9.80	7.50	8.08	2.33	10.41
							Mean	11.64 %
							Median	12.11 %
							Average of Mean and Median	11.88 %

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 30, 2019. 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.reuters.com, www.zacks.com, and www.yahoo.com (excluding any negative growth rates) and then adding that growth rate to the adjusted dividend yield.

Source of Information: Value Line Investment Survey
www.reuters.com Downloaded on 04/30/2019
www.zacks.com Downloaded on 04/30/2019
www.yahoo.com Downloaded on 04/30/2019

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

Line No.		Proxy Group of Eleven Non-Price Regulated Companies
1.	Prospective Yield on Baa Rated Corporate Bonds (1)	5.21 %
2.	Equity Risk Premium (2)	6.79
3.	Risk Premium Derived Common Equity Cost Rate	12.00 %

Notes: (1) Average forecast of Baa corporate bonds based upon the consensus of nearly 50 economists reported in Blue Chip Financial Forecasts dated May 1, 2019 and December 1, 2018 (see pages 10 and 11 of Schedule DWD-4). The estimates are detailed below.

Second Quarter 2019	4.80 %
Third Quarter 2019	4.90
Fourth Quarter 2019	4.90
First Quarter 2020	5.00
Second Quarter 2020	5.10
Third Quarter 2020	5.10
2020-2024	5.90
2025-2029	6.00
Average	5.21 %

(2) From page 5 of this Schedule.

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

	Moody's Long-Term Issuer Rating April 2019		Standard & Poor's Long-Term Issuer Rating April 2019	
Proxy Group of Eleven Non-Price Regulated Companies	Long-Term Issuer Rating	Numerical Weighting (1)	Long-Term Issuer Rating	Numerical Weighting (1)
AutoZone Inc.	Baa1	8.0	BBB	9.0
Cheesecake Factory	NR	--	NR	--
Casey's Gen'l Stores	NR	--	NR	--
Cboe Global Markets	A3	7.0	A-	7.0
Cracker Barrel	WR	--	NR	--
Dollar General	Baa2	9.0	BBB	9.0
Dunkin' Brands Group	NR	--	NR	6.0
Darden Restaurants	Baa2	9.0	BBB	9.0
Integra LifeSciences	NR	--	NR	--
Viad Corp.	WR	--	NR	--
Valvoline Inc.	Ba3	13.0	BB+	11.0
Average	Baa2	9.2	BBB+/BBB	8.5

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

Source of Information:
Bloomberg Professional Services

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

Line No.	Equity Risk Premium Measure	Proxy Group of Eleven Non-Price Regulated Companies
	Ibbotson-Based Equity Risk Premiums:	
1.	Ibbotson Equity Risk Premium (1)	5.54 %
2.	Regression on Ibbotson Risk Premium Data (2)	7.93
3.	Ibbotson Equity Risk Premium based on PRPM (3)	8.32
5.	Equity Risk Premium Based on Value Line Summary and Index (4)	9.57
6.	Equity Risk Premium Based on Value Line S&P 500 Companies (5)	11.78
8.	Equity Risk Premium Based on Bloomberg S&P 500 Companies (6)	9.10
9.	Conclusion of Equity Risk Premium	8.71 %
10.	Adjusted Beta (7)	0.78
11.	Forecasted Equity Risk Premium	6.79 %

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

Sources of Information:
Stocks, Bonds, Bills, and Inflation - 2019 SBBI Yearbook, John Wiley & Sons, Inc.
Value Line Summary and Index
Blue Chip Financial Forecasts, May 1, 2019 and December 1, 2018
Bloomberg Professional Services

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

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Proxy Group of Eleven 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)
AutoZone Inc.	0.80	0.60	0.70	9.73 %	3.33 %	10.14 %	10.87 %	10.51 %
Cheesecake Factory	0.75	0.73	0.74	9.73	3.33	10.53	11.16	10.85
Casey's Gen'l Stores	0.75	0.82	0.79	9.73	3.33	11.02	11.53	11.27
Cboe Global Markets	0.75	0.85	0.80	9.73	3.33	11.11	11.60	11.36
Cracker Barrel	0.75	0.72	0.74	9.73	3.33	10.53	11.16	10.85
Dollar General	0.80	0.73	0.77	9.73	3.33	10.82	11.38	11.10
Dunkin' Brands Group	0.70	0.86	0.78	9.73	3.33	10.92	11.45	11.19
Darden Restaurants	0.80	0.77	0.79	9.73	3.33	11.02	11.53	11.27
Integra LifeSciences	0.80	0.85	0.83	9.73	3.33	11.41	11.82	11.61
Viad Corp.	0.80	0.86	0.83	9.73	3.33	11.41	11.82	11.61
Valvoline Inc.	0.80	0.70	0.75	9.73	3.33	10.63	11.24	10.93
Mean			0.77			10.87 %	11.41 %	11.14 %
Median			0.78			10.92 %	11.45 %	11.19 %
Average of Mean and Median			0.78			10.90 %	11.43 %	11.17 %

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

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

Line No.		[1] Market Capitalization on April 30, 2019 (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.	Carolina Water Service, Inc. of North Carolina	$ 217.491		10	5.22%	
2.	Proxy Group of Six Water Companies	$ 4,385.585	20.2 x	5	1.28%	3.94%

	[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	$ 29,428.909	$ 1,073,390.566	-0.30%
	2	13,512.960	29,022.867	0.52%
	3	7,275.967	13,455.802	0.81%
	4	4,504.066	7,524.230	0.85%
	5	2,996.003	4,503.549	1.28%
	6	1,961.831	2,992.251	1.50%
	7	1,292.791	1,960.201	1.58%
	8	730.047	1,292.224	1.80%
	9	325.360	727.843	2.46%
Smallest	10	2.455	321.578	5.22%

*From 2019 Duff & Phelps Cost of Capital Navigator

Notes:
(1) From page 2 of this Schedule.
(2) Gleaned from Columns [B] and [C] on the bottom of this page. The appropriate decile (Column [A]) corresponds to the market capitalization of the proxy group, which is found in Column [1].
(3) Corresponding risk premium to the decile is provided in Column [D] on the bottom of this page.
(4) Line No. 1 Column [3] – Line No. 2 Column [3]. For example, the 3.94% in Column [4], Line No. 2 is derived as follows 3.94% = 5.22% - 1.28%.

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

Company	Exchange	[1] Common Stock Shares Outstanding at Fiscal Year End 2018 (millions)	[2] Book Value per Share at Fiscal Year End 2018 (1)	[3] Total Common Equity at Fiscal Year End 2018 (millions)	[4] Closing Stock Market Price on April 30, 2019	[5] Market-to-Book Ratio on April 30, 2019 (2)	[6] Market Capitalization on April 30, 2019 (3) (millions)
Carolina Water Service, Inc. of North Carolina		NA	NA	62.623 (4)	NA		
Based upon Proxy Group of Six Water Companies						347.3 (5)	$ 217.491 (6)
Proxy Group of Six Water Companies							
American States Water Co.	NYSE	36.758	$ 15.187	$ 558.223	$ 71.170	468.6 %	$ 2,616.056
American Water Works Company Inc	NYSE	180.684	32.454	5,864.000	108.190	333.4	19,548.202
Artesian Resources Corporation	NYSE	9.250	16.568	153.251	36.280	219.0	335.590
California Water Service Group	NYSE	48.065	15.191	730.157	50.390	331.7	2,421.981
Middlesex Water Co.	NYSE	16.403	15.167	248.787	57.990	382.3	951.210
York Water Co.	NYSE	12.944	9.750	126.195	34.030	349.0	440.469
Average		50.684	$ 17.386	$ 1,280.102	$ 59.675	347.3 %	$ 4,385.585

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 equity ratio.
(5) The market-to-book ratio of Carolina Water Service, Inc. of North Carolina on April 30, 2019 is assumed to be equal to the market-to-book ratio of Proxy Group of Six Water Companies on April 30, 2019 as appropriate.
(6) Column [3] multiplied by Column [5].

Source of Information: 2018 Annual Forms 10K
yahoo.finance.com

BEFORE THE
PUBLIC SERVICE COMMISSION
OF SOUTH CAROLINA

DOCKET NO. 2017-292-WS

In the Matter of:

Application of Carolina Water Service,)
Inc. For Adjustment)
of Rates and Charges and)
Modification of Certain Terms and)
Conditions for the Provision of)
Water and Sewer Service)

Prepared Direct Testimony

of

Dylan W. D'Ascendis, CRRA
Director
ScottMadden, Inc.

On Behalf of

Carolina Water Service, Inc.

February 26, 2018

TABLE OF CONTENTS

I. INTRODUCTION

A. Witness Identification

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

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

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

A. I am a Director at ScottMadden, Inc.

B. Background and Qualifications

Q. PLEASE SUMMARIZE YOUR PROFESSIONAL EXPERIENCE AND EDUCATIONAL BACKGROUND.

A. I offer expert testimony on behalf of investor-owned utilities on rate of return issues and class cost of service issues. I also assist in the preparation of rate filings, including but not limited to revenue requirements and original cost and lead/lag studies. I am a graduate of the University of Pennsylvania, where I received a Bachelor of Arts degree in Economic History. I also hold a Master of Business Administration from Rutgers University with a concentration in Finance and International Business, which was conferred with high honors. I am a Certified Rate of Return Analyst ("CRRA") and a Certified Valuation Analyst ("CVA"). My full professional qualifications are provided in Appendix A.

II. PURPOSE OF TESTIMONY

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

A. The purpose of my testimony is to testify on behalf of Carolina Water Service, Inc. ("CWS" or the "Company") about the appropriate capital structure and corresponding cost rates that the Company should be afforded the opportunity to earn on its jurisdictional rate base.

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

A. Yes. I have prepared Exhibit No. __, which consists of Schedules DWD-1 through DWD-8.

Q. WHAT IS YOUR RECOMMENDED COST OF CAPITAL FOR CWS?

A. I recommend that the South Carolina Public Service Commission ("SC PSC" or the "Commission") authorize the Company the opportunity to earn an overall rate of return within a range of 8.60% to 8.86% based on a test year ended December 31, 2017. The ratemaking capital structure consists of 48.11% long-term debt, at an embedded debt cost rate of 6.60%, and 51.89% common equity at my recommended range of common equity cost rates between 10.45% and 10.95%. 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	48.11%	6.60%	3.18%
Common Equity	51.89%	10.45% - 10.95%	5.42% - 5.68%
Total	100.00%		8.60% - 8.86%

III. SUMMARY

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

A. My recommended range of common equity cost rates between 10.45% and 10.95% 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 not necessarily identical, risk to CWS. 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 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 eight 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

[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).

of domestic, non-price regulated companies comparable in total risk to the eight water companies ("Non-Price Regulated Proxy Group").

The results derived from each are as follows:

Table 2: Summary of Common Equity Cost Rate

	Utility Proxy Group
Discounted Cash Flow Model	8.64%
Risk Premium Model	10.69
Capital Asset Pricing Model	10.51
Cost of Equity Models Applied to Comparable Risk, Non-Price Regulated Companies	12.06
Indicated Common Equity Cost Rate Before Adjustment	10.45%
Size Adjustment	0.50
Indicated Common Equity Cost Rate Cost Rate after Adjustment	10.95%
Recommended Range of Common Equity Cost Rates	10.45% - 10.95%

After analyzing the indicated common equity cost rates derived by these models, I conclude that a common equity cost rate of 10.45% for the Company is indicated before any Company-specific adjustment. I then adjusted the indicated common equity cost rate upward by 0.50% to reflect CWS's smaller relative size as compared with the members of the Utility Proxy Group, resulting in a size-adjusted indicated common equity cost rate of 10.95%. Based on these results, I recommend the Commission consider a range of common equity cost rates between 10.45% and 10.95% for use in setting rates for the Company.

IV. GENERAL PRINCIPLES

Q. WHAT GENERAL PRINCIPLES HAVE YOU CONSIDERED IN ARRIVING AT YOUR RECOMMENDED RANGE OF COMMON EQUITY COST RATES?

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

A. Business Risk

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 general business risks faced by all utilities (*i.e.*, electric, natural gas distribution, and water) include size, the quality of management, the regulatory environment in which they 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 supplies are drawn in order to preserve and protect essential natural resources of the United States. Compliance with the Safe Water Drinking Act and response to continuous monitoring by the Environmental Protection Agency ("EPA") and state and local governments of the water supply for potential contaminants and their resultant regulations directly result in increased environmental stewardship by water utilities. This, plus aging infrastructure, necessitate additional capital investment in the distribution and treatment of water, exacerbating the pressure on free cash flows arising from increased capital expenditures for infrastructure repair and replacement. The significant amount of capital investment and, hence, high capital intensity, is a major risk factor for the water and wastewater utility industry.

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

> One of the most positive attributes of the water industry is that companies and regulatory authorities usually work together reasonably well. This isn't always the case in other domestic regulated markets, such as electricity. In general, regulators realize

> that the U.S. went decades without plowing enough capital back into the pipelines and wastewater facilities. Now they realize that a huge amount of funds have to be directed toward fixing their systems.
>
> We cannot underestimate the importance of a positive regulatory climate. Essentially, they determine a utility's allowed return on equity. Should there be a sea change in this area, it would greatly impact this group in our opinion.[3]

The water and wastewater industries also experience 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 to a company to fund ongoing replacements and repairs of the system. Water / wastewater utilities' assets have long lives, and therefore have long capital recovery periods. As such, they face greater risk due to inflation, which results in a higher replacement cost per dollar of net plant.

Substantial capital expenditures, as noted by *Value Line,* will require significant financing. The three sources of financing typically used are debt, equity (common and preferred), and cash flow. All three are intricately linked to the opportunity to earn a sufficient rate of return as well as the ability to achieve that return. Consistent with *Hope* and *Bluefield*, the return must be sufficient to maintain credit quality as well as enable the attraction of necessary new capital, be it debt or equity capital. If unable to raise debt or equity capital, the utility must turn to either retained earnings or free cash flow,[4] both of which are directly linked to earning a sufficient rate of return. The level of free cash flow represents a company'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 nearly impossible for the utility to attract the needed new capital to invest in new infrastructure to ensure quality service to

3 *Value Line Investment Survey*, October 13, 2017.
4 Free Cash Flow = Operating Cash Flow (funds from operations) minus Capital Expenditures.

its customers. An insufficient rate of return can be financially devastating for utilities and 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, particularly a sufficient authorized return on common equity, so that the industry can successfully meet the challenges it faces.

B. <u>Financial Risk</u>

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 RISKS (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.[5] Although

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

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, as the purpose of the bond/credit rating process is to assess credit quality or credit risk and not common equity risk.

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. <u>CAPITAL STRUCTURE</u>

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 48.11% long-term debt and 51.89% common equity as shown on page 1 of Schedule DWD-1. This capital structure is based on a test year capital structure for Utilities, Inc., CWS's parent company, ended December 31, 2017.

Q. **HOW DOES YOUR PROPOSED RATEMAKING COMMON EQUITY RATIO OF 51.89% FOR CWS COMPARE WITH THE TOTAL EQUITY RATIOS MAINTAINED BY THE COMPANIES IN YOUR UTILITY PROXY GROUP?**

A. My proposed ratemaking common equity ratio of 51.89% for CWS is reasonable and 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. As shown on page 2 of Schedule DWD-2, the common equity ratios of the Utility Proxy Group range from 45.17% to 60.60%, with a midpoint of 52.89% and an average of 53.75% in 2016. The equity ratio, on average, maintained by the Utility Proxy Group is higher than the equity ratio requested by the Company.

In my opinion, a capital structure consisting of 48.11% long-term debt and 51.89% total equity is appropriate for ratemaking purposes for CWS in the current proceeding because it is comparable, but conservative to the average capital structure ratios (based on total permanent capital) maintained, on average, by the water companies in the Utility Proxy Group on whose market data I base my recommended common equity cost rate.

Q. WHAT COST RATE FOR LONG-TERM DEBT IS MOST APPROPRIATE FOR USE IN A COST OF CAPITAL DETERMINATION FOR CWS?

A. A long-term debt cost rate of 6.60% is reasonable and appropriate as it is based on a test year of Utilities, Inc.'s ("UI") long-term debt outstanding ending December 31, 2017.

VI. CAROLINA WATER SERVICE, INC. AND UTILITY PROXY GROUP SELECTION

Q. HAVE YOU REVIEWED FINANCIAL DATA FOR CWS?

A. Yes. CWS is the surviving entity after the merger of the four UI operating subsidiaries in South Carolina.[6] The merged company serves approximately 26,400 water and sewer customers throughout South Carolina. CWS is a wholly-owned subsidiary of UI, which is a wholly-owned subsidiary of Corix, Inc. CWS's common stock is not publicly traded.

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6 The four merged companies are as follows: Carolina Water Service, Inc., United Utility Companies, Inc., Utility Services of South Carolina, and Southland Utilities, Inc.

Q. **PLEASE EXPLAIN HOW YOU CHOSE YOUR PROXY GROUP OF EIGHT WATER COMPANIES.**

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* (October 13, 2017);

(ii) They have 70% or greater of 2016 total operating income and 70% or greater of 2016 total assets attributable to regulated water operations;

(iii) At the time of the 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 2016 or through the time of the preparation of this testimony;

(v) They have *Value Line* and Bloomberg adjusted betas;

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

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

The following eight companies met these criteria: American States Water Co., American Water Works Co., Inc., Aqua America, Inc., California Water Service Group, Connecticut Water Service, Inc., Middlesex Water Co., SJW Corp., and York Water Co.

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

A. Page 1 of Schedule DWD-2 contains comparative capitalization and financial statistics for the eight water companies identified above for the years 2012 to 2016.

During the five-year period ending 2016, the historically achieved average earnings rate on book common equity for the group averaged 10.56%. The average common equity ratio based on total permanent capital (excluding short-term debt) was 53.13%, and the average dividend payout ratio was 56.73%.

Total debt to earnings before interest, taxes, depreciation, and amortization ("EBITDA") for the years 2012 to 2016 ranges between 3.40 and 3.83, with an average of 3.63. Funds from operations to total debt range from 20.86% to 25.95%, with an average of 23.18%.

VII. <u>COMMON EQUITY COST RATE MODELS</u>

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 coefficients (β) to determine the equity risk premium reflects the market's assessment of market/systematic risk since beta coefficients 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 betas). 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. Discounted Cash Flow Model

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 DO YOU USE?

A. I use 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 October 13, 2017, divided by the average of closing market prices for the 60 trading days ending October 13, 2017.[7]

[7] See Schedule DWD-3, page 1, column 1.

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 twelve-month period, my adjustment is a conservative approach that does not overstate the dividend yield. Therefore, the actual average dividend yields in Column 1 on page 1 of Schedule DWD-3 have been adjusted upward to reflect one-half the average projected growth rate shown in Column 6.

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

A. Investors with more limited resources than institutional investors are likely to rely on widely available financial information services, such as *Value Line*, Reuters, 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 use analysts' five-year forecasts of earnings per share ("EPS") growth in my DCF analysis.

Over the long run, there can be no growth in dividends per share ("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-3, the mean result of the application of the single-stage DCF model is 8.86%, the median result is 8.42%, and the average of the two is 8.64% for the Utility Proxy Group. In arriving at a conclusion for the DCF-indicated common equity cost rate for the Utility Proxy Group, I have relied on an average of the mean and the median results of the DCF. This approach takes into consideration all of the proxy companies' results while mitigating the high and low outliers of those individual results.

B. <u>The Risk Premium Model</u>

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.

Q. PLEASE EXPLAIN THE PRPM.

A. The PRPM, published in the *Journal of Regulatory Economics ("JRE")*,[8] 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")".[9] 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

[8] Autoregressive conditional heteroscedasticity. See "A New Approach for Estimating the Equity Risk Premium for Public Utilities", Pauline M. Ahern, Frank J. Hanley and Richard A. Michelfelder, Ph.D. The Journal of Regulatory Economics (December 2011), 40:261-278.

[9] www.nobelprize.org.

on an estimate of investor behavior, but rather on the evaluation of the results of that behavior (*i.e.*, the variance of historical equity risk premiums).

The inputs to the model are the historical returns on the common shares of each company in the Utility Proxy Group minus the historical monthly yield on long-term U.S. Treasury securities through September 2017. Using a generalized form of ARCH, known as GARCH, I calculate each Utility Proxy Group company's projected equity risk premium using Eviews© statistical software. When the GARCH Model is applied to the historical return data, it produces a predicted GARCH variance series[10] and a GARCH coefficient[11]. Multiplying the predicted monthly variance by the GARCH coefficient and annualizing it[12] produces the predicted annual equity risk premium. I then add the forecasted 30-year U.S. Treasury Bond yield, 3.58%[13], 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")*[14]. The mean PRPM indicated common equity cost rate for the Utility Proxy Group is 11.48%, the median is 11.41%, and the average of the two is 11.45%. Consistent with my reliance on the average of the median and mean results of the DCF, I will rely on the average of the mean and median results of the Utility Proxy Group PRPM to calculate a cost of common equity rate of 11.45%.

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10 Illustrated on Columns 1 and 2 of page 2 of Schedule DWD-4.
11 Illustrated on Column 4 of page 2 of Schedule DWD-4.
12 Annualized Return = (1+Monthly Return)^12 - 1
13 See column 6 of page 2 of Schedule DWD-4.
14 *Blue Chip Financial Forecasts*, October 1, 2017 at p. 2 and June 1, 2017 at p. 14.

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 4.92% 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 first calendar quarter of 2019 and the long-term projections for 2019 to 2023 and 2024 to 2028 from Blue Chip. As shown on Line No. 1 of page 3 of Schedule DWD-4, the average expected yield on Moody's Aaa-rated corporate bonds is 4.61%. In order to derive an expected yield on A2 rated-public utility bonds, I make an upward adjustment of 0.25%, which represents a recent spread between Aaa corporate bonds and A2-rated public utility bonds, in order to adjust the expected Aaa corporate bond yield to an equivalent Moody's A2-rated public utility bond.[15] Adding that recent 0.25% spread to the expected Aaa corporate bond yield of 4.61% results in an expected A2 public utility bond of 4.86%.

Since the Utility Proxy Group's average Moody's long-term issuer rating is A2/A3, another adjustment to the expected A2 public utility bond yield is needed to reflect the difference in bond ratings. An upward adjustment of 0.06%, which represents one-sixth of

[15] As shown on Line No. 2 and explained in note 2 of page 3 of Schedule DWD-4.

a recent spread between A2 and A3 public utility bond yields, is necessary to make the A2 prospective bond yield applicable to an A2/A3 public utility bond.[16] Adding the 0.06% to the 4.86% prospective A2 public utility bond yield results in a 4.92% expected bond yield for the Utility Proxy Group.

Q. PLEASE EXPLAIN THE DERIVATION OF THE BETA-DERIVED EQUITY RISK PREMIUM.

A. The components of the beta derived risk premium model are: 1) An expected market equity risk premium over corporate bonds, and 2) the beta coefficient. The derivation of the beta-derived equity risk premium that I apply to the Utility Proxy Group is shown on lines 1 through 11 of page 8 of Schedule DWD-4. The total beta-derived equity risk premium I apply is based on an average of: 1) Historical data-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 2017 Stocks, Bonds, Bills, and Inflation ("SBBI") Yearbook ("SBBI – 2017")[17] less the average historical yield on Moody's Aaa/Aa-rated corporate bonds for the period 1928 to 2016. The use of holding period returns over a very long period of time is appropriate because it is consistent with

[16] As shown on Line No. 4 and explained in note 3 on page 3 of Schedule DWD-4.

[17] SBBI Appendix A Tables: Morningstar Stocks, Bonds, Bills, & Inflation 1926-2016.

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 11.69% and the long-term arithmetic mean monthly yield on Moody's Aaa/Aa-rated corporate bonds was 6.13%.[18] As shown on line 1 of page 8 of Schedule DWD-4, subtracting the mean monthly bond yield from the total return on large company stocks results in a long-term historical equity risk premium of 5.56%.

I used the arithmetic mean monthly total return rates for the large company stocks and yields (income returns) for the Moody's Aaa/Aa corporate bonds, because they are appropriate for the purpose of estimating the cost of capital as noted in SBBI – 2017.[19] 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 7.37%, shown on line 2 of page 8 of Schedule DWD-4, I used the same monthly annualized total returns on

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18 As explained in note 1 on page 8 of Schedule DWD-4.
19 SBBI – 2017, at 10-22.

large company common stocks relative to the monthly annualized yields on Moody's Aaa/Aa corporate bonds as mentioned above. The relationship between interest rates and the market equity risk premium was modeled using the observed monthly market equity risk premium as the dependent variable, and the monthly yield on Moody's Aaa/Aa 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 corporate bonds yield:

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

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 corporate bonds during the period from January 1928 through September 2017.[20] 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 5.91%.[21]

The average historical data-based equity risk premium is 6.28%, which is shown on line 4 of page 8 of Schedule DWD-4.

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20 Data from January 1926-December 2016 is from SBBI – 2017. Data from January – September 2017 is from Bloomberg Professional Services.

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

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

A. As noted previously, because both ratemaking and the cost of capital, including the cost rate of common equity, are prospective, a prospective market equity risk premium is essential. The derivation of the forecasted or prospective market equity risk premium can be found in note 4 on page 8 of Schedule DWD-4. Consistent with my calculation of the dividend yield component in my DCF analysis, this prospective market equity risk premium is derived from an average of the three- to five-year median market price appreciation potential by *Value Line* for the thirteen weeks ending October 13, 2017, 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.[22]

The average median expected price appreciation is 33%, which translates to a 7.39% annual appreciation, and, when added to the average of *Value Line's* median expected dividend yields of 2.06%, equates to a forecasted annual total return rate on the market of 9.45%. The forecasted Aaa bond yield of 4.61% is deducted from the total market return of 9.45%, resulting in an equity risk premium of 4.84%, shown on page 8, line 5 of Schedule DWD-4.

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

A. Using data from *Value Line*, I calculate 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 14.30%. Subtracting the

[22] As explained in detail in page 2, note 1 of Schedule DWD-5.

prospective yield on Aaa Corporate bonds of 4.61% results in an 9.69% projected equity risk premium.

The average *Value Line*-based Equity risk premium is 7.26%, which is shown on Line No. 7 on page 8 of Schedule DWD-4.

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

A. Using data from Bloomberg Professional Services, I calculate 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 return for the S&P 500 is 13.92%. Subtracting the prospective yield on Aaa Corporate bonds of 4.61% results in a 9.31% projected equity risk premium.

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

A. I give equal weight to equity risk premiums based on each source, historical, *Value Line*, and Bloomberg in arriving at my conclusion of 7.62%.[23]

After calculating the average market equity risk premium of 7.62%, I adjust it by beta to account for the risk of the Utility Proxy Group. As discussed below, the beta coefficient 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 share of the market's total equity risk premium, relative to corporate bond yields. As shown on page 1 of Schedule DWD-5, the average of the mean and median beta coefficient for the Utility

[23] 7.62% = (6.28% + 7.26% + 9.31%)/3. See Line No. 9 on page 8 of Schedule DWD-4.

Proxy Group is 0.77. Multiplying the beta coefficient of the Utility Proxy Group of 0.77 by the market equity risk premium of 7.62% results in a beta-adjusted equity risk premium of 5.87% 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 estimate three equity risk premiums based 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 derive a long-term monthly arithmetic mean equity risk premium between the S&P Utility Index total returns of 10.57% and monthly A-rated public utility bond yields of 6.61% from 1928 to 2016 to arrive at an equity risk premium of 3.96%.[24] I then use the same historical data to derive an equity risk premium of 5.59% based on a regression of the monthly equity risk premiums. The final S&P Utility Index holding period equity risk premium involves applying the PRPM using the historical monthly equity risk premiums from January 1928 to September 2017 to arrive at a PRPM-derived equity risk premium of 3.96% for the S&P Utility Index. The average of the three S&P Utilities Index holding return equity risk premiums is 4.50%.

I then derive expected total returns on the S&P Utilities Index of 9.06% and 8.60% using data from *Value Line* and Bloomberg Professional Services, respectively, and subtract the prospective A2-rated public utility bond yield (4.86%[25]), which results in risk premiums of 4.20% and 3.74%, respectively. As with the market equity risk premiums, I

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[24] As shown on Line No. 1 of page 12 of Schedule DWD-4.
[25] Derived on Line No. 3 of page 3 of Schedule DWD-4.

average the risk premium based on each source (*i.e.*, Historical, *Value Line*, and Bloomberg) to arrive at my utility-specific equity risk premium of 4.15%.[26]

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 apply to the Utility Proxy Group is 5.01%, which is the average of the beta-derived and the S&P utility equity risk premiums of 5.87% and 4.15%, respectively.[27]

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

A. As shown on Line No. 7 of Schedule DWD-4, page 3, I calculate a common equity cost rate of 9.93% for the Utility Proxy Group based on the total market approach of the RPM.

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

A. As shown on page 1 of Schedule DWD-4, the indicated RPM-derived common equity cost rate is 10.69%, which gives equal weight to the PRPM (11.45%) and the adjusted market approach results (9.93%).

C. <u>The Capital Asset Pricing Model</u>

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 the beta coefficient (β). A beta coefficient less than 1.0 indicates

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[26] 4.15% = (4.50% + 4.20% + 3.74%)/3.

[27] As shown on page 7 of Schedule DWD-4.

lower variability than the market as a whole, while a beta coefficient 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 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 the beta coefficient. 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

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

Numerous tests of the CAPM have measured the extent to which security returns and beta coefficients 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 the beta coefficient 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.[28] In view of theory and practical research, I have applied both the

[28] Roger A. Morin, New Regulatory Finance (Public Utility Reports, Inc., 2006), at p. 175.

traditional CAPM and the ECAPM to the companies in the Utility Proxy Group and averaged the results.

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

A. With respect to the beta coefficient, I considered two methods of calculation: the average of the Beta coefficients of the Utility Proxy Group companies reported by Bloomberg Professional Services, and the average of the Beta coefficients of the Utility Proxy Group companies as reported by *Value Line*. While both of those services adjust their calculated (or "raw") Beta coefficients to reflect the tendency of the Beta coefficient to regress to the market mean of 1.00, *Value Line* calculates the Beta coefficient 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 shown in column 5 on page 1 of Schedule DWD-5, the risk-free rate adopted for both applications of the CAPM is 3.58%. This risk-free rate of 3.58% 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 first calendar quarter of 2019 and long-term projections for the years 2019 to 2023 and 2024 to 2028.

Q. WHY IS THE YIELD ON LONG-TERM U.S. TREASURY BONDS APPROPRIATE FOR USE AS THE RISK-FREE RATE?

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 A-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.

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 Schedule DWD-5. As discussed previously, the market risk premium is derived from an average of:

1) Historical data-based market risk premiums;
2) *Value Line* data-based market risk premiums; and
3) Bloomberg data-based market risk premium.

The long-term income return on U.S. Government Securities of 5.17% was deducted from the SBBI-2017 monthly historical total market return of 11.97%, which results in an historical market equity risk premium of 6.80%.[29] I applied a linear OLS regression to the monthly annualized historical returns on the S&P 500 relative to historical yields on long-term U.S. Government Securities from SBBI-2017. That regression analysis yielded a market equity risk premium of 8.60%. The PRPM market equity risk premium is 6.69%, and is derived using the PRPM relative to the yields on long-term U.S. Treasury securities from January 1926 through September 2017. The average of the historical data-based market risk premiums is 7.36%.[30]

The *Value Line*-derived forecasted total market equity risk premium is derived by deducting the forecasted risk-free rate of 3.58%, discussed above, from the *Value Line* projected total annual market return of 9.45%, resulting in a forecasted total market equity

29 SBBI – 2017, at Appendix A-1 (1) through .A-1 (3) and Appendix A-7 (19) through A-7 (21).
30 7.36% = (6.80% + 8.60% + 6.69%)/3.

risk premium of 5.87%. The S&P 500 projected market equity risk premium using *Value Line* data is derived by subtracting the projected risk-free rate of 3.58% from the projected total return of the S&P 500 of 14.30%. The resulting market equity risk premium is 10.72%. The average *Value Line* market risk premium is 8.29%.[31]

The S&P 500 projected market equity risk premium using Bloomberg data is derived by subtracting the projected risk-free rate of 3.58% from the projected total return of the S&P 500 of 13.92%. The resulting market equity risk premium is 10.34%.

These three sources (historical, *Value Line*, and Bloomberg), when averaged, result in an average total market equity risk premium of 8.67%.[32]

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

A. As shown on page 1 of Schedule DWD-5, the mean result of my CAPM/ECAPM analyses is 10.43%, the median is 10.58%, and the average of the two is 10.51%. Consistent with my reliance on the average of mean and median DCF results discussed above, the indicated common equity cost rate using the CAPM/ECAPM is 10.51%.

D. Common Equity Cost Rates for a Proxy Group of Domestic, Non-Price Regulated Companies Based on the DCF, RPM, and CAPM

Q. **WHY DO 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

31 8.29% = (5.87% + 10.72%)/2.
32 8.67% = (7.36% + 8.29% + 10.34%)/3.

for the competition of the marketplace, non-price regulated firms operating in the competitive marketplace make an excellent proxy if they are comparable in total risk to the Utility Proxy Group being used to estimate the cost of common equity. The selection of such domestic, non-price-regulated competitive firms theoretically and empirically results in a proxy group which is comparable in total risk to the Utility Proxy Group.

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

A. In order to select a proxy group of domestic, non-price regulated companies similar in total risk to the Utility Proxy Group, I relied on the beta coefficients 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 results in a proxy group of twenty-eight 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 were:

1) They must be covered by *Value Line Investment Survey* (Standard Edition);
2) They must be domestic, non-price regulated companies, *i.e.*, non-utilities;
3) Their beta coefficients must lie within plus or minus two standard deviations of the average unadjusted beta of the Utility Proxy Group; and
4) The residual standard errors of the *Value Line* regressions, which gave rise to the unadjusted beta coefficients, must lie within plus or minus two standard deviations of the average residual standard error of the Utility Proxy Group.

Beta coefficients 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 and similar residual standard errors resulting from the same regression analyses have similar total investment risk.

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

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

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

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

Page 2 of Schedule DWD-7 contains the derivation of the DCF cost rates. As shown, the indicated common equity cost rate using the DCF for the Non-Price Regulated Proxy Group comparable in total risk to the Utility Proxy Group, is 13.57%.

Pages 3 through 5 contain the data and calculations that support the 11.91% RPM cost rate. As shown on Line No. 1 of page 3 of Schedule DWD-7, the consensus prospective yield on Moody's Baa rated corporate bonds for the six quarters ending in the first quarter of 2019, and for the years 2019 to 2023 and 2024 to 2028, is 5.36%.[33] When the beta-adjusted risk premium of 6.55%,[34] relative to the Non-Price Regulated Proxy Group, is added to the prospective Baa2 rated corporate bond yield of 5.36%, the indicated RPM cost rate is 11.91%.

Page 6 contains the inputs and calculations that support my indicated CAPM/ECAPM cost rate of 11.15%.

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

A. As shown on page 1 of Schedule DWD-7, the results of the DCF, RPM, and CAPM, applied to the Non-Price Regulated Proxy Group comparable in total risk to the Utility Proxy Group, are 13.57%, 11.91%, and 11.15%, respectively. The average of the mean and median of these models is 12.06%, which I use as the indicated common equity cost rate for the Non-Price Regulated Proxy Group.

VIII. CONCLUSION OF COMMON EQUITY COST RATE BEFORE ADJUSTMENTS

Q. WHAT IS THE INDICATED COMMON EQUITY COST RATE BEFORE ADJUSTMENTS?

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 cost of equity before adjustments is 10.45%. I use multiple cost of common equity models as primary tools in arriving at my recommended common equity cost rate, because no single model is

33 *Blue Chip Financial Forecasts*, October 1, 2017 at p. 2 and June 1, 2017, at p. 14.
34 Derived on page 5 of Schedule DWD-7.

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.

Based on these common equity cost rate results, I conclude that a common equity cost rate of 10.45% is reasonable and appropriate for the Company before any adjustment is made for relative risk between the Company and the Utility Proxy Group. The 10.45% indicated ROE is the approximate average of the results produced by my application of the models as explained above.

IX. ADJUSTMENT TO THE COMMON EQUITY COST RATE

A. Size Adjustment

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

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

Table 5: Size as Measured by Market Capitalization for the Company and the Utility Proxy Group

	Market Capitalization* ($ Millions)	Times Greater than the Company
CWS	$57.209	
Utility Proxy Group	$3,543.646	61.9x

*From page 1 of Schedule DWD-8.

The Company's estimated market capitalization was at $57.209 million as of October 13, 2017, compared with the market capitalization of the average water company in the Utility Proxy Group of $3.544 billion as of October 13, 2017. The Utility Proxy Group's market capitalization is 61.9 times the size of CWS's estimated market capitalization.

Q. PLEASE EXPLAIN WHY SIZE HAS A BEARING ON BUSINESS RISK.

A. Company size is a significant element of business risk for which investors expect to be compensated through higher returns. Generally, smaller companies are less able to cope with significant events that affect sales, revenues, and earnings. For example, smaller companies face more risk exposure to business cycles and economic conditions, both nationally and locally. Additionally, the loss of revenues from a few larger customers would have a greater effect on a small company than on a much larger company with a larger, more diverse, customer base.

Further evidence of the risk effects of size include the fact that investors demand greater returns to compensate for the lack of marketability and liquidity of the securities of smaller firms. For these reasons, the Commission should authorize a cost of common equity in this proceeding that reflects CWS's relevant risk, including the impact of its small size.

As a result, it is necessary to upwardly adjust the indicated common equity cost rate of 10.45% to reflect CWS's greater risk due to its smaller relative size. The determination is based on the size premiums for portfolios of New York Stock Exchange ("NYSE"), American Stock Exchange ("AMEX"), and NASDAQ listed companies ranked by deciles for the 1926 to 2016 period. The average size premium for the Utility Proxy Group with a market capitalization of \$3.545 billion falls in the 5th decile, while CWS's market capitalization of \$57.209 million puts the Company in the 10th decile. The size premium spread between the 5th decile and the 10th decile is 4.08%. Even though a 4.08% upward size adjustment is indicated, I apply a size premium of 0.50% to CWS's indicated common equity cost rate.

Q. DID YOU EVALUATE CWS'S PARENT, UTILITIES, INC.'S ESTIMATED MARKET CAPITALIZATION COMPARED TO THE PROXY GROUP?

A. Yes. Even though I do not think it is applicable[35], I looked at Utilities, Inc.'s common equity balance at December 31, 2016. I then adjusted it by the proxy group market-to-book ratio and compared it with the proxy group. Utilities, Inc.'s estimated market capitalization, \$699.722 million[36], would fall in between the 8th and 9th deciles, which would indicate a 0.87% size premium over the average proxy group company.

[35] It is Mr. D'Ascendis' opinion that the parent company's size is irrelevant in setting rates for one of its jurisdictional subsidiaries. Regulation is required to look at each operating utility as a stand-alone company since they can only set rates for that particular utility and no other operating subsidiary outside of their jurisdiction.

[36] \$212.230M x 329.7% = \$699.722M

Q. DID YOU EVALUATE OTHER MEASURES OF RELATIVE SIZE BETWEEN CWS AND THE PROXY GROUP?

A. Yes. In order to present a more robust analysis, I compared CWS and the water proxy group using various measures of size as described by Duff and Phelps' 2017 Valuation Yearbook. The measures are listed below:

- Market Value of Common Equity
- Book Value of Common Equity
- Market Value of Invested Capital
- Total Assets
- Total Sales
- Number of Employees

As shown on page 3 of Schedule DWD-8, in all measures, CWS was determined to be smaller than the average water proxy group company with associated size premiums ranging from 1.34% to 3.94%. In view of these results, in my opinion, an upward size adjustment of 0.50% to the indicated cost of common equity is both appropriate and conservative.

Q. WHAT IS THE INDICATED COST OF COMMON EQUITY AFTER YOUR ADJUSTMENT FOR SIZE?

A. After applying the 0.50% size adjustment to the indicated cost of common equity of 10.45%, a size-adjusted cost of common equity of 10.95% results.

X. CONCLUSION OF COMMON EQUITY COST RATE

Q. WHAT IS YOUR RECOMMENDED COST OF COMMON EQUITY FOR CWS?

A. Given the indicated cost of common equity of 10.45% and the size adjusted cost of common equity of 10.95%, I conclude that an appropriate range of common equity cost rates for the Company is from 10.45% to 10.95%.

Q. IS YOUR RECOMMENDED RANGE OF COMMON EQUITY COST RATES REASONABLE FOR CWS?

A. In my opinion, a range of common equity cost rates between 10.45% and 10.95% is both reasonable and conservative, providing CWS with sufficient earnings to enable it to attract necessary new capital.

Q. DOES THAT CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes, it does

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MANAGEMENT CONSULTANTS

Appendix A
Professional Qualifications of Dylan W. D'Ascendis, CRRA, CVA

Summary

Dylan is an experienced consultant and a Certified Rate of Return Analyst (CRRA) and Certified Valuation Analyst (CVA). He has served as a consultant for investor-owned and municipal utilities and authorities for 9 years. Dylan has extensive experience in rate of return analyses, class cost of service, rate design, and valuation for regulated public utilities. He has testified as an expert witness in the subjects of rate of return, cost of service, rate design, and valuation before 13 regulatory commissions in the U.S. and an American Arbitration Association panel.

He also maintains the benchmark index against which the Hennessy Gas Utility Mutual Fund performance is measured. He serves on the Rates and Regulatory Committee of the National Association of Water Companies (NAWC).

Areas of Specialization

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

Recent Expert Testimony Submission/Appearances

Jurisdiction	*Topic*
Regulatory Commission of Alaska	Return on Common Equity & Capital Structure
New Jersey Board of Public Utilities	Cost of Service, Rate Design
Pennsylvania Public Utility Commission	Return on Common Equity
South Carolina Public Service Commission	Return on Common Equity
American Arbitration Association	Valuation

Recent Assignments

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

Recent Publications and Speeches

- Co-Author of: "The Impact of Decoupling on the Cost of Capital of Public Utilities", co-authored with Richard A. Michelfelder, Ph.D., Rutgers University and Pauline M. Ahern. (Forthcoming)
- "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.

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SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
Regulatory Commission of Alaska				
Alaska Power Company	07/16	Alaska Power Company	Docket No. TA857-2	Rate of Return
Colorado Public Utilities Commission				
Atmos Energy Corporation	06/17	Atmos Energy Corporation	Docket No. 17AL-0429G	Return on Equity
Delaware Public Service Commission				
Tidewater Utilities, Inc.	11/13	Tidewater Utilities, Inc.	Docket No. 13-466	Capital Structure
Hawaii Public Utilities Commission				
Kaupulehu Water Company	02/18	Kaupulehu Water Company	Docket No. __	Rate of Return
Aqua Engineers, LLC	05/17	Puhi Sewer & Water Company	Docket No. 2017-0118	Cost of Service / Rate Design
Hawaii Resources, Inc.	09/16	Laie Water Company	Docket No. 2016-0229	Cost of Service / Rate Design
Illinois Commerce Commission				
Utility Services of Illinois, Inc.	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
Louisiana Public Service Commission				
Louisiana Water Service, Inc.	06/13	Louisiana Water Service, Inc.	Docket No. U-32848	Rate of Return
Massachusetts Department of Public Utilities				
Liberty Utilities	07/15	Liberty Utilities d/b/a New England Natural Gas Company	Docket No. 15-75	Rate of Return
Missouri Public Service Commission				
Indian Hills Utility Operating Company, Inc.	10/17	Indian Hills Utility Operating Company, Inc.	Case No. SR-2017-0259	Rate of Return
Raccoon Creek Utility Operating Company, Inc.	09/16	Raccoon Creek Utility Operating Company, Inc.	Docket No. SR-2016-0202	Rate of Return
New Jersey Board of Public Utilities				

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SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
Middlesex Water Company	10/17	Middlesex Water Company	Docket No. WR1710xxxx	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
Public Utilities Commission of Ohio				
Aqua Ohio, Inc.	05/16	Aqua Ohio, Inc.	Docket No. 16-0907-WW-AIR	Rate of Return
Pennsylvania Public Utility Commission				
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				
Carolina Water Service, Inc.	06/15	Carolina Water Service, Inc.	Docket No. 2015-199-WS	Rate of Return
Carolina Water Service, Inc.	11/13	Carolina Water Service, Inc.	Docket No. 2013-275-WS	Rate of Return
United Utility Companies, Inc.	09/13	United Utility Companies, Inc.	Docket No. 2013-199-WS	Rate of Return
Utility Services of South Carolina, Inc.	09/13	Utility Services of South Carolina, Inc.	Docket No. 2013-201-WS	Rate of Return
Tega Cay Water Services, Inc.	11/12	Tega Cay Water Services, Inc.	Docket No. 2012-177-WS	Capital Structure
Virginia State Corporation Commission				
Aqua Virginia, Inc.	7/17	Aqua Virginia, Inc.	PUR-2017-00082	Rate of Return
Massanutten Public Service Corp.	08/14	Massanutten Public Service Corp.	PUE-2014-00035	Rate of Return / Rate Design

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

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

Carolina Water Service, Inc. of South Carolina
Recommended Capital Structure and Cost Rates for Ratemaking Purposes
Estimated at December 31, 2017

Type Of Capital	Ratios (1)	Cost Rate			Weighted Cost Rate	
Long-Term Debt	48.11%	6.60%		(1)	3.18%	
Common Equity	51.89%	10.45% -	10.95%	(2)	5.42% -	5.68%
Total	100.00%				8.60%	8.86%

Notes:

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

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

Carolina Water Service, Inc. of South Carolina
Brief Summary of Common Equity Cost Rate

Line No.	Principal Methods	Proxy Group of Eight Water Companies
1.	Discounted Cash Flow Model (DCF) (1)	8.64%
2.	Risk Premium Model (RPM) (2)	10.69%
3.	Capital Asset Pricing Model (CAPM) (3)	10.51%
4.	Market Models Applied to Comparable Risk, Non-Price Regulated Companies (4)	12.06%
5.	Indicated Common Equity Cost Rate before Adjustment for Business Risks	10.45%
6.	Size Risk Adjustment (5)	0.50%
7.	Indicated Common Equity Cost Rate	10.95%
8.	Range of Common Equity Cost Rates	10.45% - 10.95%

Notes: (1) From Schedule DWD-3.
(2) From page 1 of Schedule DWD-4.
(3) From page 1 of Schedule DWD-5.
(4) From page 1 of Schedule DWD-7.
(5) From Schedule DWD-8

Proxy Group of Eight Water Companies
CAPITALIZATION AND FINANCIAL STATISTICS (1)
2012 - 2016, Inclusive

	2016	2015	2014	2013	2012	5 YEAR AVERAGE
			(MILLIONS OF DOLLARS)			
CAPITALIZATION STATISTICS						
AMOUNT OF CAPITAL EMPLOYED						
TOTAL PERMANENT CAPITAL	$2,399.854	$2,269.476	$2,156.407	$2,058.747	$1,998.358	
SHORT-TERM DEBT	$137.724	$95.003	$72.459	$95.589	$60.594	
TOTAL CAPITAL EMPLOYED	$2,537.578	$2,364.479	$2,228.866	$2,154.336	$2,058.952	
INDICATED AVERAGE CAPITAL COST RATES (2)						
TOTAL DEBT	4.73 %	4.89 %	5.01 %	5.19 %	5.36 %	
PREFERRED STOCK	5.42 %	5.42 %	5.30 %	5.51 %	5.53 %	
CAPITAL STRUCTURE RATIOS						
BASED ON TOTAL PERMANENT CAPITAL:						
LONG-TERM DEBT	46.13 %	46.25 %	45.71 %	46.24 %	49.32 %	46.73 %
PREFERRED STOCK	0.12	0.12	0.13	0.16	0.18	0.14
COMMON EQUITY	53.75	53.63	54.16	53.60	50.50	53.13
TOTAL	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
BASED ON TOTAL CAPITAL:						
TOTAL DEBT, INCLUDING SHORT-TERM	48.59 %	47.63 %	47.00 %	47.77 %	50.87 %	48.37 %
PREFERRED STOCK	0.11	0.12	0.13	0.15	0.17	0.14
COMMON EQUITY	51.30	52.25	52.87	52.08	48.96	51.49
TOTAL	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
FINANCIAL STATISTICS						
FINANCIAL RATIOS - MARKET BASED						
EARNINGS / PRICE RATIO	4.01 %	4.72 %	5.44 %	4.84 %	5.47 %	4.90 %
MARKET / AVERAGE BOOK RATIO	274.64	224.46	212.84	206.33	187.65	221.18
DIVIDEND YIELD	2.17	2.66	2.76	2.88	3.17	2.73
DIVIDEND PAYOUT RATIO	55.72	56.71	52.46	58.35	60.42	56.73
RATE OF RETURN ON AVERAGE BOOK COMMON EQUITY	10.83 %	10.40 %	11.38 %	10.08 %	10.12 %	10.56 %
TOTAL DEBT / EBITDA (3)	3.63 X	3.64 X	3.40 X	3.65 X	3.83 X	3.63 X
FUNDS FROM OPERATIONS / TOTAL DEBT (4)	22.17 %	24.05 %	25.95 %	22.85 %	20.86 %	23.18 %
TOTAL DEBT / TOTAL CAPITAL	48.59 %	47.63 %	47.00 %	47.77 %	50.87 %	48.37 %

Notes:

(1) All capitalization and financial statistics for the group are the arithmetic average of the achieved results for each individual company in the group, and are based upon financial statements as originally reported in each year.

(2) Computed by relating actual total debt interest or preferred stock dividends booked to average of beginning and ending total debt or preferred stock reported to be outstanding.

(3) Total debt relative to EBITDA (Earnings before Interest, Income Taxes, Depreciation and Amortization).

(4) Funds from operations (sum of net income, depreciation, amortization, net deferred income tax and investment tax credits, less total AFUDC) plus interest charges as a percentage of total debt.

Source of Information: Company Annual Forms 10-K

Capital Structure Based upon Total Permanent Capital for the Proxy Group of Eight Water Companies 2012 - 2016, Inclusive

	2016	2015	2014	2013	2012	5 YEAR AVERAGE
American States Water Co.						
Long-Term Debt	39.40 %	41.15 %	39.15 %	40.30 %	42.49 %	40.50 %
Preferred Stock	0.00	0.00	0.00	0.00	0.00	0.00
Common Equity	60.60	58.85	60.85	59.70	57.51	59.50
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
American Water Works Company Inc						
Long-Term Debt	54.74 %	53.89 %	52.70 %	52.42 %	54.30 %	53.61 %
Preferred Stock	0.09	0.11	0.15	0.17	0.21	0.15
Common Equity	45.17	46.00	47.15	47.41	45.49	46.24
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
Aqua America Inc						
Long-Term Debt	50.81 %	50.76 %	49.45 %	50.32 %	53.41 %	50.95 %
Preferred Stock	0.00	0.00	0.00	0.01	0.01	0.00
Common Equity	49.19	49.24	50.55	49.67	46.58	49.05
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
California Water Service Group						
Long-Term Debt	45.83 %	44.69 %	40.46 %	42.03 %	50.39 %	44.68 %
Preferred Stock	0.00	0.00	0.00	0.00	0.00	0.00
Common Equity	54.17	55.31	59.54	57.97	49.61	55.32
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
Connecticut Water Service Inc						
Long-Term Debt	46.02 %	44.54 %	45.91 %	47.34 %	49.03 %	46.57 %
Preferred Stock	0.18	0.19	0.20	0.20	0.21	0.20
Common Equity	53.80	55.27	53.89	52.46	50.76	53.23
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
Middlesex Water Co.						
Long-Term Debt	38.91 %	40.44 %	41.55 %	41.36 %	43.53 %	41.16 %
Preferred Stock	0.67	0.69	0.71	0.88	1.02	0.79
Common Equity	60.42	58.87	57.74	57.76	55.45	58.05
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
SJW Corp						
Long-Term Debt	50.69 %	50.03 %	51.66 %	51.09 %	55.39 %	51.77 %
Preferred Stock	0.00	0.00	0.00	0.00	0.00	0.00
Common Equity	49.31	49.97	48.34	48.91	44.61	48.23
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
York Water Co.						
Long-Term Debt	42.60 %	44.46 %	44.81 %	45.07 %	45.98 %	44.58 %
Preferred Stock	0.00	0.00	0.00	0.00	0.00	0.00
Common Equity	57.40	55.54	55.19	54.93	54.02	55.42
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
Proxy Group of Eight Water Companies						
Long-Term Debt	46.13 %	46.25 %	45.71 %	46.24 %	49.32 %	46.73 %
Preferred Stock	0.12	0.12	0.13	0.16	0.18	0.14
Common Equity	53.75	53.63	54.16	53.60	50.50	53.13
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %

Source of Information
Annual Forms 10-K

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

Proxy Group of Eight Water Companies	[1] Average Dividend Yield (1)	[2] Value Line Projected Five Year Growth in EPS (2)	[3] Reuters Mean Consensus Projected Five Year Growth Rate in EPS	[4] Zack's Five Year Projected Growth Rate in EPS	[5] Yahoo! Finance Projected Five Year Growth in EPS	[6] Average Projected Five Year Growth in EPS (3)	[7] Adjusted Dividend Yield (4)	[8] Indicated Common Equity Cost Rate (5)
American States Water Co.	2.03 %	6.50 %	4.90 %	5.00 %	4.90 %	5.33 %	2.08 %	7.41 %
American Water Works Company Inc	2.03	8.50	8.52	7.40	7.03	7.86	2.11	9.97
Aqua America Inc	2.43	7.00	6.87	6.30	5.60	6.44	2.51	8.95
California Water Service Group	1.88	9.00	9.80	5.50	9.80	8.53	1.96	10.49
Connecticut Water Service Inc	2.08	4.50	5.45	6.00	5.45	5.35	2.14	7.49
Middlesex Water Co.	2.16	8.50	NA	NA	2.70	5.60	2.22	7.82
SJW Corp	1.56	4.50	NA	NA	14.00	9.25	1.63	10.88
York Water Co.	1.88	7.00	NA	NA	4.90	5.95	1.94	7.89
							Average	8.86 %
							Median	8.42 %
							Average of Mean and Median	8.64 %

NA= Not Available

Notes:

(1) Indicated dividend at 10/13/2017 divided by the average closing price of the last 60 trading days ending 10/13/2017 for each company.

(2) From pages 2 through 9 of this Schedule.

(3) Average of columns 2 through 5 excluding negative growth rates.

(4) This reflects a growth rate component equal to one-half the conclusion of growth rate (from column 6) x column 1 to reflect the periodic payment of dividends (Gordon Model) as opposed to the continuous payment. Thus, for American States Water Co., 2.03% x (1+(1/2 x 5.33%)) = 2.08%.

(5) Column 6 + column 7.

Source of Information:

Value Line Investment Survey
www.reuters.com Downloaded on 10/13/201'
www.zacks.com Downloaded on 10/13/2017
www.yahoo.com Downloaded on 10/13/2017

AMER. STATES WATER NYSE-AWR

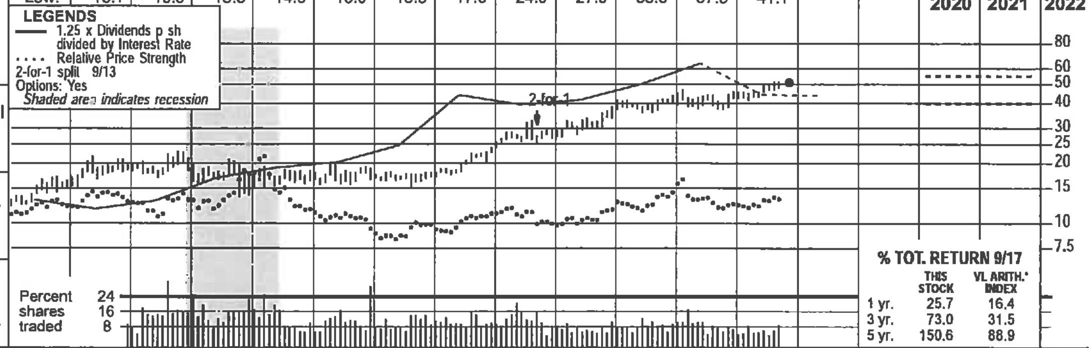
RECENT PRICE 51.11 | P/E RATIO 26.9 (Trailing: 27.6 / Median: 20.0) | RELATIVE P/E RATIO 1.35 | DIV'D YLD 2.0% | VALUE LINE

TIMELINESS 3 Lowered 8/11/17
SAFETY 2 Raised 7/20/12
TECHNICAL 2 Raised 9/29/17
BETA .80 (1.00 = Market)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
High:	21.9	23.1	21.0	19.4	19.8	18.2	24.1	33.1	38.7	44.1	47.2	51.8
Low:	15.1	16.8	13.5	14.9	15.6	15.3	17.0	24.0	27.0	35.8	37.3	41.1

Target Price Range

2020	2021	2022



2020-22 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	55	(+10%)	4%
Low	40	(-20%)	-3%

Insider Decisions

	D	J	F	M	A	M	J	J	A
to Buy	0	0	0	0	0	0	0	0	0
Options	2	3	11	11	0	8	2	0	3
to Sell	1	3	2	3	1	4	3	2	4

Institutional Decisions

	4Q2016	1Q2017	2Q2017
to Buy	102	87	96
to Sell	87	89	84
Hld's(000)	24607	29082	28355

% TOT. RETURN 9/17

	THIS STOCK	VL ARITH.* INDEX
1 yr.	25.7	16.4
3 yr.	73.0	31.5
5 yr.	150.6	88.9

2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	© VALUE LINE PUB. LLC	20-22
6.53	6.89	6.99	6.81	7.03	7.88	8.75	9.21	9.74	10.71	11.12	12.12	12.19	12.17	12.56	11.92	**12.40**	**12.65**	Revenues per sh	**15.95**
1.26	1.27	1.04	1.11	1.32	1.45	1.65	1.69	1.70	2.11	2.13	2.48	2.65	2.67	2.81	2.70	**2.85**	**3.05**	"Cash Flow" per sh	**3.85**
.67	.67	.39	.53	.66	.67	.81	.78	.81	1.11	1.12	1.41	1.61	1.57	1.60	1.62	**1.85**	**1.85**	Earnings per sh A	**2.35**
.43	.44	.44	.44	.45	.46	.48	.50	.51	.52	.55	.64	.76	.83	.87	.91	**.98**	**1.05**	Div'd Decl'd per sh B■	**1.35**
1.59	1.34	1.88	2.51	2.12	1.95	1.45	2.23	2.09	2.12	2.13	1.77	2.52	1.89	2.39	3.55	**3.15**	**3.15**	Cap'l Spending per sh	**3.60**
6.61	7.02	6.98	7.51	7.86	8.32	8.77	8.97	9.70	10.13	10.84	11.80	12.72	13.24	12.77	13.52	**14.20**	**14.85**	Book Value per sh	**16.80**
30.24	30.36	30.42	33.50	33.60	34.10	34.46	34.60	37.06	37.26	37.70	38.53	38.72	38.29	36.50	36.57	**36.70**	**36.80**	Common Shs Outst'g C	**37.00**
16.7	18.3	31.9	23.2	21.9	27.7	24.0	22.6	21.2	15.7	15.4	14.3	17.2	20.1	24.6	25.6	*Bold figures are*		Avg Ann'l P/E Ratio	**21.0**
.86	1.00	1.82	1.23	1.17	1.50	1.27	1.36	1.41	1.00	.97	.91	.97	1.06	1.24	1.35	*Value Line*		Relative P/E Ratio	**1.30**
3.9%	3.6%	3.5%	3.6%	3.1%	2.5%	2.5%	2.9%	2.9%	3.0%	3.2%	3.1%	2.7%	2.6%	2.2%	2.2%	*estimates*		Avg Ann'l Div'd Yield	**2.8%**

CAPITAL STRUCTURE as of 6/30/17
Total Debt $365.3 mill. **Due in 5 Yrs** $41.7 mill.
LT Debt $321.0 mill. **LT Interest** $20.0 mill.
(38% of Cap'l)

Leases, Uncapitalized: Annual rentals $2.5 mill.
Pension Assets-12/16 $150.9 mill.
Oblig. $180.4 mill.
Pfd Stock None.

Common Stock 36,644,758 shs.
as of 7/31/17

MARKET CAP: $1.9 billion (Mid Cap)

2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	© VALUE LINE PUB. LLC	20-22
301.4	318.7	361.0	398.9	419.3	466.9	472.1	465.8	458.6	436.1	**465**	**470**	Revenues ($mill)	**590**
28.0	26.8	29.5	41.4	42.0	54.1	62.7	61.1	60.5	59.7	**62.0**	**66.0**	Net Profit ($mill)	**87.0**
42.6%	37.8%	38.9%	43.2%	41.7%	39.9%	36.3%	38.4%	38.4%	36.8%	**36.5%**	**35.0%**	Income Tax Rate	**35.0%**
8.5%	6.9%	3.2%	5.8%	2.0%	2.5%	--	--	2.5%	.5%	**1.5%**	**2.0%**	AFUDC % to Net Profit	**2.5%**
46.9%	46.2%	45.9%	44.3%	45.4%	42.2%	39.8%	39.1%	41.1%	39.4%	**40.0%**	**42.0%**	Long-Term Debt Ratio	**43.5%**
53.1%	53.8%	54.1%	55.7%	54.6%	57.8%	60.2%	60.9%	58.9%	60.6%	**60.0%**	**58.0%**	Common Equity Ratio	**56.5%**
569.4	577.0	665.0	677.4	749.1	787.0	818.4	832.6	791.5	815.3	**870**	**935**	Total Capital ($mill)	**1100**
776.4	825.3	866.4	855.0	896.5	917.8	981.5	1003.5	1060.8	1150.9	**1200**	**1250**	Net Plant ($mill)	**1400**
6.7%	6.4%	5.9%	7.6%	7.1%	8.3%	8.9%	8.6%	9.0%	8.6%	**8.5%**	**8.5%**	Return on Total Cap'l	**9.0%**
9.3%	8.6%	8.2%	11.0%	10.3%	11.9%	12.7%	12.0%	13.0%	12.1%	**12.0%**	**12.0%**	Return on Shr. Equity	**14.0%**
9.3%	8.6%	8.2%	11.0%	10.3%	11.9%	12.7%	12.0%	13.0%	12.1%	**12.0%**	**12.0%**	Return on Com Equity	**14.0%**
3.9%	3.1%	3.2%	5.8%	5.3%	6.6%	6.8%	5.7%	6.0%	5.3%	**5.0%**	**5.5%**	Retained to Com Eq	**6.0%**
58%	64%	61%	47%	49%	45%	47%	53%	54%	56%	**58%**	**58%**	All Div'ds to Net Prof	**57%**

CURRENT POSITION ($MILL.)	2015	2016	6/30/17
Cash Assets	4.4	.4	2.1
Accts Receivable	18.9	20.0	25.3
Other	109.4	146.5	122.1
Current Assets	132.7	166.9	149.5
Accts Payable	50.6	43.7	45.2
Debt Due	28.3	90.3	44.3
Other	44.6	43.9	51.0
Current Liab.	123.5	177.9	140.5

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '14-'16 to '20-'22
Revenues	5.5%	3.0%	4.5%
"Cash Flow"	7.5%	6.5%	6.0%
Earnings	10.0%	9.5%	6.5%
Dividends	7.0%	10.5%	7.5%
Book Value	5.5%	5.0%	4.0%

Cal-endar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2014	102.0	115.6	138.3	109.9	465.8
2015	100.9	114.6	133.0	110.1	458.6
2016	93.5	112.0	123.8	106.8	436.1
2017	98.8	113.2	**140**	**113**	**465**
2018	**102**	**118**	**135**	**115**	**470**

Cal-endar	EARNINGS PER SHARE A Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2014	.28	.39	.54	.36	1.57
2015	.32	.41	.56	.31	1.60
2016	.28	.45	.59	.30	1.62
2017	.34	.62	**.59**	**.30**	**1.85**
2018	**.39**	**.48**	**.60**	**.38**	**1.85**

Cal-endar	QUARTERLY DIVIDENDS PAID B■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2013	.1775	.1775	.2025	.2025	.76
2014	.2025	.2025	.213	.213	.83
2015	.213	.213	.224	.224	.87
2016	.224	.224	.224	.242	.91
2017	.242	.242	.255		

BUSINESS: American States Water Co. operates as a holding company. Through its principal subsidiary, Golden State Water Company, it supplies water to 261,002 customers in 75 cities and 10 counties. Service areas include the greater metropolitan areas of Los Angeles and Orange Counties. The company also provides electric utility services to 23,940 customers in the city of Big Bear Lake and in areas of San Bernardino County. Sold Chaparral City Water of Arizona (6/11). Has 736 employees. BlackRock, Inc. owns 11.7% of out. shares; Vanguard, 9.5%;; off. & dir. 1.5%. (4/17 Proxy). Chairman: Lloyd Ross. President & Chief Executive Officer: Robert J. Sprowls. Inc: CA. Address: 630 East Foothill Blvd., San Dimas, CA 91773. Tel: 909-394-3600. Internet: www.aswater.com.

American States Water was forced to divest an operation for a profit. The water utility's California-based Golden States Water subsidiary sold its Ojai Water System this summer to the municipal district of Casitas for $34.3 million. Ultimately, the company didn't have a choice, as Casitas was using eminent domain to acquire the assets. In any case, the sale resulted in a second-quarter pretax gain of $8.3 million, or about $0.13 a share.

The nonutility sector is performing well. Responsible for about 20% of the company's normalized profits, the ASUS subsidiary provides water services to U.S. military installations. The government is in the midst of privatizing the water systems on many domestic bases. Earlier this year, ASUS snagged a 50-year contract with the Elgin Air Force Base that is expected to generate $510 million in revenues. On October 2nd, the company announced that it was awarded another 50-year contract worth $601 million to service Ft. Riley in Kansas. We expect the company to continue to win a fair share of this business. Since these operations are unregulated, ASUS's return on equity is not limited, however, the business also carries more risk.

Overall, earnings and dividend growth prospects are good. Due mostly to the aforementioned sale of assets, we have raised our 2017 share-earning's estimate for the company $0.15, to $1.85. This represents a hefty 14% year-over-year gain. In 2018, we think that the company will manage to post the same strong share earnings as the nonregulated sector contribution to the bottom line rises.

We think both short- and long-term investors can find better alternatives elsewhere. Shares of AWR have been on a nice run of late. Historically, water utility stocks have been defensive income plays because of their low volatility, high dividend yields, and good dividend growth prospects. At its recent price, AWR's 2.0% yield is only on par with the *Value Line* median. In our opinion, most of the good news associated with the stock appears to be reflected in the recent price. Hence, this neutrally ranked equity has subpar total return prospects through 2020-2022.

James A. Flood — *October 13, 2017*

(A) Primary earnings. Excludes nonrecurring gains/(losses): '04, 7¢; '05, 13¢; '06, 3¢; '08, (14¢); '10, (23¢); '11, 10¢. Next earnings report due mid-November.
(B) Dividends historically paid in early March, June, September, and December. ■ Div'd reinvestment plan available.
(C) In millions, adjusted for split.

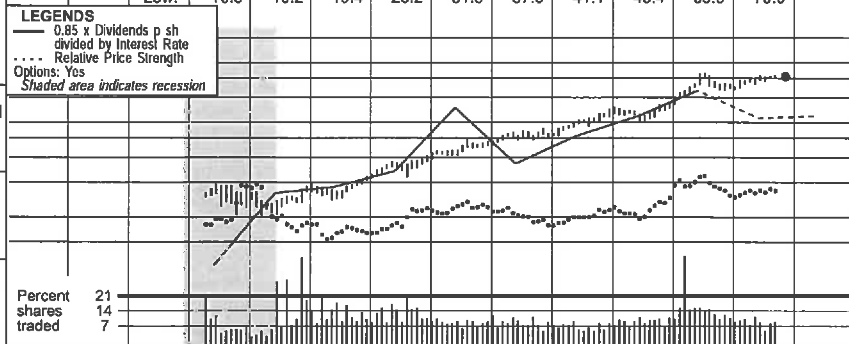
Company's Financial Strength	A
Stock's Price Stability	75
Price Growth Persistence	70
Earnings Predictability	85

AMERICAN WATER NYSE-AWK

RECENT PRICE 81.75 | P/E RATIO 27.7 (Trailing: 30.8, Median: NMF) | RELATIVE P/E RATIO 1.39 | DIV'D YLD 2.1% | VALUE LINE

TIMELINESS 3 Lowered 8/18/17
SAFETY 3 New 7/25/08
TECHNICAL 2 Raised 10/13/17
BETA .65 (1.00 = Market)

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
High:	23.7	23.0	25.8	32.8	39.4	45.1	56.2	61.2	85.2	83.1
Low:	16.5	16.2	19.4	25.2	31.3	37.0	41.1	48.4	58.9	70.0



Target Price Range: 2020 | 2021 | 2022 — 128, 96, 80, 64, 48, 40, 32, 24, 16, 12

2020-22 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	90	(+10%)	5%
Low	60	(-25%)	-4%

Insider Decisions

	D	J	F	M	A	M	J	J	A
to Buy	0	0	0	0	0	0	0	0	0
Options	0	0	9	3	0	7	0	0	1
to Sell	0	0	1	2	0	2	0	0	1

Institutional Decisions

	4Q2016	1Q2017	2Q2017
to Buy	316	269	281
to Sell	278	302	291
Hld's(000)	145668	160388	158865

% TOT. RETURN 9/17

	THIS STOCK	VL ARITH.* INDEX
1 yr.	10.4	16.4
3 yr.	79.2	31.5
5 yr.	146.0	88.9

2001	2002	2003	2004	2005	2006	2007E	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	© VALUE LINE PUB. LLC	20-22
--	--	--	--	--	13.08	13.84	14.61	13.98	15.49	15.18	16.25	16.28	16.78	17.72	18.54	*19.25*	*20.10*	Revenues per sh	*23.05*
--	--	--	--	--	.65	d.47	2.87	2.89	3.56	3.73	4.27	4.36	4.75	5.13	5.26	*5.60*	*6.15*	"Cash Flow" per sh	*7.45*
--	--	--	--	--	d.97	d2.14	1.10	1.25	1.53	1.72	2.11	2.06	2.39	2.64	2.62	*2.85*	*3.25*	Earnings per sh A	*4.15*
--	--	--	--	--	--	--	.40	.82	.86	.90	1.21	.84	1.21	1.33	1.47	*1.62*	*1.76*	Div'd Decl'd per sh B■	*2.35*
--	--	--	--	--	4.31	4.74	6.31	4.50	4.38	5.27	5.25	5.50	5.33	6.51	7.36	*6.75*	*6.70*	Cap'l Spending per sh	*6.40*
--	--	--	--	--	23.86	28.39	25.64	22.91	23.59	24.11	25.11	26.52	27.39	28.25	29.24	*30.90*	*32.40*	Book Value per sh D	*39.45*
--	--	--	--	--	160.00	160.00	160.00	174.63	175.00	175.66	176.99	178.25	179.46	178.28	178.10	*178.50*	*179.00*	Common Shs Outst'g C	*187.50*
--	--	--	--	--	--	--	18.9	15.6	14.6	16.8	16.7	19.9	20.0	20.5	27.7	Bold figures are	Value Line	Avg Ann'l P/E Ratio	*18.0*
--	--	--	--	--	--	--	1.14	1.04	.93	1.05	1.06	1.12	1.05	1.03	1.46	estimates		Relative P/E Ratio	*1.15*
--	--	--	--	--	--	--	1.9%	4.2%	3.8%	3.1%	3.4%	2.0%	2.5%	2.5%	2.0%			Avg Ann'l Div'd Yield	*3.1%*
						2214.2	2336.9	2440.7	2710.7	2666.2	2876.9	2901.9	3011.3	3159.0	3302.0	*3440*	*3600*	Revenues ($mill)	*4325*
						d342.3	187.2	209.9	267.8	304.9	374.3	369.3	429.8	476.0	468.0	*510*	*580*	Net Profit ($mill)	*780*
						--	37.4%	37.9%	40.4%	39.5%	40.7%	39.1%	39.4%	39.1%	39.2%	*41.0%*	*38.0%*	Income Tax Rate	*36.5%*
						--	--	--	--	--	6.2%	5.1%	--	5.1%	1.4%	*2.0%*	*2.5%*	AFUDC % to Net Profit	*3.5%*
						50.9%	53.1%	56.9%	56.8%	55.7%	53.9%	52.4%	52.4%	53.7%	52.4%	*53.5%*	*55.0%*	Long-Term Debt Ratio	*54.0%*
						49.1%	46.9%	43.1%	43.2%	44.2%	46.1%	47.6%	47.4%	46.2%	47.5%	*46.5%*	*45.0%*	Common Equity Ratio	*46.0%*
						9245.7	8750.2	9289.0	9561.3	9580.3	9635.5	9940.7	10364	10911	10967	*11600*	*12850*	Total Capital ($mill)	*16000*
						9318.0	9991.8	10524	11059	11021	11739	12391	12900	13933	14992	*15675*	*16400*	Net Plant ($mill)	*18000*
						NMF	3.7%	3.8%	4.4%	4.8%	5.4%	5.1%	5.5%	5.7%	5.6%	*6.0%*	*6.0%*	Return on Total Cap'l	*6.5%*
						NMF	4.6%	5.2%	6.5%	7.2%	8.4%	7.8%	8.7%	9.4%	9.0%	*9.5%*	*10.0%*	Return on Shr. Equity	*10.5%*
						NMF	4.6%	5.2%	6.5%	7.2%	8.4%	7.8%	8.7%	9.4%	9.0%	*9.5%*	*10.0%*	Return on Com Equity	*10.5%*
						NMF	3.0%	1.8%	2.8%	3.5%	3.6%	4.7%	4.3%	4.7%	4.0%	*4.5%*	*4.5%*	Retained to Com Eq	*4.5%*
						--	34%	65%	56%	52%	57%	40%	50%	50%	56%	*57%*	*55%*	All Div'ds to Net Prof	*57%*

CAPITAL STRUCTURE as of 6/30/17
Total Debt $7453.0 mil. **Due in 5 Yrs** $1698.0 mil.
LT Debt $5650.0 mil. **LT Interest** $300.0 mil.
(51% of Cap'l)

Leases, Uncapitalized: Annual rentals $14.0 mill.
Pension Assets 12/16 $1443.0 mill **Oblig.** $1864.0 mill.
Pfd Stock $9.0 mill. **Pfd Div'd** $.5 mill

Common Stock 178,282,329 shs. as of 7/27/17

MARKET CAP: $14.6 billion (Large Cap)

CURRENT POSITION ($MILL.)	2015	2016	6/30/17
Cash Assets	45.0	75.0	64.0
Accts Receivable	255.0	269.0	288.0
Other	357.0	440.0	456.0
Current Assets	657.0	784.0	808.0
Accts Payable	126.0	154.0	134.0
Debt Due	682.0	1423.0	1803.0
Other	725.0	815.0	724.0
Current Liab.	1533.0	2392.0	2661.0

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '14-'16 to '20-'22
Revenues	3.0%	3.5%	*4.5%*
"Cash Flow"	23.0%	8.5%	*6.5%*
Earnings	--	11.0%	*8.5%*
Dividends	--	9.0%	*10.0%*
Book Value	1.5%	4.0%	*5.5%*

Cal-endar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2014	679.0	754.8	846.1	731.4	3011.3
2015	698.0	782.0	896.0	783.0	3159.0
2016	743.0	827.0	930.0	802.0	3302.0
2017	756.0	844.0	*985*	*855*	*3440*
2018	*770*	*895*	*1040*	*895*	*3600*

Cal-endar	EARNINGS PER SHARE A Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2014	.39	.62	.86	.52	2.39
2015	.44	.68	.96	.56	2.64
2016	.46	.77	.83	.57	2.62
2017	.52	.73	*1.02*	*.58*	*2.85*
2018	*.62*	*.83*	*1.09*	*.71*	*3.25*

Cal-endar	QUARTERLY DIVIDENDS PAID B■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2014	.28	.31	.31	.31	1.21
2015	.31	.34	.34	.34	1.33
2016	.34	.375	.375	.375	1.47
2017	.375	.415	.415		

BUSINESS: American Water Works Company, Inc. is the largest investor-owned water and wastewater utility in the U.S., providing services to over 15 million people in over 47 states and Canada. (Regulated presence in 16 states.) Nonregulated business assists municipalities and military bases with the maintenance and upkeep as well. Regulated operations made up 86.5% of 2016 revenues. New Jersey is its largest market accounting for 25.4% of regulated revenues. Has 6,800 employees. The Vanguard Group, owns 9.6% of outstanding shares; BlackRock, Inc., 8.2%; officers & directors, less than 1.0%. (3/17 Proxy). President & CEO: Susan N. Story. Chair.: George MacKenzie. Address: 1025 Laurel Oak Road, Voorhees, NJ 08043. Tel.: 856-346-8200. Internet: www.amwater.com.

A court has granted preliminary approval to a settlement in a legal suit against American Water Works. In January of 2014, the wholly owned West Virginia-based subsidiary of the water utility was sued over the Freedom Industries chemical spill into the Elk River. According to the proposed deal, American Water would have to pay approximately $126 million to resolve all claims against it. Net of insurance proceeds, management believes that the final aftertax hit to earnings will be about $26 million, or $0.14 a share.

The bottom line has also been hurt by a couple of other factors. A recent ruling in the state of New York, which indicated that water utilities do not qualify for the manufacturer tax break, resulted in a one-time noncash charge of around $7 million in the second quarter. Also, during the same period, operating income from the company's nonutility business declined 30% due largely to reduced capital spending at U.S. military bases.

Still, on the whole, the utility's earning prospects are relatively bright. Even with the penalty from the West Virginia settlement (we have taken it out of this year's fourth quarter), we estimate that American Water's share earnings will rise 9% over 2016's mediocre figure. What's more, with the company earning a return on more assets and demand for the military expected to pick up (there are several military bases seeking bids to privatize their water systems), share earnings can probably climb a hefty 14% in 2018. The company's continued strategy of making many small acquisitions and using economies of scale to make the operations more efficient will also play a major part.

The long-term outlook for dividend growth is excellent. We think that the annual payout can rise 10% over the next 3- to 5-year period. This is the highest of any member of this group.

These shares do not hold any great appeal at this time, however. Despite being the largest and possibly best-run publicly owned water utility in the country, the premium demanded by the market for this group of stocks seems excessive, in our opinion. Hence, investors can probably do better elsewhere.

James A. Flood *October 13, 2017*

(A) Diluted earnings. Excludes nonrecurring losses: '08, $4.62; '09, $2.63; '11, $0.07. Discontinued operations: '06, ($0.04); '11, $0.03; '12, ($0.10); '13,($0.01). GAAP used as of 2014. Next earnings report due mid-November. Quarterly earnings do not sum in '16 due to rounding. (B) Dividends paid in March, June, September, and December. ■ Div. reinvestment available. (C) In millions. (D) Includes intangibles. On 6/30/17: $1.373 billion, $7.70/share. (E) Pro forma numbers for '06 & '07.

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

AQUA AMERICA NYSE-WTR

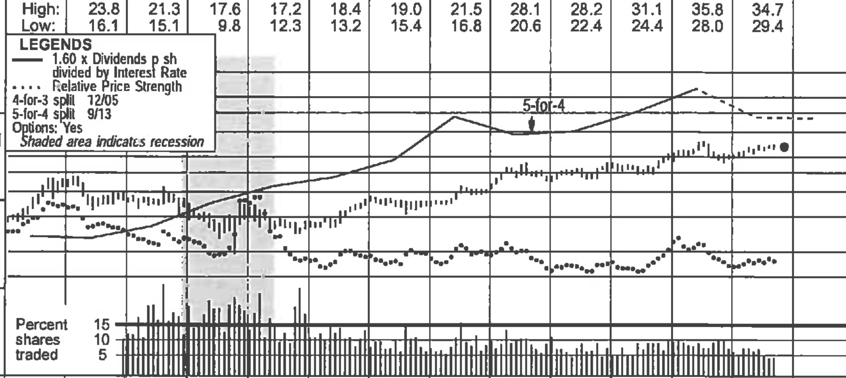
RECENT PRICE **33.77** | P/E RATIO **24.3** (Trailing: 25.8; Median: 22.0) | RELATIVE P/E RATIO **1.21** | DIV'D YLD **2.5%** | VALUE LINE

TIMELINESS 3 Lowered 8/26/16
SAFETY 2 Raised 4/20/12
TECHNICAL 1 Raised 10/13/17
BETA .70 (1.00 = Market)

	High:	Low:
2005	23.8	16.1
2006	21.3	15.1
2007	17.6	9.8
2008	17.2	12.3
2009	18.4	13.2
2010	19.0	15.4
2011	21.5	16.8
2012	28.1	20.6
2013	28.2	22.4
2014	31.1	24.4
2015	35.8	28.0
2016	34.7	29.4

Target Price Range 2020 | 2021 | 2022

LEGENDS
— 1.60 x Dividends p sh divided by Interest Rate
.... Relative Price Strength
4-for-3 split 12/05
5-for-4 split 9/13
Options: Yes
Shaded area indicates recession



2020-22 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	45	(+35%)	*10%*
Low	35	(+5%)	*4%*

Insider Decisions

	D	J	F	M	A	M	J	J	A
to Buy	0	0	0	0	0	0	0	0	0
Options	0	7	6	7	7	0	1	7	0
to Sell	0	0	0	0	0	0	2	0	0

Institutional Decisions

	4Q2016	1Q2017	2Q2017
to Buy	182	179	172
to Sell	171	180	155
Hld's(000)	88568	103594	104564

Percent shares traded 15 10 5

% TOT. RETURN 9/17

	THIS STOCK	VL ARITH.* INDEX
1 yr.	11.6	16.4
3 yr.	51.9	31.5
5 yr.	89.6	88.9

2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	© VALUE LINE PUB. LLC	20-22
2.16	2.28	2.38	2.78	3.08	3.23	3.61	3.71	3.93	4.21	4.10	4.32	4.32	4.37	4.61	4.62	*4.65*	*4.95*	Revenues per sh	*6.05*
.69	.76	.77	.87	.97	1.01	1.10	1.14	1.29	1.42	1.45	1.51	1.82	1.89	1.87	2.07	*2.15*	*2.25*	"Cash Flow" per sh	*2.75*
.41	.43	.46	.51	.57	.56	.57	.58	.62	.72	.83	.87	1.16	1.20	1.14	1.32	*1.36*	*1.45*	Earnings per sh A	*1.85*
.24	.26	.28	.29	.32	.35	.38	.41	.44	.47	.50	.54	.58	.63	.69	.74	*.80*	*.85*	Div'd Decl'd per sh B■	*1.15*
.87	.96	1.06	1.23	1.47	1.64	1.43	1.58	1.66	1.89	1.90	1.98	1.73	1.84	2.07	2.16	*2.55*	*2.45*	Cap'l Spending per sh	*2.25*
3.32	3.49	4.27	4.71	5.04	5.57	5.85	6.26	6.50	6.81	7.21	7.90	8.63	9.27	9.78	10.43	*11.10*	*11.75*	Book Value per sh	*14.85*
142.47	141.49	154.31	158.97	161.21	165.41	166.75	169.21	170.61	172.46	173.60	175.43	177.93	178.59	176.54	177.39	*178.00*	*178.50*	Common Shs Outst'g C	*180.00*
23.6	23.6	24.5	25.1	31.8	34.7	32.0	24.9	23.1	21.1	21.3	21.9	21.2	20.8	23.5	23.9	*Bold figures are*		Avg Ann'l P/E Ratio	*21.0*
1.21	1.29	1.40	1.33	1.69	1.87	1.70	1.50	1.54	1.34	1.34	1.39	1.19	1.09	1.18	1.26	*Value Line*		Relative P/E Ratio	*1.30*
2.5%	2.5%	2.5%	2.3%	1.8%	1.8%	2.1%	2.8%	3.1%	3.1%	2.8%	2.8%	2.4%	2.5%	2.6%	2.3%	*estimates*		Avg Ann'l Div'd Yield	*2.9%*

CAPITAL STRUCTURE as of 6/30/17
Total Debt $2093.6 mill. **Due in 5 Yrs** $430.5 mill.
LT Debt $1882.6 mill. **LT Interest** $76.3 mill.
(51% of Cap'l)

Pension Assets-12/16 $242.4 mill.
Oblig. $308.2 mill.

Pfd Stock None

Common Stock 177,651,543 shares
as of 7/24/17

MARKET CAP: $6.0 billion (Large Cap)

2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018		20-22
602.5	627.0	670.5	726.1	712.0	757.8	768.6	779.9	814.2	819.9	*830*	*880*	Revenues ($mill)	*1085*
95.0	97.9	104.4	124.0	144.8	153.1	205.0	213.9	201.8	234.2	*245*	*260*	Net Profit ($mill)	*335*
38.9%	39.7%	39.4%	39.2%	32.9%	39.0%	10.0%	10.5%	6.9%	8.2%	*9.0%*	*9.0%*	Income Tax Rate	*10.0%*
--	--	--	--	--	--	1.1%	2.4%	3.1%	3.8%	*3.5%*	*3.0%*	AFUDC % to Net Profit	*3.5%*
55.4%	54.1%	55.6%	56.6%	52.7%	52.7%	48.9%	48.5%	50.3%	48.4%	*47.0%*	*49.0%*	Long-Term Debt Ratio	*51.0%*
44.6%	45.9%	44.4%	43.4%	47.3%	47.3%	51.1%	51.5%	49.7%	51.6%	*53.0%*	*51.0%*	Common Equity Ratio	*49.0%*
2191.4	2306.6	2495.5	2706.2	2646.8	2929.7	3003.6	3216.0	3469.5	3587.7	*3735*	*4100*	Total Capital ($mill)	*5500*
2792.8	2997.4	3227.3	3469.3	3612.9	3936.2	4167.3	4402.0	4688.9	5001.6	*5080*	*5275*	Net Plant ($mill)	*5800*
5.9%	5.7%	5.6%	5.9%	6.9%	6.6%	8.0%	7.8%	6.9%	7.6%	*7.5%*	*7.5%*	Return on Total Cap'l	*7.5%*
9.7%	9.3%	9.4%	10.6%	11.6%	11.0%	13.4%	12.9%	11.7%	12.7%	*12.5%*	*12.5%*	Return on Shr. Equity	*12.5%*
9.7%	9.3%	9.4%	10.6%	11.6%	11.0%	13.4%	12.9%	11.7%	12.7%	*12.5%*	*12.5%*	Return on Com Equity	*12.5%*
3.2%	2.8%	2.7%	3.7%	4.6%	4.3%	6.7%	6.1%	4.7%	5.6%	*5.5%*	*5.0%*	Retained to Com Eq	*4.5%*
67%	70%	72%	65%	60%	61%	50%	52%	60%	56%	*58%*	*59%*	All Div'ds to Net Prof	*62%*

CURRENT POSITION ($MILL.)	2015	2016	6/30/17
Cash Assets	3.2	3.7	7.8
Receivables	99.1	97.4	98.9
Inventory (AvgCst)	12.4	13.0	16.8
Other	13.7	14.6	14.6
Current Assets	128.4	128.7	138.1
Accts Payable	56.5	59.9	46.4
Debt Due	52.3	157.2	221.0
Other	84.4	84.4	65.1
Current Liab.	193.2	301.5	332.5

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '14-'16 to '20-'22
Revenues	4.0%	2.0%	*5.0%*
"Cash Flow"	7.5%	7.0%	*6.0%*
Earnings	8.5%	11.0%	*7.0%*
Dividends	8.0%	8.0%	*9.0%*
Book Value	7.0%	7.5%	*6.5%*

Cal-endar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2014	182.7	195.3	210.5	191.4	779.9
2015	190.3	205.8	221.0	197.1	814.2
2016	192.6	203.9	226.6	196.8	819.9
2017	187.8	203.4	*233.8*	*205*	*830*
2018	*200*	*220*	*245*	*215*	*880*

Cal-endar	EARNINGS PER SHARE A Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2014	.24	.31	.38	.27	1.20
2015	.27	.32	.38	.17	1.14
2016	.29	.34	.41	.28	1.32
2017	.28	.34	*.43*	*.31*	*1.36*
2018	*.31*	*.36*	*.47*	*.31*	*1.45*

Cal-endar	QUARTERLY DIVIDENDS PAID B■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2013	.14	.14	.152	.152	.58
2014	.152	.152	.165	.165	.63
2015	.165	.165	.178	.178	.69
2016	.178	.178	.1913	.1913	.74
2017	.1913	.1913	.205		

BUSINESS: Aqua America, Inc. is the holding company for water and wastewater utilities that serve approximately three million residents in Pennsylvania, Ohio, North Carolina, Illinois, Texas, New Jersey, Florida, Indiana, and five other states. Has 1,551 employees. Acquired AquaSource, 7/13; North Maine Utilities, 7/15; and others. Water supply revenues '2016: residential, 59%; commercial, 16%; industrial, wastewater & other, 25%. Off. & dir. own less than 1% of the common stock; Vangurad Group, 8.9%; Blackrock, Inc, 8.1%; State Street Capital, 6.0% (3/17 Proxy). President & Chief Executive Officer: Christopher Franklin. Incorporated: Pennsylvania. Address: 762 West Lancaster Avenue, Bryn Mawr, Pennsylvania 19010. Tel.: 610-525-1400. Internet: www.aquaamerica.com.

A large percentage of Aqua America's future growth will likely come via acquisitions. Similar to other large publicly traded water utilities, Aqua has been a continual buyer of small local water districts. Indeed, most of the 100,000-plus water systems in the U.S. do not have the financial wherewithal to replace their aging infrastructures. By constantly purchasing these types of entities, Aqua can gradually increase its customer base. Moreover, since actual synergies do result from mergers in this industry, the new assets can be operated more efficiently.

There's always something happening on the regulatory front. The company has received rate relief in Indiana, New Jersey, North Carolina, Ohio and Pennsylvania. Other rate cases are pending in Virginia and Illinois. Aqua has good relationships with its regulators, so we are not expecting any major negative surprises.

Dividends should increase at a healthy rate for the foreseeable future. Last quarter, the payout was hiked by 7%. This is less than the company's five- and 10-year historical average of 8%. Nevertheless, we think Aqua's strong cash generation should enable its payouts to rise 8%-10% annually through 2020-2022.

Capital outlays are large but manageable. Aqua increased this year's capital expenditure budget to approximately $450 million. The majority of funds will be allocated to repair, maintain, and replace aged pipelines and equipment. We don't expect this figure to change much in 2018. In 2019, though, we think outlays should decline to the $300 million-$325 million range. Of the nine members included in the water group, Aqua is only one of two that rates a Financial Strength rating of at least an A. While the balance sheet may be more leveraged over the next couple of years, it should remain relatively healthy.

The stock has a high yield for a water utility. WTR is yielding 2.5%, or about 50 basis points more than its peers. This is unusual considering the equity's strong projected dividend growth. As a result, even though we still think shares of water utilities are currently trading at too high a premium, WTR is probably the best selection for those investors who must own a stock in this industry.

James A. Flood *October 13, 2017*

(A) Diluted egs. Excl. nonrec. gains: '01, 2¢; '02, 4¢; '03, 3¢; '12, 18¢. Excl. gain from disc. operations: '12, 7¢; '13, 9¢; '14, 11¢. May not sum due to rounding. Next earnings report due mid-November.
(B) Dividends historically paid in early March, June, Sept. & Dec. ■ Div'd. reinvestment plan available (5% discount).
(C) In millions, adjusted for stock splits.

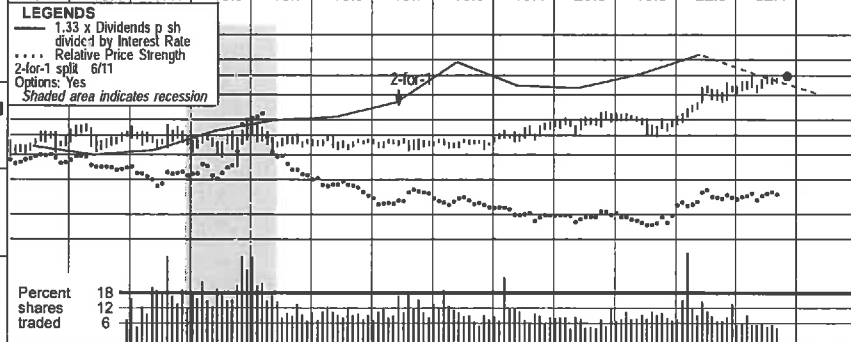
Company's Financial Strength	A
Stock's Price Stability	95
Price Growth Persistence	65
Earnings Predictability	90

CALIFORNIA WATER NYSE-CWT

RECENT PRICE 39.65 | P/E RATIO 28.3 (Trailing: 33.0, Median: 20.0) | RELATIVE P/E RATIO 1.41 | DIV'D YLD 1.8% | VALUE LINE

TIMELINESS 2 Raised 9/1/17
SAFETY 3 Lowered 7/27/07
TECHNICAL 2 Lowered 10/13/17
BETA .80 (1.00 = Market)

High:	22.9	22.7	23.3	24.1	19.8	19.4	19.3	23.4	26.4	26.0	36.8	39.8
Low:	16.4	17.1	13.8	16.7	16.9	16.7	16.8	18.4	20.3	19.5	22.5	32.4



2020-22 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	50	(+25%)	8%
Low	30	(-25%)	-4%

Insider Decisions

	D	J	F	M	A	M	J	J	A
to Buy	1	1	1	1	1	1	1	1	1
Options	0	0	0	22	0	0	0	0	0
to Sell	0	0	0	1	0	1	1	0	0

Institutional Decisions

	4Q2016	1Q2017	2Q2017
to Buy	93	97	88
to Sell	82	83	77
Hld's(000)	34200	38886	38422

Target Price Range

2020 | 2021 | 2022

64, 48, 40, 32, 24, 20, 16, 12, 8, 6

% TOT. RETURN 9/17

	THIS STOCK	VL ARITH.* INDEX
1 yr.	21.4	16.4
3 yr.	83.2	31.5
5 yr.	134.5	88.9

2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	© VALUE LINE PUB. LLC	20-22
8.13	8.67	8.18	8.59	8.72	8.10	8.88	9.90	10.82	11.05	12.00	13.34	12.23	12.50	12.29	12.70	*13.45*	*13.90*	Revenues per sh	*14.70*
1.10	1.32	1.26	1.42	1.52	1.36	1.56	1.86	1.93	1.93	2.07	2.32	2.21	2.47	2.22	2.34	*2.65*	*2.80*	"Cash Flow" per sh	*3.15*
.47	.63	.61	.73	.74	.67	.75	.95	.98	.91	.86	1.02	1.02	1.19	.94	1.01	*1.35*	*1.45*	Earnings per sh A	*1.75*
.56	.56	.56	.57	.57	.58	.58	.59	.59	.60	.62	.63	.64	.65	.67	.69	*.72*	*.75*	Div'd Decl'd per sh B ■	*.99*
2.04	2.91	2.19	1.87	2.01	2.14	1.84	2.41	2.66	2.97	2.83	3.04	2.58	2.76	3.69	4.77	*3.85*	*3.65*	Cap'l Spending per sh	*3.65*
6.48	6.56	7.22	7.83	7.90	9.07	9.25	9.72	10.13	10.45	10.76	11.28	12.54	13.11	13.41	13.75	*14.20*	*14.45*	Book Value per sh C	*16.00*
30.36	30.36	33.86	36.73	36.78	41.31	41.33	41.45	41.53	41.67	41.82	41.98	47.74	47.81	47.88	47.97	*48.25*	*48.50*	Common Shs Outst'g D	*50.00*
27.1	19.8	22.1	20.1	24.9	29.2	26.1	19.8	19.7	20.3	21.3	17.9	20.1	19.7	24.8	29.6	*Bold figures are*		Avg Ann'l P/E Ratio	*23.0*
1.39	1.08	1.26	1.06	1.33	1.58	1.39	1.19	1.31	1.29	1.34	1.14	1.13	1.04	1.25	1.56	*Value Line*		Relative P/E Ratio	*1.45*
4.4%	4.5%	4.2%	3.9%	3.1%	2.9%	3.0%	3.1%	3.1%	3.2%	3.4%	3.5%	3.1%	2.8%	2.9%	2.3%	*estimates*		Avg Ann'l Div'd Yield	*2.5%*

CAPITAL STRUCTURE as of 6/30/17
Total Debt $746.1 mill. Due in 5 Yrs $174.0 mill.
LT Debt $519.9 mill. LT Interest $35.0 mill.
(44% of Cap'l)

Pension Assets-12/16 $376.5 mill.
Oblig. $564.8 mill.

Pfd Stock None

Common Stock 48,018,000 shs.

MARKET CAP: $1.9 billion (Mid Cap)

2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018		20-22
367.1	410.3	449.4	460.4	501.8	560.0	584.1	597.5	588.3	609.4	*650*	*675*	Revenues ($mill) E	*735*
31.2	39.8	40.6	37.7	36.1	42.6	47.3	56.7	45.0	48.7	*65.0*	*70.0*	Net Profit ($mill)	*88.0*
39.9%	37.7%	40.3%	39.5%	40.5%	37.5%	30.3%	33.0%	36.0%	35.5%	*35.0%*	*35.0%*	Income Tax Rate	*35.0%*
8.3%	8.6%	7.6%	4.2%	7.6%	8.0%	4.3%	2.7%	4.3%	6.1%	*5.0%*	*5.0%*	AFUDC % to Net Profit	*5.0%*
42.9%	41.6%	47.1%	52.4%	51.7%	47.8%	41.6%	40.1%	44.4%	44.6%	*45.0%*	*45.0%*	Long-Term Debt Ratio	*43.0%*
56.6%	58.4%	52.9%	47.6%	48.3%	52.2%	58.4%	59.9%	55.6%	55.4%	*55.0%*	*55.0%*	Common Equity Ratio	*57.0%*
674.9	690.4	794.9	914.7	931.5	908.2	1024.9	1045.9	1154.4	1191.2	*1250*	*1275*	Total Capital ($mill)	*1400*
1010.2	1112.4	1198.1	1294.3	1381.1	1457.1	1515.8	1590.4	1701.6	1859.3	*1900*	*1930*	Net Plant ($mill)	*2000*
5.9%	7.1%	6.5%	5.5%	5.5%	6.3%	6.0%	6.3%	5.2%	5.5%	*6.5%*	*6.5%*	Return on Total Cap'l	*7.0%*
8.1%	9.9%	9.6%	8.6%	8.0%	9.0%	7.9%	9.1%	7.0%	7.4%	*9.5%*	*10.0%*	Return on Shr. Equity	*11.0%*
8.1%	9.9%	9.6%	8.6%	8.0%	9.0%	7.9%	9.1%	7.0%	7.4%	*9.5%*	*10.0%*	Return on Com Equity	*11.0%*
1.8%	3.8%	3.8%	3.0%	2.3%	3.4%	3.4%	4.1%	2.0%	2.4%	*4.5%*	*5.0%*	Retained to Com Eq	*5.0%*
77%	61%	60%	66%	71%	62%	56%	55%	71%	68%	*53%*	*52%*	All Div'ds to Net Prof	*56%*

CURRENT POSITION ($MILL.)	2015	2016	6/30/17
Cash Assets	8.8	25.5	29.1
Other	118.8	116.6	141.5
Current Assets	127.6	142.1	170.6
Accts Payable	66.4	77.8	84.2
Debt Due	40.2	123.3	226.2
Other	41.9	49.1	50.6
Current Liab.	148.5	250.2	361.0

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '14-'16 to '20-'22
Revenues	4.0%	2.0%	*2.5%*
"Cash Flow"	5.0%	3.5%	*5.0%*
Earnings	4.0%	3.0%	*9.0%*
Dividends	1.5%	2.0%	*6.5%*
Book Value	5.0%	5.0%	*3.0%*

Calendar	QUARTERLY REVENUES ($ mill.)E Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2014	110.5	158.4	191.2	137.4	597.5
2015	122.0	144.4	183.5	138.4	588.3
2016	121.7	152.4	184.3	151.0	609.4
2017	122.0	171.1	*200*	*156.9*	*650*
2018	*140*	*170*	*205*	*160*	*675*

Calendar	EARNINGS PER SHARE A Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2014	d.11	.36	.70	.24	1.19
2015	.03	.21	.52	.18	.94
2016	d.02	.24	.48	.31	1.01
2017	.02	.39	*.62*	*.32*	*1.35*
2018	*.07*	*.38*	*.67*	*.33*	*1.45*

Calendar	QUARTERLY DIVIDENDS PAID B ■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2013	.16	.16	.16	.16	.64
2014	.1625	.1625	.1625	.1625	.65
2015	.1675	.1675	.1675	.1675	.67
2016	.1725	.1725	.1725	.1725	.69
2017	.18	.18	.18		

BUSINESS: California Water Service Group provides regulated and nonregulated water service to 482,400 customers in 100 communities in the state of California. Accounts for over 94% of total customers. Also operates in Washington, New Mexico, and Hawaii. Main service areas: San Francisco Bay area, Sacramento Valley, Salinas Valley, San Joaquin Valley & parts of Los Angeles. Acquired Rio Grande Corp; West Hawaii Utilities (9/08). Revenue breakdown, '16: residential, 72%; business, 20%; industrial, 4%; public authorities, 3%; other 1%. Off. and dir. own 1% of common stock (4/17 proxy). Has 1,163 employees. Pres. and CEO: Martin A. Kropelnicki Inc.: DE. Addr.: 1720 North First St., San Jose, CA 95112-4598. Tel.: 408-367-8200. Internet: www.calwatergroup.com.

California Water Service Group benefited from favorable rate activity in the second quarter. The regulated water provider saw revenues surge to $171 million, a 12% annual improvement, and a 40% increase on a sequential basis. The advance can largely be attributed to recent rate changes by the California regulatory authority (effective earlier this year). Specifically, rate increases alone added more than $17 million to the top line in the June period, with unbilled revenue accounting for the remainder of gains.

Profits are on the right track. California Water earned $0.39 a share in the second quarter, besting our $0.35 call. Lower incremental drought costs were positive, but the real takeaway was the 280-basis-point decline in operating expenses, notably slimmer maintenance and administrative costs. Our 2017 bottom-line estimate of $1.35 a share remains intact, equating to year-over-year growth of 34%.

We are tacking $10 million onto our current-year revenue estimate, to $650 million. This is partly owing to the strong second-quarter showing, but also factors in the higher base rate going forward. Meanwhile, our 2018 top-line forecast is unchanged, at $675 million.

The long-term story hasn't changed much. Acquisitions and capital spending remain the main themes here. The company has ample funding to allocate to infrastructure upgrades and water system improvements. Year to date, CWT has spent just over $100 million on investments, leaving approximately $450 million-$500 million at its disposal. Further, bolt-on acquisitions are a possible avenue to explore should management want to supplement organic growth. All this, along with continued inquiry into increased base rates, augurs well for business prospects into next decade.

These shares are trading near all-time highs. No doubt, the market has rewarded the company for returning to growth in 2016, as the stock price is up nearly 75% from last year's lows. This issue is timely (2), and is slated to outperform the year-ahead broader market averages. However, due to the run-up in price, total return potential over the 3- to 5-year stretch is below average.

Nicholas P. Patrikis *October 13, 2017*

(A) Basic EPS. Excl. nonrecurring gain (loss): '01, 2¢; '02, 4¢; '11, 4¢. Next earnings report due late November.
(B) Dividends historically paid in late Feb., May, Aug., and Nov. ■ Div'd reinvestment plan available.
(C) Incl. intangible assets. In '16 : $21.9 mill., $0.46/sh.
(D) In millions, adjusted for splits.
(E) Excludes non-reg. rev.

Company's Financial Strength	B++
Stock's Price Stability	80
Price Growth Persistence	35
Earnings Predictability	70

Exhibit No. ___
Schedule DWD-3
Page ___

CONNECTICUT WATER NDQ-CTWS

RECENT PRICE **60.93** | P/E RATIO **27.8** (Trailing: 30.5; Median: 20.0) | RELATIVE P/E RATIO **1.39** | DIV'D YLD **2.0%** | VALUE LINE

TIMELINESS **3** Raised 10/13/17
SAFETY **3** New 1/18/13
TECHNICAL **3** Lowered 10/13/17
BETA .65 (1.00 = Market)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
High:	27.7	25.6	29.0	26.4	27.9	29.1	32.8	36.4	37.5	39.9	58.3	62.2
Low:	20.3	22.4	19.3	17.3	20.0	23.3	26.2	27.8	31.0	33.2	37.5	50.8

2020-22 PROJECTIONS

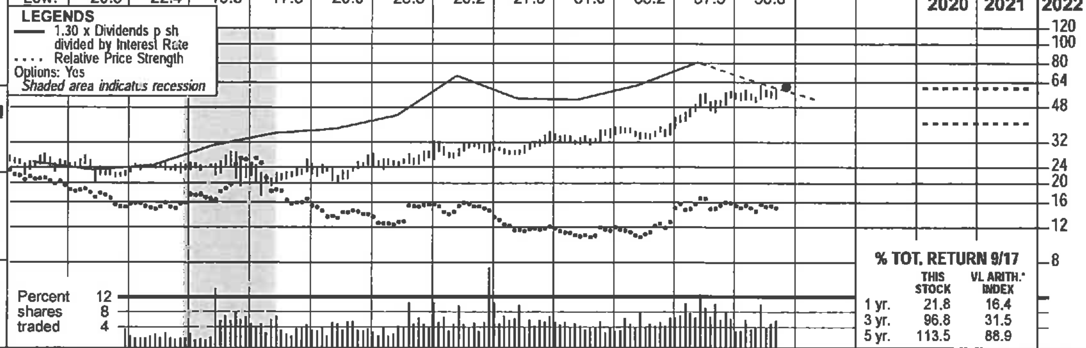
	Price	Gain	Ann'l Total Return
High	60	(Nil)	2%
Low	40	(-35%)	-7%

Insider Decisions

	D	J	F	M	A	M	J	J	A
to Buy	0	0	0	0	0	0	0	0	0
Options	0	5	0	1	0	0	0	0	0
to Sell	0	0	0	0	0	0	0	0	1

Institutional Decisions

	4Q2016	1Q2017	2Q2017
to Buy	59	48	55
to Sell	45	56	44
Hld's(000)	5436	6170	6289



% TOT. RETURN 9/17

	THIS STOCK	VL ARITH.* INDEX
1 yr.	21.8	16.4
3 yr.	96.8	31.5
5 yr.	113.5	88.9

2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	© VALUE LINE PUB. LLC	20-22
5.93	5.77	5.91	6.04	5.81	5.68	7.05	7.24	6.93	7.65	7.93	9.47	8.29	8.45	8.58	8.77	*9.00*	*9.60*	Revenues per sh	*12.80*
1.78	1.78	1.89	1.91	1.62	1.52	1.90	1.95	1.93	2.04	2.11	2.64	2.63	2.97	3.18	3.31	*3.40*	*3.50*	"Cash Flow" per sh	*3.85*
1.13	1.12	1.15	1.16	.88	.81	1.05	1.11	1.19	1.13	1.13	1.53	1.66	1.92	2.04	2.08	*2.20*	*2.35*	Earnings per sh A	*2.65*
.80	.81	.83	.84	.85	.86	.87	.88	.90	.92	.94	.96	.98	1.01	1.05	1.12	*1.18*	*1.24*	Div'd Decl'd per sh B■	*1.40*
1.86	1.98	1.49	1.58	1.96	1.96	2.24	2.44	3.28	3.06	2.61	2.79	3.02	4.11	4.29	5.93	*4.50*	*4.35*	Cap'l Spending per sh	*3.35*
9.25	10.06	10.46	10.94	11.52	11.60	11.95	12.23	12.67	13.05	13.50	20.95	17.92	18.83	20.01	20.98	*21.70*	*21.65*	Book Value per sh D	*22.80*
7.65	7.94	7.97	8.04	8.17	8.27	8.38	8.46	8.57	8.68	8.76	8.85	11.04	11.12	11.19	11.25	*11.75*	*12.00*	Common Shs Outst'g C	*12.50*
21.5	24.3	23.5	22.9	28.6	29.0	23.0	22.2	18.4	20.7	23.0	19.4	18.4	17.5	17.6	23.3	*Bold figures are*		Avg Ann'l P/E Ratio	*19.0*
1.10	1.33	1.34	1.21	1.52	1.57	1.22	1.34	1.23	1.32	1.44	1.23	1.03	.92	.89	1.22	*Value Line*		Relative P/E Ratio	*1.20*
3.3%	3.0%	3.0%	3.1%	3.4%	3.6%	3.6%	3.6%	4.1%	3.9%	3.6%	3.2%	3.2%	3.0%	2.9%	2.3%	*estimates*		Avg Ann'l Div'd Yield	*2.8%*
						59.0	61.3	59.4	66.4	69.4	83.8	91.5	94.0	96.0	98.7	*106*	*115*	Revenues ($mill)	*160*
						8.8	9.4	10.2	9.8	9.9	13.6	18.3	21.3	22.8	23.4	*26.0*	*28.0*	Net Profit ($mill)	*32.0*
						32.4%	27.2%	19.5%	35.2%	41.3%	32.0%	28.0%	14.4%	3.5%	9.9%	*19.0%*	*20.0%*	Income Tax Rate	*28.0%*
						--	1.7%	--	--	--	1.7%	2.0%	2.4%	2.3%	5.1%	*3.0%*	*2.5%*	AFUDC % to Net Profit	*2.5%*
						47.6%	46.9%	50.6%	49.5%	53.2%	49.0%	46.9%	45.7%	44.1%	45.4%	*46.5%*	*47.0%*	Long-Term Debt Ratio	*46.5%*
						51.8%	52.7%	49.1%	50.2%	46.5%	50.8%	52.9%	54.1%	55.7%	54.4%	*53.5%*	*53.0%*	Common Equity Ratio	*53.5%*
						193.2	196.5	221.3	225.6	254.2	364.6	373.6	386.8	402.4	433.8	*475*	*490*	Total Capital ($mill)	*535*
						284.3	302.3	325.2	344.2	362.4	447.9	471.9	506.9	546.3	601.4	*615*	*635*	Net Plant ($mill)	*675*
						5.5%	5.9%	5.5%	5.4%	4.9%	4.8%	5.9%	6.4%	6.5%	6.3%	*6.0%*	*6.5%*	Return on Total Cap'l	*7.0%*
						8.7%	9.0%	9.3%	8.6%	8.3%	7.3%	9.2%	10.1%	10.1%	9.9%	*10.0%*	*11.0%*	Return on Shr. Equity	*11.5%*
						8.7%	9.1%	9.4%	8.7%	8.3%	7.3%	9.2%	10.2%	10.1%	9.9%	*10.0%*	*11.0%*	Return on Com Equity	*11.5%*
						1.6%	1.9%	2.3%	1.6%	1.4%	2.8%	3.8%	4.8%	4.9%	4.6%	*4.5%*	*5.0%*	Retained to Com Eq	*5.5%*
						82%	79%	76%	81%	83%	62%	59%	53%	52%	54%	*54%*	*53%*	All Div'ds to Net Prof	*53%*

CAPITAL STRUCTURE as of 6/30/17
Total Debt $210.6 mill. **Due in 5 Yrs** $19.8 mill.
LT Debt $205.4 mill. **LT Interest** $7.7 mill.
(45% of Cap'l)

Leases, Uncapitalized: Annual rentals $.3 mill.
Pension Assets-12/16 $62.7 mill.
Oblig. $79.3 mill.

Pfd Stock $0.8 mill. **Pfd Divd** NMF

Common Stock 11,575,400 shs.

MARKET CAP: $700 million (Small Cap)

CURRENT POSITION ($MILL.)	2015	2016	6/30/17
Cash Assets	.7	1.6	2.7
Accounts Receivable	11.0	13.0	12.9
Other	15.3	14.8	16.6
Current Assets	27.0	29.4	32.2
Accts Payable	11.9	13.1	9.6
Debt Due	2.8	4.9	5.2
Other	22.2	37.1	47.8
Current Liab.	36.9	55.1	62.6

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '14-'16 to '20-'22
Revenues	4.0%	3.0%	*7.0%*
"Cash Flow"	6.5%	9.5%	*3.5%*
Earnings	8.0%	12.0%	*4.5%*
Dividends	2.5%	3.0%	*4.5%*
Book Value	6.0%	9.0%	*2.5%*

Cal-endar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2014	20.3	25.4	27.6	20.7	94.0
2015	20.0	26.6	28.4	21.0	96.0
2016	21.6	26.1	29.5	21.5	98.7
2017	22.5	27.9	*32.0*	*23.6*	*106*
2018	*25.0*	*30.0*	*35.0*	*25.0*	*115*

Cal-endar	EARNINGS PER SHARE A Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2014	.27	.67	.76	.22	1.92
2015	.28	.77	.79	.20	2.04
2016	.28	.89	.84	.07	2.08
2017	.36	.73	*.88*	*.23*	*2.20*
2018	*.35*	*.80*	*.90*	*.30*	*2.35*

Cal-endar	QUARTERLY DIVIDENDS PAID B■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2013	.2425	.2425	.2475	.2475	.98
2014	.2475	.2475	.2575	.2575	1.01
2015	.2575	.2575	.2675	.2675	1.05
2016	.2675	.2825	.2825	.2825	1.12
2017	.2825	.2975	.2975		

BUSINESS: Connecticut Water Service, Inc. is a non-operating holding company, whose income is derived from earnings of its wholly-owned subsidiary companies (regulated water utilities). In 2016, 95% of net income was derived from these activities. Provides water services to 440,000 people in 79 municipalities throughout Connecticut and Maine. Acquired The Maine Water Company, January, 2012; Biddeford and Saco Water, December, 2012; Heritage Village, February, 2017. Inc.: Conn.. Has 266 employees. Chairman/President/Chief Executive Officer: Eric W. Thornburg. Officers and directors own 2.5% of the common stock; BlackRock, Inc., 7.2% (4/17 proxy). Address: 93 West Main Street, Clinton, CT 06413. Telephone: (860) 669-8636. Internet: www.ctwater.com.

Connecticut Water Service delivered second-quarter results that fell short of our expectations. Revenues of $27.9 million improved marginally, on a year-over-year basis, but missed our $28.5 million call. The July period included a full quarter of Heritage Village operations, as well as incremental surcharges in both Connecticut and Maine. Not until the third quarter will the completed acquisition (July 1st) of the Avon Water Company be included in the financials. Similarly, the bottom line was a nickel shy of our estimate, at $0.73 a share. Net income was adversely impacted by several cents due to greater business development costs associated with the above-mentioned deals. Nonetheless, Connecticut Water should right the ship in the recently concluded third quarter, as we look for revenues of $32 million and share net of $0.88.

There has been some activity on the rate front. Earlier this summer, The Maine Water Company filed for a rate increase (pending approval from the Maine Public Utilities Commission) in its Biddeford and Saco division. This could potentially add about $2 million to the top line. Additionally, the company filed for a rate increase of 1.6% on WICA (recovered funds from infrastructure upgrades.)

Long term, acquisitions and higher capital spending are likely in the cards. Indeed, the strategy is starting to bear fruit, as CTWS lifted its customer base by nearly 9,500 via its Avon and Heritage purchases. Financials results should feel the effects beginning in the second half of this year. Moreover, Connecticut plans to take full advantage of WICA and WISC benefits (increase to WICA surcharge pending), and ought to continue to replace aging water mains in the coming years.

This equity has slipped a notch in Timeliness to 3, Average. What's more, the current valuation (28.0x 12-month earnings-per-share estimate) is a bit rich when compared to historical norms, and on a peer-to-peer basis. The stock is trading above our 3- to 5-year Target Price Range, and total return potential is subpar. Thus, we recommend investors wait for a better entry point before committing funds here.

Nicholas P. Patrikis *October 13, 2017*

(A) Diluted earnings. Next earnings report due late November.
(B) Dividends historically paid in mid-March, June, September, and December. ■ Div'd reinvestment plan available.
(C) In millions
(D) Includes intangibles. In 2016: $30.4 million/$2.70 a share.

Company's Financial Strength	B+
Stock's Price Stability	90
Price Growth Persistence	50
Earnings Predictability	90

MIDDLESEX WATER NDQ-MSEX

RECENT PRICE 40.47 | P/E RATIO 26.3 (Trailing: 30.4 / Median: 20.0) | RELATIVE P/E RATIO 1.32 | DIV'D YLD 2.1% | VALUE LINE

High:	20.5	20.2	19.8	17.9	19.3	19.4	19.6	22.5	23.7	28.0	44.5	42.8
Low:	16.5	16.9	12.0	11.6	14.7	16.5	17.5	18.6	19.1	21.2	25.0	32.2

TIMELINESS 4 Lowered 7/7/17
SAFETY 2 New 10/21/11
TECHNICAL 3 Raised 7/14/17
BETA .80 (1.00 = Market)

2020-22 PROJECTIONS

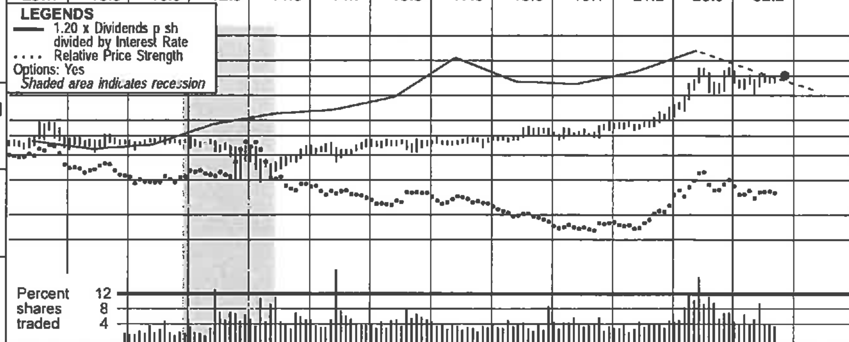
	Price	Gain	Ann'l Total Return
High	50	(+25%)	8%
Low	35	(-15%)	-1%

Insider Decisions

	D	J	F	M	A	M	J	J	A
to Buy	0	0	0	0	0	0	0	0	0
Options	0	0	0	0	7	0	0	0	0
to Sell	0	0	1	1	0	0	0	0	0

Institutional Decisions

	4Q2016	1Q2017	2Q2017
to Buy	40	45	60
to Sell	62	51	44
Hld's(000)	7874	9400	9201



Target Price Range

2020	2021	2022

% TOT. RETURN 9/17

	THIS STOCK	VL ARITH.* INDEX
1 yr.	14.1	16.4
3 yr.	117.7	31.5
5 yr.	140.1	88.9

2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	© VALUE LINE PUB. LLC	20-22
5.87	5.98	6.12	6.25	6.44	6.16	6.50	6.79	6.75	6.60	6.50	6.98	7.19	7.26	7.77	8.16	*8.30*	*8.65*	Revenues per sh	*9.40*
1.18	1.20	1.15	1.28	1.33	1.33	1.49	1.53	1.40	1.55	1.46	1.56	1.72	1.84	1.97	2.17	*2.35*	*2.50*	"Cash Flow" per sh	*3.10*
.66	.73	.61	.73	.71	.82	.87	.89	.72	.96	.84	.90	1.03	1.13	1.22	1.38	*1.48*	*1.60*	Earnings per sh A	*2.05*
.62	.63	.65	.66	.67	.68	.69	.70	.71	.72	.73	.74	.75	.76	.78	.81	*.84*	*.87*	Div'd Decl'd per sh B■	*1.02*
1.25	1.59	1.87	2.54	2.18	2.31	1.66	2.12	1.49	1.90	1.50	1.36	1.26	1.40	1.59	2.91	*1.80*	*1.90*	Cap'l Spending per sh	*2.05*
7.11	7.39	7.60	8.02	8.26	9.52	10.05	10.03	10.33	11.13	11.27	11.48	11.82	12.24	12.74	13.40	*13.95*	*14.35*	Book Value per sh	*16.45*
10.17	10.36	10.48	11.36	11.58	13.17	13.25	13.40	13.52	15.57	15.70	15.82	15.96	16.12	16.23	16.30	*16.50*	*16.75*	Common Shs Outst'g C	*17.00*
24.6	23.5	30.0	26.4	27.4	22.7	21.6	19.8	21.0	17.8	21.7	20.8	19.7	18.5	19.1	25.6	*Bold figures are*		Avg Ann'l P/E Ratio	*21.0*
1.26	1.28	1.71	1.39	1.46	1.23	1.15	1.19	1.40	1.13	1.36	1.32	1.11	.97	.96	1.35	*Value Line*		Relative P/E Ratio	*1.30*
3.8%	3.7%	3.5%	3.4%	3.5%	3.7%	3.7%	4.0%	4.7%	4.2%	4.0%	4.0%	3.7%	3.7%	3.3%	2.3%	*estimates*		Avg Ann'l Div'd Yield	*2.4%*
						86.1	91.0	91.2	102.7	102.1	110.4	114.8	117.1	126.0	132.9	*137*	*145*	Revenues ($mill)	*160*
						11.8	12.2	10.0	14.3	13.4	14.4	16.6	18.4	20.0	22.7	*24.5*	*27.0*	Net Profit ($mill)	*35.0*
						32.6%	33.2%	34.1%	32.1%	32.7%	33.9%	34.1%	35.0%	34.5%	34.0%	*35.0%*	*36.0%*	Income Tax Rate	*37.0%*
						--	--	--	6.8%	6.1%	3.4%	1.9%	1.7%	1.9%	2.7%	*2.0%*	*2.0%*	AFUDC % to Net Profit	*2.5%*
						49.0%	45.6%	46.6%	43.1%	42.3%	41.5%	40.4%	40.5%	39.4%	37.9%	*37.5%*	*37.5%*	Long-Term Debt Ratio	*37.5%*
						49.6%	51.8%	52.1%	55.8%	56.6%	57.4%	58.7%	58.8%	59.8%	61.5%	*62.0%*	*62.0%*	Common Equity Ratio	*62.0%*
						268.8	259.4	267.9	310.5	312.5	316.5	321.4	335.8	345.4	355.4	*370*	*385*	Total Capital ($mill)	*455*
						333.9	366.3	376.5	405.9	422.2	435.2	446.5	465.4	481.9	517.8	*525*	*535*	Net Plant ($mill)	*575*
						5.6%	5.8%	5.0%	5.7%	5.2%	5.4%	5.9%	6.3%	6.6%	7.1%	*7.5%*	*7.5%*	Return on Total Cap'l	*8.0%*
						8.6%	8.6%	7.0%	8.1%	7.5%	7.8%	8.7%	9.2%	9.6%	10.3%	*10.5%*	*11.0%*	Return on Shr. Equity	*12.5%*
						8.7%	8.9%	7.0%	8.2%	7.5%	7.8%	8.7%	9.3%	9.6%	10.3%	*10.5%*	*11.0%*	Return on Com Equity	*12.5%*
						1.8%	2.0%	.1%	2.1%	1.0%	1.4%	2.4%	3.1%	3.5%	4.3%	*4.5%*	*5.0%*	Retained to Com Eq	*6.0%*
						79%	78%	98%	75%	87%	83%	73%	67%	63%	58%	*57%*	*54%*	All Div'ds to Net Prof	*50%*

CAPITAL STRUCTURE as of 6/30/17
Total Debt $159.6 mill. **Due in 5 Yrs** $32.1 mill.
LT Debt $136.4 mill. **LT Interest** $6.0 mill.
(Total interest coverage: 8.6x)
(38% of Cap'l)

Pension Assets-12/16 $59.4 mill.
Oblig. $78.6 mill.
Pfd Stock $2.4 mill. **Pfd Div'd:** $.1 mill.

Common Stock 16,337,784 shs.
as of 7/31/17

MARKET CAP: $650 million (Small Cap)

CURRENT POSITION ($MILL.)	2015	2016	6/30/17
Cash Assets	3.5	3.9	3.7
Other	20.9	22.8	26.0
Current Assets	24.4	26.7	29.7
Accts Payable	6.5	12.3	15.0
Debt Due	8.7	18.2	23.2
Other	13.1	16.6	17.2
Current Liab.	28.3	47.1	55.4

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '14-'16 to '20-'22
Revenues	2.0%	3.0%	*3.5%*
"Cash Flow"	4.5%	6.5%	*7.5%*
Earnings	5.0%	8.0%	*8.5%*
Dividends	1.5%	1.5%	*4.5%*
Book Value	4.0%	3.0%	*4.5%*

Cal-endar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2014	27.1	29.2	32.7	28.1	117.1
2015	28.8	31.7	34.7	30.8	126.0
2016	30.6	32.7	37.8	31.8	132.9
2017	30.1	33.0	*39.0*	*34.9*	*137*
2018	*33.0*	*37.0*	*40.0*	*35.0*	*145*

Cal-endar	EARNINGS PER SHARE A Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2014	.20	.29	.42	.22	1.13
2015	.22	.31	.41	.28	1.22
2016	.29	.36	.54	.19	1.38
2017	.27	.33	*.55*	*.33*	*1.48*
2018	*.33*	*.38*	*.57*	*.32*	*1.60*

Cal-endar	QUARTERLY DIVIDENDS PAID B■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2013	.1875	.1875	.1875	.19	.75
2014	.19	.19	.19	.1925	.76
2015	.1925	.1925	.1925	.19875	.78
2016	.19875	.19875	.19875	.21125	.81
2017	.21125	.21125	.21125		

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 2016, the Middlesex System accounted for 60% of operating revenues. At 12/31/16, the company had 309 employees. Incorporated: NJ. President, CEO, and Chairman: Dennis W. Doll. Officers & directors own 3.5% of the common stock; BlackRock Institutional Trust Co., 7.2% (4/17 proxy). Add.: 1500 Ronson Road, Iselin, NJ 08830. Tel.: 732-634-1500. Internet: www.middlesexwater.com.

Middlesex Water Company reported soft results for the second quarter. Following a somewhat colder (longer) winter season, customer water usage picked up only moderately through the late spring into early summer months. Indeed, the volatile Northeast region of the U.S. (MSEX's main area of operation) leaves the company subject to weather disruptions. First-quarter revenues came in roughly flat, year over year, at $33.0 million. Delaware operations registered a modest gain thanks to new customer additions, while its New Jersey segment slipped due to a continued trend of weak water consumption. Similar to the first quarter, net income took a step back, compared to the year-earlier figure. Share net of $0.33 missed our mark by $0.04, with increased water production costs weighing on profits.

Our current-year top- and bottom-line estimates are being modestly reduced. We now expect Middlesex to earn $1.48 a share (-$0.02 less than our previous call), on $137 million in revenues (-$1 million).

Infrastructure upgrades are still management's main focus. Under its recently established RENEW program and Water for Tomorrow initiative, the company aims to allocate nearly $12 million in each of the next three years to bolster its water transmission capabilities by replacing old water mains, valves, and services lines throughout New Jersey. Total capital spending on its water distribution infrastructure (approximately $200 million through next decade) ought to be closely monitored, with a portion of those corresponding investment costs being recovered by appropriate rate filings. Finally, a slow but sure pickup in consumption from New Jersey residents should provide an extra boost to the top line further out.

Our Timeliness Ranking System pegs shares of Middlesex Water Company as year-ahead market laggards (4, Below Average). In the same breath, the issue offers unattractive total return potential over the 3- to 5-year pull, and its dividend yield, though average, pales in comparison to its historical norms. Therefore, we suggest investors stay on the sidelines, for now.

Nicholas P. Patrikis *October 13, 2017*

(A) Diluted earnings. Next earnings report due early November.
(B) Dividends historically paid in mid-Feb., May, Aug., and November.■ Div'd reinvestment plan available.
(C) In millions, adjusted for split.

Company's Financial Strength	B++
Stock's Price Stability	70
Price Growth Persistence	40
Earnings Predictability	85

SJW GROUP NYSE-SJW

RECENT PRICE **57.60** | P/E RATIO **22.7** (Trailing: 21.6 Median: 23.0) | RELATIVE P/E RATIO **1.13** | DIV'D YLD **1.5%** | VALUE LINE

High:	45.3	43.0	35.1	30.4	28.2	26.8	26.9	30.1	33.7	35.7	56.9	57.8
Low:	21.2	27.7	20.0	18.2	21.6	20.9	22.6	24.5	25.5	27.5	28.6	45.4

TIMELINESS 3 Raised 6/30/17

SAFETY 3 New 4/22/11

TECHNICAL 3 Lowered 8/11/17

BETA .75 (1.00 = Market)

2020-22 PROJECTIONS

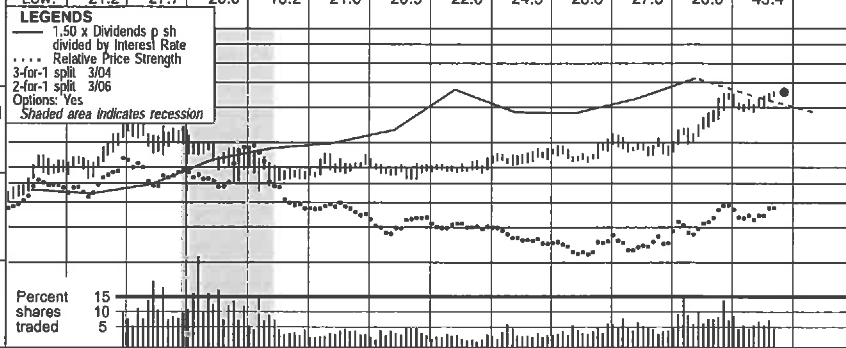
	Price	Gain	Ann'l Total Return
High	80	(+40%)	10%
Low	55	(-5%)	1%

Insider Decisions

	D	J	F	M	A	M	J	J	A
to Buy	0	0	0	0	0	0	0	0	0
Options	0	8	0	6	8	0	0	0	0
to Sell	1	1	1	0	0	0	0	0	1

Institutional Decisions

	4Q2016	1Q2017	2Q2017
to Buy	81	83	67
to Sell	59	59	73
Hld's(000)	9218	10726	10969



Target Price Range 2020 | 2021 | 2022

% TOT. RETURN 9/17

	THIS STOCK	VL ARITH.* INDEX
1 yr.	31.8	16.4
3 yr.	124.9	31.5
5 yr.	151.9	88.9

2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	© VALUE LINE PUB. LLC	20-22
7.45	7.97	8.20	9.14	9.86	10.35	11.25	12.12	11.68	11.62	12.85	14.01	13.73	15.76	14.97	16.61	*17.15*	*16.80*	Revenues per sh	*20.65*
1.49	1.55	1.75	1.89	2.21	2.38	2.30	2.44	2.21	2.38	2.80	2.97	2.90	4.42	3.86	4.76	*4.60*	*4.65*	"Cash Flow" per sh	*5.15*
.77	.78	.91	.87	1.12	1.19	1.04	1.08	.81	.84	1.11	1.18	1.12	2.54	1.85	2.57	*2.45*	*2.60*	Earnings per sh A	*3.00*
.43	.46	.49	.51	.53	.57	.61	.65	.66	.68	.69	.71	.73	.75	.78	.81	*.87*	*.93*	Div'd Decl'd per sh B■	*1.12*
2.63	2.06	3.41	2.31	2.83	3.87	6.62	3.79	3.17	5.65	3.75	5.67	4.68	5.02	5.24	6.95	*6.00*	*5.50*	Cap'l Spending per sh	*5.00*
8.17	8.40	9.11	10.11	10.72	12.48	12.90	13.99	13.66	13.75	14.20	14.71	15.92	17.75	18.83	20.61	*21.20*	*21.60*	Book Value per sh	*23.90*
18.27	18.27	18.27	18.27	18.27	18.28	18.36	18.18	18.50	18.55	18.59	18.67	20.17	20.29	20.38	20.46	*21.00*	*22.00*	Common Shs Outst'g C	*23.00*
18.5	17.3	15.4	19.6	19.7	23.5	33.4	26.2	28.7	29.1	21.2	20.4	24.3	11.2	16.6	15.7	*Bold figures are*		Avg Ann'l P/E Ratio	*22.0*
.95	.94	.88	1.04	1.05	1.27	1.77	1.58	1.91	1.85	1.33	1.30	1.37	.59	.84	.83	*Value Line*		Relative P/E Ratio	*1.40*
3.0%	3.4%	3.5%	3.0%	2.4%	2.0%	1.7%	2.3%	2.8%	2.8%	2.9%	3.0%	2.7%	2.6%	2.5%	2.0%	*estimates*		Avg Ann'l Div'd Yield	*1.7%*
						206.6	220.3	216.1	215.6	239.0	261.5	276.9	319.7	305.1	339.7	*360*	*370*	Revenues ($mill)	*475*
						19.3	20.2	15.2	15.8	20.9	22.3	23.5	51.8	37.9	52.8	*51.0*	*57.0*	Net Profit ($mill)	*69.0*
						39.4%	39.5%	40.4%	38.8%	41.1%	41.1%	38.7%	32.5%	38.1%	38.8%	*39.0%*	*39.0%*	Income Tax Rate	*39.0%*
						2.7%	2.3%	2.0%	--	--	--	--	--	2.0%	1.0%	*1.5%*	*1.5%*	AFUDC % to Net Profit	*1.5%*
						47.7%	46.0%	49.4%	53.7%	56.6%	55.0%	51.1%	51.6%	49.8%	50.7%	*49.0%*	*48.5%*	Long-Term Debt Ratio	*49.0%*
						52.3%	54.0%	50.6%	46.3%	43.4%	45.0%	48.9%	48.4%	50.2%	49.3%	*51.0%*	*51.5%*	Common Equity Ratio	*51.0%*
						453.2	470.9	499.6	550.7	607.9	610.2	656.2	744.5	764.6	855.0	*870*	*925*	Total Capital ($mill)	*1075*
						645.5	684.2	718.5	785.5	756.2	831.6	898.7	963.0	1036.8	1146.4	*1200*	*1250*	Net Plant ($mill)	*1325*
						5.7%	5.8%	4.4%	4.3%	4.9%	5.0%	5.0%	8.3%	6.3%	7.4%	*7.0%*	*7.5%*	Return on Total Cap'l	*7.5%*
						8.2%	8.0%	6.0%	6.2%	7.9%	8.1%	7.3%	14.4%	9.9%	12.5%	*11.5%*	*12.0%*	Return on Shr. Equity	*12.5%*
						8.2%	8.0%	6.0%	6.2%	7.9%	8.1%	7.3%	14.4%	9.9%	12.5%	*11.5%*	*12.0%*	Return on Com Equity	*12.5%*
						3.5%	3.3%	1.2%	1.2%	3.1%	3.3%	2.8%	10.2%	5.7%	8.6%	*7.5%*	*7.5%*	Retained to Com Eq	*8.0%*
						57%	59%	80%	80%	61%	59%	62%	29%	42%	31%	*36%*	*36%*	All Div'ds to Net Prof	*37%*

CAPITAL STRUCTURE as of 6/30/17
Total Debt $430.9 mill. Due in 5 Yrs $14.3 mill.
LT Debt $430.9 mill. LT Interest $20.0 mill.
(50% of Cap'l)

Leases, Uncapitalized: Annual rentals $6.6 mill.

Pension Assets-12/16 $113.9 mill.
Oblig. $174.1 mill.

Pfd Stock None.

Common Stock 20,506,494 shs.

MARKET CAP: $1.2 billion (Mid Cap)

CURRENT POSITION ($MILL.)	2015	2016	6/30/17
Cash Assets	5.2	25.3	9.2
Accts Receivable	16.4	16.4	20.6
Other	51.8	57.9	43.1
Current Assets	73.4	99.6	72.9
Accts Payable	16.2	18.7	27.1
Debt Due	38.1	14.3	--
Other	25.3	30.6	43.3
Current Liab.	79.6	63.6	70.4

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '14-'16 to '20-'22
Revenues	5.0%	5.5%	*4.5%*
"Cash Flow"	7.0%	12.0%	*3.0%*
Earnings	8.0%	20.5%	*4.5%*
Dividends	4.0%	3.0%	*6.0%*
Book Value	5.5%	6.5%	*4.0%*

Cal-endar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2014	54.6	70.4	125.4	69.3	319.7
2015	62.1	72.4	83.0	87.6	305.1
2016	61.1	86.9	112.3	79.4	339.7
2017	69.0	102.1	*102*	*87.0*	*360*
2018	*70.0*	*105*	*105*	*90.0*	*370*

Cal-endar	EARNINGS PER SHARE A Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2014	.04	.34	1.88	.28	2.54
2015	.23	.36	.46	.80	1.85
2016	.16	.82	.92	.67	2.57
2017	.18	.90	*.75*	*.62*	*2.45*
2018	*.27*	*.88*	*.80*	*.65*	*2.60*

Cal-endar	QUARTERLY DIVIDENDS PAID B■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2013	.1825	.1825	.1825	.1825	.73
2014	.1875	.1875	.1875	.1875	.75
2015	.1950	.1950	.1950	.1950	.78
2016	.2025	.2025	.2025	.2025	.81
2017	.2175	.2175	.2175		

BUSINESS: SJW Group engages in the production, purchase, storage, purification, distribution, and retail sale of water. It provides water service to approximately 229,000 connections with a total population of roughly one million people in the San Jose area and 13,000 connections that reaches about 39,000 residents in the region between San Antonio and Austin, Texas. The company also offers nonregulated water-related services and owns and operates commercial real estate investments. Has about 406 employees. Officers and directors (including Nancy O. Moss) own 26.9% of outstanding shares (3/17 proxy). Chairman & C.E.O.: Richard Roth. Inc.: California. Address: 110 West Taylor Street, San Jose, CA 95110. Telephone: (408) 279-7800. Internet: www.sjwater.com.

SJW Group is making a change at the helm. Current President and Chief Executive Officer Richard Roth announced his retirement effective November 5th. The board of directors has appointed Eric W. Thornburg as a replacement for both positions, as well as a new board member. Mr. Roth will also step down as Chairman, but will serve until the next annual stockholder's meeting.

The second-quarter performance was better than expected. SJW delivered impressive financial results during the June period, underpinned by cumulative rate increases and higher recordings in its water conservation memorandum account. Customer water usage also ramped up in the period. All told, revenues of $102 million rose 17% from the previous-year tally. Meanwhile, water production and operating costs edged higher, but the company managed to report earnings of $0.90 a share. Note, there was a one-time gain on the sale of real estate assets. Still, the bottom line would have exceeded our expectations.

Our financial projections are being raised across the board. We have added $0.25 to our current-year earnings estimate, to $2.45 a share mainly owing to the recent quarter's beat. For 2018, we now look for share net of $2.60 (+$0.25). Revenues for this year and next are being ratcheded up by $15 million and $20 million, to $360 million and $370 million, respectively.

Capital spending ought to be a key growth driver further out. Year to date, SJW has invested $62 million, and will likely allocate more funds to its Montevina project this year. On balance, only a small dent has been made in its $300 million spending budget. Lastly, the company ought to get a better handle on its operating costs, which should provide a modest boost to margins down the road.

SJW Group stock does not jump out at us at the current quotation. Shares of the San Jose utility have surged almost 15% in value since our July review. Even after raising our 2020-2022 Target Price Range, the issue presents lackluster total return potential over the long haul. Moreover, the dividend yield is below the *Value Line* median.

Nicholas P. Patrikis *October 13, 2017*

(A) Diluted earnings. Excludes nonrecurring losses: '03, $1.97; '04, $3.78; '05, $1.09; '06, $16.36; '08, $1.22; '10, $0.46. GAAP accounting as of 2013. Next earnings report due late November. Quarterly earnings 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, adjusted for stock splits.

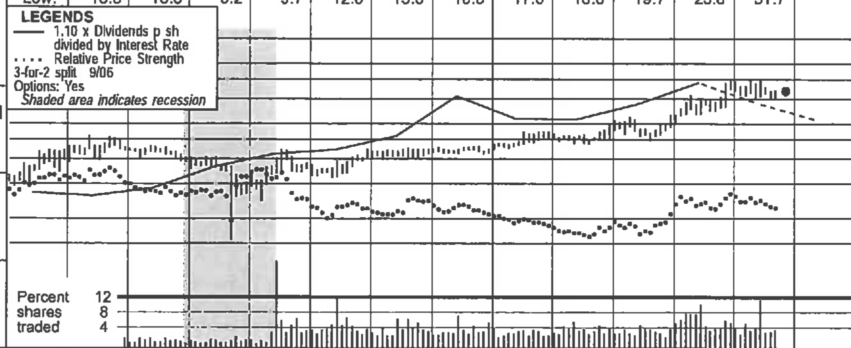
Company's Financial Strength	B+
Stock's Price Stability	70
Price Growth Persistence	35
Earnings Predictability	45

YORK WATER NDQ-YORW

RECENT PRICE 35.05 | P/E RATIO 34.4 (Trailing: 37.7 Median: 24.0) | RELATIVE P/E RATIO 1.72 | DIV'D YLD 1.8% | VALUE LINE

TIMELINESS 4 Lowered 8/25/17
SAFETY 3 Lowered 7/17/15
TECHNICAL 2 Raised 10/13/17
BETA .80 (1.00 = Market)

High:	21.0	18.5	16.5	18.0	18.0	18.1	18.5	22.0	24.3	26.7	39.8	39.9		Target Price Range
Low:	15.3	15.5	6.2	9.7	12.8	15.8	16.8	17.6	18.8	19.7	23.8	31.7		2020 2021 2022



2020-22 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	40	(+15%)	6%
Low	25	(-30%)	-5%

Insider Decisions

	D	J	F	M	A	M	J	J	A
to Buy	1	1	1	1	13	2	2	13	2
Options	1	0	0	0	0	13	0	0	0
to Sell	0	0	0	0	0	0	0	0	0

Institutional Decisions

	4Q2016	1Q2017	2Q2017
to Buy	46	38	42
to Sell	34	33	33
Hld's(000)	4284	5127	5206

% TOT. RETURN 9/17

	THIS STOCK	VL ARITH.* INDEX
1 yr.	16.3	16.4
3 yr.	80.9	31.5
5 yr.	107.4	88.9

2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	© VALUE LINE PUB. LLC	20-22
2.05	2.05	2.17	2.18	2.58	2.56	2.79	2.89	2.95	3.07	3.18	3.21	3.27	3.58	3.68	3.70	*3.90*	*4.10*	Revenues per sh	*5.65*
.59	.57	.65	.65	.79	.77	.86	.88	.95	1.07	1.09	1.12	1.19	1.36	1.45	1.42	*1.60*	*1.65*	"Cash Flow" per sh	*2.05*
.43	.40	.47	.49	.56	.58	.57	.57	.64	.71	.71	.72	.75	.89	.97	.92	*1.00*	*1.05*	Earnings per sh A	*1.40*
.34	.35	.37	.39	.42	.45	.48	.49	.51	.52	.53	.54	.55	.57	.60	.63	*.66*	*.70*	Div'd Decl'd per sh B	*.90*
.75	.66	1.07	2.50	1.69	1.85	1.69	2.17	1.18	.83	.74	.94	.76	1.10	1.11	1.03	*1.50*	*1.25*	Cap'l Spending per sh	*.85*
3.79	3.90	4.06	4.65	4.85	5.84	5.97	6.14	6.92	7.19	7.45	7.73	7.98	8.15	8.51	8.88	*9.15*	*9.55*	Book Value per sh	*11.00*
9.46	9.55	9.63	10.33	10.40	11.20	11.27	11.37	12.56	12.69	12.79	12.92	12.98	12.83	12.81	12.85	*12.90*	*12.75*	Common Shs Outst'g C	*12.00*
17.8	26.9	24.5	25.7	26.3	31.2	30.3	24.6	21.9	20.7	23.9	24.4	26.3	23.1	23.5	32.8	*Bold figures are*		Avg Ann'l P/E Ratio	*22.5*
.91	1.47	1.40	1.36	1.40	1.68	1.61	1.48	1.46	1.32	1.50	1.55	1.48	1.22	1.18	1.72	*Value Line*		Relative P/E Ratio	*1.40*
4.4%	3.3%	3.2%	3.1%	2.9%	2.5%	2.8%	3.5%	3.6%	3.5%	3.1%	3.1%	2.8%	2.8%	2.6%	2.1%	*estimates*		Avg Ann'l Div'd Yield	*2.8%*

CAPITAL STRUCTURE as of 6/30/17
Total Debt $88.2 mill. Due in 5 Yrs $30.5 mill.
LT Debt $88.2 mill. LT Interest $5.4 mill.
(43% of Cap'l)

Pension Assets 12/16 $35.5 mill.
Oblig. $40.8 mill.

Pfd Stock None

Common Stock 12,845,000 shs.

MARKET CAP: $450 million (Small Cap)

2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	© VALUE LINE PUB. LLC	20-22
31.4	32.8	37.0	39.0	40.6	41.4	42.4	45.9	47.1	47.6	*50.0*	*52.0*	Revenues ($mill)	*68.0*
6.4	6.4	7.5	8.9	9.1	9.3	9.7	11.5	12.5	11.8	*13.0*	*13.5*	Net Profit ($mill)	*17.0*
36.5%	36.1%	37.9%	38.5%	35.3%	37.6%	37.6%	29.8%	27.5%	31.3%	*29.0%*	*30.0%*	Income Tax Rate	*31.5%*
3.6%	10.1%	--	1.2%	1.1%	1.1%	.8%	1.8%	1.6%	1.9%	*1.5%*	*1.5%*	AFUDC % to Net Profit	*1.0%*
46.5%	54.5%	45.7%	48.3%	47.1%	46.0%	45.1%	44.8%	44.4%	42.6%	*43.5%*	*44.0%*	Long-Term Debt Ratio	*45.0%*
53.5%	45.5%	54.3%	51.7%	52.9%	54.0%	54.9%	55.2%	55.6%	57.4%	*56.5%*	*56.0%*	Common Equity Ratio	*55.0%*
125.7	153.4	160.1	176.4	180.2	184.8	188.4	189.4	196.3	198.7	*210*	*215*	Total Capital ($mill)	*240*
191.6	211.4	222.0	228.4	233.0	240.3	244.2	253.2	261.4	270.9	*275*	*280*	Net Plant ($mill)	*295*
6.7%	5.7%	6.2%	6.5%	6.4%	6.4%	6.5%	7.4%	7.6%	7.2%	*7.5%*	*7.5%*	Return on Total Cap'l	*8.0%*
9.5%	9.2%	8.6%	9.8%	9.5%	9.3%	9.3%	11.0%	11.5%	10.4%	*11.0%*	*11.0%*	Return on Shr. Equity	*12.5%*
9.5%	9.2%	8.6%	9.8%	9.5%	9.3%	9.3%	11.0%	11.5%	10.4%	*11.0%*	*11.0%*	Return on Com Equity	*12.5%*
1.7%	1.4%	1.9%	2.7%	2.5%	2.4%	2.4%	3.9%	4.4%	3.4%	*4.0%*	*3.5%*	Retained to Com Eq	*4.5%*
82%	85%	78%	72%	73%	74%	74%	64%	62%	67%	*66%*	*67%*	All Div'ds to Net Prof	*64%*

CURRENT POSITION ($MILL.)	2015	2016	6/30/17
Cash Assets	2.9	4.2	--
Accounts Receivable	3.5	4.3	4.2
Inventory (Avg. Cost)	.8	.7	.8
Other	4.6	3.4	3.4
Current Assets	11.8	12.6	8.4
Accts Payable	1.8	3.7	5.1
Debt Due	--	--	--
Other	4.4	4.5	4.7
Current Liab.	6.2	8.2	9.8

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '14-'16 to '20-'22
Revenues	4.0%	3.5%	7.5%
"Cash Flow"	6.5%	6.5%	6.5%
Earnings	5.5%	6.0%	7.0%
Dividends	3.5%	3.0%	7.0%
Book Value	5.0%	3.5%	4.5%

Cal-endar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2014	10.6	11.8	12.0	11.5	45.9
2015	11.2	11.9	12.4	11.6	47.1
2016	11.3	11.8	12.6	11.9	47.6
2017	11.3	12.3	*13.4*	*13.0*	*50.0*
2018	*12.2*	*12.7*	*13.8*	*13.3*	*52.0*

Cal-endar	EARNINGS PER SHARE A Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2014	.16	.22	.23	.28	.89
2015	.20	.22	.28	.27	.97
2016	.19	.23	.27	.23	.92
2017	.20	.23	*.29*	*.28*	*1.00*
2018	*.22*	*.24*	*.30*	*.29*	*1.05*

Cal-endar	QUARTERLY DIVIDENDS PAID B Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2013	.138	.138	.138	.138	.552
2014	.1431	.1431	.1431	.1431	.572
2015	.1495	.1495	.1495	.1555	.604
2016	.1555	.1555	.1555	.1602	.627
2017	.1602	.1602	.1602		

BUSINESS: The York Water Company is the oldest investor-owned regulated water utility in the United States. It has operated continuously since 1816. As of December 31, 2016, the company's average daily availability was 35.4 million gallons and its service territory had an estimated population of 196,000. Has more than 67,000 customers. Residential customers accounted for 63% of 2016 revenues; commercial and industrial (29%); other (8%). It also provides sewer billing services. Incorporated: PA. York had 105 full-time employees at 12/31/16. President/CEO: Jeffrey R. Hines. Officers/directors own 1.1% of the common stock (3/17 proxy). Address: 130 East Market Street, York, Pennsylvania 17401. Telephone: (717) 845-3601. Internet: www.yorkwater.com.

Shares of York Water are trading at levels seen three months prior. It has been a relatively quiet summer for the Pennsylvania-based regulated water utility, as the stock price has been somewhat rangebound.

Second-quarter financial results were a mixed bag. Revenues of $12.3 million were in line with our expectations, with help from recent acquisitions and higher surcharges. But the annual jump in revenues did not directly translate to an increase in earnings. Operating expenses, namely maintenance and administrative, rose substantially to almost 39% of total revenues (+240 basis points year over year). Consequently, share net of $0.23 was flat compared to the like-2016 figure.

We are scaling back our 2017 and 2018 share-net estimates accordingly. Due to the rise in operating costs, we are lowering our current-year profit forecast by $0.03, to $1.00 a share. Meanwhile, our 2018 earnings estimate is being reduced by $0.05, to $1.05 a share.

Ensuing benefits from capital expenditures should help offset the uptick in operating costs (lower effective tax rate). York ought to continue to benefit on the tax front thanks to higher maintenance and repair deductions. Year-to-date spending is already 180% above last year's tally. For the remainder of 2017, York estimates an additional $9 million in capital investment on water mains and various infrastructure upgrades. Overall, our model projects top- and bottom-line advances of 5% and 9% this year, and 4% and 5% in the next, respectively.

This issue holds limited investment appeal, at the moment. The stock is an unfavorable selection for relative year-ahead price performance (Timeliness: 4). And from a price-to-earnings perspective, the recent valuation is a bit lofty, in our view. Although York's track record of dividend payout increases is second to none, the current yield is nothing to write home about. Indeed, the recent price surge has pushed the yield below 2.0%, fractionally below the broader market average. All told, those looking to gain exposure to the regulated water utility space will probably find more attractive options elsewhere.

Nicholas P. Patrikis *October 13, 2017*

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

Company's Financial Strength	B+
Stock's Price Stability	60
Price Growth Persistence	55
Earnings Predictability	95

Carolina Water Service, Inc. of South Carolina
Summary of Risk Premium Models for the
Proxy Group of Eight Water Companies

	Proxy Group of Eight Water Companies	
Predictive Risk Premium Model (PRPM) (1)	11.45	%
Risk Premium Using an Adjusted Total Market Approach (2)	9.93	%
Average	10.69	%

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

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

	[1]	[2]	[3]	[4]	[5]	[6]	[7]
Proxy Group of Eight Water Companies	LT Average Predicted Variance	Spot Predicted Variance	Average Predicted Variance	GARCH Coefficient	Predicted Risk Premium (2)	Risk-Free Rate (3)	Indicated ROE (4)
American States Water Co.	0.38%	0.31%	0.35%	1.75224	7.61%	3.58%	11.19%
American Water Works Company Inc	NMF	NMF	NMF	5.76835	NMF	3.58%	NMF
Aqua America Inc	0.45%	0.23%	0.34%	2.27726	9.70%	3.58%	13.28%
California Water Service Group	0.32%	0.28%	0.30%	1.94189	7.22%	3.58%	10.80%
Connecticut Water Service Inc	0.29%	0.25%	0.27%	1.94197	6.48%	3.58%	10.06%
Middlesex Water Co.	0.29%	0.37%	0.33%	2.03529	8.36%	3.58%	11.94%
SJW Corp	0.42%	0.40%	0.41%	1.57789	8.05%	3.58%	11.63%
York Water Co.	0.46%	0.41%	0.44%	2.12297	11.80%	3.58%	NMF
						Average	11.48%
						Median	11.41%
						Average of Mean and Median	11.45%

NMF = Not Meaningful Figure

Notes:
(1) The Predictive Risk Premium Model uses historical data to generate a predicted variance and a GARCH coefficient. The historical data used are the equity risk premiums for the first available trading month as reported by Bloomberg Professional Service.
(2) $(1+(\text{Column [3]} * \text{Column [4]})^{12}) - 1$.
(3) From note 2 on page 2 of Schedule DWD-5.
(4) Column [5] + Column [6].

Exhibit No. ___
Schedule DWD-4
Page 3 of 12

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

Line No.		Proxy Group of Eight Water Companies	
1.	Prospective Yield on Aaa Rated Corporate Bonds (1)	4.61	%
2.	Adjustment to Reflect Yield Spread Between Aaa Rated Corporate Bonds and A Rated Public Utility Bonds	0.25	(2)
3.	Adjusted Prospective Yield on A Rated Public Utility Bonds	4.86	%
4.	Adjustment to Reflect Bond Rating Difference of Proxy Group	0.06	(3)
5.	Adjusted Prospective Bond Yield	4.92	%
6.	Equity Risk Premium (4)	5.01	
7.	Risk Premium Derived Common Equity Cost Rate	9.93	%

Notes:
(1) Consensus forecast of Moody's Aaa Rated Corporate bonds from Blue Chip Financial Forecasts (see pages 10-11 of this Schedule).
(2) The average yield spread of A rated public utility bonds over Aaa rated corporate bonds of 0.25% from page 4 of this Schedule.
(3) Adjustment to reflect the A2 / A3 Moody's LT issuer rating of the proxy group of eight water companies as shown on page 5 of this Schedule. The 0.06% upward adjustment is derived by taking 1/6 of the spread between A2 and A3 Public Utility Bonds (1/6 * 0.37% = 0.06%) as derived from page 4 of this Schedule.
(4) From page 7 of this Schedule.

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

Selected Bond Yields

	[1]	[2]	[3]
	Aaa Rated Corporate Bond	A Rated Public Utility Bond	Baa Rated Public Utility Bond
Sep-2017	3.63 %	3.86 %	4.23 %
Aug-2017	3.63	3.86	4.23
Jul-2017	3.70	3.99	4.36
Average	3.65 %	3.90 %	4.27 %

Selected Bond Spreads

A Rated Public Utility Bonds Over Aaa Rated Corporate Bonds:
0.25 % (1)

Baa Rated Public Utility Bonds Over A Rated Public Utility Bonds:
0.37 % (2)

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

Source of Information:
Bloomberg Professional Service

Exhibit No. ___
Schedule DWD-4
Page 5 of 12

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

	Moody's Long-Term Issuer Rating October 2017		Standard & Poor's Long-Term Issuer Rating October 2017	
Proxy Group of Eight Water Companies	Long-Term Issuer Rating	Numerical Weighting(1)	Long-Term Issuer Rating	Numerical Weighting(1)
American States Water Co. (2)	A2	6.0	A+	5.0
American Water Works Company Inc (3)	A3	7.0	A	6.0
Aqua America Inc (4)	NR	- -	A+	5.0
California Water Service Group (5)	NR	- -	A+	5.0
Connecticut Water Service Inc (6)	NR	- -	A	6.0
Middlesex Water Co.	NR	- -	A	6.0
SJW Corp (7)	NR	- -	A	6.0
York Water Co.	NR	- -	A-	7.0
Average	A2/A3	6.5	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 and Pennsylvania American Water Companies.
(4) Ratings that of Aqua Pennsylvania, Inc.
(5) Ratings that of California Water Service Company.
(6) Ratings that of Connecticut Water Company.
(7) Ratings that of San Jose Water Company.

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

Exhibit No.
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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-

Exhibit No.
Schedule DWD-4
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Carolina Water Service, Inc. of South Carolina
Judgment of Equity Risk Premium for
Proxy Group of Eight Water Companies

Line No.		Proxy Group of Eight Water Companies
1.	Calculated equity risk premium based on the total market using the beta approach (1)	5.87 %
2.	Mean equity risk premium based on a study using the holding period returns of public utilities with A rated bonds (2)	4.15
3.	Average equity risk premium	5.01 %

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

Exhibit No.
Schedule DWD-4
Page 8 of 32

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

Line No.	Equity Risk Premium Measure	Proxy Group of Eight Water Companies
	Ibbotson-Based Equity Risk Premiums:	
1.	Ibbotson Equity Risk Premium (1)	5.56 %
2.	Regression on Ibbotson Risk Premium Data (2)	7.37
3.	Ibbotson Equity Risk Premium based on PRPM (3)	5.91
4.	Average Ibbotson Equity Risk Premium	6.28
	Value Line-Based Equity Risk Premiums:	
5.	Equity Risk Premium Based on Value Line Summary and Index (4)	4.84
6.	Equity Risk Premium Based on Value Line S&P 500 Companies (5)	9.69
7.	Average Value Line Equity Risk Premium	7.26
	Bloomberg-Based Equity Risk Premium:	
8.	Equity Risk Premium Based on Bloomberg S&P 500 Companies (6)	9.31
9.	Conclusion of Equity Risk Premium (7)	7.62 %
10.	Adjusted Beta (8)	0.77
11.	Forecasted Equity Risk Premium	5.87 %

Notes provided on page 9 of this Schedule.

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

Notes:

(1) Based on the arithmetic mean historical monthly returns on large company common stocks from Ibbotson® SBBI® 2017 Market Report minus the arithmetic mean monthly yield of Moody's average Aaa and Aa corporate bonds from 1926-2016.

(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 Aa rated corporate bond yields from 1928-2016 referenced in Note 1 above.

(3) The Predictive Risk Premium Model (PRPM) is discussed in the accompanying direct testimony. The Ibbotson equity risk premium based on the PRPM is derived by applying the PRPM to the monthly risk premiums between Ibbotson large company common stock monthly returns and average Aaa and Aa corporate monthly bond yields, from January 1928 through September 2017.

(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 4.61% (from page 3 of this Schedule) from the projected 3-5 year total annual market return of 9.45% (described fully in note 1 on page 2 of Schedule DWD-5).

(5) Using data from Value Line for the S&P 500, an expected total return of 14.30% 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 4.61% results in an expected equity risk premium of 9.69%.

(6) Using data from the Bloomberg Professional Service for the S&P 500, an expected total return of 13.92% 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 4.61% results in an expected equity risk premium of 9.31%.

(7) Average of lines 4, 7, and 8.

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

Sources of Information:

Stocks, Bonds, Bills, and Inflation - 2017 SBBI Yearbook, John Wiley & Sons, Inc.
Industrial Manual and Mergent Bond Record Monthly Update.
Value Line Summary and Index
Blue Chip Financial Forecasts, October 1, 2017 and June 1, 2017
Bloomberg Professional Service

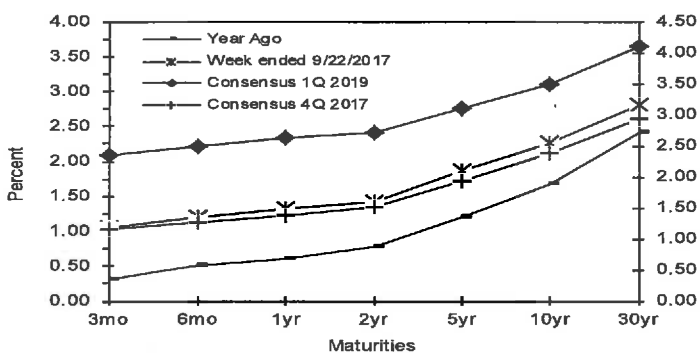
Consensus Forecasts Of U.S. Interest Rates And Key Assumptions[1]

	History								Consensus Forecasts-Quarterly Avg.					
	Average For Week Ending				Average For Month			Latest Qtr						
Interest Rates	Sep. 22	Sep. 15	Sep. 8	Sep. 1	Aug	Jul	Jun	3Q 2017*	4Q 2017	1Q 2018	2Q 2018	3Q 2018	4Q 2018	1Q 2019
Federal Funds Rate	1.16	1.16	1.15	1.16	1.16	1.15	1.03	1.16	1.2	1.4	1.6	1.8	2.0	2.2
Prime Rate	4.25	4.25	4.25	4.25	4.25	4.25	4.13	4.25	4.3	4.5	4.7	4.9	5.1	5.2
LIBOR, 3-mo.	1.33	1.32	1.32	1.32	1.31	1.31	1.26	1.32	1.4	1.6	1.8	2.0	2.2	2.4
Commercial Paper, 1-mo.	1.11	1.11	1.10	1.11	1.10	1.10	1.00	1.11	1.2	1.4	1.6	1.8	2.0	2.2
Treasury bill, 3-mo.	1.04	1.04	1.05	1.04	1.04	1.09	1.00	1.04	1.2	1.4	1.5	1.7	1.9	2.1
Treasury bill, 6-mo.	1.19	1.16	1.15	1.11	1.13	1.13	1.11	1.17	1.3	1.5	1.7	1.9	2.1	2.2
Treasury bill, 1 yr.	1.31	1.27	1.23	1.23	1.23	1.23	1.20	1.27	1.4	1.6	1.8	2.0	2.2	2.3
Treasury note, 2 yr.	1.43	1.35	1.29	1.33	1.34	1.38	1.33	1.36	1.5	1.7	1.9	2.1	2.3	2.4
Treasury note, 5 yr.	1.87	1.77	1.65	1.72	1.79	1.88	1.77	1.76	1.9	2.1	2.3	2.5	2.6	2.8
Treasury note, 10 yr.	2.26	2.18	2.07	2.14	2.23	2.32	2.19	2.17	2.4	2.5	2.7	2.8	3.0	3.1
Treasury note, 30 yr.	2.81	2.77	2.69	2.75	2.81	2.89	2.81	2.76	2.9	3.1	3.3	3.4	3.5	3.6
Corporate Aaa bond	3.77	3.76	3.70	3.72	3.76	3.81	3.81	3.74	3.9	4.1	4.3	4.4	4.6	4.7
Corporate Baa bond	4.33	4.34	4.3	4.31	4.34	4.39	4.39	4.32	4.5	4.8	5.0	5.1	5.3	5.5
State & Local bonds	3.32	3.31	3.29	3.30	3.35	3.43	3.37	3.31	3.6	3.8	4.0	4.1	4.2	4.3
Home mortgage rate	3.83	3.78	3.78	3.82	3.88	3.97	3.90	3.80	4.0	4.2	4.4	4.5	4.7	4.8

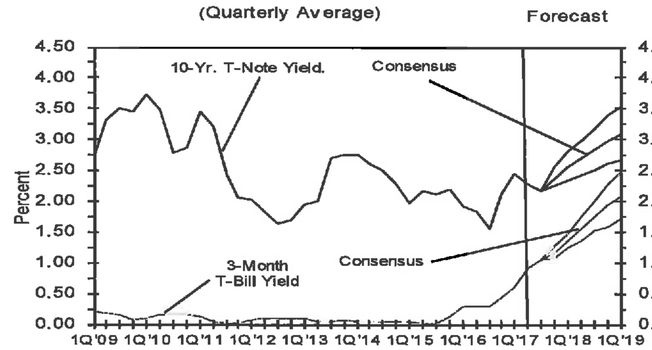
	History								Consensus Forecasts-Quarterly					
Key Assumptions	4Q 2015	1Q 2016	2Q 2016	3Q 2016	4Q 2016	1Q 2017	2Q 2017	3Q 2017*	4Q 2017	1Q 2018	2Q 2018	3Q 2018	4Q 2018	1Q 2019
Major Currency Index	93.1	93.3	89.6	90.3	93.7	94.4	93.0	88.3	88.4	88.9	89.1	89.1	89.2	88.6
Real GDP	0.5	0.6	2.2	2.8	1.8	1.2	3.1	2.2	2.6	2.3	2.4	2.3	2.2	2.1
GDP Price Index	0.8	0.3	2.4	1.4	2.0	2.0	1.0	1.7	2.0	1.9	1.9	2.1	2.1	2.2
Consumer Price Index	0.4	0.1	2.3	1.8	3.0	3.1	-0.3	1.9	2.4	2.0	2.0	2.2	2.3	2.3

Forecasts for interest rates and the Federal Reserve's Major Currency Index represent averages for the quarter. Forecasts for Real GDP, GDP Price Index and Consumer Price Index are seasonally-adjusted annual rates of change (saar). Individual panel members' forecasts are on pages 4 through 9. Historical data: Treasury rates from the Federal Reserve Board's H.15; AAA-AA and A-BBB corporate bond yields from Bank of America-Merrill Lynch and are 15+ years, yield to maturity; State and local bond yields from Bank of America-Merrill Lynch, A-rated, yield to maturity; Mortgage rates from Freddie Mac, 30-year, fixed; LIBOR quotes from Intercontinental Exchange. All interest rate data is sourced from Haver Analytics. Historical data for Fed's Major Currency Index is from FRSR H.10. Historical data for Real GDP and GDP Chained Price Index are from the Bureau of Economic Analysis (BEA). Consumer Price Index (CPI) history is from the Department of Labor's Bureau of Labor Statistics (BLS). [1]*Interest rate data for 3Q 2017 based on historical data through the week ended September 22nd. *Data for 3Q 2017 Major Currency Index is based on data through week ended September 22nd. Figures for 3Q 2017 Real GDP, GDP Chained Price Index and Consumer Price Index are consensus forecasts based on a special question asked of the panelists' this month.*

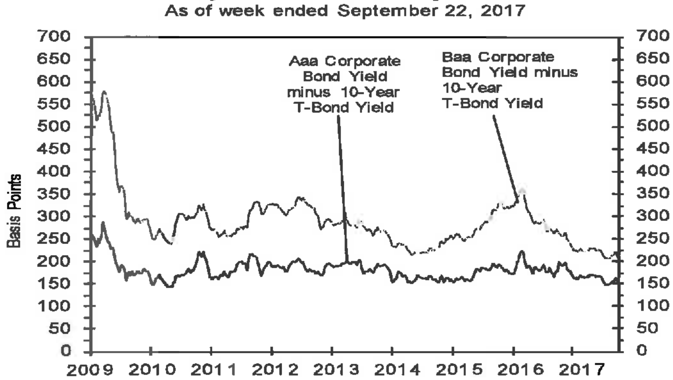
U.S. Treasury Yield Curve
Week ended September 22, 2017 and Year Ago vs. 4Q 2017 and 1Q 2019 Consensus Forecasts



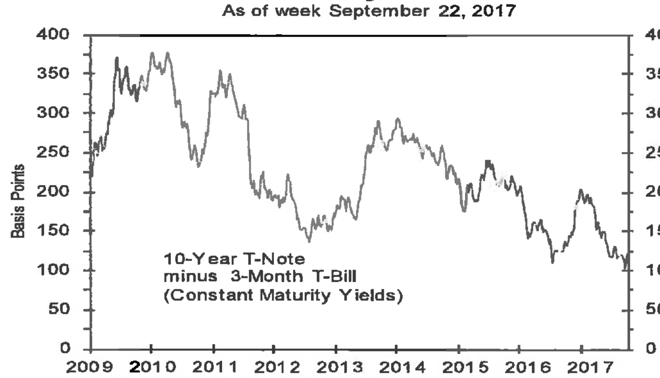
U.S. 3-Mo. T-Bills & 10-Yr. T-Note Yield
(Quarterly Average)



Corporate Bond Spreads
As of week ended September 22, 2017



U.S. Treasury Yield Curve
As of week September 22, 2017



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 2019 through 2023 and averages for the five-year periods 2019-2023 and 2024-2028. 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	
Interest Rates		**2019**	**2020**	**2021**	**2022**	**2023**	**2019-2023**	**2024-2028**
1. Federal Funds Rate	**CONSENSUS**	**2.6**	**2.9**	**2.9**	**2.9**	**2.9**	**2.8**	**3.0**
	Top 10 Average	3.1	3.5	3.4	3.5	3.5	3.4	3.5
	Bottom 10 Average	2.0	2.3	2.3	2.3	2.4	2.3	2.4
2. Prime Rate	**CONSENSUS**	**5.6**	**5.9**	**5.9**	**5.9**	**5.9**	**5.8**	**6.0**
	Top 10 Average	6.1	6.5	6.5	6.5	6.5	6.4	6.5
	Bottom 10 Average	5.0	5.3	5.3	5.2	5.3	5.2	5.4
3. LIBOR, 3-Mo.	**CONSENSUS**	**2.9**	**3.1**	**3.2**	**3.1**	**3.2**	**3.1**	**3.2**
	Top 10 Average	3.4	3.7	3.7	3.7	3.8	3.7	3.8
	Bottom 10 Average	2.4	2.6	2.6	2.5	2.6	2.5	2.6
4. Commercial Paper, 1-Mo.	**CONSENSUS**	**2.7**	**3.0**	**3.0**	**3.0**	**3.1**	**3.0**	**3.1**
	Top 10 Average	3.2	3.5	3.5	3.6	3.6	3.5	3.6
	Bottom 10 Average	2.2	2.5	2.5	2.4	2.5	2.4	2.6
5. Treasury Bill Yield, 3-Mo.	**CONSENSUS**	**2.5**	**2.8**	**2.8**	**2.8**	**2.9**	**2.8**	**2.9**
	Top 10 Average	3.1	3.4	3.4	3.4	3.5	3.3	3.5
	Bottom 10 Average	1.9	2.2	2.3	2.2	2.3	2.2	2.3
6. Treasury Bill Yield, 6-Mo.	**CONSENSUS**	**2.6**	**2.9**	**3.0**	**3.0**	**3.0**	**2.9**	**3.0**
	Top 10 Average	3.2	3.6	3.5	3.6	3.6	3.5	3.6
	Bottom 10 Average	2.0	2.4	2.4	2.4	2.4	2.3	2.4
7. Treasury Bill Yield, 1-Yr.	**CONSENSUS**	**2.8**	**3.1**	**3.1**	**3.1**	**3.1**	**3.0**	**3.2**
	Top 10 Average	3.4	3.7	3.7	3.7	3.7	3.6	3.7
	Bottom 10 Average	2.1	2.5	2.5	2.5	2.5	2.4	2.5
8. Treasury Note Yield, 2-Yr.	**CONSENSUS**	**2.9**	**3.2**	**3.3**	**3.3**	**3.3**	**3.2**	**3.3**
	Top 10 Average	3.5	3.9	3.9	3.9	3.9	3.8	4.0
	Bottom 10 Average	2.3	2.6	2.7	2.6	2.6	2.6	2.7
10. Treasury Note Yield, 5-Yr.	**CONSENSUS**	**3.3**	**3.5**	**3.5**	**3.6**	**3.6**	**3.5**	**3.6**
	Top 10 Average	3.9	4.2	4.2	4.2	4.2	4.1	4.3
	Bottom 10 Average	2.7	2.9	2.9	3.0	3.0	2.9	3.0
11. Treasury Note Yield, 10-Yr.	**CONSENSUS**	**3.6**	**3.8**	**3.8**	**3.9**	**3.9**	**3.8**	**3.9**
	Top 10 Average	4.2	4.5	4.4	4.5	4.5	4.4	4.6
	Bottom 10 Average	2.9	3.1	3.1	3.2	3.3	3.1	3.3
12. Treasury Bond Yield, 30-Yr.	**CONSENSUS**	**4.2**	**4.3**	**4.4**	**4.4**	**4.4**	**4.3**	**4.5**
	Top 10 Average	4.9	5.0	5.0	5.0	5.0	5.0	5.1
	Bottom 10 Average	3.5	3.7	3.7	3.8	3.8	3.7	3.8
13. Corporate Aaa Bond Yield	**CONSENSUS**	**5.2**	**5.4**	**5.4**	**5.4**	**5.5**	**5.4**	**5.5**
	Top 10 Average	5.7	5.9	5.9	6.0	5.9	5.9	6.0
	Bottom 10 Average	4.7	4.9	4.9	4.9	5.0	4.9	5.1
13. Corporate Baa Bond Yield	**CONSENSUS**	**6.1**	**6.3**	**6.3**	**6.3**	**6.3**	**6.3**	**6.4**
	Top 10 Average	6.8	7.0	6.9	7.0	6.9	6.9	7.0
	Bottom 10 Average	5.5	5.6	5.7	5.6	5.8	5.6	5.7
14. State & Local Bonds Yield	**CONSENSUS**	**4.6**	**4.7**	**4.7**	**4.7**	**4.7**	**4.7**	**4.8**
	Top 10 Average	5.1	5.3	5.2	5.3	5.3	5.2	5.3
	Bottom 10 Average	4.2	4.2	4.2	4.1	4.1	4.2	4.2
15. Home Mortgage Rate	**CONSENSUS**	**5.3**	**5.5**	**5.5**	**5.5**	**5.5**	**5.4**	**5.6**
	Top 10 Average	5.9	6.2	6.1	6.2	6.1	6.1	6.2
	Bottom 10 Average	4.6	4.8	4.8	4.7	4.9	4.8	4.9
A. FRB - Major Currency Index	**CONSENSUS**	**93.8**	**93.2**	**93.1**	**93.0**	**92.7**	**93.2**	**92.5**
	Top 10 Average	96.5	96.6	96.9	97.1	97.2	96.9	97.1
	Bottom 10 Average	91.0	89.7	89.2	88.7	88.1	89.3	88.1

		Year-Over-Year, % Change					Five-Year Averages	
		2019	**2020**	**2021**	**2022**	**2023**	**2019-2023**	**2024-2028**
B. Real GDP	**CONSENSUS**	**2.2**	**2.0**	**2.0**	**2.0**	**2.0**	**2.0**	**2.1**
	Top 10 Average	2.6	2.4	2.4	2.4	2.3	2.4	2.3
	Bottom 10 Average	1.7	1.6	1.6	1.6	1.6	1.6	1.8
C. GDP Chained Price Index	**CONSENSUS**	**2.2**	**2.1**	**2.1**	**2.0**	**2.0**	**2.1**	**2.0**
	Top 10 Average	2.5	2.3	2.3	2.2	2.2	2.3	2.3
	Bottom 10 Average	1.9	1.9	1.9	1.9	1.7	1.8	1.9
D. Consumer Price Index	**CONSENSUS**	**2.3**	**2.3**	**2.3**	**2.3**	**2.2**	**2.2**	**2.2**
	Top 10 Average	2.6	2.6	2.5	2.5	2.4	2.5	2.4
	Bottom 10 Average	1.9	2.0	2.0	2.1	1.8	2.0	2.0

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

Line No.		Implied Equity Risk Premium
	Equity Risk Premium based on S&P Utility Index Holding Period Returns (1):	
1.	Historical Equity Risk Premium	3.96 %
2.	Regression of Historical Equity Risk Premium (2)	5.59
3.	Forecasted Equity Risk Premium Based on PRPM (3)	3.96
4.	Average Equity Risk Premium Using S&P Holding Period Returns	4.50 %
	Equity Risk Premium based on Projected Market Appreciation of the S&P Utility Index	
5.	Forecasted Equity Risk Premium based on Projected Total Return on the S&P Utilities Index (Value Line Data) (4)	4.20
6.	Forecasted Equity Risk Premium based on Projected Total Return on the S&P Utilities Index (Bloomberg Data) (5)	3.74
7.	Average Equity Risk Premium (6)	4.15 %

Notes:
(1) Based on S&P Public Utility Index monthly total returns and Moody's Public Utility Bond average monthly yields from 1928-2016. 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 A rated public utility bond yields from 1928 - 2016 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 A rated public utility bonds from January 1928 - September 2017.

(4) Using data from Value Line for the S&P Utilities Index, an expected return of 9.06% was derived based on expected dividend yields and long-term growth estimates as a proxy for market appreciation. Subtracting the expected A rated public utility bond yield of 4.86%, calculated on line 3 of page 3 of this Schedule results in an equity risk premium of 4.20%. (9.06% - 4.86% = 4.20%)

(5) Using data from Bloomberg Professional Service for the S&P Utilities Index, an expected return of 8.60% was derived based on expected dividend yields and long-term growth estimates as a proxy for market appreciation. Subtracting the expected A rated public utility bond yield of 4.86%, calculated on line 3 of page 3 of this Schedule results in an equity risk premium of 3.74%. (8.60% - 4.86% = 3.74%)

(6) Average of lines 4 through 6.

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

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Proxy Group of Eight Water Companies	Value Line Adjusted Beta	Bloomberg Adjusted Beta	Average Beta	Market Risk Premium (1)	Risk-Free Rate (2)	Traditional CAPM Cost Rate	ECAPM Cost Rate	Indicated Common Equity Cost Rate (3)
American States Water Co.	0.80	0.74	0.77	8.67 %	3.58 %	10.25 %	10.75 %	10.50 %
American Water Works Company Inc	0.65	0.57	0.61	8.67	3.58	8.87	9.71	9.29
Aqua America Inc	0.70	0.61	0.66	8.67	3.58	9.30	10.04	9.67
California Water Service Group	0.80	0.78	0.79	8.67	3.58	10.43	10.88	10.65
Connecticut Water Service Inc	0.65	0.69	0.67	8.67	3.58	9.39	10.10	9.74
Middlesex Water Co.	0.80	0.97	0.89	8.67	3.58	11.29	11.53	11.41
SJW Corp	0.75	0.84	0.80	8.67	3.58	10.51	10.95	10.73
York Water Co.	0.80	0.98	0.89	8.67	3.58	11.29	11.53	11.41
Mean			0.76			10.17 %	10.69 %	10.43 %
Median			0.78			10.34 %	10.82 %	10.58 %
Average of Mean and Median			0.77			10.26	10.76	10.51 %

Notes on page 2 of this Schedule.

Carolina Water Service, Inc. of South Carolina
Notes to Accompany the Application of the CAPM and ECAPM

Notes:

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

Historical Data MRP Estimates:

Measure 1: Ibbotson Arithmetic Mean MRP (1926-2016)

Arithmetic Mean Monthly Returns for Large Stocks 1926-2016:	11.97	%
Arithmetic Mean Income Returns on Long-Term Government Bonds:	5.17	
MRP based on Ibbotson Historical Data:	6.80	%

Measure 2: Application of a Regression Analysis to Ibbotson Historical Data (1926-2016)	8.60	%
Measure 3: Application of the PRPM to Ibbotson Historical Data: (January 1926 - September 2017)	6.69	%
Average Historical Data MRP	7.36	%

Value Line MRP Estimates:

Measure 4: Value Line Projected MRP (Thirteen weeks ending October 13, 2017)

Total projected return on the market 3-5 years hence*:	9.45	%
Projected Risk-Free Rate (see note 2):	3.58	
MRP based on Value Line Summary & Index:	5.87	%

*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:	14.30	%
Projected Risk-Free Rate (see note 2):	3.58	
MRP based on Value Line data	10.72	%
Average Value Line MRP:	8.29	%

Measure 6: Bloomberg Projected MRP

Total return on the Market based on the S&P 500:	13.92	%
Projected Risk-Free Rate (see note 2):	3.58	
MRP based on Bloomberg data	10.34	%
Average of Value Line, Ibbotson, and Bloomberg MRP:	8.67	%

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

Fourth Quarter 2017	2.90	%
First Quarter 2018	3.10	
Second Quarter 2018	3.30	
Third Quarter 2018	3.40	
Fourth Quarter 2018	3.50	
First Quarter 2019	3.60	
2019-2023	4.30	
2024-2028	4.50	
	3.58	%

(3) Average of Column 6 and Column 7.

Sources of Information:

Value Line Summary and Index
Blue Chip Financial Forecasts, October 1, 2017 and June 1, 2017
Stocks, Bonds, Bills, and Inflation - 2017 SBBI Yearbook, John Wiley & Sons, Inc.
Bloomberg Professional Services

Carolina Water Service, Inc. of South Carolina
Basis of Selection of the Group of Non-Price Regulated Companies
Comparable in Total Risk to the Utility Proxy Group

The criteria for selection of the proxy group of twenty-eight non-price regulated companies was that the non-price regulated companies be domestic and reported in Value Line Investment Survey (Standard Edition).

The proxy group of twenty-eight non-price regulated companies were then selected based on the unadjusted beta range of 0.37 – 0.77 and residual standard error of the regression range of 2.4240 – 2.8912 of the water proxy group.

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

The standard deviation of the water industry's residual standard error of the regression is 0.0860. 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

$$\text{Thus, } 0.1168 = \frac{2.6576}{\sqrt{518}} = \frac{2.6576}{22.7596}$$

Source of Information: Value Line, Inc., September 2017
Value Line Investment Survey (Standard Edition)

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

	[1]	[2]	[3]	[4]
Proxy Group of Eight Water Companies	Value Line Adjusted Beta	Unadjusted Beta	Residual Standard Error of the Regression	Standard Deviation of Beta
American States Water Co.	0.80	0.62	2.7883	0.1032
American Water Works Company Inc	0.65	0.41	1.9968	0.0739
Aqua America Inc	0.70	0.54	2.1879	0.0810
California Water Service Group	0.80	0.63	2.6120	0.0967
Connecticut Water Service Inc	0.65	0.46	2.4195	0.0895
Middlesex Water Co.	0.80	0.64	2.9923	0.1107
SJW Corp	0.75	0.56	3.0548	0.1131
York Water Co.	0.80	0.68	3.2092	0.1188
Average	0.74	0.57	2.6576	0.0984
Beta Range (+/- 2 std. Devs. of Beta)	0.37	0.77		
2 std. Devs. of Beta	0.20			
Residual Std. Err. Range (+/- 2 std. Devs. of the Residual Std. Err.)	2.4240	2.8912		
Std. dev. of the Res. Std. Err.	0.1168			
2 std. devs. of the Res. Std. Err.	0.2336			

Source of Information: Valueline Proprietary Database, September 2017

Exhibit No.
Schedule DWD-6
Page 3

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

Proxy Group of Twenty-Eight Non-Price Regulated Companies	[1] VL Adjusted Beta	[2] Unadjusted Beta	[3] Residual Standard Error of the Regression	[4] Standard Deviation of Beta
AmerisourceBergen	0.85	0.75	2.5531	0.0945
ARAMARK Holdings	0.85	0.77	2.4453	0.1022
AutoZone Inc.	0.80	0.64	2.4990	0.0925
Bright Horizons Fami	0.85	0.70	2.4558	0.0942
Cheesecake Factory	0.75	0.58	2.6263	0.0972
CBOE Holdings	0.70	0.50	2.5399	0.0940
Chemed Corp.	0.80	0.68	2.8556	0.1057
C.H. Robinson	0.85	0.70	2.6811	0.0992
CME Group	0.80	0.62	2.4557	0.0909
DineEquity Inc.	0.80	0.67	2.7737	0.1026
Dunkin' Brands Group	0.65	0.45	2.7843	0.1030
Darden Restaurants	0.85	0.76	2.7543	0.1019
Forrester Research	0.70	0.47	2.6503	0.0981
Hormel Foods	0.75	0.57	2.4428	0.0904
Lilly (Eli)	0.75	0.59	2.5230	0.0934
Mercury General	0.80	0.64	2.4716	0.0915
Vail Resorts	0.85	0.72	2.6041	0.0964
NVR, Inc.	0.85	0.70	2.4253	0.0898
Pinnacle Foods	0.80	0.68	2.5721	0.0998
Quintiles IMS Hldgs.	0.85	0.77	2.6073	0.1016
Regal Entertainment	0.85	0.75	2.7024	0.1000
Six Flags Entertainm	0.85	0.74	2.8322	0.1048
Spectrum Brands	0.85	0.72	2.8725	0.1063
Target Corp.	0.85	0.74	2.6959	0.0998
VeriSign Inc.	0.85	0.73	2.8219	0.1044
VWR Corp.	0.85	0.75	2.8069	0.1261
WD-40 Co.	0.85	0.70	2.4499	0.0907
West Pharmac. Svcs.	0.85	0.74	2.5450	0.0942
Average	0.81	0.67	2.6200	0.1000
Proxy Group of Eight Water Companies	0.74	0.57	2.6576	0.0984

Source of Information: Valueline Proprietary Database, September 2017

Exhibit No.
Schedule DWD-7
Page 1 of 6

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

Principal Methods	Proxy Group of Twenty-Eight Non-Price Regulated Companies
Discounted Cash Flow Model (DCF) (1)	13.57 %
Risk Premium Model (RPM) (2)	11.91
Capital Asset Pricing Model (CAPM) (3)	11.15
Mean	12.21 %
Median	11.91 %
Average of Mean and Median	12.06 %

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

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

Proxy Group of Twenty-Eight Non-Price Regulated Companies	[1] Average Dividend Yield	[2] Value Line Projected Five Year Growth in EPS	[3] Reuters Mean Consensus Projected Five Year Growth Rate in EPS	[4] Zack's Five Year Projected Growth Rate in EPS	[5] Yahoo! Finance Projected Five Year Growth in EPS	[6] Average Projected Five Year Growth Rate in EPS	[7] Adjusted Dividend Yield	[8] Indicated Common Equity Cost Rate (1)
AmerisourceBergen	1.77 %	11.00 %	8.24 %	9.30 %	8.24 %	9.20 %	1.85 %	11.05 %
ARAMARK Holdings	1.02	NA	13.96	12.00	13.96	13.31	1.09	14.40
AutoZone Inc.	-	11.50	10.11	11.60	10.11	10.83	-	NA
Bright Horizons Fami	-	19.50	17.17	20.00	17.17	18.46	-	NA
Cheesecake Factory	1.98	8.50	10.55	14.60	10.55	11.05	2.09	13.14
CBOE Holdings	1.06	13.00	NA	17.40	18.28	16.23	1.15	17.38
Chemed Corp.	0.57	13.50	NA	10.00	10.00	11.17	0.60	11.77
C.H. Robinson	2.55	6.00	6.30	8.80	6.31	6.85	2.64	9.49
CME Group	2.05	8.50	8.65	10.60	8.65	9.10	2.14	11.24
DineEquity Inc.	9.49	5.00	3.90	NA	3.90	4.27	9.69	13.96
Dunkin' Brands Group	2.43	10.00	10.51	13.40	10.51	11.11	2.56	13.67
Darden Restaurants	3.06	11.00	11.60	10.30	11.60	11.13	3.23	14.36
Forrester Research	1.86	10.00	12.00	12.00	12.00	11.50	1.97	13.47
Hormel Foods	2.09	10.50	1.62	9.30	1.62	5.76	2.15	7.91
Lilly (Eli)	2.52	11.00	11.40	10.30	11.41	11.03	2.66	13.69
Mercury General	4.35	14.00	26.50	26.50	26.50	23.38	4.86	28.24
Vail Resorts	1.91	20.50	17.50	NA	17.50	18.50	2.09	20.59
NVR, Inc.	-	15.00	18.70	14.90	18.70	16.83	-	NA
Pinnacle Foods	2.20	NA	10.91	9.30	10.91	10.37	2.31	12.68
Quintiles IMS Hldgs.	-	12.00	12.93	13.00	13.78	12.93	-	NA
Regal Entertainment	5.30	12.00	3.34	10.00	4.27	7.40	5.50	12.90
Six Flags Entertainm	4.53	12.00	8.00	8.00	8.00	9.00	4.73	13.73
Spectrum Brands	1.55	11.50	9.25	9.60	9.25	9.90	1.63	11.53
Target Corp.	4.33	4.50	(3.33)	4.70	(3.33)	4.60	4.43	9.03
VeriSign Inc.	-	10.50	NA	NA	8.00	9.25	-	NA
VWR Corp.	-	NA	8.99	NA	8.99	8.99	-	NA
WD-40 Co.	1.80	8.00	NA	10.00	13.00	10.33	1.89	12.22
West Pharmac. Svcs.	0.62	15.00	18.13	17.10	18.13	17.09	0.67	17.76
							Mean	13.83 %
							Median	13.31 %
							Average of Mean and Median	13.57 %

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 October 13, 2017. 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.reuters.com, www.zacks.com, and www.yahoo.com (excluding any negative growth rates) and then adding that growth rate to the adjusted dividend yield.

Source of Information: Value Line Investment Survey
www.reuters.com Downloaded on 10/13/2017
www.zacks.com Downloaded on 10/13/2017
www.yahoo.com Downloaded on 10/13/2017

Exhibit No.
Schedule DWD-7
Page 6

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

Line No.		Proxy Group of Twenty-Eight Non-Price Regulated Companies
1.	Prospective Yield on Baa Rated Corporate Bonds (1)	5.36 %
2.	Equity Risk Premium (2)	6.55
3.	Risk Premium Derived Common Equity Cost Rate	11.91 %

Notes: (1) Average forecast of Baa corporate bonds based upon the consensus of nearly 50 economists reported in Blue Chip Financial Forecasts dated October 1, 2017 and June 1, 2017 (see pages 10 and 11 of Schedule DWD-4). The estimates are detailed below.

Fourth Quarter 2017	4.50 %
First Quarter 2018	4.80
Second Quarter 2018	5.00
Third Quarter 2018	5.10
Fourth Quarter 2018	5.30
First Quarter 2019	5.50
2019-2023	6.30
2024-2028	6.40
Average	5.36 %

(2) From page 5 of this Schedule.

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

	Moody's Long-Term Issuer Rating October 2017		Standard & Poor's Long-Term Issuer Rating October 2017	
Proxy Group of Twenty-Eight Non-Price Regulated Companies	Long-Term Issuer Rating	Numerical Weighting (1)	Long-Term Issuer Rating	Numerical Weighting (1)
AmerisourceBergen	Baa2	9.0	A-	7.0
ARAMARK Holdings	NR	--	BB+	11.0
AutoZone Inc.	Baa1	8.0	BBB	9.0
Bright Horizons Fami	NR	--	NR	--
Cheesecake Factory	NR	--	NR	--
CBOE Holdings	Baa1	8.0	BBB+	8.0
Chemed Corp.	NR	--	NR	--
C.H. Robinson	NR	--	NR	--
CME Group	Aa3	4.0	AA-	4.0
DineEquity Inc.	NR	--	NR	--
Dunkin' Brands Group	NR	--	NR	--
Darden Restaurants	Baa3	10.0	BBB	9.0
Forrester Research	NR	--	NR	--
Hormel Foods	A1	5.0	A	6.0
Lilly (Eli)	A2	6.0	AA-	4.0
Mercury General	Baa2	9.0	NR	--
Vail Resorts	NR	--	NR	--
NVR, Inc.	Baa2	9.0	BBB+	8.0
Pinnacle Foods	NR	--	BB-	13.0
Quintiles IMS Hldgs.	NR	--	BBB-	10.0
Regal Entertainment	B3	16.0	BB-	13.0
Six Flags Entertainm	B2	15.0	BB	12.0
Spectrum Brands	NR	--	NR	--
Target Corp.	A2	6.0	A	6.0
VeriSign Inc.	Ba1	11.0	BB+	11.0
VWR Corp.	NR	--	BB-	13.0
WD-40 Co.	NR	--	NR	--
West Pharmac. Svcs.	NR	--	NR	--
Average	Baa2	8.9	BBB	9.0

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

Source of Information:
Bloomberg Professional Services

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

Line No.	Equity Risk Premium Measure	Proxy Group of Twenty-Eight Non-Price Regulated Companies
	Ibbotson-Based Equity Risk Premiums:	
1.	Ibbotson Equity Risk Premium (1)	5.56 %
2.	Regression on Ibbotson Risk Premium Data (2)	7.37
3.	Ibbotson Equity Risk Premium based on PRPM (3)	5.91
4.	Average Ibbotson Equity Risk Premium	6.28
	Value Line-Based Equity Risk Premiums:	
5.	Equity Risk Premium Based on Value Line Summary and Index (4)	4.84
6.	Equity Risk Premium Based on Value Line S&P 500 Companies (5)	9.69
7.	Average Value Line Equity Risk Premium	7.26
	Bloomberg-Based Equity Risk Premium:	
8.	Equity Risk Premium Based on Bloomberg S&P 500 Companies (6)	9.31
9.	Conclusion of Equity Risk Premium (7)	7.62 %
10.	Adjusted Beta (8)	0.86
11.	Forecasted Equity Risk Premium	6.55 %

Notes:
(1) From note 1 of page 9 of Schedule DWD-4.
(2) From note 2 of page 9 of Schedule DWD-4.
(3) From note 3 of page 9 of Schedule DWD-4.
(4) From note 4 of page 9 of Schedule DWD-4.
(5) From note 5 of page 9 of Schedule DWD-4.
(6) From note 6 of page 9 of Schedule DWD-4.
(7) Average of lines 4, 7, and 8.
(8) Average of mean and median beta from page 6 of this Schedule.

Sources of Information:
Stocks, Bonds, Bills, and Inflation - 2017 SBBI Yearbook, John Wiley & Sons, Inc.
Value Line Summary and Index
Blue Chip Financial Forecasts, October 1, 2017 and June 1, 2017
Bloomberg Professional Services

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

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Proxy Group of Twenty-Eight 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	0.96	0.91	8.67 %	3.58 %	11.47 %	11.66 %	11.56 %
ARAMARK Holdings	0.85	0.87	0.86	8.67	3.58	11.03	11.34	11.18
AutoZone Inc.	0.75	0.85	0.80	8.67	3.58	10.51	10.95	10.73
Bright Horizons Fami	0.85	1.09	0.97	8.67	3.58	11.99	12.05	12.02
Cheesecake Factory	0.75	0.91	0.83	8.67	3.58	10.77	11.14	10.96
CBOE Holdings	0.70	0.82	0.76	8.67	3.58	10.17	10.69	10.43
Chemed Corp.	0.80	1.07	0.94	8.67	3.58	11.73	11.86	11.79
C.H. Robinson	0.85	0.66	0.75	8.67	3.58	10.08	10.62	10.35
CME Group	0.80	0.94	0.87	8.67	3.58	11.12	11.40	11.26
DineEquity Inc.	0.80	0.79	0.80	8.67	3.58	10.51	10.95	10.73
Dunkin' Brands Group	0.65	0.88	0.77	8.67	3.58	10.25	10.75	10.50
Darden Restaurants	0.85	0.84	0.85	8.67	3.58	10.95	11.27	11.11
Forrester Research	0.70	1.11	0.91	8.67	3.58	11.47	11.66	11.56
Hormel Foods	0.75	0.55	0.65	8.67	3.58	9.21	9.97	9.59
Lilly (Eli)	0.75	0.81	0.78	8.67	3.58	10.34	10.82	10.58
Mercury General	0.80	0.92	0.86	8.67	3.58	11.03	11.34	11.18
Vail Resorts	0.85	0.90	0.88	8.67	3.58	11.21	11.47	11.34
NVR, Inc.	0.85	0.89	0.87	8.67	3.58	11.12	11.40	11.26
Pinnacle Foods	0.80	0.75	0.77	8.67	3.58	10.25	10.75	10.50
Quintiles IMS Hldgs.	0.85	0.91	0.88	3.67	3.58	11.21	11.47	11.34
Regal Entertainment	0.85	0.88	0.86	8.67	3.58	11.03	11.34	11.18
Six Flags Entertainm	0.85	0.86	0.85	8.67	3.58	10.95	11.27	11.11
Spectrum Brands	0.85	0.76	0.80	8.67	3.58	10.51	10.95	10.73
Target Corp.	0.80	0.92	0.86	8.67	3.58	11.03	11.34	11.18
VeriSign Inc.	0.85	1.12	0.99	8.67	3.58	12.16	12.18	12.17
VWR Corp.	0.85	1.02	0.94	8.67	3.58	11.73	11.86	11.79
WD-40 Co.	0.85	0.81	0.83	8.67	3.58	10.77	11.14	10.96
West Pharmac. Svcs.	0.85	1.05	0.95	8.67	3.58	11.81	11.92	11.87
Mean			0.85			10.94 %	11.27 %	11.11 %
Median			0.86			11.03 %	11.34 %	11.19 %
Average of Mean and Median			0.86			10.99 %	11.31 %	11.15 %

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

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

		[1]		[2]	[3]	[4]
Line No.		Market Capitalization on October 13, 2017 (1)		Applicable Decile of the NYSE/AMEX/ NASDAQ (2)	Applicable Size Premium (3)	Spread from Applicable Size Premium (4)
		(millions)	(times larger)			
1.	Carolina Water Service, Inc. of South Carolina	$ 57.209		10	5.59%	
2.	Proxy Group of Eight Water Companies	$ 3,543.646	61.9 x	5	1.51%	4.08%

	[A]	[B]	[C]	[D]	[E]
	Decile	Number of Companies	Recent Total Market Capitalization (millions)	Recent Average Market Capitalization (millions)	Size Premium (Return in Excess of CAPM)
Largest	1	191	$15,290,475.30	$80,054.84	-0.35%
	2	200	$3,010,671.02	$15,053.36	0.61%
	3	202	$1,609,575.62	$7,968.20	0.89%
	4	221	$1,010,851.81	$4,573.99	0.98%
	5	227	$677,120.07	$2,982.91	1.51%
	6	259	$541,038.00	$2,088.95	1.66%
	7	283	$384,129.20	$1,357.35	1.72%
	8	361	$297,164.94	$823.17	2.08%
	9	487	$212,609.64	$436.57	2.68%
Smallest	10	790	$92,882.17	$117.57	5.59%

*From 2017 Stocks, Bonds, Bills, and Inflation (SBBI) Yearbook

Notes:
(1) From page 2 of this Schedule.
(2) Gleaned from Column (D) 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 on Column (E) on the bottom of this page.
(4) Line No. 1 Column 3 – Line No. 2 Column 3. For example, the 4.08% in Column 4, Line No. 2 is derived as follows 4.08% = 5.59% - 1.51%.

Carolina Water Service, Inc. of South Carolina
Market Capitalization of Carolina Water Service, Inc. of South Carolina and
Proxy Group of Eight Water Companies

Company	Exchange	[1] Common Stock Shares Outstanding at Fiscal Year End 2016 (millions)	[2] Book Value per Share at Fiscal Year End 2016 (1)	[3] Total Common Equity at Fiscal Year End 2016 (millions)	[4] Closing Stock Market Price on October 13, 2017	[5] Market-to-Book Ratio on October 13, 2017 (2)	[6] Market Capitalization on October 13, 2017 (3) (millions)
Carolina Water Service, Inc. of South Carolina		NA	NA	$ 17.352 (4)	NA		
Based upon Proxy Group of Eight Water Companies						329.7 (5)	$ 57.209 (6)
Proxy Group of Eight Water Companies							
American States Water Co.	NYSE	36.571	$ 13.516	$ 494.297	$ 52.810	390.7 %	$ 1,931.334
American Water Works Company Inc	NYSE	178.097	29.299	5,218.000	85.020	290.2	15,141.780
Aqua America Inc	NYSE	177.394	10.429	1,850.068	34.810	333.8	6,175.098
California Water Service Group	NYSE	47.965	13.749	659.471	41.350	300.7	1,983.349
Connecticut Water Service Inc	NASDAQ	11.248	20.983	236.028	62.170	296.3	699.317
Middlesex Water Co.	NASDAQ	16.296	13.404	218.437	43.610	325.4	710.669
SJW Corp	NYSE	20.456	20.612	421.646	60.890	295.4	1,245.580
York Water Co.	NASDAQ	12.852	8.875	114.061	35.950	405.1	462.040
Average		62.610	$ 16.358	$ 1,151.501	$ 52.076	329.7 %	$ 3,543.646

NA= Not Available

Notes: (1) Column 3 / Column 1.
(2) Column 4 / Column 2.
(3) Column 1 * Column 4.
(4) Carolina Water Services, Inc. of South Carolina's 2016 book equity from its annual report to the Commission multiplied by the requested common equity ratio.
(5) The market-to-book ratio of Carolina Water Service, Inc. of South Carolina on October 13, 2017 is assumed to be equal to the market-to-book ratio of Proxy Group of Eight Water Companies on October 13, 2017.
(6) Carolina Water Service, Inc. of South Carolina's common stock, if traded, would trade at a market-to-book ratio equal to the average market-to-book ratio at October 13, 2017 of the Proxy Group of Eight Water Companies, 329.7%, and Carolina Water Service, Inc. of South Carolina's market capitalization on October 13, 2017 would therefore have been $57.21 million.

Source of Information: 2016 Annual Forms 10K
Bloomberg Financial Services

Carolina Water Service, Inc. of South Carolina
Portfolio Ranks by Size and Risk Premiums over CAPM Results
as Compiled by Duff and Phelps 2017 Guide to Cost of Capital

	B-1		B-2		B-4		B-5		B-7		B-8	
Portfolio Rank by Size	Average Mkt. Value (in $millions)	Smoothed Premium over CAPM	Average Book Val. (in $millions)	Smoothed Premium over CAPM	MVIC (in $millions)	Smoothed Premium over CAPM	Total Assets (in $millions)	Smoothed Premium over CAPM	Sales (in $millions)	Smoothed Premium over CAPM	Average Number of Employees	Smoothed Premium over CAPM
1	$ 238,299	-1.78%	$ 67,532	0.98%	$ 277,921	-1.02%	$ 161,117	52.00%	$ 123,791	0.88%	341,434	0.43%
2	60,613	-0.16%	21,719	1.68%	77,365	0.28%	51,936	1.39%	38,382	1.75%	107,466	1.40%
3	35,630	0.47%	14,074	1.95%	46,877	0.79%	35,110	1.69%	22,044	2.17%	64,944	1.82%
4	23,756	0.95%	9,200	2.22%	32,471	1.16%	25,351	1.95%	17,114	2.35%	46,747	2.09%
5	17,471	1.32%	6,875	2.40%	24,248	1.45%	18,141	2.20%	13,286	2.54%	34,256	2.35%
6	13,871	1.59%	5,488	2.54%	18,506	1.73%	14,376	2.38%	10,376	2.73%	26,595	2.57%
7	11,594	1.80%	4,590	2.65%	15,426	1.91%	11,035	2.59%	8,400	2.88%	22,447	2.71%
8	9,463	2.04%	3,716	2.78%	13,457	2.05%	9,004	2.74%	6,977	3.02%	18,590	2.86%
9	7,822	2.27%	3,112	2.89%	10,762	2.28%	7,861	2.85%	5,938	3.14%	15,489	3.02%
10	6,482	2.49%	2,586	3.01%	8,658	2.50%	6,771	2.96%	5,106	3.25%	13,344	3.14%
11	5,637	2.66%	2,266	3.09%	7,453	2.65%	5,710	3.09%	4,435	3.36%	11,841	3.24%
12	4,791	2.85%	2,012	3.16%	6,455	2.79%	4,998	3.19%	3,740	3.48%	10,389	3.35%
13	3,915	3.09%	1,751	3.25%	5,466	2.96%	4,290	3.31%	3,184	3.60%	9,004	3.47%
14	3,329	3.28%	1,500	3.34%	4,718	3.11%	3,661	3.43%	2,771	3.71%	7,588	3.61%
15	2,897	3.45%	1,303	3.43%	4,043	3.27%	3,160	3.55%	2,509	3.78%	6,511	3.74%
16	2,508	3.62%	1,174	3.50%	3,541	3.40%	2,735	3.66%	2,276	3.85%	5,710	3.85%
17	2,130	3.81%	1,030	3.58%	3,075	3.55%	2,345	3.78%	1,980	3.96%	4,908	3.98%
18	1,842	3.99%	861	3.69%	2,587	3.72%	1,927	3.93%	1,670	4.08%	4,194	4.11%
19	1,584	4.17%	711	3.81%	2,109	3.93%	1,621	4.06%	1,412	4.21%	3,507	4.26%
20	1,313	4.39%	577	3.94%	1,696	4.15%	1,363	4.19%	1,181	4.34%	2,908	4.42%
21	1,023	4.69%	479	4.05%	1,323	4.40%	1,069	4.38%	696	4.49%	2,328	4.60%
22	731	5.08%	385	4.19%	1,014	4.67%	801	4.60%	797	4.63%	1,797	4.82%
23	532	5.46%	303	4.34%	738	4.99%	600	4.82%	589	4.86%	1,281	5.10%
24	370	5.89%	207	4.57%	513	5.36%	429	5.08%	407	5.13%	871	5.42%
25	121	7.22%	76	5.19%	163	6.52%	161	5.83%	129	5.99%	305	6.30%

	B-1 Value	Portfolio Ranking	B-2 Value	Portfolio Ranking	B-4 Value	Portfolio Ranking	B-5 Value	Portfolio Ranking	B-7 Value	Portfolio Ranking	B-8 Value	Portfolio Ranking
Proxy Group of Eight Water Companies	$ 3,383	14	$ 1,152	16	$ 4,769	14	$ 3,961	13-14	$ 723	21-22	1,417	22-23
Carolina Water Service, Inc. of South Carolina	$ 57.21	25	$ 17.35	25	$ 57.21	25	$ 79.51	25	$ 21.47	25	48	25
Indicated Risk Premium	3.94%		1.69%		3.41%		2.46%		1.43%		1.34%	

Sources of Information:
Duff & Phelps 2017 Valuation Handbook Exhibit B-1 through B-8
SNL Financial
Company Form 10-K

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Application for an increase in water and wastewater rates in Charlotte, Highlands, Lake, Lee, Marion, Orange, Pasco, Pinellas, Polk, and Seminole Counties by Utilities, Inc. of Florida
____/

Docket No. 20200139-WS

DIRECT TESTIMONY

OF

DYLAN W. D'ASCENDIS, CRRA, CVA

on behalf of

Utilities, Inc. of Florida

TABLE OF CONTENTS

I. INTRODUCTION

Q. Please state your name, profession and address.

A. My name is Dylan W. D'Ascendis. I am a Director at ScottMadden, Inc. My business address is 3000 Atrium Way, Suite 241, Mount Laurel, NJ 08054.

Q. State briefly your educational background and experience.

A. I have offered expert testimony on behalf of investor-owned utilities before 19 state regulatory commissions in the United States, one Canadian province, and one American Arbitration Association panel on rate of return issues including, but not limited to, common equity cost rate, rate of return, valuation, capital structure issues, relative investment risk, and credit quality issues.

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

I am a member of the Society of Utility and Regulatory Financial Analysts ("SURFA"). In 2011, I was awarded the professional designation "Certified Rate of Return Analyst" ("CRRA") 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 ("CVA") 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 shown in Exhibit DWD-1.

Q. On whose behalf are you presenting this testimony?

A. I am presenting this testimony and appearing on behalf of Utilities, Inc. of Florida. ("UIF" or the "Company"), the applicant for rate increase in the present docket.

Q. What is the purpose of your direct testimony?

A. The purpose is to provide testimony related to the return on investor-supplied capital, including the appropriate return on common equity ("ROE") which the Company should be afforded in order to have the opportunity to earn a fair return on its property used and useful in the public service. I am presenting testimony regarding the appropriate return on investor-supplied capital associated with UIF's operations because the Company does not believe that in this case the use of the Florida Leverage Formula (the "FL ROE Formula") accurately reflects the return on equity necessary to afford it an opportunity to earn a fair return.

Q. Are you aware of the FL ROE Formula?

A. Yes. Our firm participated in Docket No. 20190006-WS and Ms. Pauline M. Ahern, CRRA sponsored comments on behalf of UIF.

Q. What would UIF's indicated ROE be using the FL ROE Formula as specified in Order No. PSC-2019-0267-PAA-WS?

A. Given UIF's 13-month common equity ratio of 49.39%[1] in this proceeding, the indicated ROE using the FL ROE Formula would be 9.69%.[2]

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[1] Excluding customer deposits and deferred tax liabilities.
[2] ROE = 6.05% + (1.80 / Equity Ratio) → 9.69% = 6.05% + (1.80 / 49.39%).

Q. Does the 9.69% ROE produced by the FL ROE Formula reflect the cost of common equity of water utilities, specifically, UIF, at this time?

A. No. As I will demonstrate throughout this testimony, an ROE of 9.69% understates the current investor-required return for both water and wastewater utilities generally and UIF specifically.

Q. What is your recommended common equity cost rate?

A. I recommend that the FL PSC authorize the Company the opportunity to earn an overall rate of return on common equity of 11.75%. My recommended ROE applied to the 13-month average balances of investor-supplied capital[3] based on UIF's parent, CORIX Regulated Utilities, Inc.'s ("CRU-US" or the "Parent"), consisting of 45.58% long-term debt at an embedded cost rate of 5.78%, 5.03% short-term debt at an embedded cost rate of 4.04%, and 49.39% common equity results in a return on investor-supplied capital of 8.63%, shown on page 1 of Schedule 1 and Table 1 below:

Table 1: Summary of the Return on Investor-Supplied Capital

Type of Capital	Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	45.58%	5.78%	2.63%
Short-Term Debt	5.03%	4.04%	0.20%
Common Equity	49.39%	11.75%	5.80%
Total	100.00%		8.63%

Q. Have you prepared an exhibit that supports your recommended return on investor-supplied capital?

A. Yes, I am sponsoring Exhibit DWD-2 which summarizes my analysis supporting the reasonable rate of return, which in my opinion applies to UIF in this rate case. Exhibit DWD-2, containing Schedules 1 through 8, was prepared by me or my staff under my supervision and control.

[3] Includes long-term debt, short-term debt, and common equity and excludes customer deposits and accumulated deferred income taxes.

II. SUMMARY

Q. Please summarize your recommended common equity cost rate.

A. My recommended common equity cost rate of 11.75% is summarized on page 2 of Schedule 1. Because UIF's common stock is not publicly traded, a market-based common equity cost rate cannot be directly observed for the Company. Consequently, I have assessed the market-based common equity cost rates of companies with relatively similar, but not necessarily identical risk, *i.e.*, a proxy group, for insight into a recommended common equity cost rate applicable to UIF. Using companies of relatively similar risk as proxies is consistent with the principle of fair and reasonable rates of return required by the *Hope*[4] and *Bluefield*[5] decisions, adding reliability to the informed expert judgment necessary to arrive at a recommended common equity cost rate.

However, no proxy is completely identical in risk to any single entity. Accordingly, a comparison of relative risk between UIF and a proxy group of publicly traded water utilities ("Utility Proxy Group"), discussed in further detail later in this testimony, must be made to determine whether any adjustments to the Utility Proxy Group's indicated common equity cost rate are justified or necessary.

In determining my recommended common equity cost rate, I applied several well-recognized cost of common equity models (*i.e.,* Discounted Cash Flow ("DCF") Risk Premium Model ("RPM"), and Capital Asset Pricing Model ("CAPM")) to the market data of a Utility Proxy Group whose selection will also be discussed below. In addition, I applied the DCF model, RPM, and CAPM to a proxy group of non-price regulated companies comparable in total risk to the Utility Proxy Group ("Non-Price Regulated Proxy Group"). The results derived from each model are summarized as follows:

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

Table 2: Summary of Common Equity Cost Rate

	Utility Proxy Group
Discounted Cash Flow Model	9.07%
Risk Premium Model	10.91%
Capital Asset Pricing Model	10.90%
Cost of Equity Models Applied to Non-Price Regulated Proxy Group	11.48%
Indicated Common Equity Cost Rate before Adjustment	10.75%
Business Risk Adjustment	1.00%
Recommended Common Equity Cost Rate	11.75%

After reviewing the cost rates based on these models, I conclude that the indicated common equity cost rate is 10.75% before any adjustment for business risks arising from UIF's greater unique business risks relative to the Utility Proxy Group as discussed in more detail below. Thus, the indicated common equity cost rate of 10.75% based solely on the Utility Proxy Group must be adjusted upward by 1.00% to reflect UIF's increased unique business risk, as noted above. The details of this adjustment will be discussed below. After adjustment, my recommended Company-specific risk-adjusted common equity cost rate applicable to UIF is 11.75%.

III. GENERAL PRINCIPLES

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

A. The cost of common equity is the return investors require to make an equity investment in a given firm. From the firm's perspective, that required return, whether it is provided to debt or equity investors, has a cost. Collectively, the "cost of debt" and the "cost of equity" are referred to as the "cost of capital."

The cost of capital is based on the economic principle of "opportunity cost," meaning that investing in any asset or security implies a forgone opportunity to invest in alternative assets or securities. The opportunity cost of an investment should equal the return available on investments of comparable risk.

Although both debt and equity have costs, those costs differ fundamentally. The cost of debt is often contractually defined and can be directly observed in the market as the interest rate or yield on debt securities. In contrast, the cost of equity is not normally contractually defined nor can it be directly observed in the market. Rather, because common equity investors have a claim on a firm's cash flows only after debt holders are paid, it is the uncertainty (or risk) associated with the equity investors' lower priority or junior position to receive those residual cash flows compared to debt holders that determines the cost of equity. In other words, because common equity investors bear this "residual risk," they require higher returns than debt holders. In that sense, common equity and debt investors are distinct: they invest in different securities, face different risks, and require different returns. That is not to say that the risks facing debt and equity investors are completely separate and distinct; the two may share common risks, but only to a point. Therefore, commentary from both debt and equity analysts is instructive and helps inform the determination of the required return.

According to the basic financial principle of risk and return, the investor-required return on investment is a function of the level of investor-perceived risk as reflected in the market prices paid by investors. The higher/lower the investor-perceived risk, the higher/lower the investor-required return. The investor-required return is forward-looking, or expectational, as it is the return which investors expect to receive in the future for investing capital today and is based on expected economic and capital market conditions.

In unregulated industries, the competition of the marketplace is the principal determinant of the price of products or services. For regulated public utilities, like UIF, regulation acts as a substitute for marketplace competition. A sufficient level of earnings is required to assure that the utility can: (1) fulfill its obligation to provide safe and reliable service at all times; (2) maintain the integrity of presently invested capital through future reinvestment and (3) attract needed new capital at a reasonable cost and on reasonable terms in competition with other firms of comparable risk. This is consistent with the previously noted rate of return standard established by the Supreme Court in the *Hope* and *Bluefield* cases.

In rate base/rate of return regulation, the authorized return on common equity is defined as the investor-required return. In turn, the investor-required return is defined as the return required by the investor on the funds invested in the publicly traded common stocks of firms. As stated previously, the cost of common equity is not directly observable in the capital markets since there is no contractual basis or obligation on the part of a firm to provide a return to its common shareholders, unlike the contractual coupon or interest rate on its debt obligations. Therefore, the cost of common equity must be estimated from market (economic and financial) data, using financial models developed for that purpose, such as the CAPM, DCF, and RPM. Therefore, my recommended common equity cost rate is based on the marketplace data of a proxy group of utilities that are as similar in risk as possible to UIF based on selection criteria discussed below.

Because empirical financial models for determining the cost of common equity are subject to limiting assumptions or other constraints, most finance texts recommend using multiple approaches to estimate the cost of common equity. Because of this, generally, regulatory commissions rely on multiple financial models in determining the allowed ROE for regulated utilities. As a practical matter, no individual model is more reliable than all others under all market conditions. The use of multiple common equity cost rate models adds reliability to the estimation of the investor-required return.

Using both the market data of proxy groups of similar risk and multiple common equity cost rate models adds reliability to the informed expert judgment used in estimating the common equity cost rate. Therefore, it is prudent and appropriate to use multiple methodologies to mitigate the effects of limiting assumptions and inputs associated with any single approach.

A. Business Risk

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

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

Business risk refers to the basic viability of a business, the question of whether a company will be able to generate sufficient revenue to cover its operational expenses and cost of capital. Financial risk is related to the company's ability to generate sufficient cash flow to be able to make interest payments on financing or to meet other debt-related obligations.

Examples of the business risks generally faced by water utilities include, but are not limited to, the legal and regulatory environment, mandatory environmental compliance requirements, customer mix and concentration of customers, service territory economic growth, declining per customer water use, risks and uncertainties of water supply limitations, operations, capital intensity, size, the degree of operating leverage, and the like, all of which have a direct bearing on earnings.

Although analysts, including rating agencies, may categorize business risks according to individual categories, as a practical matter they are inter-related and are not wholly distinct from one another. For determining an appropriate return on equity, the relevant issue is where investors see the subject company as falling within a spectrum of risk. To the extent investors view a company as being exposed to additional risk, the required return will increase.

For regulated water utilities, business risks are both long- and near-term in nature. Whereas near-term business risks are reflected in the year-to-year variability in earnings and cash flow brought about by economic or regulatory factors, long-term business risks reflect the prospect of an impaired ability of investors to earn a return on and of their invested capital. Moreover, because water utilities accept the obligation to provide safe, adequate, and reliable water service at all times (in exchange for the opportunity to earn a fair and reasonable return on their investment), they generally do not have the option to delay, defer, or reject required long-term capital investments in order to comply with Safe Drinking Water Act ("SDWA") standards. Those investments are generally capital-intensive, and water utilities therefore cannot choose to avoid raising external funds during periods of capital market distress.

Because water utilities invest in long-lived assets, long-term business risks are of considerable concern to equity investors. That is, the risk of not recovering the return on and of their investment extends far into the future. But, the timing and nature of events that may lead to losses are also uncertain. Consequently, those risks and their implications for the required return on equity tend to be difficult to quantify. That does not mean, however, that the risk is of no consequence to investors. Analysts may apply, for example, simulation-based methods to assess the potential risk, but in the final analysis (like the investors that commit their capital) regulatory commissions, like the FL PSC, must review a variety of quantitative and qualitative data, applying their reasoned judgment to determine how long-term risks weigh in their assessment of the market-required return on equity.

Q. What business risks does the water utility industry in general face today?

A. Water is necessary for life and is the only utility product intended for customers to ingest. Consequently, water quality is of paramount importance to the public health and well-being of customers. As a result, water utilities are subject to additional and increasingly stringent public health and safety regulations. Beyond health and safety concerns, customers also have significant aesthetic (*e.g.* taste and odor) concerns regarding the water delivered to them, with regulators paying close attention to these concerns because of the strong reactions they evoke in consumers.

Increasingly stringent environmental standards necessitate additional capital investment in the treatment and distribution of water, thereby increasing the pressure on water utilities' free cash flow through increased capital expenditure for infrastructure, repair, and replacement. In addition, the United States Environmental Protection Agency and individual state and local environmental agencies continually monitor potential contaminants in the water supply and promulgate or expand regulations when necessary. In the course of procuring water supplies and treating water so that it complies with SDWA standards, water utilities have an ever-increasing responsibility to be stewards of the environment from which supplies are drawn in order to preserve and protect essential natural resources.

Water utilities are typically vertically engaged in the entire process of acquiring supply, producing, treating, and distributing water, serving both a production function and a delivery function. Accordingly, water utilities require significant capital investment, not only in transmission and distribution systems, but also in sources of supply (surface and groundwater), production (wells), treatment, and storage. Significant capital investment is necessary to serve additional customers and to replace aging systems, creating a major risk factor for the water utility industry.

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

> Until the past decade, or so, both municipal and investor-owned utilities didn't sufficiently invest in keeping pipelines and other assets in proper condition. As a result, the average age of pipelines in the U.S. is estimated to be between 50 and 75 years. Utilities and regulators have realized that more funds would have to be allocated to replacing and modernizing large portions of the nation's water infrastructure. That's why this group's construction budget is large, though manageable. Authorities also realize that water bills were kept artificially low for years, especially in relation to other vital utility services, and have to be gradually raised.

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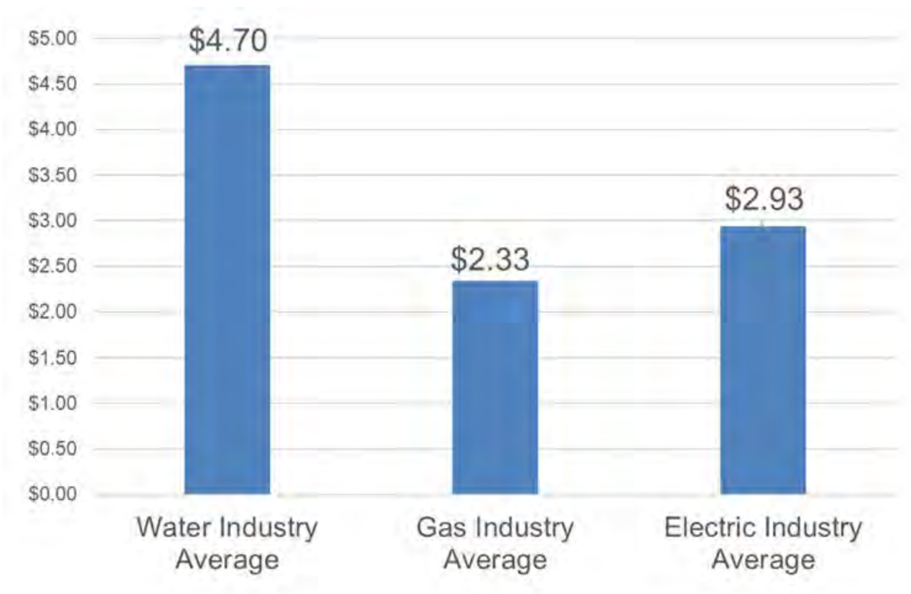
> Probably the prime reason for water utility stocks performing so well over the past five years has been due to constructive regulation. Unlike, electric utilities, for example, both sides are basically in agreement that upgrades are required and ratepayers[‘] bills will have to [be] raised. Investors should be aware of what can happen when authorities and utilities do not work as partners (i.e. the Electric Utility Industry). As of now, we see no signs of rifts between the water group and regulators.[6]

Q. Please discuss the capital intensity of the water utility industry relative to other utility industries.

A. As a capital-intensive industry, water utilities require significantly greater capital investment in the infrastructure required to produce a dollar of revenue than do other industries, including electric and natural gas utilities. For example, as shown on Chart 1, below, it took $4.70 of net utility plant on average to produce $1.00 in operating revenues in 2019 for the water utility industry. In contrast, for the natural gas and electric utility industries, on average it took just $2.33 and $2.93, respectively, to produce $1.00 in operating revenues in 2019. As financing needs have increased and will continue to increase, the competition for capital from traditional sources has increased and continues to increase, making the need to maintain financial integrity and the ability to attract needed new capital increasingly important.

6 *Value Line Investment Survey*, April 10, 2020. [clarification added]

Chart 1:
Capital Intensity of the Water, Gas, and Electric Utility Industries[7]



Q. How will water utilities raise the capital required to fund necessary infrastructure replacements?

A. The water utility industry's high degree of capital intensity, coupled with the need for substantial infrastructure capital spending, requires regulatory support in the form of adequate and timely rate relief, including the allowance of a sufficient rate of return on investment.

Substantial water utility investment and expenditures require significant financing. The three sources typically used for financing are debt, equity (common and preferred), and cash flow from operations. All three are intricately linked to the opportunity to earn a sufficient rate of return on investment and the ability to actually achieve that return. The return must be sufficient to maintain credit quality and enable the water utility to attract necessary new capital, be it debt or equity capital. If unable to raise debt or equity capital, the water utility must turn to either retained earnings or free cash flow[8], both of which are directly linked to earning a

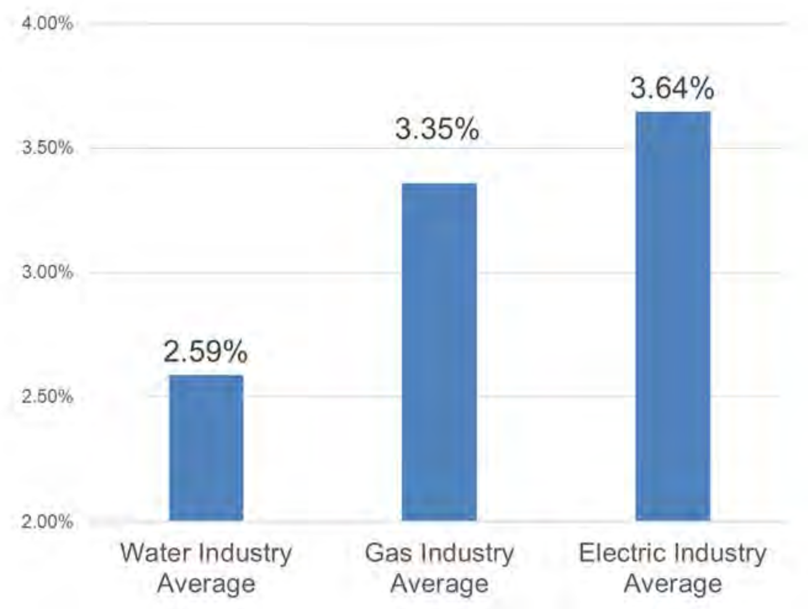
7 SNL Financial, Company SEC Form 10-Ks.
8 Operating cash flow (funds from operations) minus capital expenditures.

sufficient rate of return. The level of free cash flow represents the financial flexibility of a firm, *i.e.*, its ability to meet the needs of its debt and equity holders. If either retained earnings or free cash flows are inadequate, it will be nearly impossible for the water utility to attract the new capital, at a reasonable cost and on reasonable terms, needed to invest in critical new utility infrastructure. An insufficient rate of return can be financially devastating for water utilities given their obligation to protect the public health by providing safe, adequate, and reliable water service to their customers at all times.

Q. Please continue your discussion of business risks.

A. In addition to its capital-intensive nature, the water utility industry also experiences low depreciation rates. Given that depreciation is one of the principal sources of internally-generated cash flows for all utilities, low depreciation rates mean that utilities cannot rely on depreciation as a source of cash like other industries do. Because utility assets have long lives and, hence, long capital recovery periods, utilities face increased risk due to inflation, which results in a significantly higher cost to replace a decades-old utility plant where original cost was a small fraction of the cost of the plant to replace it. As shown on Chart 2, below, water utilities experienced a depreciation rate of 2.59% for 2019. In contrast, in 2019, the natural gas and electric utilities experienced average depreciation rates of 3.35% and 3.64%, respectively. Low depreciation rates signify that the pressure on cash flow remains significantly greater for water utilities than for other gas and electricity utilities, on average.

Chart 2:
Depreciation Rates of the Water, Gas, and Electric Utility Industries[9]



In view of the foregoing, the water utility industry's high degree of capital intensity and low depreciation rates, coupled with the need for capital spending to replace aging and failing water infrastructure, makes the need to maintain financial integrity and the ability to attract needed new capital, through the allowance of a sufficient rate of return, increasingly important in order for water utilities to be able to successfully meet the challenges and investment needs they face.

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 created by the introduction of senior capital, *i.e.*, debt and preferred stock, into the capital structure. As noted above, it is the additional risk that a company may not have sufficient cash flow to meet its financial obligations. The higher the proportion of debt in the

[9] SNL Financial, Company SEC Form 10-Ks.

capital structure, the higher the financial risk which must be factored into the common equity cost rate, consistent with the previously mentioned basic financial principle of risk and return, *i.e.*, investors demand a higher common equity return as compensation for bearing higher investment risk.

Q. Can the combined business and financial risks (*i.e.*, investment risk) of an enterprise be proxied by bond and credit ratings?

A. Yes, but not entirely. Similar bond/issuer credit ratings reflect and are representative of similar combined business and financial risks, *i.e.*, the total risk faced by bond investors. Although specific business or financial risks may differ between companies, the same bond/credit rating indicates that the combined risks are similar, albeit not necessarily equal (as the purpose of the bond/credit rating process is to assess credit quality or credit risk and not common equity risk).

However, one must keep in mind that a long-term credit or bond issue rating is an opinion regarding the particular company's overall financial capacity to pay its financial obligations as they become due and payable. It is not an assessment of the risk faced by equity investors. The claims of equity holders are subordinate to the claims of debt holders, including bond holders, and are perpetual in life. As noted above, whereas bondholders can be assured of the probability that a particular company will be able to meet its financial obligations (and thus have higher credit/bond ratings), common equity holders bear the residual risk of insufficient or volatile cash flows in perpetuity. For that fundamental reason, the risks of owning common equity do not directly correspond to the risks of owning bonds.

IV. UTILITIES, INC. OF FLORIDA AND THE UTILITY PROXY GROUP

Q. Have you reviewed financial data for UIF?

A. Yes. UIF provides service to approximately 64,000 water and wastewater customers in ten counties throughout Florida. UIF is an operating subsidiary of CRU-US. Neither entity is publicly-traded.

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

A. I chose the Utility Proxy Group by selecting those water companies that met the following criteria:

1) They are included in the Water Utility Group of *Value Line's* Standard Edition (April 10, 2020);
2) They have 70% or greater of 2019 total operating income derived from, and 70% or greater of 2019 total assets devoted to, regulated water operations;
3) They had not publicly announced involvement in any major merger or acquisition activity (*i.e.*, one publicly-traded utility merging with or acquiring another) at the time of the preparation of this testimony;
4) They have not cut or omitted their common dividends during the past five years or through the time of the preparation of this testimony;
5) They have *Value Line* and Bloomberg adjusted Beta coefficients;
6) They have a positive *Value Line* five-year dividends per share ("DPS") growth rate projection and,
7) They have *Value Line*, Bloomberg, Zacks or Yahoo! Finance, consensus five-year earnings per share ("EPS") growth rate projections.

The following seven companies meet these criteria:

- American States Water Co. ("AWR");
- American Water Works Co. Inc. ("AWK");
- California Water Service Corp. ("CWT");
- Essential Utilities, Inc. ("WTRG");
- Middlesex Water Co. ("MSEX");
- SJW Corporation ("SJW"); and
- York Water Co. ("YORW").

Q. Have you reviewed financial data for the utility proxy group?

A. Yes. Page 1 of Schedule 2 contains comparative capitalization and financial statistics for the Utility Proxy Group for the years 2015-2019. As shown on page 1, during the five-year period ending 2019, the historically achieved average earnings rate on book common equity for the group was 10.45%. The Utility Proxy Group had an average common equity ratio (including short-term debt) during the years 2015-2019 of 51.09%. Total debt to earnings before interest, taxes, depreciation, and amortization ("EBITDA") for the years 2015-2019 ranged between 3.41 and 5.54 times, averaging 4.00 times. Funds from operations to total debt ranged from 14.49% to 25.81%, averaging 21.64%.

V. <u>CAPITAL STRUCTURE AND DEBT COST RATES</u>

Q. What are the balances of investor-provided capital that you recommend be employed in developing a return on investor-supplied capital applicable to UIF?

A. In this instance, I recommend the use of UIF's Parent's 13-month average capital structure ending December 31, 2019, which consists of 45.58% long-term debt, 5.03% short-term debt, and 49.39% common equity.

Q. How does UIF's common equity ratio of 49.39% compare with the equity ratios maintained by the Utility Proxy Group?

A. UIF's common equity ratio of 49.39% is reasonable and consistent with the range of common equity ratios maintained, on average, by the utilities used for the derivation of ROE. As shown on page 2 of Schedule 2, the range of equity ratios maintained by the Utility Proxy Group is between 38.48% and 57.05%, with an average of 49.34%.

In my opinion, a capital structure consisting of 45.58% long-term debt, 5.03% short-term debt, and 49.39% common equity is appropriate for ratemaking purposes for UIF in the current proceeding because it is comparable to the average capital structure ratios (based on total capital) maintained by the Utility Proxy Group on whose market data I base my recommended common equity cost rate.

Q. What cost rates for long-term and short-term debt are most appropriate for use in a cost of capital determination for UIF?

A. A long-term debt cost rate of 5.78% and a short-term debt cost rate of 4.04% are the most appropriate for use in a cost of capital determination for UIF, as they are the actual average debt cost rates incurred by UIF's Parent for the 13-months ended December 31, 2019.

VI. COMMON EQUITY COST RATE MODELS

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

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

Q. Are the cost of common equity models you use market-based models?

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

A. Discounted Cash Flow Model

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 assumes 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 do you use?

A. I use the single-stage constant growth DCF model. The single-stage DCF model is expressed as:

$$K = (D_1 / P_0) + g$$

Where:

K	=	Cost of Equity Capital
D_1	=	Expected Dividend Per Share in one year
P_0	=	Current Market Price
G	=	Expected Dividend Per Share Growth

Q. Please describe the dividend yield used in your application of the DCF model.

A. The unadjusted dividend yields are based on a recent (April 30, 2020) indicated dividend, divided by the average of closing market prices for the 60 days ending April 30, 2020, as shown in Column [1] on page 1 of Schedule 3.

Q. Please explain the adjusted dividend yield shown in column [7] on page 1 of Schedule 3.

A. Because dividends are paid quarterly, or periodically, 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 expectational growth rate, referred to as D_1, in calculating the dividend yield component of the model. However, 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, referred to as $D_{1/2}$. This is a conservative approach because it does not overstate the dividend yield, which should be representative of the next 12-month period. Therefore, the actual average dividend yields in Column [1] on page 1 of Schedule 3, have been adjusted upward to reflect one-half the average projected growth rate shown in Column [6].

Q. Please explain the basis of the growth rates of the Utility Proxy Group used in your application of the DCF model.

A. Investors with more limited resources than institutional investors are likely to rely on widely available financial information services, such as *Value Line*, Bloomberg, Zacks, and Yahoo! Finance. Investors recognize that such analysts have significant insight into the dynamics of the industries and individual companies they analyze, as well as an entity's historical and future ability to effectively manage the effects of changing laws and regulations and ever-changing economic and market conditions.

Over the long run, there can be no growth in DPS without growth in EPS. Thus, the use of earnings growth rate forecasts in a DCF analysis provides a better matching between investors' market price appreciation expectations and the growth rate component of the DCF. Therefore, I have relied on security analysts' five-year forecasts of EPS growth in my application of the DCF model.

Q. Please summarize the DCF model results.

A. As shown on page 1 of Schedule 3, the average result of the single-stage DCF model is 8.70%, while the median result is 9.44%. I have averaged these two results in arriving at a conclusion of a DCF-indicated common equity cost rate of 9.07% for the Utility Proxy Group. By doing so, I have considered the DCF results for each company without giving undue weight to outliers on either the high or the low side.

B. The Risk Premium Model

Q. Please describe the theoretical basis of the RPM.

A. The RPM is based on the basic 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 last in line in any claim on an entity's assets and earnings, as previously discussed. Therefore, investors require higher returns from investment in 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, the investor-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 then use that premium to derive a cost rate of common equity. In summary, according to the RPM, 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 a corporation's assets and earnings.

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, as shown in Schedule 4. The first method is the PRPM. The second method is a risk premium model using an adjusted total market approach.

Q. Please explain the PRPM.

A. The PRPM, published in the *Journal of Regulatory Economics ("JRE")*[10] and *The Electricity*

[10] "A New Approach for Estimating the Equity Risk Premium for Public Utilities", Pauline M. Ahern, Frank J. Hanley and Richard A. Michelfelder, Ph.D. The Journal of Regulatory Economics (December 2011), 40:261-278.

Journal ("TEJ"),[11] 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")"[12] (with "ARCH" standing for autoregressive conditional heteroskedasticity). Engle found that the volatility in market prices, returns, and equity risk premiums cluster over time, making them highly predictable and available 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 predictability of volatility, or risk. Thus, the PRPM is not based on an estimate of investor behavior, but rather on the evaluation of the actual 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 publicly traded utility in the Utility Proxy Group, minus the historical monthly yield on long-term U.S. Treasury securities, through April 2020. Using a generalized form of ARCH, known as GARCH, each water utility's projected equity risk premium was determined using Eviews© statistical software. When the GARCH model is applied to the historical return data, it produces a predicted GARCH variance series[13] and a GARCH coefficient.[14] The forecasted 30-year U.S. Treasury Bond yield of 2.03% is based on consensus forecasts for the six quarters ending with the third quarter 2021, derived from the May 1, 2020 *Blue Chip Financial Forecasts ("Blue Chip")*, averaged with the long-range forecasts for 2021 – 2025 and 2026 – 2030, from the December 1, 2019 *Blue Chip*. The average PRPM indicated common equity cost rate is 11.66%, while the median is 10.96% for the Utility Proxy Group, as shown in

[11] "Comparative Evaluation of the Predictive Risk Premium Model™, the Discounted Cash Flow Model and the Capital Asset Pricing Model", Pauline M. Ahern, Richard A. Michelfelder, Ph.D., Rutgers University, Dylan W. D'Ascendis, and Frank J. Hanley, The Electricity Journal (May, 2013).

[12] www.nobelprize.org

[13] Illustrated in Columns [1] and [2] on page 2 of Schedule 4.

[14] Illustrated in Column [4] on page 2 of Schedule 4.

Column [7] on page 2 of Schedule 4. Consistent with my use of the average of the mean and median DCF results, I rely on the average of the mean and median PRPM results of 11.31% as my conclusion of the PRPM equity cost rate, also shown in Column [7] on page 2 of Schedule 4.

Q. Please explain the adjusted total market approach RPM.

A. The adjusted total market approach RPM adds a prospective public utility bond yield to the average of: (1) an equity risk premium 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 adjusted prospective bond yield of 3.82% applicable to the Utility Proxy Group, shown on line 5 on page 3 of Schedule 4.

A. The first step in the adjusted total market approach RPM analysis is to determine the expected bond yield. Because both ratemaking and the cost of capital, including the common equity cost rate, are prospective in nature, a prospective yield on long-term debt, similarly rated to the Utility Proxy Group, is essential. Since *Blue Chip* does not publish consensus yield forecasts for the Moody's A-rated public utility bonds, I began with the May 1, 2020 *Blue Chip* 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 2021, averaged with the long-range forecasts for 2021 – 2025, and 2026 – 2030, from the December 1, 2019 *Blue Chip*.[15] As shown on line 1 on page 3, the average expected yield on Moody's Aaa-rated corporate bonds is 3.21%. In order to derive a prospective Moody's A-rated public utility bond yield, an adjustment of 0.53%, or the average spread between Moody's Aaa-rated corporate bond yields and Moody's A-rated public utility bond yields for the three months ending April 2020[16] must be made to the average Aaa corporate bond yield, which results in a bond yield of

15 See pages 10 and 11 of Schedule 4.
16 See page 4 of Schedule 4.

3.74% applicable to a Moody's A-rated public utility bond.

Because the Utility Proxy Group average Moody's issuer rating is A2/A3, as shown on page 5 of Schedule 4, an 0.08% upward adjustment to the prospective Moody's A-rated public utility bond yield of 3.74% is necessary. The 0.08% represents one-sixth (1/6) of the average spread of 0.46% between Moody's A-rated and Baa-rated public utility bonds for the three months ending April 2020. This is necessary so that the prospective bond yield is consistent with the Utility Proxy Group's average A2/A3 long-term issuer rating. Adding the 0.08% to the 3.74% prospective Moody's A-rated public utility bond yield results in a 3.82% expected bond yield for the Utility Proxy Group, as shown on line 5 on page 3 of Schedule 4.

Q. Please explain the derivation of the beta-derived equity risk premium.

A. The components of the beta-derived risk premium model are: (1) An expected market equity risk premium over corporate bonds, and (2) the Beta coefficient. The derivation of the beta-derived equity risk premium applied to the Utility Proxy Group is shown on lines 1 through 9 on page 8 of Schedule 4. The total beta-derived equity risk premium applied is based on an average of three historical data-based equity risk premiums, two *Value Line*-based equity risk premiums, and one Bloomberg-based equity risk premium. Each of these is described in turn.

Q. How did you derive a market 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 2020 SBBI® Yearbook: Stocks, Bonds, Bills, and Inflation ("SBBI – 2020")[17] less the average historical yield on Moody's Aaa/Aa-rated corporate bonds for the period 1928 to 2019. 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.

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[17] SBBI – 2020 Appendix A Tables.

SBBI's long-term arithmetic mean monthly total return rate on large company common stocks was 11.83% and the long-term arithmetic mean monthly yield on Moody's Aaa/Aa-rated corporate bonds was 6.05%.[18] As shown on line 1 on page 8 of Schedule 4, subtracting the mean monthly bond yield from the total return on large company stocks results in a long-term historical equity risk premium of 5.78%.

I used the arithmetic mean monthly total return rates for the large company stocks and yields (income returns) for the Moody's Aaa/Aa corporate bonds, because they are appropriate for the purpose of estimating the cost of capital as noted in SBBI – 2020.[19] 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 time 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 equity risk premium.

A. To derive the regression analysis-derived market equity risk premium of 9.12%, shown on line 2 on page 8 of Schedule 4, I used the same monthly annualized total returns on large company common stocks relative to the monthly annualized yields on Moody's Aaa/Aa corporate bonds as mentioned above. The relationship between interest rates and the market equity risk premium was modeled using the observed monthly market equity risk premium as the dependent variable, and the monthly yield on Moody's Aaa/Aa corporate bonds as the independent variable. I used a linear Ordinary Least Squares ("OLS") regression, in which the

18 As explained in note 1 on page 8 of Schedule 4.
19 SBBI – 2020, at 10-22.

market equity risk premium is expressed as a function of the Moody's Aaa/Aa corporate bonds yield:

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

Q. Please explain the derivation of the 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 corporate bonds during the period from January 1928 through April 2020.[20] 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 11.95%.[21]

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

A. As noted previously, because both ratemaking and the cost of capital, including the cost rate of common equity, are prospective, a prospective market equity risk premium is essential. The derivation of the forecasted or prospective market equity risk premium can be found in note 4 on page 8 of Schedule 4. Consistent with my calculation of the dividend yield component in my DCF analysis, this prospective market equity risk premium is derived from an average of the three- to five-year median market price appreciation potential by *Value Line* for the 13 weeks ending May 1, 2020, 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.[22]

The average median expected price appreciation is 81%, which translates to a 15.99% annual appreciation, and, when added to the average of *Value Line's* median expected dividend

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20 Data from January 1926-December 2019 is from SBBI – 2020. Data from January 2020 – April 2020 is from Bloomberg Professional Services.

21 Shown on line 3 on page 8 of Schedule 4.

22 As explained in detail in page 2, note 1 of Schedule 5.

yields of 2.72%, equates to a forecasted annual total return rate on the market of 18.71%. The forecasted Aaa bond yield of 3.21% is deducted from the total market return of 18.71%, resulting in an equity risk premium of 15.50%, shown on page 8, line 4 of Schedule 4.

Q. Please explain the derivation of an equity risk premium based on the S&P 500 composite index companies using *Value Line* data.

A. Using data from *Value Line*, I calculate 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 14.79%. Subtracting the prospective yield on Aaa Corporate bonds of 3.21% results in an 11.58% projected equity risk premium.

Q. Please explain the derivation of an equity risk premium based on the S&P 500 composite index companies using Bloomberg data.

A. Using data from Bloomberg Professional Services, I calculate 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 relative to *Value Line* data. The expected total return for the S&P 500 is 13.53%. Subtracting the prospective yield on Aaa Corporate bonds of 3.21% results in a 10.32% projected equity risk premium.

Q. What is your conclusion of the market equity risk premium for your total market approach RPM?

A. I give equal weight to all these market equity risk premiums in arriving at my conclusion of market equity risk premium of 10.71%. After calculating the average market equity risk premium of 10.71%, I adjust it by the Beta coefficient of the Utility Proxy Group to account for the risk of the Group. As discussed below, the Beta coefficient 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 share of the market's total equity risk premium, relative to corporate bond yields. As shown on page 1 of Schedule 5, the average of the mean and median

Beta coefficients for the Utility Proxy Group is 0.71. Multiplying the Beta coefficient of the Utility Proxy Group of 0.71 by the market equity risk premium of 10.71% results in a beta-adjusted equity risk premium of 7.60% 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 estimate three equity risk premiums based on the 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 derive a long-term monthly arithmetic mean equity risk premium between the S&P Utility Index total returns of 10.74% and monthly A-rated public utility bond yields of 6.53% from 1928 to 2019 to arrive at an equity risk premium of 4.21%.[23] I then use the same historical data to derive an equity risk premium of 6.68% based on a regression of the monthly equity risk premiums. The final S&P Utility Index holding period equity risk premium involves applying the PRPM using the historical monthly equity risk premiums from January 1928 to April 2020 to arrive at a PRPM-derived equity risk premium of 5.95% for the S&P Utility Index.

I then derive expected total returns on the S&P Utilities Index of 10.50% and 8.97% using data from *Value Line* and Bloomberg Professional Services, respectively, and subtract the prospective A2-rated public utility bond yield (3.74%)[24], which results in risk premiums of 6.76% and 5.23%, respectively. As with the market equity risk premiums, I average all the risk premiums to arrive at my utility-specific equity risk premium of 5.76%.

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[23] As shown on line 1 on page 12 of Schedule 4.

[24] Derived on line 3 on page 3 of Schedule 4.

Q. **What is your conclusion regarding the appropriate equity risk premium for use in your adjusted total market approach RPM analysis?**

A. The equity risk premium applicable to the Utility Proxy Group is 6.68%, derived by averaging the beta-derived premium of 7.60% (line 9 on page 8 of Schedule 4) with the equity risk premium of 5.76% based on the holding period returns of public utilities with Moody's A-rated bonds (line 6 on page 12 of Schedule 4).

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

A. It is 10.50% for the Utility Proxy Group as shown on line 7 on page 3 of Schedule 4.

Q. **What are the results of your application of the PRPM and the adjusted total market approach RPM?**

A. As shown on page 1 of Schedule 4, the indicated RPM-derived common equity cost rate is 10.91%, derived by averaging the PRPM results (11.31%) with those based on the adjusted total market approach (10.50%).

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 the Beta coefficient (β). A Beta coefficient of less than 1.0 indicates lower variability while a Beta coefficient 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 through diversification is called market or systematic risk. In addition, the CAPM presumes that investors require compensation only for those systematic risks that are 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 coefficient. The traditional CAPM model is expressed as:

$$Rs = Rf + \beta(Rm - Rf)$$

Where:	Rs	=	Return rate on the common stock
	Rf	=	Risk-free rate of return
	Rm	=	Return rate on the market as a whole
	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 Beta coefficients are related, as predicted by the CAPM, confirming the CAPM's validity. The empirical CAPM ("ECAPM") reflects the reality that, while the results of these tests support the notion that the Beta coefficient 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. Morin[25] 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.
>
> * * *
>
> Therefore, the empirical evidence suggests that the expected return on a security is related to its risk by the following approximation:
>
> $$K = R_F + x\,\beta(R_M - R_F) + (1-x)\ \beta(R_M - R_F)$$
>
> where x is a fraction to be determined empirically. The value of x that best explains the observed relationship Return = 0.0829 + 0.0520 β is between 0.25 and 0.30. If x = 0.25, the equation becomes:
>
> $$K = R_F + 0.25(R_M - R_F) + 0.75\ \beta(R_M - R_F)$$

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.

[25] Roger A. Morin, New Regulatory Finance, Public Utility Reports, 2006, at 175, 190.

Q. Please describe your selection of the Beta coefficient for your CAPM analysis?

A. I relied on an average of the adjusted Beta coefficients published by *Value Line* and provided by Bloomberg Professional Services. While both of those services adjust their calculated (or "raw") Beta coefficients to reflect the tendency of the Beta coefficient to regress to the market mean of 1.00, *Value Line* calculates its Beta coefficients 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 for your CAPM analysis.

A. As shown in Column [5] on Schedule 5, the risk-free rate adopted for both applications of the CAPM is 2.03%. The risk-free rate of 2.03% is based on the average of the consensus forecast for the six quarters ending with the third quarter 2021, from the May 1, 2020 *Blue Chip*, averaged with the long-range forecasts for 2021 – 2025 and 2026 – 2030, from the December 1, 2019 *Blue Chip*,[26] as detailed in note 2 on page 2 of Schedule 5.

Q. Why is the yield on long-term U.S. treasury bonds appropriate for use as the risk-free rate?

A. The yield on long-term U.S. Treasury Bonds is almost risk-free and its term is consistent with: (1) the long-term cost of capital to public utilities measured by the yields on A-rated public utility bonds; (2) the long-term investment horizon inherent in utilities' common stock and (3) the long-term life of the jurisdictional rate base to which the allowed reasonable rate of return (*i.e.*, cost of capital) will be applied. In contrast, short-term U.S. Treasury yields are more volatile, and reflect a short-term investment horizon that is not consistent with the long-term investment horizon, and life of the rate base to which the allowed rate of return is applied.

Q. Please explain the estimation of the expected equity risk premium for the market.

A. The basis of the market risk premium is explained in detail in note 1 on page 2 of Schedule 5.

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[26] See pages 10 and 11 of Schedule 4.

As discussed previously, the market risk premium is derived from an average of three historical data-based market risk premiums, two *Value Line* data-based market risk premiums, and one Bloomberg data-based market risk premium.

The long-term income return on U.S. Government Securities of 5.09% was deducted from the SBBI – 2020 monthly historical total market return of 12.10%, which resulted in a historical market equity risk premium of 7.01%.[27] I applied a linear OLS regression to the monthly annualized historical returns on the S&P 500 relative to historical yields on long-term U.S. Government Securities from SBBI – 2020. That regression analysis yielded a market equity risk premium of 10.26%. The PRPM market equity risk premium is 13.44% and is derived using the PRPM relative to the yields on long-term U.S. Treasury securities from January 1926 through April 2020.

The *Value Line*-derived forecasted total market equity risk premium is derived by deducting the forecasted risk-free rate of 2.03%, discussed above, from the *Value Line* projected total annual market return of 18.71%, resulting in a forecasted total market equity risk premium of 16.68%. The S&P 500 projected market equity risk premium using *Value Line* data is derived by subtracting the projected risk-free rate of 2.03% from the projected total return of the S&P 500 of 14.79%. The resulting market equity risk premium is 12.76%.

The S&P 500 projected market equity risk premium using Bloomberg data is derived by subtracting the projected risk-free rate of 2.03% from the projected total return of the S&P 500 of 13.53%. The resulting market equity risk premium is 11.50%.

These six measures, when averaged, result in an average total market equity risk premium of 11.94%.

27 SBBI – 2020, at Appendix A-1 (1) through A-1 (3) and Appendix A-7 (19) through A-7 (21).

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

A. As shown in Column [8] on page 1 of Schedule 5, the average and median CAPM/ECAPM equity cost rate is 10.90%.

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 do 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 marketplace competition, non-price regulated firms operating in the competitive marketplace make an excellent proxy if they are comparable in total risk to the Utility Proxy Group being used to estimate the cost of common equity. The selection of such domestic, non-price regulated competitive firms theoretically and empirically results in a proxy group which is comparable in total risk to the Utility Proxy Group, since all of these companies compete for capital in the exact same markets.

Q. How did you select non-price regulated companies that are comparable in total risk to the Utility Proxy Group?

A. In *order* to select a proxy group of domestic, non-price regulated companies similar in total risk to the Utility Proxy Group, I relied on the Beta coefficients and related statistics derived from *Value Line* regression analyses of weekly market prices over the most recent 260 weeks (*i.e.*, five years). These selection criteria resulted in a proxy group of 12 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 selecting the domestic, non-price regulated firms was:

1) They must be covered by *Value Line Investment Survey* (Standard Edition);

2) They must be domestic, non-price regulated companies, *i.e.*, not utilities;
3) Their Beta coefficients must lie within plus or minus two standard deviations of the average unadjusted Beta coefficients of the Utility Proxy Group; and
4) The residual standard errors of the *Value Line* regressions which gave rise to the unadjusted Beta coefficients must lie within plus or minus two standard deviations of the average residual standard error of the Utility Proxy Group.

Beta coefficients measure market, or systematic, risk, which is not diversifiable. The residual standard errors of the regressions measure each firm's company-specific, diversifiable risk. This is demonstrated clearly by Jack C. Francis on page 273 of Investments: Analysis and Management, where he states "Total risk can be measured by the variance of returns, denoted Var(*r*). This measure of *total risk is partitioned into its systematic and unsystematic components*."[28] Essentially, companies that have similar betas and standard errors of regression have similar total investment risk.

Q. Have you prepared a schedule which shows the data from which you selected the 12 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 6.

Q. Did you calculate common equity cost rates using the DCF model, RPM, and CAPM for the Non-Price Regulated Proxy Group?

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

[28] Jack C. Francis, Investments: Analysis and Management 5th (McGraw-Hill, 1991) at 273 (italics in original).

companies.

Page 2 of Schedule 7 derives the constant growth DCF model common equity cost rate. As shown, the indicated common equity cost rate, using the constant growth DCF for the Non-Price Regulated Proxy Group comparable in total risk to the Utility Proxy Group, is 8.41%.

Pages 3 through 5 of Schedule 7 contain the data and calculations that support the 13.12% RPM common equity cost rate. As shown on line 1, page 3 of Schedule 7, the consensus prospective yield on Moody's Baa-rated corporate bonds for the six quarters ending in the third quarter of 2021, and for the years 2021 – 2025 and 2026 – 2030, is 4.55%.[29] When the beta-adjusted risk premium of 8.57%[30] relative to the Non-Price Regulated Proxy Group is added to the prospective Baa2-rated corporate bond yield of 4.55%, the indicated RPM common equity cost rate is 13.12%.

Page 6 of Schedule 7 contains the inputs and calculations that support my indicated CAPM/ECAPM common equity cost rate of 11.83%.

Q. What is the cost rate of common equity based on the Non-Price Regulated Proxy Group?

A. As shown on page 1 of Schedule 7, the results of the common equity models applied to the Non-Price Regulated Proxy Group -- which group is comparable in total risk to the Utility Proxy Group -- are as follows: 8.41% (DCF), 13.12% (RPM), and 11.83% (CAPM). The average of the mean and median of these models is 11.48%, which I used as the indicated common equity cost rate for the Non-Price Regulated Proxy Group.

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29 *Blue Chip Financial Forecasts*, December 1, 2019, at page 14 and May 1, 2020, at page 2.
30 Derived on page 4 of Schedule 7.

VII. INDICATED COMMON EQUITY COST RATE BEFORE ADJUSTMENT FOR COMPANY-SPECIFIC RISK

Q. What is the indicated common equity cost rate based on the cost of common equity model results?

A. It is 10.75%, based on the common equity cost rates resulting from the application of cost of common equity models to the Utility Proxy Group and the Non-Price Regulated Proxy Group summarized in Table 2 above and on page 2 of Schedule 1. As discussed above, I employ multiple cost of common equity models as primary tools in arriving at my recommended common equity cost rate because:

1) No single model is so inherently precise that it can be relied on solely to the exclusion of other theoretically sound models;
2) All of the models are market-based;
3) The use of multiple models adds reliability to the estimation of the common equity cost rate; and
4) The prudence of using multiple cost of common equity models is supported in both the financial literature and regulatory precedent.

Based on these common equity cost rate results, I conclude that a common equity cost rate of 10.75% is indicated for the Utility Proxy Group before determining if there need to be any Company-specific adjustments.

A. Company-Specific Risk Adjustments

1. Business Risk Adjustment

Q. Does UIF's smaller size compared with the Utility Proxy Group increase its business risk?

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

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

As further evidence illustrates that smaller firms are riskier, investors generally demand greater returns from smaller firms to compensate for less marketability and liquidity of their securities. Duff & Phelps 2019 Valuation Handbook Guide to Cost of Capital - Market Results through 2018 ("D&P - 2019") 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," D&P - 2019 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)[31]

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

> **. . .** the higher average returns on small stocks and high book-to-market stocks reflect unidentified state variables that produce undiversifiable risks (covariances) in returns not captured in the market return and are priced separately from market betas.[32]

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

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[31] Duff & Phelps 2019 Valuation Handbook Guide to Cost of Capital - Market Results through 2018, Wiley 2018, at 4-1.

[32] Eugene F. Fama and Kenneth R. French, "The Capital Asset Pricing Model: Theory and Evidence," *Journal of Economic Perspectives*, Volume 18, Number 3, Summer 2004, at 25-43.

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

> A number of researchers have observed that portfolios of small-firms (sic) have earned consistently higher average returns than those of large-firm stocks; this is called the "small-firm effect." On the surface, it would seem to be advantageous to the small firms to provide average returns in a stock market that are higher than those of larger firms. In reality, it is bad news for the small firm; **what the small-firm effect means is that the capital market demands higher returns on stocks of small firms than on otherwise similar stocks of the large firms.** (emphasis added)[34]

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 unique risks of UIF's, including its small size, which is justified and supported above by evidence in the financial literature.

Q. Is there a way to quantify an adjustment to compensate UIF for greater business risk due to its smaller size relative to the Utility Proxy Group?

A. Yes. UIF has greater relative risk than the average utility in the Utility Proxy Group because of its smaller size compared with the Utility Proxy Group, as measured by an estimated market capitalization of common equity for UIF.

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

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

Table 3: Size as Measured by Market Capitalization for UIF and the Utility Proxy Group

	Market Capitalization* ($ Millions)	Times Greater Than The Company
UIF	$196.004	
Utility Proxy Group	$5,657.608	28.9x

*From page 1 of Schedule 8.

UIF's estimated market capitalization was $196.004 million as of April 30, 2020,[35] compared with the market capitalization of the average company in the Utility Proxy Group of $5.657 billion as of April 30, 2020. The average company in the Utility Proxy Group has a market capitalization 28.9 times the size of UIF's estimated market capitalization.

As a result, it is necessary to upwardly adjust the indicated common equity cost rate of 10.75% to reflect UIF's greater risk due to their smaller relative size. The determination is based on the size premiums for portfolios of the New York Stock Exchange, American Stock Exchange, and NASDAQ listed companies ranked by deciles for the 1926 to 2019 period as shown on the bottom half of page 1 of Schedule 8. The average size premium for the Utility Proxy Group with a market capitalization of $5.7 billion falls in the 4th decile, while the Company's estimated market capitalization of $196.004 million places it in the 10th decile. The size premium spread between the 4th decile and the 10th decile is 4.20% as shown on the top half of page 1 of Schedule 8. Even though a 4.20% upward size adjustment is indicated, I applied a size premium of 1.00% to the Company's indicated common equity cost rate.

35 $196.004M = $122.446M (book equity from UIF 2019 Annual Report to the FL PSC) * 49.39% (requested common equity ratio from page 1 of Schedule 1) * 324.1% (market-to-book ratio of the Utility Proxy Group) as demonstrated on page 2 of Schedule 8.

Q. Did you evaluate UIF's parent, CRU-US's estimated market capitalization compared to the proxy group?

A. Yes. Even though I do not think it is applicable,[36] I looked at CRU's common equity balance at December 31, 2019. I then adjusted it by the proxy group market-to-book ratio and compared it with the proxy group. CRU-US's estimated market capitalization, $944.372 million,[37] would fall in the 8th decile, which would indicate a 0.80% size premium over the average proxy group company.

Q. Does the FL ROE Formula allow for adjustments for increased risks of small utilities?

A. Yes, it does. Order No. PSC-2019-0267-PAA-WS states the following:

> A private placement premium of 50 basis points is added to reflect the difference in yields on publicly-traded debt and privately placed debt, which is illiquid. Investors require a premium for the lack of liquidity of privately placed debt.
>
> A small utility risk premium of 50 basis points is added because the average Florida WAW [water and wastewater] utility is too small to qualify for privately placed debt and smaller companies are considered by investors to be more risky than larger companies. [clarification added]

In view of the all of the above, and especially given CRU-US's debt was privately placed, my 1.00% upward adjustment to reflect the increased risk of UIF relative to the Utility Proxy Group is both reasonable and conservative.

VIII. <u>CONCLUSION</u>

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

A. Given the Company's 13-month average balances of investor-supplied capital ending December 31, 2019 which consists of 45.58% long-term debt at an embedded debt cost rate of 5.78%, 5.03% short-term debt at an embedded debt cost rate of 4.04%, and 49.39% common equity at my recommended ROE of 11.75%, I conclude that an appropriate return on investor-

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36 It is Mr. D'Ascendis' opinion that the parent company's size is irrelevant in setting rates for one of its jurisdictional subsidiaries. Regulation is required to look at each operating utility as a stand-alone company since they can only set rates for that particular utility and no other operating subsidiary outside of their jurisdiction.

37 $291.383M (CRU-US book equity) * 324.1% (market-to-book ratio of the Utility Proxy Group) = $944.372M

supplied capital for the Company is 8.63%. A common equity cost rate of 11.75% 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 UIF will be able to continue providing safe, adequate and reliable water service to the benefit of customers. Thus, it balances the interests of both customers and the Company.

Q. Does that conclude your direct testimony?

A. Yes

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Application for increase in water and wastewater rates in Charlotte, Highlands, Lake, Lee, Marion, Orange, Pasco, Pinellas, Polk, and Seminole Counties by Utilities, Inc. of Florida.	)	Docket No. 20200139-WS

EXHIBIT (DWD-1) ______

OF

DYLAN D. D'ASCENDIS

on behalf of

Utilities, Inc. of Florida

Summary

Dylan is an experienced consultant and a Certified Rate of Return Analyst (CRRA) and Certified Valuation Analyst (CVA). He has served as a consultant for investor-owned and municipal utilities and authorities for 11 years. Dylan has extensive experience in rate of return analyses, class cost of service, rate design, and valuation for regulated public utilities. He has testified as an expert witness in the subjects of rate of return, cost of service, rate design, and valuation before 19 regulatory commissions in the U.S. and an American Arbitration Association panel.

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

Areas of Specialization

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

Recent Expert Testimony Submission/Appearances

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

Recent Assignments

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

Recent Publications and Speeches

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

SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
Regulatory Commission of Alaska				
Alaska Power Company	07/16	Alaska Power Company	Docket No. TA857-2	Rate of Return
Arizona Corporation Commission				
Arizona Water Company	12/19	Arizona Water Company – Western Group	Docket No. W01445A-19-0278	Rate of Return
Arizona Water Company	08/18	Arizona Water Company – Northern Group	Docket No. W01445A-18-0164	Rate of Return
Colorado Public Utilities Commission				
Summit Utilities, Inc.	04/18	Colorado Natural Gas Company	Docket No. 18AL-0305G	Return on Equity
Atmos Energy Corporation	06/17	Atmos Energy Corporation	Docket No. 17AL-0429G	Return on Equity
Delaware Public Service Commission				
Tidewater Utilities, Inc.	11/13	Tidewater Utilities, Inc.	Docket No. 13-466	Capital Structure
Hawaii Public Utilities Commission				
Lanai Water Company, Inc.	12/19	Lanai Water Company, Inc.	Docket No. 2019-0386	Cost of Service / Rate Design
Manele Water Resources, LLC	8/19	Manele Water Resources, LLC	Docket No. 2019-0311	Cost of Service / Rate Design
Kaupulehu Water Company	02/18	Kaupulehu Water Company	Docket No. 2016-0363	Rate of Return
Aqua Engineers, LLC	05/17	Puhi Sewer & Water Company	Docket No. 2017-0118	Cost of Service / Rate Design
Hawaii Resources, Inc.	09/16	Laie Water Company	Docket No. 2016-0229	Cost of Service / Rate Design
Illinois Commerce Commission				
Utility Services of Illinois, Inc.	11/17	Utility Services of Illinois, Inc.	Docket No. 17-1106	Cost of Service / Rate Design
Aqua Illinois, Inc.	04/17	Aqua Illinois, Inc.	Docket No. 17-0259	Rate of Return
Utility Services of Illinois, Inc.	04/15	Utility Services of Illinois, Inc.	Docket No. 14-0741	Rate of Return
Indiana Utility Regulatory Commission				
Aqua Indiana, Inc.	03/16	Aqua Indiana, Inc. Aboite Wastewater Division	Docket No. 44752	Rate of Return
Twin Lakes, Utilities, Inc.	08/13	Twin Lakes, Utilities, Inc.	Docket No. 44388	Rate of Return
Kansas Corporation Commission				
Atmos Energy	07/19	Atmos Energy	19-ATMG-525-RTS	Rate of Return
Louisiana Public Service Commission				
Louisiana Water Service, Inc.	06/13	Louisiana Water Service, Inc.	Docket No. U-32848	Rate of Return
Maryland Public Service Commission				
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

SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
Liberty Utilities	07/15	Liberty Utilities d/b/a New England Natural Gas Company	Docket No. 15-75	Rate of Return
Mississippi Public Service Commission				
Atmos Energy	03/19	Atmos Energy	Docket No. 2015-UN-049	Capital Structure
Atmos Energy	07/18	Atmos Energy	Docket No. 2015-UN-049	Capital Structure
Missouri Public Service Commission				
Indian Hills Utility Operating Company, Inc.	10/17	Indian Hills Utility Operating Company, Inc.	Case No. SR-2017-0259	Rate of Return
Raccoon Creek Utility Operating Company, Inc.	09/16	Raccoon Creek Utility Operating Company, Inc.	Docket No. SR-2016-0202	Rate of Return
New Jersey Board of Public Utilities				
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
North Carolina Utilities Commission				
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
Public Utilities Commission of Ohio				
Aqua Ohio, Inc.	05/16	Aqua Ohio, Inc.	Docket No. 16-0907-WW-AIR	Rate of Return
Pennsylvania Public Utility Commission				
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

SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
Veolia Energy Philadelphia, Inc.	06/17	Veolia Energy Philadelphia, Inc.	Docket No. R-2017-2593142	Rate of Return
Emporium Water Company	07/14	Emporium Water Company	Docket No. R-2014-2402324	Rate of Return
Columbia Water Company	07/13	Columbia Water Company	Docket No. R-2013-2360798	Rate of Return
Penn Estates Utilities, Inc.	12/11	Penn Estates, Utilities, Inc.	Docket No. R-2011-2255159	Capital Structure / Long-Term Debt Cost Rate
South Carolina Public Service Commission				
Blue Granite Water Co.	12/19	Blue Granite Water Company	Docket No. 2019-292-WS	Rate of Return
Carolina Water Service, Inc.	02/18	Carolina Water Service, Inc.	Docket No. 2017-292-WS	Rate of Return
Carolina Water Service, Inc.	06/15	Carolina Water Service, Inc.	Docket No. 2015-199-WS	Rate of Return
Carolina Water Service, Inc.	11/13	Carolina Water Service, Inc.	Docket No. 2013-275-WS	Rate of Return
United Utility Companies, Inc.	09/13	United Utility Companies, Inc.	Docket No. 2013-199-WS	Rate of Return
Utility Services of South Carolina, Inc.	09/13	Utility Services of South Carolina, Inc.	Docket No. 2013-201-WS	Rate of Return
Tega Cay Water Services, Inc.	11/12	Tega Cay Water Services, Inc.	Docket No. 2012-177-WS	Capital Structure
Virginia State Corporation Commission				
WGL Holdings, Inc.	7/18	Washington Gas Light Company	PUR-2018-00080	Rate of Return
Atmos Energy Corporation	5/18	Atmos Energy Corporation	PUR-2018-00014	Rate of Return
Aqua Virginia, Inc.	7/17	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

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Application for increase in water and wastewater rates in Charlotte, Highlands, Lake, Lee, Marion, Orange, Pasco, Pinellas, Polk, and Seminole Counties by Utilities, Inc. of Florida.	)	Docket No. 20200139-WS

EXHIBIT (DWD-2) ______

OF

DYLAN D. D'ASCENDIS

on behalf of

Utilities, Inc. of Florida

Utilities, Inc. of Florida
Table of Contents to
Exhibit DWD-2

Utilities, Inc of Florida
Recommended Capital Structure and Cost Rates
for Ratemaking Purposes
at December 31, 2019

Type Of Capital	Ratios (1)	Cost Rate		Weighted Cost Rate
Long-Term Debt	45.58%	5.78%	(1)	2.63%
Short-Term Debt	5.03%	4.04%	(1)	0.20%
Common Equity	49.39%	11.75%	(2)	5.80%
Total	100.00%			8.63%

Notes:

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

Utilities, Inc of Florida
Brief Summary of Common Equity Cost Rate

Line No.	Principal Methods	Proxy Group of Seven Water Companies
1.	Discounted Cash Flow Model (DCF) (1)	9.07%
2.	Risk Premium Model (RPM) (2)	10.91%
3.	Capital Asset Pricing Model (CAPM) (3)	10.90%
4.	Market Models Applied to Comparable Risk, Non-Price Regulated Companies (4)	11.48%
5.	Indicated Common Equity Cost Rate before Adjustment for Risk	10.75%
6.	Size Risk Adjustment (5)	1.00%
7.	Recommended Common Equity Cost Rate after Adjustment for Risk	11.75%

Notes: (1) From Schedule 3.
(2) From page 1 of Schedule 4.
(3) From page 1 of Schedule 5.
(4) From page 1 of Schedule 7.
(5) Business risk adjustment to reflect UIF's smaller relative size to the Utility Proxy Group as detailed in the accompanying direct testimony.

Proxy Group of Seven Water Companies
CAPITALIZATION AND FINANCIAL STATISTICS (1)
2014 - 2018, Inclusive

	2019	2018	2017	2016	2015	
			(MILLIONS OF DOLLARS)			
CAPITALIZATION STATISTICS						
AMOUNT OF CAPITAL EMPLOYED						
TOTAL PERMANENT CAPITAL	$3,888.223	$3,208.636	$2,837.657	$2,680.018	$2,535.795	
SHORT-TERM DEBT	$189.862	$184.221	$185.250	$152.691	$106.277	
TOTAL CAPITAL EMPLOYED	$4,078.085	$3,392.857	$3,022.907	$2,832.709	$2,642.072	
INDICATED AVERAGE CAPITAL COST RATES (2)						
TOTAL DEBT	4.30 %	4.75 %	4.829 %	4.943 %	5.079 %	
PREFERRED STOCK	5.84 %	5.92 %	5.91 %	5.91 %	5.91 %	
						5 YEAR AVERAGE
CAPITAL STRUCTURE RATIOS						
BASED ON TOTAL PERMANENT CAPITAL:						
LONG-TERM DEBT	47.17 %	45.15 %	45.58 %	46.14 %	46.49 %	46.11 %
PREFERRED STOCK	0.06	0.09	0.10	0.11	0.11	0.09
COMMON EQUITY	52.77	54.76	54.32	53.75	53.40	53.80
TOTAL	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
BASED ON TOTAL CAPITAL:						
TOTAL DEBT, INCLUDING SHORT-TERM	50.61 %	48.37 %	48.93 %	48.42 %	47.77 %	48.82 %
PREFERRED STOCK	0.06	0.08	0.09	0.10	0.11	0.09
COMMON EQUITY	49.34	51.54	50.98	51.47	52.12	51.09
TOTAL	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
FINANCIAL STATISTICS						
FINANCIAL RATIOS - MARKET BASED						
EARNINGS / PRICE RATIO	2.67 %	6.31 %	7.91 %	3.97 %	4.59 %	5.09 %
MARKET / AVERAGE BOOK RATIO	340.26	289.89	288.75	280.21	229.70	285.76
DIVIDEND YIELD	1.77	3.74	3.69	2.15	2.62	2.79
DIVIDEND PAYOUT RATIO	72.32	60.08	55.80	56.03	57.45	60.34
RATE OF RETURN ON AVERAGE BOOK COMMON EQUITY	9.49 %	10.12 %	11.31 %	10.93 %	10.39 %	10.45 %
TOTAL DEBT / EBITDA (3)	5.54 x	4.22 x	3.42 x	3.41 x	3.42 x	4.00 x
FUNDS FROM OPERATIONS / TOTAL DEBT (4)	14.49 %	21.37 %	22.87 %	23.65 %	25.81 %	21.64 %
TOTAL DEBT / TOTAL CAPITAL	50.61 %	48.37 %	48.93 %	48.42 %	47.77 %	48.82 %

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

Source of Information: Company Annual Forms 10-K

Capital Structure Based upon Total Permanent Capital for the
Proxy Group of Seven Water Companies
2014 - 2018, Inclusive

	2019	2018	2017	2016	2015	5 YEAR AVERAGE
American States Water Co.						
Long-Term Debt	25.86 %	32.96 %	35.30 %	35.48 %	39.75 %	33.87 %
Short-Term Debt	18.84	9.79	6.48	9.94	3.41	9.69
Preferred Stock	0.00	0.00	0.00	0.00	0.00	0.00
Common Equity	55.30	57.25	58.22	54.58	56.84	56.44
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
American Water Works Company Inc						
Long-Term Debt	55.63 %	52.78 %	51.96 %	50.99 %	50.98 %	52.47 %
Short-Term Debt	5.05	6.66	6.90	6.85	5.41	6.17
Preferred Stock	0.03	0.05	0.06	0.08	0.10	0.06
Common Equity	39.29	40.51	41.08	42.08	43.51	41.30
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
California Water Service Group						
Long-Term Debt	45.85 %	50.61 %	35.44 %	42.44 %	43.44 %	43.56 %
Short-Term Debt	9.93	4.04	18.34	7.39	2.81	8.50
Preferred Stock	0.00	0.00	0.00	0.00	0.00	0.00
Common Equity	44.22	45.35	46.22	50.17	53.75	47.94
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
Essential Utilities, Inc.						
Long-Term Debt	44.06 %	55.87 %	52.21 %	50.72 %	50.52 %	50.67 %
Short-Term Debt	0.37	0.34	0.09	0.17	0.47	0.29
Preferred Stock	0.00	0.00	0.00	0.00	0.00	0.00
Common Equity	55.57	43.79	47.70	49.11	49.01	49.04
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
Middlesex Water Co.						
Long-Term Debt	40.76 %	34.83 %	35.98 %	37.66 %	40.10 %	37.87 %
Short-Term Debt	3.42	10.55	6.90	3.21	0.85	4.99
Preferred Stock	0.36	0.53	0.60	0.65	0.68	0.56
Common Equity	55.46	54.09	56.52	58.48	58.37	56.58
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
SJW Group						
Long-Term Debt	56.45 %	30.37 %	46.89 %	49.86 %	47.88 %	46.29 %
Short-Term Debt	5.07	7.04	2.72	1.63	4.31	4.15
Preferred Stock	0.00	0.00	0.00	0.00	0.00	0.00
Common Equity	38.48	62.59	50.39	48.51	47.81	49.56
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
York Water Co.						
Long-Term Debt	42.95 %	42.33 %	42.81 %	42.60 %	44.46 %	43.03 %
Short-Term Debt	0.00	0.45	0.48	0.00	0.00	0.19
Preferred Stock	0.00	0.00	0.00	0.00	0.00	0.00
Common Equity	57.05	57.22	56.71	57.40	55.54	56.78
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
Proxy Group of Seven Water Companies						
Long-Term Debt	44.51 %	42.82 %	42.94 %	44.25 %	45.30 %	43.97 %
Short-Term Debt	6.10	5.55	5.99	4.17	2.47	4.85
Preferred Stock	0.05	0.08	0.09	0.10	0.11	0.09
Common Equity	49.34	51.55	50.98	51.48	52.12	51.09
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %

Source of Information
Annual Forms 10-K

Utilities, Inc of Florida
Indicated Common Equity Cost Rate Using the Discounted Cash Flow Model for
Proxy Group of Seven Water Companies

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Proxy Group of Seven Water Companies	Average Dividend Yield (1)	Value Line Projected Five Year Growth in EPS (2)	Zack's Five Year Projected Growth Rate in EPS	Yahoo! Finance Projected Five Year Growth in EPS	Bloomberg Projected Five Year Growth in EPS	Average Projected Five Year Growth in EPS (3)	Adjusted Dividend Yield (4)	Indicated Common Equity Cost Rate (5)
American States Water Co.	1.45 %	6.50 %	NA %	6.00 %	6.00 %	6.17 %	1.49 %	7.66 %
American Water Works Company Inc	1.73	8.50	8.10	8.20	8.19	8.25	1.80	10.05
California Water Service Group	1.66	6.50	NA	9.80	9.00	8.43	1.73	10.16
Essential Utilities, Inc.	2.11	10.00	5.90	6.40	6.69	7.25	2.19	9.44
Middlesex Water Co.	1.66	6.00	NA	2.70	NA	4.35	1.70	6.05
SJW Group	2.04	6.00	4.00	14.00	7.00	7.75	2.12	9.87
York Water Co.	1.66	7.00	NA	4.90	NA	5.95	1.71	7.66
							Average	8.70 %
							Median	9.44 %
							Average of Mean and Median	9.07 %

NA= Not Available

Notes:
(1) Indicated dividend at 04/30/2020 divided by the average closing price of the last 60 trading days ending 04/30/2020 for each company.
(2) From pages 2 through 8 of this Schedule.
(3) Average of columns 2 through 4 excluding negative growth rates.
(4) This reflects a growth rate component equal to one-half the conclusion of growth rate (from column 5) x column 1 to reflect the periodic payment of dividends (Gordon Model) as opposed to the continuous payment. Thus, for American States Water Co., 1.45% x (1+(1/2 x 6.17%)) = 1.49%.
(5) Column 5 + column 6.

Source of Information:
Value Line Investment Survey
www.zacks.com Downloaded on 04/30/2020
www.yahoo.com Downloaded on 04/30/2020
Bloomberg Professional Services

AMER. STATES WATER NYSE-AWR

RECENT PRICE **84.60** | P/E RATIO **37.6** (Trailing: 37.1; Median: 22.0) | RELATIVE P/E RATIO **2.85** | DIV'D YLD **1.5%** | VALUE LINE

TIMELINESS	2	Lowered 3/20/20	
SAFETY	2	Raised 7/20/12	
TECHNICAL	3	Raised 3/6/20	
BETA .60 (1.00 = Market)			

18-Month Target Price Range
Low-High: $68-$116 — Midpoint (% to Mid): $92 (10%)

2023-25 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	80	(-5%)	1%
Low	60	(-30%)	-6%

Institutional Decisions

	2Q2019	3Q2019	4Q2019
to Buy	139	149	137
to Sell	109	124	145
Hld's(000)	26893	27173	26734

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
High:	19.4	19.8	18.2	24.1	33.1	38.7	44.1	47.2	58.4	69.6	96.0	96.6	
Low:	14.9	15.6	15.3	17.0	24.0	27.0	35.8	37.3	41.1	50.1	63.3	65.1	

Target Price Range 2023 | 2024 | 2025

% TOT. RETURN 2/20

	THIS STOCK	VL ARITH.* INDEX
1 yr.	8.9	-6.8
3 yr.	79.8	6.6
5 yr.	109.4	20.3

2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	© VALUE LINE PUB. LLC	23-25
6.81	7.03	7.88	8.75	9.21	9.74	10.71	11.12	12.12	12.19	12.17	12.56	11.92	12.01	11.88	12.86	**12.95**	**13.30**	Revenues per sh	**16.40**
1.11	1.32	1.45	1.65	1.69	1.70	2.11	2.13	2.48	2.65	2.67	2.81	2.70	2.96	2.84	3.26	**3.25**	**3.55**	"Cash Flow" per sh	**4.50**
.53	.66	.67	.81	.78	.81	1.11	1.12	1.41	1.61	1.57	1.61	1.62	1.88	1.72	2.28	**2.25**	**2.40**	Earnings per sh A	**2.90**
.44	.45	.46	.48	.50	.51	.52	.55	.64	.76	.83	.87	.91	.99	1.06	1.16	**1.25**	**1.35**	Div'd Decl'd per sh B■	**1.85**
2.51	2.12	1.95	1.45	2.23	2.09	2.12	2.13	1.77	2.52	1.89	2.39	3.55	3.08	3.44	4.12	**3.50**	**3.50**	Cap'l Spending per sh	**3.75**
7.51	7.86	8.32	8.77	8.97	9.70	10.13	10.84	11.80	12.72	13.24	12.77	13.52	14.45	15.19	16.33	**17.15**	**18.10**	Book Value per sh D	**21.35**
33.50	33.60	34.10	34.46	34.60	37.06	37.26	37.70	38.53	38.72	38.29	36.50	36.57	36.68	36.76	36.85	**37.00**	**37.25**	Common Shs Outst'g C	**37.50**
23.2	21.9	27.7	24.0	22.6	21.2	15.7	15.4	14.3	17.2	20.1	24.6	25.6	25.7	34.0	34.4	*Bold figures are*		Avg Ann'l P/E Ratio	**23.5**
1.23	1.17	1.50	1.27	1.36	1.41	1.00	.97	.91	.97	1.06	1.24	1.34	1.29	1.84	1.87	*Value Line*		Relative P/E Ratio	**1.30**
3.6%	3.1%	2.5%	2.5%	2.9%	2.9%	3.0%	3.2%	3.1%	2.7%	2.6%	2.2%	2.2%	2.0%	1.8%	1.5%	*estimates*		Avg Ann'l Div'd Yield	**2.6%**

CAPITAL STRUCTURE as of 12/31/19
Total Debt $286.3 mill. **Due in 5 Yrs** $6.9 mill.
LT Debt $281.0 mill. **LT Interest** $24.5 mill.
(32% of Cap'l)

Leases, Uncapitalized: Annual rentals $2.7 mill.
Pension Assets-12/19 $192.5 mill.
Oblig. $231.9 mill.
Pfd Stock None

Common Stock 36,859,505 shs.
as of 2/20/20

MARKET CAP: $3.1 billion (Mid Cap)

2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021		23-25
398.9	419.3	466.9	472.1	465.8	458.6	436.1	440.6	436.8	473.9	**480**	**495**	Revenues ($mill)	**615**
41.4	42.0	54.1	62.7	61.1	60.5	59.7	69.4	63.9	84.3	**83.0**	**90.0**	Net Profit ($mill)	**110**
43.2%	41.7%	39.9%	36.3%	38.4%	38.4%	36.8%	36.0%	22.0%	22.6%	**23.0%**	**23.0%**	Income Tax Rate	**23.0%**
5.8%	2.0%	2.5%	- -	- -	- -	- -	- -	2.5%	- -	**1.0%**	**1.0%**	AFUDC % to Net Profit	**1.0%**
44.3%	45.4%	42.2%	39.8%	39.1%	41.1%	39.4%	38.0%	40.5%	44.4%	**46.0%**	**47.0%**	Long-Term Debt Ratio	**49.5%**
55.7%	54.6%	57.8%	60.2%	60.9%	58.9%	60.6%	62.0%	59.5%	55.6%	**54.0%**	**53.0%**	Common Equity Ratio	**51.5%**
677.4	749.1	787.0	818.4	832.6	791.5	815.3	854.9	938.4	1082.5	**1180**	**1275**	Total Capital ($mill)	**1565**
855.0	896.5	917.8	981.5	1003.5	1060.8	1150.9	1205.0	1296.3	1415.7	**1485**	**1590**	Net Plant ($mill)	**1780**
7.6%	7.1%	8.3%	8.9%	8.6%	9.0%	8.6%	9.3%	7.9%	8.9%	**8.0%**	**8.0%**	Return on Total Cap'l	**8.5%**
11.0%	10.3%	11.9%	12.7%	12.0%	13.0%	12.1%	13.1%	11.4%	14.0%	**13.0%**	**13.5%**	Return on Shr. Equity	**14.0%**
11.0%	10.3%	11.9%	12.7%	12.0%	13.0%	12.1%	13.1%	11.4%	14.0%	**13.0%**	**13.5%**	Return on Com Equity	**14.0%**
5.8%	5.3%	6.6%	6.8%	5.7%	6.0%	5.3%	6.2%	4.5%	6.9%	**6.0%**	**6.0%**	Retained to Com Eq	**5.0%**
47%	49%	45%	47%	53%	54%	56%	52%	61%	51%	**56%**	**56%**	All Div'ds to Net Prof	**64%**

CURRENT POSITION ($MILL.)	2017	2018	12/31/19
Cash Assets	.2	7.1	1.3
Accts Receivable	26.1	23.4	20.9
Other	129.2	101.0	100.3
Current Assets	155.5	131.5	122.5
Accts Payable	51.0	59.5	55.6
Debt Due	59.3	40.3	5.3
Other	46.4	46.8	55.1
Current Liab.	156.7	146.6	116.0

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '17-'19 to '23-'25
Revenues	3.0%	- -	5.0%
"Cash Flow"	6.0%	3.0%	7.0%
Earnings	9.5%	5.0%	6.5%
Dividends	8.0%	7.5%	9.5%
Book Value	5.5%	4.0%	5.5%

Cal-endar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2017	98.8	113.2	124.4	104.2	440.6
2018	94.7	106.9	124.2	111.0	436.8
2019	101.7	124.7	134.5	113.0	473.9
2020	*105*	*120*	*140*	*115*	*480*
2021	*107*	*123*	*145*	*120*	*495*

Cal-endar	EARNINGS PER SHARE A Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2017	.34	.62	.57	.35	1.88
2018	.29	.44	.62	.37	1.72
2019	.35	.72	.76	.45	2.28
2020	*.40*	*.68*	*.72*	*.50*	*2.25*
2021	*.43*	*.72*	*.75*	*.55*	*2.40*

Cal-endar	QUARTERLY DIVIDENDS PAID B■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2016	.224	.224	.224	.242	.91
2017	.242	.242	.255	.255	.99
2018	.255	.255	.275	.275	1.06
2019	.275	.275	.305	.305	1.16
2020	.305				

BUSINESS: American States Water Co. operates as a holding company. Through its principal subsidiary, Golden State Water Co., it supplies water to 260,708 customers in 10 California counties. Service areas include the metropolitan areas of Los Angeles and Orange Counties. The company also provides electricity to 24,420 customers in Big Bear Lake and San Bernardino Cnty. Provides water & wastewater services to U.S. military bases through its ASUS subsidiary. Sold Chaparral City Wtr. of AZ. (6/11). Employs 841. BlackRock, Inc. owns 15.1% of out. shares; Vanguard, 11.5%; off. & dir. 1.2%. (4/19 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.

The stock of American States Water has performed better than most equities during the latest disruption in the financial markets. The utility provides a service that is essential. So, whether the economy is booming or experiencing problems, people's usage of water will not change significantly. Hence, American States' income stream is much better defined than the typical corporation. This has been reflected in AWR's year-to-date price performance, as the equity has declined less than 7%, versus the approximately 19% decrease posted by the broader market averages.

Earnings in 2020 will most likely not be able to match last year's impressive showing. The company's stronger-than-expected fourth quarter of 2019 will make year-over-year comparisons difficult. Still, a combination of rate relief, cost control improvements, and a greater contribution from ASUS (more below), could enable share net to reach $2.25. These same factors, along with growth in the rate base, ought to result in an increase in earnings per share to $2.40, a 6% rise, in 2021.

The nonregulated business should remain a key growth driver. Through its ASUS subsidiary, American States provides water services to U.S. Army bases. As more water services at military installations are privatized, we expect ASUS to continue to increase, or at least maintain, its market share. The typical contract is for 50 years, and unlike its other operations, income is not regulated by state authorities. In 2019, profits increased here by 12%, and represented $0.47 of the company's total share net.

Dividend growth prospects are bright. The board usually announces a new annual increase in the payout in mid-August. While we do not think that 2019's 11% hike will be equaled, the new dividend per share should be somewhere between $0.325 and $0.33. This would still represent a percentage increase that is higher than the group norm. Moreover, the trend should continue to mid-decade.

These shares are timely. Investors may want to note that like most members of this group, the stock's total return potential to 2023-2025 is well below average.

James A. Flood — *April 10, 2020*

(A) Primary earnings. Excludes nonrecurring gains/(losses): '04, 7¢; '05, 13¢; '06, 3¢; '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 12/31/19; $28.6 million/$0.78. a share.

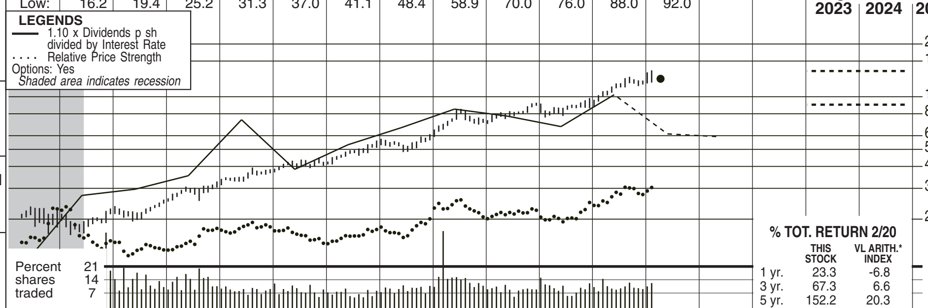
Company's Financial Strength	A
Stock's Price Stability	85
Price Growth Persistence	95
Earnings Predictability	85

AMERICAN WATER NYSE-AWK

RECENT PRICE **126.72** | P/E RATIO **36.0** (Trailing: 36.9; Median: 22.0) | RELATIVE P/E RATIO **2.73** | DIV'D YLD **1.7%** | VALUE LINE

TIMELINESS **3** Lowered 4/3/20
SAFETY **3** New 7/25/08
TECHNICAL **3** Raised 4/10/20
BETA .50 (1.00 = Market)

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
High:	23.0	25.8	32.8	39.4	45.1	56.2	61.2	85.2	92.4	98.2	129.9	141.7	
Low:	16.2	19.4	25.2	31.3	37.0	41.1	48.4	58.9	70.0	76.0	88.0	92.0	



18-Month Target Price Range

Low-High	Midpoint (% to Mid)
$119-$173	$146 (15%)

2023-25 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	140	(+10%)	5%
Low	90	(-30%)	-6%

Institutional Decisions

	2Q2019	3Q2019	4Q2019
to Buy	360	385	393
to Sell	331	322	361
Hld's(000)	155051	153329	155435

% TOT. RETURN 2/20

	THIS STOCK	VL ARITH.* INDEX
1 yr.	23.3	-6.8
3 yr.	67.3	6.6
5 yr.	152.2	20.3

2004	2005	2006E	2007E	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	© VALUE LINE PUB. LLC	23-25
--	--	13.08	13.84	14.61	13.98	15.49	15.18	16.25	16.28	16.78	17.72	18.54	18.81	19.04	19.97	**20.90**	**21.85**	Revenues per sh	**24.75**
--	--	.65	d.47	2.87	2.89	3.56	3.73	4.27	4.36	4.75	5.13	5.26	5.14	6.15	6.65	**8.00**	**8.15**	"Cash Flow" per sh	**8.75**
--	--	d.97	d2.14	1.10	1.25	1.53	1.72	2.11	2.06	2.39	2.64	2.62	2.38	3.15	3.43	**3.70**	**4.00**	Earnings per sh A	**4.90**
--	--	--	--	.40	.82	.86	.90	1.21	.84	1.21	1.33	1.47	1.62	1.78	1.96	**2.10**	**2.25**	Div'd Decl'd per sh B■	**2.90**
--	--	4.31	4.74	6.31	4.50	4.38	5.27	5.25	5.50	5.33	6.51	7.36	8.04	8.78	9.15	**8.70**	**9.20**	Cap'l Spending per sh	**9.00**
--	--	23.86	28.39	25.64	22.91	23.59	24.11	25.11	26.52	27.39	28.25	29.24	30.13	32.42	33.83	**35.35**	**36.95**	Book Value per sh D	**42.50**
--	--	160.00	160.00	160.00	174.63	175.00	175.66	176.99	178.25	179.46	178.28	178.10	178.44	180.68	180.81	**181.00**	**182.00**	Common Shs Outst'g C	**189.00**
--	--	--	--	18.9	15.6	14.6	16.8	16.7	19.9	20.0	20.5	27.7	33.8	27.3	32.9	*Bold figures are*	*Value Line*	Avg Ann'l P/E Ratio	**23.5**
--	--	--	--	1.14	1.04	.93	1.05	1.06	1.12	1.05	1.03	1.45	1.70	1.47	1.79	*estimates*		Relative P/E Ratio	**1.30**
--	--	--	--	1.9%	4.2%	3.8%	3.1%	3.4%	2.0%	2.5%	2.5%	2.0%	2.0%	2.1%	1.7%			Avg Ann'l Div'd Yield	**2.5%**

CAPITAL STRUCTURE as of 12/31/19
Total Debt $9453.0 mil. **Due in 5 Yrs** $1773.0 mil.
LT Debt $8639.0 mil. **LT Interest** $354.0 mil.
(59% of Cap'l)

Leases, Uncapitalized: Annual rentals $14.0 mill.
Pension Assets12/19 $1747.0 mill
Oblig. $2161.0 mill.
Pfd Stock $5.0 mill. **Pfd Div'd** $.4 mill

Common Stock 180,974,719 shares
as of 2/13/20

MARKET CAP: $22.9 billion (Large Cap)

2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021		23-25
2710.7	2666.2	2876.9	2901.9	3011.3	3159.0	3302.0	3357.0	3440.0	3610.0	**3785**	**3975**	Revenues ($mill)	**4675**
267.8	304.9	374.3	369.3	429.8	476.0	468.0	426.0	567.0	621.0	**670**	**730**	Net Profit ($mill)	**925**
40.4%	39.5%	40.7%	39.1%	39.4%	39.1%	39.2%	53.3%	28.2%	25.5%	**21.0%**	**21.0%**	Income Tax Rate	**21.0%**
--	--	6.2%	5.1%	--	--	--	--	5.1%	4.0%	**5.0%**	**5.0%**	AFUDC % to Net Profit	**5.0%**
56.8%	55.7%	53.9%	52.4%	52.4%	53.7%	52.4%	54.7%	56.3%	58.5%	**58.5%**	**59.0%**	Long-Term Debt Ratio	**59.0%**
43.2%	44.2%	46.1%	47.6%	47.4%	46.2%	47.5%	45.3%	43.6%	41.4%	**41.5%**	**41.0%**	Common Equity Ratio	**41.0%**
9561.3	9580.3	9635.5	9940.7	10364	10911	10967	11875	13433	14760	**15400**	**16325**	Total Capital ($mill)	**20000**
11059	11021	11739	12391	12900	13933	14992	16246	17409	18232	**19100**	**19900**	Net Plant ($mill)	**22200**
4.4%	4.8%	5.4%	5.1%	5.5%	5.7%	5.6%	4.9%	5.4%	5.4%	**5.5%**	**6.0%**	Return on Total Cap'l	**6.0%**
6.5%	7.2%	8.4%	7.8%	8.7%	9.4%	9.0%	7.9%	9.7%	10.1%	**10.5%**	**11.0%**	Return on Shr. Equity	**11.5%**
6.5%	7.2%	8.4%	7.8%	8.7%	9.4%	9.0%	7.9%	9.7%	10.1%	**10.5%**	**11.0%**	Return on Com Equity	**11.5%**
2.8%	3.5%	3.6%	4.7%	4.3%	4.7%	4.0%	2.5%	4.2%	4.4%	**4.5%**	**4.5%**	Retained to Com Eq	**4.5%**
56%	52%	57%	40%	50%	50%	56%	68%	56%	57%	**57%**	**56%**	All Div'ds to Net Prof	**59%**

CURRENT POSITION ($MILL.)	2017	2018	12/31/19
Cash Assets	82	158	91
Accts Receivable	272	301	294
Other	366	322	900
Current Assets	720	781	1285
Accts Payable	195	175	203
Debt Due	1227	1035	814
Other	903	884	1028
Current Liab.	2325	2094	2045

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '17-'19 to '23-'25
Revenues	3.0%	3.0%	4.5%
"Cash Flow"	13.0%	6.0%	6.5%
Earnings	45.5%	6.5%	8.5%
Dividends	16.0%	10.5%	8.5%
Book Value	2.5%	4.0%	5.0%

Cal-endar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2017	756.0	844.0	936.0	821.0	3357.0
2018	761.0	853.0	976.0	850.0	3440.0
2019	813.0	882.0	1013.0	902.0	3610.0
2020	**835**	**920**	**1080**	**950**	**3785**
2021	**885**	**970**	**1120**	**1000**	**3975**

Cal-endar	EARNINGS PER SHARE A Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2017	.52	.73	1.12	.01	2.38
2018	.59	.91	1.03	.62	3.15
2019	.62	.94	1.33	.54	3.43
2020	**.66**	**.97**	**1.35**	**.72**	**3.70**
2021	**.73**	**1.05**	**1.45**	**.77**	**4.00**

Cal-endar	QUARTERLY DIVIDENDS PAID B■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2016	.34	.375	.375	.375	1.47
2017	.375	.415	.415	.415	1.62
2018	.415	.455	.455	.455	1.78
2019	.455	.50	.50	.50	1.96
2020	.50				

BUSINESS: American Water Works Company, Inc. is the largest investor-owned water and wastewater utility in the U.S., providing services to approximately 15 million people in 46 states. Nonregulated business assists municipalities and military bases with the maintenance and upkeep as well. Regulated operations made up 86% of 2019 revenues. New Jersey is its largest market accounting for 24.6% of regulated revenues; Pennsylvania, 22.3%; Missouri, 10.5%. Has 6,800 employees. The Vanguard Grp, owns 11.0% of outstanding shares; BlackRock, Inc., 7.9%; officers & directors, less than 1.0%. (3/19 Proxy). President & CEO: Susan N. Story. Chairman: George MacKenzie. Address: 1 Water Street, Camden, NJ 08102. Tel.: 856-346-8200. Internet: www.amwater.com.

Shares of American Water Works have been a safe haven for investors during the recent turmoil caused by the coronavirus. Year to date, the price of the stock has increased nearly 3%. By comparison, the S&P 500 Index has declined about 19% over the same time period. Indeed, both long- and short-term investors have done well holding this equity, as it has outpaced bull markets, as well as outperformed most stocks during the downturns.

What's the reason behind American Water's success? There are a few basic principles behind the company's consistent positive performance. The first is to expand the asset base on which it earns a return. That's one of the reasons for the large construction program. (Domestic pipelines are in desperate need of repair.) The second is the an ongoing acquisition program. Third, is a focus on cost controls.

Earnings and dividend growth prospects are bright through mid-decade. American Water is perhaps the biggest beneficiary of the consolidation taking place in the domestic water market. As the largest water utility, it is able to continually acquire smaller water districts and merge them into its existing operations. Unlike many other industries, synergies are easily achievable in the water business. The company is able to increase its ratebase, and simultaneously make the acquired assets more efficient. This is one of the reasons that management has a constructive relationship with regulators in states where it operates.

Finances are only average. The combination of the aggressive construction program, together with an aversion to selling new equity has resulted in American Water having the highest debt-to-total capital ratio of all the water utilities we follow, by a wide margin. Over the past decade, shares outstanding have risen just 3.5%. Thus, now would seem to be a good time to have an equity offering.

Despite all of the company's positive attributes, the stock does not stand out at this time. Our ranking system pegs AWK to mirror the market in the year ahead. Moreover, like most water utilities, AWK has unattractive long-term total return potential.

James A. Flood *April 10, 2020*

(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. Next earnings report due mid-May. Quarterly earnings do not sum in '16 due to rounding.
(B) Dividends paid in March, June, September, and December. ■ Div. reinvestment available.
(C) In millions. (D) Includes intangibles. On 12/31/19: $1.568 billion, $8.67/share.
(E) Pro forma numbers for '06 & '07.

Company's Financial Strength	B+
Stock's Price Stability	100
Price Growth Persistence	85
Earnings Predictability	80

ESSENTIAL UTIL. NYSE-WTRG

RECENT PRICE **43.05** | P/E RATIO **32.4** (Trailing: 43.1; Median: 23.0) | RELATIVE P/E RATIO **2.45** | DIV'D YLD **2.3%** | VALUE LINE

TIMELINESS **1** Raised 12/20/19
SAFETY **2** Raised 4/20/12
TECHNICAL **3** Raised 3/6/20
BETA .60 (1.00 = Market)

18-Month Target Price Range

Low-High	Midpoint (% to Mid)
$35-$68	$52 (20%)

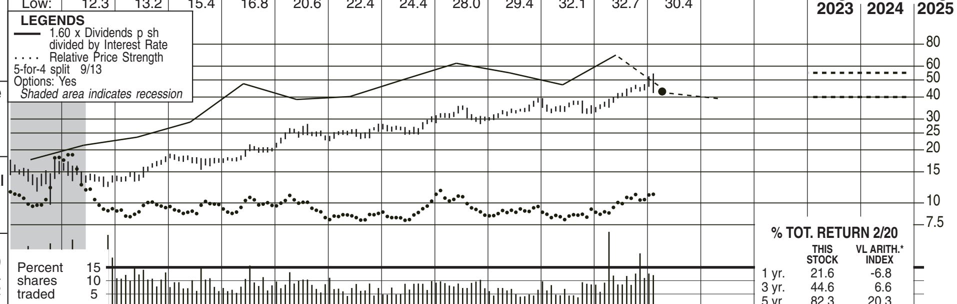
2023-25 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	55	(+30%)	*9%*
Low	40	(-5%)	*1%*

Institutional Decisions

	2Q2019	3Q2019	4Q2019
to Buy	280	248	274
to Sell	167	210	242
Hld's(000)	140358	143792	149836

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
High:	17.2	18.4	19.0	21.5	28.1	28.2	31.1	35.8	39.6	39.4	47.3	54.5
Low:	12.3	13.2	15.4	16.8	20.6	22.4	24.4	28.0	29.4	32.1	32.7	30.4



Target Price Range 2023 | 2024 | 2025

% TOT. RETURN 2/20

	THIS STOCK	VL ARITH.* INDEX
1 yr.	21.6	-6.8
3 yr.	44.6	6.6
5 yr.	82.3	20.3

2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	© VALUE LINE PUB. LLC	23-25
2.78	3.08	3.23	3.61	3.71	3.93	4.21	4.10	4.32	4.32	4.37	4.61	4.62	4.56	4.71	4.03	*6.50*	*7.70*	Revenues per sh	*8.70*
.87	.97	1.01	1.10	1.14	1.29	1.42	1.45	1.51	1.82	1.89	1.87	2.07	2.12	1.90	1.73	*2.40*	*2.65*	"Cash Flow" per sh	*3.50*
.51	.57	.56	.57	.58	.62	.72	.83	.87	1.16	1.20	1.14	1.32	1.35	1.08	1.04	*1.45*	*1.55*	Earnings per sh A	*2.05*
.29	.32	.35	.38	.41	.44	.47	.50	.54	.58	.63	.69	.74	.79	.85	.91	*.97*	*1.05*	Div'd Decl'd per sh B■	*1.30*
1.23	1.47	1.64	1.43	1.58	1.66	1.89	1.90	1.98	1.73	1.84	2.07	2.16	2.69	2.78	2.49	*3.75*	*4.45*	Cap'l Spending per sh	*4.75*
4.71	5.04	5.57	5.85	6.26	6.50	6.81	7.21	7.90	8.63	9.27	9.78	10.43	11.02	11.28	17.58	*17.35*	*17.60*	Book Value per sh	*19.55*
158.97	161.21	165.41	166.75	169.21	170.61	172.46	173.60	175.43	177.93	178.59	176.54	177.39	177.71	178.09	220.76	*225.00*	*227.00*	Common Shs Outst'g C	*230.00*
25.1	31.8	34.7	32.0	24.9	23.1	21.1	21.3	21.9	21.2	20.8	23.5	23.9	24.7	32.6	39.1	*Bold figures are*		Avg Ann'l P/E Ratio	*24.0*
1.33	1.69	1.87	1.70	1.50	1.54	1.34	1.34	1.39	1.19	1.09	1.18	1.25	1.24	1.76	2.12	*Value Line*		Relative P/E Ratio	*1.35*
2.3%	1.8%	1.8%	2.1%	2.8%	3.1%	3.1%	2.8%	2.8%	2.4%	2.5%	2.6%	2.3%	2.4%	2.4%	2.2%	*estimates*		Avg Ann'l Div'd Yield	*2.6%*

CAPITAL STRUCTURE as of 12/31/19
Total Debt $3074.1 mill. **Due in 5 Yrs** $252.0 mill.
LT Debt $2943.3 mill. **LT Interest** $123.5 mill.
(43% of Cap'l)

Pension Assets-12/19 $266.4 mill.
Oblig. $310.5 mill.

Pfd Stock None
Common Stock 222,781,536 shares
as of 2/19/20

MARKET CAP: $9.6 billion (Large Cap)

2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021		23-25
726.1	712.0	757.8	768.6	779.9	814.2	819.9	809.5	838.1	889.7	*1460*	*1750*	Revenues ($mill)	*2000*
124.0	144.8	153.1	205.0	213.9	201.8	234.2	239.7	192.0	224.5	*325*	*350*	Net Profit ($mill)	*470*
39.2%	32.9%	39.0%	10.0%	10.5%	6.9%	8.2%	6.6%	6.6%	6.6%	*7.0%*	*7.5%*	Income Tax Rate	*9.0%*
- -	- -	- -	1.1%	2.4%	3.1%	3.8%	6.3%	6.8%	7.2%	*7.0%*	*7.0%*	AFUDC % to Net Profit	*8.0%*
56.6%	52.7%	52.7%	48.9%	48.5%	50.3%	48.4%	50.6%	54.4%	43.1%	*49.0%*	*51.0%*	Long-Term Debt Ratio	*55.0%*
43.4%	47.3%	47.3%	51.1%	51.5%	49.7%	51.6%	49.4%	45.6%	56.9%	*51.0%*	*49.0%*	Common Equity Ratio	*45.0%*
2706.2	2646.8	2929.7	3003.6	3216.0	3469.5	3587.7	3965.4	4407.8	6824.2	*7600*	*8000*	Total Capital ($mill)	*9800*
3469.3	3612.9	3936.2	4167.3	4402.0	4688.9	5001.6	5399.9	5930.3	6345.8	*8200*	*8350*	Net Plant ($mill)	*10900*
5.9%	6.9%	6.6%	8.0%	7.8%	6.9%	7.6%	7.1%	5.5%	4.2%	*6.5%*	*5.5%*	Return on Total Cap'l	*7.0%*
10.6%	11.6%	11.0%	13.4%	12.9%	11.7%	12.7%	12.2%	9.6%	5.8%	*8.5%*	*9.0%*	Return on Shr. Equity	*10.5%*
10.6%	11.6%	11.0%	13.4%	12.9%	11.7%	12.7%	12.2%	9.6%	5.8%	*8.5%*	*9.0%*	Return on Com Equity	*10.5%*
3.7%	4.6%	4.3%	6.7%	6.1%	4.7%	5.6%	5.1%	2.1%	.9%	*2.5%*	*3.0%*	Retained to Com Eq	*4.0%*
65%	60%	61%	50%	52%	60%	56%	59%	79%	84%	*67%*	*68%*	All Div'ds to Net Prof	*63%*

CURRENT POSITION ($MILL.)	2017	2018	12/31/19
Cash Assets	4.2	3.6	1868.9
Receivables	98.6	101.2	67.1
Inventory (AvgCst)	14.4	15.8	18.4
Other	14.0	26.6	58.3
Current Assets	131.2	147.2	2012.7
Accts Payable	59.2	77.3	74.9
Debt Due	117.4	160.0	130.8
Other	107.9	161.7	113.1
Current Liab.	284.5	399.0	318.8

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '17-'19 to '23-'25
Revenues	1.5%	.5%	*12.0%*
"Cash Flow"	5.0%	2.0%	*10.5%*
Earnings	7.0%	1.5%	*10.0%*
Dividends	7.5%	8.0%	*7.5%*
Book Value	8.0%	9.0%	*6.5%*

QUARTERLY REVENUES ($ mill.)

Cal-endar	Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2017	187.8	203.4	215.0	203.3	809.5
2018	194.3	211.9	226.2	205.7	838.1
2019	201.1	218.9	243.6	226.1	889.7
2020	*215*	*385*	*410*	*450*	*1460*
2021	*390*	*410*	*450*	*500*	*1750*

EARNINGS PER SHARE A

Cal-endar	Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2017	.28	.34	.43	.30	1.35
2018	.29	.37	.44	d.02	1.08
2019	.09	.25	.38	.28	1.04
2020	*.25*	*.35*	*.45*	*.40*	*1.45*
2021	*.28*	*.40*	*.45*	*.42*	*1.55*

QUARTERLY DIVIDENDS PAID B ■

Cal-endar	Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2016	.178	.178	.1913	.1913	.74
2017	.1913	.1913	.2047	.2047	.79
2018	.2047	.2047	.219	.219	.85
2019	.219	.219	.2343	.2343	.91
2020	.2343				

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 2019, Aqua Amer. provided water and wastewater services to about three million people in PA, OH, TX, IL, NC, NJ, IN, and VA. Employed 1,583. Acquired AquaSource, 7/13; North Maine Utilities, 7/15; and others. Water supply revenues 2019: residential, 58%; commercial, 16%; industrial, wastewater & other, 26%. Off. & dir. own less than 1% of the common stock; BlackRock, Inc. 10.5%; Vanguard Grp., 10.4%; State St. Capital, 5.0% (3/20 Pre 14A). Pres. & CEO: Christopher H. Franklin. Inc.: PA Address: 762 West Lancaster Ave., Bryn Mawr, PA 19010. Tel.: 610-525-1400. Internet: www.essential.co.

Essential Utilities is the new name for Aqua America. The water company officially made the change in February, six weeks before the completion of the acquisition of Peoples, a Pittsburgh-based natural gas utility. The cost of the transaction was $4.275 billion in cash, including the assumption of $1.1 billion of debt. In connection with the deal, Essential closed on the previously announced $750 million investment from the Canadian Pension Plan, which received 21.7 million shares of newly issued stock. The equity is also trading with a new ticker: WTRG.

The coronavirus will most likely have only a minor impact on the company. People are going to be using water and gas no matter what the economic conditions. Should unemployment rise or a recession occurs, customers will obviously try to cut back on all of their expenditures, but the usage of these vital resources is required. Hence, demand for Essential's services will not take as large a hit as the typical corporation should this pandemic worsen.

The regulatory climate in Pennsylvania will have a major impact on earnings. Nearly two-thirds of the new company's customer base is now in the Keystone state. Since Aqua had done business there for a long time, we assume that management was very aware of what the expectations are from the state's regulators. (It has promised to replace 3,000 miles of old gas lines over the next 15-year period.)

Our initial estimates for the new entity are tentative. Not much guidance on Essential's operating and financial outlook has been made public. The utility's rate base will be $2.3 billion larger, but as far as the amount of the capital budget and what revenues may total, have not been discussed. As for the bottom line, much will depend on acquisition costs. Peoples is in a different business, so we don't look for much overlap, except in dealing with regulators. Moreover, since the purchase was only just approved, we won't have a good idea about quarterly earnings until after the June period, though the March interim balance sheet should provide some insight.

This stock is timely. However, like most members of this industry, long-term total return potential is unappealing.

James A Flood *April 10, 2020*

(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 due 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 splits. (D) Includes intangibles: 12/31/19, $63.8 mill./$0.29 a share.

Company's Financial Strength	A
Stock's Price Stability	95
Price Growth Persistence	75
Earnings Predictability	55

CALIFORNIA WATER NYSE-CWT

RECENT PRICE **52.32** | P/E RATIO **35.8** (Trailing: 39.9 / Median: 23.0) | RELATIVE P/E RATIO **2.71** | DIV'D YLD **1.6%** | VALUE LINE

TIMELINESS 3 Lowered 3/6/20
SAFETY 3 Lowered 7/27/07
TECHNICAL 3 Raised 4/10/20
BETA .60 (1.00 = Market)

18-Month Target Price Range
Low-High: $47-$75 | Midpoint (% to Mid): $61 (15%)

2023-25 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	55	(+5%)	3%
Low	35	(-35%)	-7%

Institutional Decisions

	2Q2019	3Q2019	4Q2019
to Buy	120	118	115
to Sell	102	94	101
Hld's(000)	36947	36133	36624

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
High:	24.1	19.8	19.4	19.3	23.4	26.4	26.0	36.8	46.2	49.1	57.5	57.4
Low:	16.7	16.9	16.7	16.8	18.4	20.3	19.5	22.5	32.4	35.3	44.6	39.7

Target Price Range: 2023 | 2024 | 2025

% TOT. RETURN 2/20

	THIS STOCK	VL ARITH.* INDEX
1 yr.	-6.7	-6.8
3 yr.	36.9	6.6
5 yr.	108.3	20.3

2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	© VALUE LINE PUB. LLC	23-25
8.59	8.72	8.10	8.88	9.90	10.82	11.05	12.00	13.34	12.23	12.50	12.29	12.70	13.89	14.53	14.72	**14.80**	**15.20**	Revenues per sh	**15.00**
1.42	1.52	1.36	1.56	1.86	1.93	1.93	2.07	2.32	2.21	2.47	2.22	2.34	3.00	3.11	3.14	**3.15**	**3.20**	"Cash Flow" per sh	**3.50**
.73	.74	.67	.75	.95	.98	.91	.86	1.02	1.02	1.19	.94	1.01	1.40	1.36	1.31	**1.55**	**1.65**	Earnings per sh A	**2.00**
.57	.57	.58	.58	.59	.59	.60	.62	.63	.64	.65	.67	.69	.72	.75	.79	**.82**	**.86**	Div'd Decl'd per sh B ■	**1.05**
1.87	2.01	2.14	1.84	2.41	2.66	2.97	2.83	3.04	2.58	2.76	3.69	4.77	5.40	5.65	5.64	**4.50**	**4.25**	Cap'l Spending per sh	**3.75**
7.83	7.90	9.07	9.25	9.72	10.13	10.45	10.76	11.28	12.54	13.11	13.41	13.75	14.44	15.19	16.07	**15.70**	**15.90**	Book Value per sh C	**16.05**
36.73	36.78	41.31	41.33	41.45	41.53	41.67	41.82	41.98	47.74	47.81	47.88	47.97	48.01	48.07	48.53	**50.00**	**51.00**	Common Shs Outst'g D	**53.00**
20.1	24.9	29.2	26.1	19.8	19.7	20.3	21.3	17.9	20.1	19.7	24.8	29.6	26.9	30.3	39.3	*Bold figures are*	*Value Line*	Avg Ann'l P/E Ratio	**23.0**
1.06	1.33	1.58	1.39	1.19	1.31	1.29	1.34	1.14	1.13	1.04	1.25	1.55	1.35	1.64	2.13	*estimates*		Relative P/E Ratio	**1.25**
3.9%	3.1%	2.9%	3.0%	3.1%	3.1%	3.2%	3.4%	3.5%	3.1%	2.8%	2.9%	2.3%	1.9%	1.8%	1.5%			Avg Ann'l Div'd Yield	**2.3%**

CAPITAL STRUCTURE as of 12/31/19
Total Debt $983.8 mill. **Due in 5 Yrs** $229.0 mill.
LT Debt $786.8 mill. **LT Interest** $40.0 mill.
(Total interest coverage: 4.2x) (50% of Cap'l)

Pension Assets-12/18 $573.6 mill. **Oblig.** $812.0 mill.

Pfd Stock None

Common Stock 48,532,000 shs.

MARKET CAP: $2.5 billion (Mid Cap)

2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021		23-25
460.4	501.8	560.0	584.1	597.5	588.4	609.4	666.9	698.2	714.6	**740**	**775**	Revenues ($mill) E	**795**
37.7	36.1	42.6	47.3	56.7	45.0	48.7	67.2	65.6	63.1	**78.0**	**85.0**	Net Profit ($mill)	**105**
39.5%	40.5%	37.5%	30.3%	33.0%	36.0%	35.5%	30.1%	24.5%	19.1%	**21.0%**	**21.0%**	Income Tax Rate	**21.0%**
4.2%	7.6%	8.0%	4.3%	2.7%	4.3%	6.1%	3.5%	3.1%	5.8%	**5.0%**	**5.0%**	AFUDC % to Net Profit	**5.0%**
52.4%	51.7%	47.8%	41.6%	40.1%	44.4%	44.6%	42.7%	49.3%	50.2%	**49.0%**	**47.0%**	Long-Term Debt Ratio	**43.5%**
47.6%	48.3%	52.2%	58.4%	59.9%	55.6%	55.4%	57.3%	50.7%	49.8%	**51.0%**	**53.0%**	Common Equity Ratio	**56.5%**
914.7	931.5	908.2	1024.9	1045.9	1154.4	1191.2	1209.3	1440.2	1566.7	**1535**	**1525**	Total Capital ($mill)	**1500**
1294.3	1381.1	1457.1	1515.8	1590.4	1701.8	1859.3	2048.0	2232.7	2406.4	**2425**	**2450**	Net Plant ($mill)	**2500**
5.5%	5.5%	6.3%	6.0%	6.3%	5.2%	5.5%	7.1%	5.9%	5.5%	**6.0%**	**6.5%**	Return on Total Cap'l	**8.0%**
8.6%	8.0%	9.0%	7.9%	9.1%	7.0%	7.4%	9.7%	9.0%	8.1%	**10.0%**	**10.5%**	Return on Shr. Equity	**12.5%**
8.6%	8.0%	9.0%	7.9%	9.1%	7.0%	7.4%	9.7%	9.0%	8.1%	**10.0%**	**10.5%**	Return on Com Equity	**12.5%**
3.0%	2.3%	3.4%	3.4%	4.1%	2.0%	2.4%	4.7%	4.0%	3.2%	**4.5%**	**5.0%**	Retained to Com Eq	**6.0%**
66%	71%	62%	56%	55%	71%	68%	51%	55%	60%	**53%**	**52%**	All Div'ds to Net Prof	**53%**

CURRENT POSITION ($MILL.)	2017	2018	12/31/19
Cash Assets	94.8	47.2	42.7
Other	133.1	141.5	142.0
Current Assets	227.9	188.7	184.7
Accts Payable	94.0	95.6	108.5
Debt Due	291.0	170.0	197.0
Other	106.0	55.6	53.2
Current Liab.	491.0	321.2	358.7

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '17-'19 to '23-'25
Revenues	4.0%	2.5%	.5%
"Cash Flow"	5.5%	5.5%	2.0%
Earnings	4.5%	4.5%	6.5%
Dividends	2.5%	3.5%	5.5%
Book Value	4.5%	4.5%	1.0%

Cal-endar	QUARTERLY REVENUES ($ mill.)E Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2017	122.1	171.1	211.7	162.0	666.9
2018	134.6	174.9	221.3	167.4	698.2
2019	126.1	179.0	232.6	176.9	714.6
2020	***140***	***185***	***237***	***178***	***740***
2021	***147***	***195***	***248***	***185***	***775***

Cal-endar	EARNINGS PER SHARE A Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2017	.02	.39	.70	.29	1.40
2018	d.02	.31	.75	.32	1.36
2019	d.16	.35	.88	.24	1.31
2020	***.03***	***.39***	***.80***	***.33***	***1.55***
2021	***.05***	***.42***	***.82***	***.36***	***1.65***

Cal-endar	QUARTERLY DIVIDENDS PAID B ■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2016	.1725	.1725	.1725	.1725	.69
2017	.18	.18	.18	.18	.72
2018	.1875	.1875	.1875	.1875	.75
2019	.1975	.1975	.1975	.1975	.79
2020	.2125				

BUSINESS: California Water Service Group provides regulated and nonregulated water service to 489,600 customers in 100 communities in the state of California. Accounts for over 94% of total customers. Also operates in Washington, New Mexico, and Hawaii. Main service areas: San Francisco Bay area, Sacramento Valley, Salinas Valley, San Joaquin Valley & parts of Los Angeles. Acquired Rio Grande Corp; West Hawaii Utilities (9/08). Revenue breakdown, '19: residential, 67%; business, 20%; industrial, 5%; public authorities, 5%; other 3%. Off. and dir. own 1% of common stock (4/19 proxy). Has 1,184 employees. Pres. and CEO: Martin A. Kropelnicki. Inc.: DE. Addr.: 1720 North First St., San Jose, CA 95112-4598. Tel.: 408-367-8200. Internet: www.calwatergroup.com.

California Water Service Group hopes to invest more than $800 million in infrastructure-related projects over the pull to 2021. At this time, its currently running general rate case with the California Public Utilities Commission was granted a settlement extension to July 1, 2020. The agreement covers various topics including, most importantly, CWT's long-term infrastructure investment plan and associated rate increases. The company already accumulated an approximate $275 million tab last year, completing several notable upgrades, including water main replacements, new treatment facilities, the installation of backup generators, and pump station replacements. Through 2020 and 2021, it is likely that capital expenditures will range between $550 million to $600 million, and cover a similar scope of improvement projects. Finally, we are optimistic that regulators will eventually rule favorably.

California Water should be a consistent performer even amidst a difficult economic backdrop. Notably, California has been one of the major domestic hot spots for the fast-spreading coronavirus, which has severely impacted business and consumer activity. That said, with many residents urged to stay at home, increased hand washing and general utility use ought to translate into greater water usage. Thus, we are keeping intact our current-year revenue call, at $740 million. On the other hand, a number of factors, namely rising operating costs, lower income tax benefits, as well as potential equity dilution, have spurred us to trim our share-net forecast from $1.70 to $1.55. Lastly, we are introducing our preliminary 2021 top- and bottom-line estimates of $775 million and $1.65 a share, respectively.

From an investment perspective, California Water stock leaves much to be desired. The shares have slipped one notch on our Timeliness Ranking scale, to 3 (Average). Moreover, total return potential over the 3- to 5-year stretch is considerably below the *Value Line* median. While the stock may have held up relatively well during recent broader market volatility, we think more-attractive options can be found elsewhere, at this juncture.

Nicholas P. Patrikis *April 10, 2020*

(A) Basic EPS. Excl. nonrecurring gain (loss): '11, 4¢. Next earnings report due early May.
(B) Dividends historically paid in late Feb., May, Aug., and Nov. ■ Div'd reinvestment plan available.
(C) Incl. intangible assets. In '19 : $24.9 mill., $0.51/sh.
(D) In millions, adjusted for split.
(E) Excludes non-reg. rev.

Company's Financial Strength	B++
Stock's Price Stability	80
Price Growth Persistence	60
Earnings Predictability	65

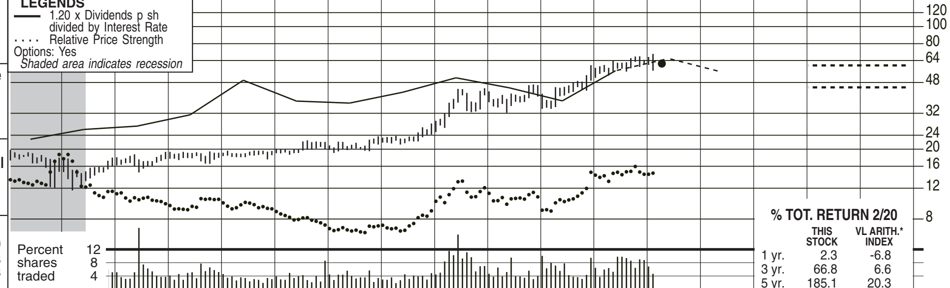
MIDDLESEX WATER NDQ-MSEX

RECENT PRICE 61.47 | P/E RATIO 29.4 (Trailing: 30.6 Median: 21.0) | RELATIVE P/E RATIO 2.23 | DIV'D YLD 1.7% | VALUE LINE

TIMELINESS 3 Lowered 5/24/19
SAFETY 2 New 10/21/11
TECHNICAL 3 Lowered 2/7/20
BETA .70 (1.00 = Market)

High:	17.9	19.3	19.4	19.6	22.5	23.7	28.0	44.5	46.7	60.3	67.7	69.9
Low:	11.6	14.7	16.5	17.5	18.6	19.1	21.2	25.0	32.2	34.0	51.0	48.8

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



18-Month Target Price Range

Low-High	Midpoint (% to Mid)
$57-$94	$76 (25%)

2023-25 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	60	(Nil)	2%
Low	45	(-25%)	-5%

Institutional Decisions

	2Q2019	3Q2019	4Q2019
to Buy	79	56	68
to Sell	58	67	68
Hld's(000)	9432	9915	10433

% TOT. RETURN 2/20

	THIS STOCK	VL ARITH.* INDEX
1 yr.	2.3	-6.8
3 yr.	66.8	6.6
5 yr.	185.1	20.3

2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	© VALUE LINE PUB. LLC	23-25
6.25	6.44	6.16	6.50	6.79	6.75	6.60	6.50	6.98	7.19	7.26	7.77	8.16	8.00	8.42	7.72	***8.20***	***8.45***	Revenues per sh	***9.15***
1.28	1.33	1.33	1.49	1.53	1.40	1.55	1.46	1.56	1.72	1.84	1.97	2.17	2.24	2.89	2.90	***2.95***	***3.10***	"Cash Flow" per sh	***3.50***
.73	.71	.82	.87	.89	.72	.96	.84	.90	1.03	1.13	1.22	1.38	1.38	1.96	2.01	***2.10***	***2.20***	Earnings per sh A	***2.50***
.66	.67	.68	.69	.70	.71	.72	.73	.74	.75	.76	.78	.81	.86	.91	.98	***1.04***	***1.10***	Div'd Decl'd per sh B■	***1.25***
2.54	2.18	2.31	1.66	2.12	1.49	1.90	1.50	1.36	1.26	1.40	1.59	2.91	3.08	4.40	5.11	***3.50***	***3.50***	Cap'l Spending per sh	***3.50***
8.02	8.26	9.52	10.05	10.03	10.33	11.13	11.27	11.48	11.82	12.24	12.74	13.40	14.02	15.17	18.57	***16.15***	***16.50***	Book Value per sh	***17.35***
11.36	11.58	13.17	13.25	13.40	13.52	15.57	15.70	15.82	15.96	16.12	16.23	16.30	16.35	16.40	17.43	***17.65***	***17.75***	Common Shs Outst'g C	***18.00***
26.4	27.4	22.7	21.6	19.8	21.0	17.8	21.7	20.8	19.7	18.5	19.1	25.6	28.4	22.2	29.7	*Bold figures are*	*Value Line*	Avg Ann'l P/E Ratio	***21.0***
1.39	1.46	1.23	1.15	1.19	1.40	1.13	1.36	1.32	1.11	.97	.96	1.34	1.43	1.20	1.61	*estimates*		Relative P/E Ratio	***1.15***
3.4%	3.5%	3.7%	3.7%	4.0%	4.7%	4.2%	4.0%	4.0%	3.7%	3.7%	3.3%	2.3%	2.2%	2.1%	1.6%			Avg Ann'l Div'd Yield	***2.4%***

CAPITAL STRUCTURE as of 12/31/19
Total Debt $258.0 mill. **Due in 5 Yrs** $33.3 mill.
LT Debt $230.8 mill. **LT Interest** $7.2 mill.
(Total interest coverage: 7.3x)
(42% of Cap'l)

Pension Assets-12/18 $80.4 mill.
Oblig. $100.9 mill.
Pfd Stock $2.4 mill. **Pfd Div'd:** $.1 mill.

Common Stock 17,434,000 shs.

MARKET CAP: $1.1 billion (Mid-Cap)

2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021		23-25
102.7	102.1	110.4	114.8	117.1	126.0	132.9	130.8	138.1	134.6	***145***	***150***	Revenues ($mill)	***165***
14.3	13.4	14.4	16.6	18.4	20.0	22.7	22.8	32.5	33.9	***37.0***	***39.0***	Net Profit ($mill)	***45.0***
32.1%	32.7%	33.9%	34.1%	35.0%	34.5%	34.0%	32.7%	2.8%	2.8%	***21.0%***	***21.0%***	Income Tax Rate	***21.0%***
6.8%	6.1%	3.4%	1.9%	1.7%	1.9%	2.7%	3.1%	1.4%	3.4%	***2.0%***	***2.0%***	AFUDC % to Net Profit	***2.5%***
43.1%	42.3%	41.5%	40.4%	40.5%	39.4%	37.9%	37.5%	37.8%	41.5%	***42.5%***	***41.5%***	Long-Term Debt Ratio	***39.0%***
55.8%	56.6%	57.4%	58.7%	58.8%	59.8%	61.5%	61.8%	61.6%	58.2%	***57.0%***	***58.0%***	Common Equity Ratio	***60.5%***
310.5	312.5	316.5	321.4	335.8	345.4	355.4	370.7	404.1	556.7	***500***	***505***	Total Capital ($mill)	***515***
405.9	422.2	435.2	446.5	465.4	481.9	517.8	557.2	618.5	705.7	***720***	***735***	Net Plant ($mill)	***775***
5.7%	5.2%	5.4%	5.9%	6.3%	6.6%	7.1%	6.9%	8.9%	6.7%	***8.0%***	***8.5%***	Return on Total Cap'l	***9.5%***
8.1%	7.5%	7.8%	8.7%	9.2%	9.6%	10.3%	9.8%	12.9%	10.4%	***13.0%***	***13.0%***	Return on Shr. Equity	***14.5%***
8.2%	7.5%	7.8%	8.7%	9.3%	9.6%	10.3%	9.9%	13.0%	10.4%	***13.0%***	***13.5%***	Return on Com Equity	***14.5%***
2.1%	1.0%	1.4%	2.4%	3.1%	3.5%	4.3%	3.8%	7.0%	5.4%	***6.5%***	***6.5%***	Retained to Com Eq	***7.5%***
75%	87%	83%	73%	67%	63%	58%	62%	46%	48%	***49%***	***50%***	All Div'ds to Net Prof	***50%***

CURRENT POSITION ($MILL.)	2017	2018	12/31/19
Cash Assets	4.9	3.7	2.2
Other	24.3	27.1	26.9
Current Assets	29.2	30.8	29.1
Accts Payable	13.9	19.3	23.3
Debt Due	34.9	55.8	27.2
Other	15.7	19.3	14.5
Current Liab.	64.5	94.4	65.0

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '17-'19 to '23-'25
Revenues	2.0%	2.5%	*2.0%*
"Cash Flow"	6.0%	9.5%	*4.5%*
Earnings	8.0%	12.0%	*6.0%*
Dividends	2.5%	4.0%	*5.5%*
Book Value	4.5%	6.0%	*1.5%*

Cal-endar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2017	30.1	33.0	36.2	31.5	130.8
2018	31.2	34.9	38.7	33.3	138.1
2019	30.7	33.4	37.8	32.7	134.6
2020	***32.0***	***36.0***	***42.0***	***35.0***	***145***
2021	***33.0***	***37.0***	***44.0***	***36.0***	***150***

Cal-endar	EARNINGS PER SHARE A Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2017	.27	.33	.46	.32	1.38
2018	.27	.52	.74	.43	1.96
2019	.39	.49	.66	.46	2.01
2020	***.40***	***.53***	***.70***	***.47***	***2.10***
2021	***.42***	***.55***	***.73***	***.50***	***2.20***

Cal-endar	QUARTERLY DIVIDENDS PAID B■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2016	.19875	.19875	.19875	.21125	.81
2017	.21125	.21125	.21125	.22375	.86
2018	.22375	.22375	.22375	.24	.91
2019	.24	.24	.24	.2562	.98
2020	.2562				

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 2019, the Middlesex System accounted for 60% of operating revenues. At 12/31/19, the company had 352 employees. Incorporated: NJ. President, CEO, and Chairman: Dennis W. Doll. Officers & directors own 3.5% of the com. stock; BlackRock Inst. Trust Co., 6.8% (4/19 proxy). Add.: 485 C Route 1 South, Suite 400, Iselin, NJ 08830. Tel.: 732-634-1500. Int.: www.middlesexwater.com.

Middlesex Water Company is well positioned to handle the currently ambiguous economic climate. Indeed, impacts from the sweeping coronavirus are still largely unknown, but will likely take a major toll on consumer spending and domestic business activity in the near term. However, taking into consideration that water is one of our most basic necessities, it is highly unlikely that service will undergo even the slightest pause or consumer disruption. Additionally, health-conscious actions, such as more frequent hand washing, as well as a greater number of residents presently staying in their homes, may well drive increased water usage. Meanwhile, the company recently raised some capital via an equity issuance, which should provide financial flexibility.

The stock has held up decently since our last report. Middlesex shares etched fresh highs in mid-February before crumbling market indices resulted in the capitulation of some gains. On balance, the stock is down only about 10% in value over the past three months.

We are introducing our preliminary 2021 top- and bottom-line forecasts at $150 million and $2.20 a share, respectively. This represents modest single-digit growth over our current-year projections.

Infrastructure spending is likely to ramp up considerably over the pull to mid-decade. To start, an $11.2 million drinking water project is already under way in New Jersey. The company plans to replace more than 20,000 linear feet of water mains, as well as upgrade service lines. Moreover, through 2021, MSEX's Water for Tomorrow program sports a budget of nearly $300 million, which ought to strengthen the company's distribution infrastructure. Beyond that, we think additional investment spending is probably in the cards.

We are not presently recommending Middlesex stock. The water utility might be a conservative option amidst volatile market conditions, but the issue is just an Average selection for the year ahead. On top of that, the yield is rather unenticing, and capital appreciation potential three to five years hence is well below the *Value Line* median. Thus, we suggest investors take a pass, for now.

Nicholas P. Patrikis *April 10, 2020*

(A) Diluted earnings. Next earnings report due late April.
(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	65
Price Growth Persistence	55
Earnings Predictability	75

SJW GROUP NYSE-SJW

RECENT PRICE 59.78 | P/E RATIO 28.6 (Trailing: 44.3 / Median: 21.0) | RELATIVE P/E RATIO 2.17 | DIV'D YLD 2.1% | VALUE LINE

TIMELINESS — E
SAFETY 3 New 4/22/11
TECHNICAL — E
BETA .60 (1.00 = Market)

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
High:	30.4	28.2	26.8	26.9	30.1	33.7	35.7	56.9	69.3	68.4	74.5	75.0
Low:	18.2	21.6	20.9	22.6	24.5	25.5	27.5	28.6	45.4	51.3	53.9	45.6

18-Month Target Price Range

Low-High	Midpoint (% to Mid)
$52-$85	$69 (15%)

2023-25 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	95	(+60%)	14%
Low	65	(+10%)	4%

Institutional Decisions

	2Q2019	3Q2019	4Q2019
to Buy	91	94	93
to Sell	62	69	76
Hld's(000)	19526	19354	19650

% TOT. RETURN 2/20

	THIS STOCK	VL ARITH.* INDEX
1 yr.	1.4	-6.8
3 yr.	32.5	6.6
5 yr.	102.4	20.3

2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	© VALUE LINE PUB. LLC	23-25
9.14	9.86	10.35	11.25	12.12	11.68	11.62	12.85	14.01	13.73	15.76	14.97	16.61	18.97	14.00	14.78	***18.80***	***19.85***	Revenues per sh	***21.65***
1.89	2.21	2.38	2.30	2.44	2.21	2.38	2.80	2.97	2.90	4.42	3.86	4.76	5.24	3.29	3.11	***4.10***	***4.40***	"Cash Flow" per sh	***5.30***
.87	1.12	1.19	1.04	1.08	.81	.84	1.11	1.18	1.12	2.54	1.85	2.57	2.86	1.82	1.35	***2.35***	***2.70***	Earnings per sh A	***3.65***
.51	.53	.57	.61	.65	.66	.68	.69	.71	.73	.75	.78	.81	1.04	1.12	1.20	***1.28***	***1.36***	Div'd Decl'd per sh B■	***1.58***
2.31	2.83	3.87	6.62	3.79	3.17	5.65	3.75	5.67	4.68	5.02	5.24	6.95	7.26	5.08	***5.00***	***5.25***	***5.25***	Cap'l Spending per sh	***5.50***
10.11	10.72	12.48	12.90	13.99	13.66	13.75	14.20	14.71	15.92	17.75	18.83	20.61	22.57	31.31	31.27	***33.30***	***35.60***	Book Value per sh	***39.15***
18.27	18.27	18.28	18.36	18.18	18.50	18.55	18.59	18.67	20.17	20.29	20.38	20.46	20.52	28.40	28.46	***29.00***	***29.50***	Common Shs Outst'g C	***30.00***
19.6	19.7	23.5	33.4	26.2	28.7	29.1	21.2	20.4	24.3	11.2	16.6	15.7	18.8	32.7	47.8	*Bold figures are*	*Value Line*	Avg Ann'l P/E Ratio	***22.0***
1.04	1.05	1.27	1.77	1.58	1.91	1.85	1.33	1.30	1.37	.59	.84	.82	.95	1.77	2.60	*estimates*		Relative P/E Ratio	***1.20***
3.0%	2.4%	2.0%	1.7%	2.3%	2.8%	2.8%	2.9%	3.0%	2.7%	2.6%	2.5%	2.0%	1.9%	1.9%	1.9%			Avg Ann'l Div'd Yield	***2.0%***

CAPITAL STRUCTURE as of 12/31/19
Total Debt $1305.9 mill. **Due in 5 Yrs** $.0 mill.
LT Debt $1283.6 mill. **LT Interest** $35.0 mill.
(LT Interest Coverage: 3.8x)
(59% of Cap'l)

Pension Assets-12/19 $243.5 mill.
Oblig. $338.2 mill.
Pfd Stock None.
Common Stock 28,456,508 shs.

MARKET CAP: $1.7 billion (Mid Cap)

2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021		23-25
215.6	239.0	261.5	276.9	319.7	305.1	339.7	389.2	397.7	420.5	***545***	***585***	Revenues ($mill)	***650***
15.8	20.9	22.3	23.5	51.8	37.9	52.8	59.2	38.8	38.5	***68.0***	***80.0***	Net Profit ($mill)	***110***
38.8%	41.1%	41.1%	38.7%	32.5%	38.1%	38.8%	36.7%	20.6%	***21.0%***	***21.0%***	***21.0%***	Income Tax Rate	***21.0%***
--	--	--	--	--	--	--	--	2.0%	***1.5%***	***1.5%***	***1.5%***	AFUDC % to Net Profit	***1.5%***
53.7%	56.6%	55.0%	51.1%	51.6%	49.8%	50.7%	48.2%	32.7%	59.0%	***51.0%***	***41.5%***	Long-Term Debt Ratio	***35.5%***
46.3%	43.4%	45.0%	48.9%	48.4%	50.2%	49.3%	51.8%	67.3%	41.0%	***49.0%***	***58.5%***	Common Equity Ratio	***64.5%***
550.7	607.9	610.2	656.2	744.5	764.6	855.0	894.3	1320.7	2173.0	***1465***	***1800***	Total Capital ($mill)	***1825***
785.5	756.2	831.6	898.7	963.0	1036.8	1146.4	1239.3	1328.8	2206.5	***2300***	***2450***	Net Plant ($mill)	***2775***
4.3%	4.9%	5.0%	5.0%	8.3%	6.3%	7.4%	7.9%	3.9%	2.3%	***4.5%***	***5.0%***	Return on Total Cap'l	***6.5%***
6.2%	7.9%	8.1%	7.3%	14.4%	9.9%	12.5%	12.8%	4.4%	4.3%	***7.5%***	***7.5%***	Return on Shr. Equity	***9.5%***
6.2%	7.9%	8.1%	7.3%	14.4%	9.9%	12.5%	12.8%	4.4%	4.3%	***7.5%***	***7.5%***	Return on Com Equity	***9.5%***
1.2%	3.1%	3.3%	2.8%	10.2%	5.7%	8.6%	8.2%	1.8%	.5%	***3.5%***	***4.0%***	Retained to Com Eq	***5.5%***
80%	61%	59%	62%	29%	42%	31%	36%	60%	89%	***52%***	***50%***	All Div'ds to Net Prof	***43%***

CURRENT POSITION ($MILL.)	2017	2018	12/31/19
Cash Assets	7.8	420.7	17.9
Accts Receivable	17.3	19.2	36.3
Other	41.8	62.8	67.8
Current Assets	66.9	502.7	122.0
Accts Payable	23.0	24.9	34.9
Debt Due	--	--	22.3
Other	62.1	139.1	177.4
Current Liab.	85.1	164.0	234.6

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '16-'18 to '23-'25
Revenues	5.0%	5.5%	*4.0%*
"Cash Flow"	7.0%	11.0%	*2.5%*
Earnings	8.0%	18.5%	*6.0%*
Dividends	4.5%	5.0%	*7.0%*
Book Value	5.5%	8.0%	*6.5%*

Cal-endar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2017	69.0	102.1	124.6	93.5	389.2
2018	75.0	99.1	124.9	98.7	397.7
2019	77.7	103.0	114.0	126.0	420.5
2020	***105***	***135***	***170***	***135***	***545***
2021	***115***	***145***	***180***	***145***	***585***

Cal-endar	EARNINGS PER SHARE A Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2017	.18	.90	.94	.84	2.86
2018	.06	.62	.76	.38	1.82
2019	.21	.47	.33	.34	1.35
2020	***.20***	***.65***	***.90***	***.60***	***2.35***
2021	***.30***	***.70***	***1.00***	***.70***	***2.70***

Cal-endar	QUARTERLY DIVIDENDS PAID BD■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2016	.2025	.2025	.2025	.2025	.81
2017	.2175	.2175	.2175	.3875	1.04
2018	.28	.28	.28	.28	1.12
2019	.30	.30	.30	.30	1.20
2020	.32				

BUSINESS: SJW Group engages in the production, purchase, storage, purification, distribution, and retail sale of water. It provides water service to approximately 231,000 connections with a total population of roughly one million people in the San Jose area and 16,000 connections that reach about 49,000 residents in the region between San Antonio and Austin, Texas. The company merged with Connecticut Water (10/19) which provides service to approx. 138,000 connections with a total population of 450,000 people. Has 361 employees. Officers and directors own 8.3% of outstanding shares (3/20 proxy). Chairman & CEO: Richard Roth. Incorporated: California. Address: 110 West Taylor Street, San Jose, CA 95110. Telephone: (408) 279-7800. Internet: www.sjwater.com.

We are lowering our current-year share-net estimate for SJW Group by a dime, to $2.35. This is largely to reflect management's recent guidance, as well as to factor in lingering integration costs from the CTWS merger (completed in October, 2019). Indeed, we look for a substantial bottom-line recovery this year, as SJW incurred an additional profit hit in 2019 in the form of a nonrecurring charge related to the denial of its subsidiary's Water Conservation Memorandum Account. Although the near-term economic outlook, especially in hard-hit California, is a bit dire, given recent health concerns, we think SJW is well positioned to operate on a fairly normal basis. In fact, a rise in household water consumption, due to increased hand washing and more people staying at home of late, may be a net positive for the company.

Long-term, we like SJW Group's business prospects. First, the recently combined company now serves more than 1.5 million people on both coasts, and the scale and scope of its operations, once the integration is in the rearview mirror, ought to support further growth. In addition, an expanding customer base and periodic rate hikes should help drive top-line results. Second, we think aggressive infrastructure investment spending is likely over the next several years. Alongside traditional upgrades, such as water main repairs and improvements to its filtration systems and treatment plants, SJW aims to roll out advanced metering technology (in an effort to achieve upcoming water standards) that can provide nearly real-time water consumption information.

The stock price has declined notably since our previous review. Over the past three months, SJW stock has lost about 20% in value, largely a consequence of broader market turbulence stemming from weakening economic concerns. Over the past five years, shares of SJW have appreciated handsomely and, even with the recent selloff, total return potential three to five years out is still subpar when compared to the *Value Line* median.

Adding it all up, given the equity's limited investment appeal, subscribers would be wise to look elsewhere at this juncture.

Nicholas P. Patrikis *April 10, 2020*

(A) Diluted earnings. Excludes nonrecurring losses: '04, $3.78; '05, $1.09; '06, $16.36; '08, $1.22; '10, $0.46. GAAP accounting as of 2013. Next earnings report due early May. Quarterly egs. may not add due to rounding.
(B) Dividends historically paid in early March, June, September, and December. ■ Div'd reinvestment plan available.
(C) In millions, adjusted for stock splits.
(D) Paid special dividend of $0.17 per share on 11/17.
(E) Suspended due to recent CTWS merger.

Company's Financial Strength	B+
Stock's Price Stability	70
Price Growth Persistence	55
Earnings Predictability	45

YORK WATER NDQ-YORW

RECENT PRICE 46.77 | P/E RATIO 42.1 (Trailing: 42.1; Median: 25.0) | RELATIVE P/E RATIO 3.19 | DIV'D YLD 1.5%

VALUE LINE

TIMELINESS 2 Lowered 3/20/20
SAFETY 3 Lowered 7/17/15
TECHNICAL 3 Lowered 3/20/20
BETA .65 (1.00 = Market)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
High:	18.0	18.0	18.1	18.5	22.0	24.3	26.7	39.8	39.9	36.1	47.3	49.8
Low:	9.7	12.8	15.8	16.8	17.6	18.8	19.7	23.8	31.7	27.5	30.3	34.6

Target Price Range 2023 | 2024 | 2025

18-Month Target Price Range

Low-High	Midpoint (% to Mid)
$31-$53	$42 (-10%)

2023-25 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	45	(-5%)	*1%*
Low	30	(-35%)	*-8%*

Institutional Decisions

	2Q2019	3Q2019	4Q2019
to Buy	48	55	52
to Sell	31	30	39
Hld's(000)	4866	5111	5387

% TOT. RETURN 2/20

	THIS STOCK	VL ARITH.* INDEX
1 yr.	18.0	-6.8
3 yr.	24.4	6.6
5 yr.	97.7	20.3

2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	© VALUE LINE PUB. LLC	23-25
2.18	2.58	2.56	2.79	2.89	2.95	3.07	3.18	3.21	3.27	3.58	3.68	3.70	3.77	3.74	3.96	*4.05*	*4.20*	Revenues per sh	*5.10*
.65	.79	.77	.86	.88	.95	1.07	1.09	1.12	1.19	1.36	1.45	1.42	1.53	1.58	1.71	*1.75*	*1.80*	"Cash Flow" per sh	*2.40*
.49	.56	.58	.57	.57	.64	.71	.71	.72	.75	.89	.97	.92	1.01	1.04	1.11	*1.15*	*1.20*	Earnings per sh A	*1.60*
.39	.42	.45	.48	.49	.51	.52	.53	.54	.55	.57	.60	.63	.65	.67	.70	*.73*	*.78*	Div'd Decl'd per sh B	*.95*
2.50	1.69	1.85	1.69	2.17	1.18	.83	.74	.94	.76	1.10	1.11	1.03	1.95	1.95	*2.00*	*2.00*	*1.95*	Cap'l Spending per sh	*1.85*
4.65	4.85	5.84	5.97	6.14	6.92	7.19	7.45	7.73	7.98	8.15	8.51	8.88	9.28	9.75	10.32	*11.20*	*11.65*	Book Value per sh	*12.50*
10.33	10.40	11.20	11.27	11.37	12.56	12.69	12.79	12.92	12.98	12.83	12.81	12.85	12.87	12.94	13.01	*12.95*	*12.90*	Common Shs Outst'g C	*12.80*
25.7	26.3	31.2	30.3	24.6	21.9	20.7	23.9	24.4	26.3	23.1	23.5	32.8	34.6	30.3	33.7	*Bold figures are*		Avg Ann'l P/E Ratio	*22.5*
1.36	1.40	1.68	1.61	1.48	1.46	1.32	1.50	1.55	1.48	1.22	1.18	1.72	1.74	1.64	1.83	*Value Line*		Relative P/E Ratio	*1.25*
3.1%	2.9%	2.5%	2.8%	3.5%	3.6%	3.5%	3.1%	3.1%	2.8%	2.8%	2.6%	2.1%	1.9%	2.1%	1.9%	*estimates*		Avg Ann'l Div'd Yield	*2.5%*

CAPITAL STRUCTURE as of 12/31/19
Total Debt $101.0 mill. **Due in 5 Yrs** $42.5 mill.
LT Debt $94.5 mill. **LT Interest** $5.5 mill.
(41% of Cap'l)

Pension Assets12/19 $49.3 mill. **Oblig.** $47.3 mill.

Pfd Stock None

Common Stock 13,014,898 shs.

MARKET CAP: $600 million (Small Cap)

2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021		23-25
39.0	40.6	41.4	42.4	45.9	47.1	47.6	48.6	48.4	51.5	*52.5*	*54.0*	Revenues ($mill)	*65.0*
8.9	9.1	9.3	9.7	11.5	12.5	11.8	13.0	13.4	14.5	*15.0*	*15.5*	Net Profit ($mill)	*20.5*
38.5%	35.3%	37.6%	37.6%	29.8%	27.5%	31.3%	25.9%	15.7%	*21.0%*	*21.0%*	*21.0%*	Income Tax Rate	*21.0%*
1.2%	1.1%	1.1%	.8%	1.8%	1.6%	1.9%	6.7%	1.7%	*2.0%*	*1.5%*	*1.5%*	AFUDC % to Net Profit	*1.5%*
48.3%	47.1%	46.0%	45.1%	44.8%	44.4%	42.6%	43.0%	42.5%	41.3%	*38.5%*	*37.5%*	Long-Term Debt Ratio	*36.0%*
51.7%	52.9%	54.0%	54.9%	55.2%	55.6%	57.4%	57.0%	57.5%	58.7%	*61.5%*	*62.5%*	Common Equity Ratio	*64.0%*
176.4	180.2	184.8	188.4	189.4	196.3	198.7	209.5	219.5	228.7	*235*	*240*	Total Capital ($mill)	*250*
228.4	233.0	240.3	244.2	253.2	261.4	270.9	288.8	299.2	313.2	*315*	*320*	Net Plant ($mill)	*335*
6.5%	6.4%	6.4%	6.5%	7.4%	7.6%	7.2%	7.5%	7.3%	7.4%	*7.5%*	*7.5%*	Return on Total Cap'l	*9.0%*
9.8%	9.5%	9.3%	9.3%	11.0%	11.5%	10.4%	10.9%	10.6%	10.8%	*10.5%*	*10.5%*	Return on Shr. Equity	*13.0%*
9.8%	9.5%	9.3%	9.3%	11.0%	11.5%	10.4%	10.9%	10.6%	10.8%	*10.5%*	*10.5%*	Return on Com Equity	*13.0%*
2.7%	2.5%	2.4%	2.4%	3.9%	4.4%	3.4%	4.0%	3.8%	4.0%	*4.0%*	*3.5%*	Retained to Com Eq	*5.0%*
72%	73%	74%	74%	64%	62%	67%	63%	64%	63%	*63%*	*65%*	All Div'ds to Net Prof	*59%*

CURRENT POSITION ($MILL.)	2017	2018	12/31/19
Cash Assets	- -	- -	- -
Accounts Receivable	4.5	4.8	4.4
Inventory (Avg. Cost)	.9	.9	1.0
Other	3.2	3.3	4.0
Current Assets	8.6	9.0	9.4
Accts Payable	3.1	3.0	3.4
Debt Due	- -	1.0	6.5
Other	6.0	6.8	5.3
Current Liab.	9.1	10.8	15.2

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '16-'18 to '23-'25
Revenues	3.0%	3.0%	*4.5%*
"Cash Flow"	6.0%	6.0%	*7.0%*
Earnings	5.5%	6.5%	*7.0%*
Dividends	3.5%	4.0%	*5.5%*
Book Value	4.5%	4.0%	*4.5%*

Cal-endar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2017	11.3	12.3	12.7	12.3	48.6
2018	11.6	12.0	12.7	12.1	48.4
2019	11.8	13.0	13.7	13.0	51.5
2020	*12.2*	*13.0*	*14.0*	*13.3*	*52.5*
2021	*12.5*	*13.3*	*14.5*	*13.7*	*54.0*

Cal-endar	EARNINGS PER SHARE A Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2017	.20	.23	.31	.27	1.01
2018	.20	.26	.29	.29	1.04
2019	.22	.28	.35	.26	1.11
2020	*.22*	*.28*	*.35*	*.30*	*1.15*
2021	*.23*	*.30*	*.36*	*.31*	*1.20*

Cal-endar	QUARTERLY DIVIDENDS PAID B Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2016	.1555	.1555	.1555	.1602	.627
2017	.1602	.1602	.1602	.1666	.647
2018	.1666	.1666	.1666	.1733	.673
2019	.1733	.1733	.1733	.1802	.70
2020	.1802				

BUSINESS: The York Water Company is the oldest investor-owned regulated water utility in the United States. It has operated continuously since 1816. As of December 31, 2019, the company's average daily availability was 35.4 million gallons and its service territory had an estimated population of 201,000. Has more than 71,400 customers. Residential customers accounted for 65% of 2019 revenues; commercial and industrial (28%); other (7%). It also provides sewer billing services. Incorporated: PA. York had 106 full-time employees at 12/31/19. President/CEO: Jeffrey R. Hines. Officers/directors own 1.2% of the common stock (3/19 proxy). Address: 130 East Market Street, York, Pennsylvania 17401. Telephone: (717) 845-3601. Internet: www.yorkwater.com.

York Water Company is apt to post modest top- and bottom-line gains this year and next. Although the current economic climate is far from ideal, York's operations are likely to move forward on a relatively normal basis. In fact, given an abundance of hand washing spurred by the recent health crisis, coupled with a growing number of residents urged to stay at home by government officials, the company may experience a near-term uptick in water consumption. All things considered, we continue to envision low single-digit revenue and share-net growth for 2020 and 2021.

The stock is a favorable selection for the coming six- to 12-month stretch. Based on our Timeliness Ranking scale, York is ranked 2 (Above Average) for relative year-ahead price performance. What's more, in comparison to the beaten-up broader market indices, shares of the regulated water utility have fared markedly better over the past six weeks of trading. Indeed, conservative investors may well continue to rebalance their portfolios, specifically by increasing exposure to companies with more stable year-ahead business prospects.

Investment spending over the pull to mid-decade ought to continue as planned. Leadership's recent commentary suggests capital investments of about $30 million are on the table this year, which will likely be followed up by an additional $27 million worth of spending in 2021. Funds will probably be allocated to dam construction and repair; waste water treatment plant expansion; and pipe, service line, and facility improvements. In our view, factoring in the company's aging infrastructure, as well as its expanding customer base, York is not likely to take its foot off the gas beyond 2021 in terms of investment spending.

At the recent quotation, long-term investment appeal is lacking. York shares have been on a steady ascent for the better part of the last decade. And even with the moderate pullback of late, total return potential three to five years hence is well below average. All told, despite the stock's defensive qualities, we think buy-and-hold accounts can find more-attractive options elsewhere at this juncture.

Nicholas P. Patrikis *April 10, 2020*

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

Company's Financial Strength	B+
Stock's Price Stability	65
Price Growth Persistence	65
Earnings Predictability	95

Utilities, Inc of Florida
Summary of Risk Premium Models for the
Proxy Group of Seven Water Companies

	Proxy Group of Seven Water Companies	
Predictive Risk Premium Model (PRPM) (1)	11.31	%
Risk Premium Using an Adjusted Total Market Approach (2)	10.50	%
Average	10.91	%

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

Utilities, Inc of Florida
Indicated ROE
Derived by the Predictive Risk Premium Model (1)

	[1]	[2]	[3]	[4]	[5]	[6]	[7]
Proxy Group of Seven Water Companies	LT Average Predicted Variance	Spot Predicted Variance	Recommended Variance	GARCH Coefficient	Predicted Risk Premium (2)	Risk-Free Rate (3)	Indicated ROE (4)
American States Water Co.	0.38%	0.45%	0.41%	1.89033	9.83%	2.03%	11.86%
American Water Works Company Inc	NMF	NMF	NMF	5.52177	NMF	2.03%	NMF
California Water Service Group	0.32%	0.32%	0.32%	1.90111	7.55%	2.03%	9.58%
Essential Utilities, Inc.	0.44%	0.53%	0.49%	2.25364	14.02%	2.03%	16.05%
Middlesex Water Co.	0.30%	0.27%	0.29%	2.12256	7.52%	2.03%	9.55%
SJW Group	0.42%	0.44%	0.43%	1.51190	8.03%	2.03%	10.06%
York Water Co.	0.45%	0.37%	0.41%	2.09473	10.81%	2.03%	12.84%
						Average	11.66%
						Median	10.96%
						Average of Mean and Median	11.31%

NMF = Not Meaningful Figure

Notes:
(1) The Predictive Risk Premium Model uses historical data to generate a predicted variance and a GARCH coefficient. The historical data used are the equity risk premiums for the first available trading month as reported by Bloomberg Professional Service.
(2) $(1+(\text{Column [3]} * \text{Column [4]})^{\wedge 12}) - 1$.
(3) From note 2 on page 2 of Schedule 5.
(4) Column [5] + Column [6].

Utilities, Inc of Florida
Indicated Common Equity Cost Rate
Through Use of a Risk Premium Model
Using an Adjusted Total Market Approach

Line No.		Proxy Group of Seven Water Companies	
1.	Prospective Yield on Aaa Rated Corporate Bonds (1)	3.21	%
2.	Adjustment to Reflect Yield Spread Between Aaa Rated Corporate Bonds and A Rated Public Utility Bonds	0.53	(2)
3.	Adjusted Prospective Yield on A Rated Public Utility Bonds	3.74	%
4.	Adjustment to Reflect Bond Rating Difference of Proxy Group	0.08	(3)
5.	Adjusted Prospective Bond Yield	3.82	%
6.	Equity Risk Premium (4)	6.68	
7.	Risk Premium Derived Common Equity Cost Rate	10.50	%

Notes:
(1) Consensus forecast of Moody's Aaa Rated Corporate bonds from Blue Chip Financial Forecasts (see pages 10-11 of this Schedule).
(2) The average yield spread of A rated public utility bonds over Aaa rated corporate bonds of 0.53% from page 4 of this Schedule.
(3) Adjustment to reflect the A2/A3 Moody's LT issuer rating of the Utility Proxy Group as shown on page 5 of this Schedule. The 0.08% upward adjustment is derived by taking 1/6 of the spread between A2 and Baa2 Public Utility Bonds (1/6 * 0.46% = 0.08%) as derived from page 4 of this Schedule.
(4) From page 7 of this Schedule.

Utilities, Inc of Florida
Interest Rates and Bond Spreads for
Moody's Corporate and Public Utility Bonds

Selected Bond Yields

	[1]	[2]	[3]
	Aaa Rated Corporate Bond	A Rated Public Utility Bond	Baa Rated Public Utility Bond
Apr-2020	2.43 %	3.19 %	3.82 %
Mar-2019	3.02	3.50	3.96
Feb-2019	2.78	3.11	3.42
Average	2.74 %	3.27 %	3.73 %

Selected Bond Spreads

A Rated Public Utility Bonds Over Aaa Rated Corporate Bonds:
0.53 % (1)

Baa Rated Public Utility Bonds Over A Rated Public Utility Bonds:
0.46 % (2)

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

Source of Information:
Bloomberg Professional Service

Utilities, Inc of Florida
Comparison of Long-Term Issuer Ratings for
Proxy Group of Seven Water Companies

	Moody's Long-Term Issuer Rating April 2020		Standard & Poor's Long-Term Issuer Rating April 2020	
Proxy Group of Seven Water Companies	Long-Term Issuer Rating	Numerical Weighting (1)	Long-Term Issuer Rating	Numerical Weighting(1)
American States Water Co. (2)	A2	6.0	A+	5.0
American Water Works Company Inc (3)	A3	7.0	A	6.0
California Water Service Group (4)	NR	- -	A+	5.0
Essential Utilities, Inc. (5)	NR	- -	A	6.0
Middlesex Water Co.	NR	- -	A	6.0
SJW Corp. (6)	NR	- -	A/A-	6.5
York Water Co.	NR	- -	A-	7.0
Average	A2/A3	6.5	A	5.9

Notes:

(1) From page 6 of this Schedule.
(2) Ratings that of Golden State Water Company.
(3) Ratings that of New Jersey and Pennsylvania American Water Companies.
(4) Ratings that of California Water Service Company.
(5) Ratings that of Aqua Pennsylvania, Inc.
(6) Ratings that of San Jose Water Company and The Connecticut Water Company

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-

Utilities, Inc of Florida
Judgment of Equity Risk Premium for
Proxy Group of Seven Water Companies

Line No.		Proxy Group of Seven Water Companies
1.	Calculated equity risk premium based on the total market using the beta approach (1)	7.60 %
2.	Mean equity risk premium based on a study using the holding period returns of public utilities with A rated bonds (2)	5.76
3.	Average equity risk premium	6.68 %

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

Utilities, Inc of Florida
Derivation of Equity Risk Premium Based on the Total Market Approach
Using the Beta for the
Proxy Group of Seven Water Companies

Line No.	Equity Risk Premium Measure	Proxy Group of Seven Water Companies
	Ibbotson-Based Equity Risk Premiums:	
1.	Ibbotson Equity Risk Premium (1)	5.78 %
2.	Regression on Ibbotson Risk Premium Data (2)	9.12
3.	Ibbotson Equity Risk Premium based on PRPM (3)	11.95
4.	Equity Risk Premium Based on Value Line Summary and Index (4)	15.50
5.	Equity Risk Premium Based on Value Line S&P 500 Companies (5)	11.58
6.	Equity Risk Premium Based on Bloomberg S&P 500 Companies (6)	10.32
7.	Conclusion of Equity Risk Premium	10.71 %
8.	Adjusted Beta (7)	0.71
9.	Forecasted Equity Risk Premium	7.60 %

Notes provided on page 9 of this Schedule.

Utilities, Inc of Florida
Derivation of Equity Risk Premium Based on the Total Market Approach
Using the Beta for the
Proxy Group of Seven Water Companies

Notes:

(1) Based on the arithmetic mean historical monthly returns on large company common stocks from Ibbotson® SBBI® 2020 Market Report minus the arithmetic mean monthly yield of Moody's average Aaa and Aa corporate bonds from 1926-2019.

(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 Aa rated corporate bond yields from 1928-2019 referenced in Note 1 above.

(3) The Predictive Risk Premium Model (PRPM) is discussed in the accompanying direct testimony. The Ibbotson equity risk premium based on the PRPM is derived by applying the PRPM to the monthly risk premiums between Ibbotson large company common stock monthly returns and average Aaa and Aa corporate monthly bond yields, from January 1928 through April 2020.

(4) The equity risk premium based on the Value Line Summary and Index is derived by subtracting the average consensus forecast of Aaa corporate bonds of 3.21% (from page 3 of this Schedule) from the projected 3-5 year total annual market return of 18.71% (described fully in note 1 on page 2 of Schedule 5).

(5) Using data from Value Line for the S&P 500, an expected total return of 14.79% was derived based upon expected dividend yields and long-term earnings growth estimates as a proxy for capital appreciation. Subtracting the average consensus forecast of Aaa corporate bonds of 3.21% results in an expected equity risk premium of 11.58%.

(6) Using data from the Bloomberg Professional Service for the S&P 500, an expected total return of 13.53% was derived based upon expected dividend yields and long-term earnings growth estimates as a proxy for capital appreciation. Subtracting the average consensus forecast of Aaa corporate bonds of 3.21% results in an expected equity risk premium of 10.32%.

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

Sources of Information:

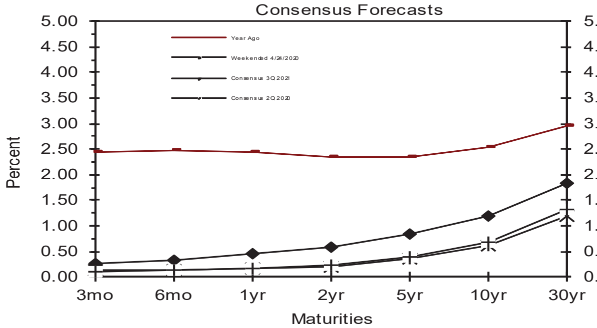
Stocks, Bonds, Bills, and Inflation - 2020 SBBI Yearbook, John Wiley & Sons, Inc.
Industrial Manual and Mergent Bond Record Monthly Update.
Value Line Summary and Index
Blue Chip Financial Forecasts, May 1, 2020 and December 1, 2019
Bloomberg Professional Service

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

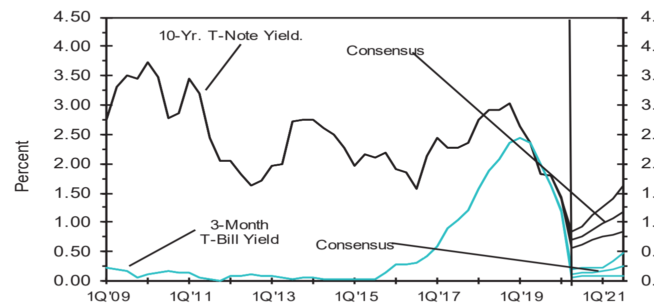
	History								Consensus Forecasts-Quarterly Avg.					
	Average For Week Ending				Average For Month			*Latest Qtr*	2Q	3Q	4Q	1Q	2Q	3Q
Interest Rates	Apr 24	Apr 17	Apr 10	Apr 3	Mar	Feb	Jan	1Q 2020	2020	2020	2020	2021	2021	2021
Federal Funds Rate	0.05	0.05	0.05	0.09	0.65	1.58	1.55	1.26	**0.1**	**0.1**	**0.1**	**0.1**	**0.2**	**0.2**
Prime Rate	3.25	3.25	3.25	3.25	3.81	4.75	4.75	4.44	**3.3**	**3.3**	**3.3**	**3.3**	**3.3**	**3.4**
LIBOR, 3-mo.	1.01	1.14	1.30	1.42	1.10	1.68	1.82	1.53	**0.9**	**0.7**	**0.6**	**0.6**	**0.6**	**0.7**
Commercial Paper, 1-mo.	0.38	0.37	0.37	1.42	1.36	1.55	1.56	1.49	**0.4**	**0.4**	**0.4**	**0.4**	**0.5**	**0.6**
Treasury bill, 3-mo.	0.12	0.17	0.19	0.10	0.30	1.54	1.55	1.13	**0.1**	**0.1**	**0.1**	**0.2**	**0.2**	**0.3**
Treasury bill, 6-mo.	0.14	0.21	0.21	0.14	0.30	1.51	1.56	1.12	**0.1**	**0.2**	**0.2**	**0.2**	**0.3**	**0.3**
Treasury bill, 1 yr.	0.17	0.21	0.22	0.15	0.33	1.41	1.53	1.09	**0.2**	**0.2**	**0.3**	**0.3**	**0.4**	**0.4**
Treasury note, 2 yr.	0.21	0.22	0.26	0.23	0.45	1.33	1.52	1.10	**0.2**	**0.3**	**0.4**	**0.4**	**0.5**	**0.6**
Treasury note, 5 yr.	0.36	0.38	0.45	0.38	0.59	1.32	1.56	1.16	**0.4**	**0.5**	**0.6**	**0.7**	**0.7**	**0.8**
Treasury note, 10 yr.	0.61	0.68	0.73	0.65	0.87	1.50	1.76	1.38	**0.7**	**0.8**	**0.9**	**1.0**	**1.1**	**1.2**
Treasury note, 30 yr.	1.19	1.31	1.33	1.29	1.46	1.97	2.22	1.88	**1.3**	**1.4**	**1.5**	**1.6**	**1.7**	**1.8**
Corporate Aaa bond	2.75	2.81	3.03	3.05	3.11	2.85	3.04	3.00	**2.6**	**2.7**	**2.8**	**2.8**	**2.9**	**3.0**
Corporate Baa bond	3.70	3.75	4.13	4.23	4.11	3.50	3.66	3.76	**4.3**	**4.3**	**4.2**	**4.3**	**4.2**	**4.3**
State & Local bonds	3.37	3.29	3.42	3.45	3.29	2.93	3.00	3.07	**2.6**	**2.6**	**2.6**	**2.6**	**2.6**	**2.6**
Home mortgage rate	3.33	3.31	3.33	3.33	3.45	3.47	3.62	3.51	**3.3**	**3.3**	**3.2**	**3.2**	**3.3**	**3.3**
	History								Consensus Forecasts-Quarterly					
	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q
Key Assumptions	2018	2018	2018	2019	2019	2019	2019	2020	2020	2020	2020	2021	2021	2021
Fed's AFE $ Index	105.5	107.8	109.4	109.4	110.3	110.5	110.3	111.2	**113.5**	**113.5**	**113.2**	**112.9**	**112.5**	**112.2**
Real GDP	3.5	2.9	1.1	3.1	2.0	2.1	2.1	-4.8	**-27.8**	**7.4**	**9.2**	**6.6**	**4.8**	**3.6**
GDP Price Index	3.2	2.0	1.6	1.1	2.4	1.8	1.3	1.3	**0.1**	**1.1**	**1.3**	**1.7**	**1.9**	**1.8**
Consumer Price Index	2.2	2.1	1.3	0.9	3.0	1.8	2.4	1.2	**-2.4**	**1.1**	**1.7**	**2.1**	**2.1**	**2.1**

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

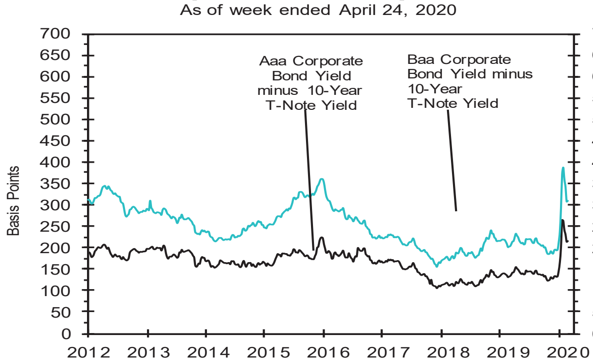
U.S. Treasury Yield Curve
Week ended April 24, 2020 & Year Ago vs.
2Q 2020 & 3Q 2021
Consensus Forecasts



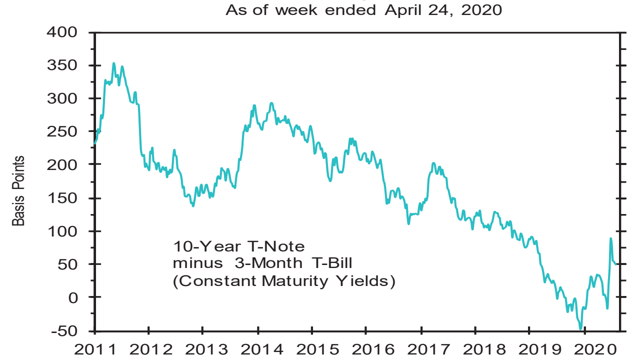
U.S. 3-Mo. T-Bills & 10-Yr. T-Note Yield
(Quarterly Average) Forecast



Corporate Bond Spreads
As of week ended April 24, 2020



U.S. Treasury Yield Curve
As of week ended April 24, 2020



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 2021 through 2025 and averages for the five-year periods 2021-2025 and 2026-2030. 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	
		2021	2022	2023	2024	2025	2021-2025	2026-2030
1. Federal Funds Rate	**CONSENSUS**	**1.5**	**1.9**	**2.1**	**2.3**	**2.4**	**2.1**	**2.4**
	Top 10 Average	2.1	2.6	2.7	2.9	3.0	2.6	3.0
	Bottom 10 Average	1.0	1.2	1.5	1.8	1.9	1.5	1.9
2. Prime Rate	**CONSENSUS**	**4.5**	**4.9**	**5.1**	**5.4**	**5.5**	**5.1**	**5.5**
	Top 10 Average	5.0	5.5	5.7	6.0	6.0	5.6	6.0
	Bottom 10 Average	4.0	4.3	4.6	4.9	5.0	4.5	5.0
3. LIBOR, 3-Mo.	**CONSENSUS**	**1.9**	**2.2**	**2.4**	**2.6**	**2.7**	**2.3**	**2.7**
	Top 10 Average	2.4	2.7	2.9	3.1	3.2	2.9	3.2
	Bottom 10 Average	1.4	1.6	1.8	2.0	2.2	1.8	2.2
4. Commercial Paper, 1-Mo.	**CONSENSUS**	**1.7**	**2.1**	**2.3**	**2.5**	**2.7**	**2.3**	**2.7**
	Top 10 Average	2.2	2.5	2.8	3.0	3.1	2.7	3.1
	Bottom 10 Average	1.3	1.6	1.8	2.1	2.2	1.8	2.2
5. Treasury Bill Yield, 3-Mo.	**CONSENSUS**	**1.5**	**1.8**	**2.0**	**2.3**	**2.4**	**2.0**	**2.4**
	Top 10 Average	2.1	2.6	2.7	2.9	3.0	2.6	**3.0**
	Bottom 10 Average	1.0	1.2	1.4	1.7	1.8	1.4	**1.8**
6. Treasury Bill Yield, 6-Mo.	**CONSENSUS**	**1.6**	**1.9**	**2.2**	**2.4**	**2.5**	**2.1**	**2.5**
	Top 10 Average	2.2	2.6	2.8	3.0	3.1	2.7	**3.1**
	Bottom 10 Average	1.1	1.3	1.5	1.8	2.0	1.5	**2.0**
7. Treasury Bill Yield, 1-Yr.	**CONSENSUS**	**1.7**	**2.0**	**2.2**	**2.5**	**2.6**	**2.2**	**2.7**
	Top 10 Average	2.3	2.7	2.9	3.2	3.2	2.8	**3.2**
	Bottom 10 Average	1.2	1.3	1.6	1.9	2.1	1.6	**2.1**
8. Treasury Note Yield, 2-Yr.	**CONSENSUS**	**1.8**	**2.1**	**2.4**	**2.6**	**2.7**	**2.3**	**2.8**
	Top 10 Average	2.4	2.8	3.1	3.3	3.4	3.0	**3.4**
	Bottom 10 Average	1.2	1.5	1.7	2.0	2.2	1.7	**2.2**
10. Treasury Note Yield, 5-Yr.	**CONSENSUS**	**2.0**	**2.3**	**2.6**	**2.8**	**2.9**	**2.5**	**3.0**
	Top 10 Average	2.6	3.0	3.2	3.5	3.5	3.2	**3.6**
	Bottom 10 Average	1.5	1.7	1.9	2.1	2.3	1.9	**2.3**
11. Treasury Note Yield, 10-Yr.	**CONSENSUS**	**2.3**	**2.5**	**2.8**	**3.0**	**3.1**	**2.8**	**3.2**
	Top 10 Average	2.9	3.3	3.6	3.8	3.9	3.5	**4.0**
	Bottom 10 Average	1.8	1.9	2.1	2.3	2.4	2.1	**2.5**
12. Treasury Bond Yield, 30-Yr.	**CONSENSUS**	**2.8**	**3.0**	**3.2**	**3.5**	**3.6**	**3.2**	**3.7**
	Top 10 Average	3.3	3.6	4.0	4.2	4.3	3.9	**4.4**
	Bottom 10 Average	2.2	2.4	2.5	2.7	2.9	2.6	**2.9**
13. Corporate Aaa Bond Yield	**CONSENSUS**	**3.7**	**4.0**	**4.3**	**4.5**	**4.6**	**4.2**	**4.7**
	Top 10 Average	4.3	4.6	4.9	5.2	5.3	4.9	**5.4**
	Bottom 10 Average	3.2	3.4	3.6	3.7	3.9	3.6	**4.0**
13. Corporate Baa Bond Yield	**CONSENSUS**	**4.7**	**4.9**	**5.2**	**5.4**	**5.6**	**5.2**	**5.6**
	Top 10 Average	5.3	5.6	5.9	6.2	6.3	5.9	**6.4**
	Bottom 10 Average	4.2	4.3	4.4	4.6	4.8	4.5	**4.8**
14. State & Local Bonds Yield	**CONSENSUS**	**3.6**	**3.7**	**3.9**	**4.1**	**4.2**	**3.9**	**4.2**
	Top 10 Average	4.0	4.3	4.5	4.6	4.7	4.4	**4.7**
	Bottom 10 Average	3.2	3.2	3.3	3.5	3.7	3.4	**3.8**
15. Home Mortgage Rate	**CONSENSUS**	**4.1**	**4.2**	**4.5**	**4.7**	**4.8**	**4.5**	**4.9**
	Top 10 Average	4.5	4.8	5.1	5.4	5.4	5.0	**5.5**
	Bottom 10 Average	3.7	3.7	3.9	4.1	4.2	3.9	**4.2**
A. Fed's AFE Nominal $ Index	**CONSENSUS**	**108.8**	**108.8**	**109.1**	**109.2**	**108.8**	**108.9**	**108.3**
	Top 10 Average	110.6	110.7	111.1	111.5	111.6	111.1	111.8
	Bottom 10 Average	107.0	107.0	107.1	107.1	106.5	106.9	105.7

		Year-Over-Year, % Change					Five-Year Averages	
		2021	2022	2023	2024	2025	2021-2025	2026-2030
B. Real GDP	**CONSENSUS**	**1.9**	**2.0**	**2.0**	**1.9**	**2.0**	**1.9**	**2.0**
	Top 10 Average	2.4	2.4	2.3	2.2	2.2	2.3	2.3
	Bottom 10 Average	1.4	1.6	1.6	1.7	1.7	1.6	1.7
C. GDP Chained Price Index	**CONSENSUS**	**2.2**	**2.3**	**2.3**	**2.2**	**2.2**	**2.2**	**2.2**
	Top 10 Average	2.6	2.8	2.7	2.6	2.6	2.7	2.6
	Bottom 10 Average	1.8	1.8	1.9	1.9	1.9	1.9	1.9
D. Consumer Price Index	**CONSENSUS**	**2.1**	**2.2**	**2.2**	**2.2**	**2.1**	**2.2**	**2.1**
	Top 10 Average	2.4	2.4	2.5	2.4	2.3	2.4	2.3
	Bottom 10 Average	1.8	1.9	2.0	2.0	1.9	1.9	2.0

Utilities, Inc of Florida
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
	Equity Risk Premium based on S&P Utility Index Holding Period Returns (1):	
1.	Historical Equity Risk Premium	4.21 %
2.	Regression of Historical Equity Risk Premium (2)	6.68
3.	Forecasted Equity Risk Premium Based on PRPM (3)	5.95
4.	Forecasted Equity Risk Premium based on Projected Total Return on the S&P Utilities Index (Value Line Data) (4)	6.76
5.	Forecasted Equity Risk Premium based on Projected Total Return on the S&P Utilities Index (Bloomberg Data) (5)	5.23
6.	Average Equity Risk Premium (6)	5.76 %

Notes:
(1) Based on S&P Public Utility Index monthly total returns and Moody's Public Utility Bond average monthly yields from 1928-2019. 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 A rated public utility bond yields from 1928 - 2019 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 A rated public utility bonds from January 1928 - April 2020.
(4) Using data from Value Line for the S&P Utilities Index, an expected return of 10.50% was derived based on expected dividend yields and long-term growth estimates as a proxy for market appreciation. Subtracting the expected A rated public utility bond yield of 3.74%, calculated on line 3 of page 3 of this Schedule results in an equity risk premium of 7.47%. (10.50% - 3.74% = 6.76%)
(5) Using data from Bloomberg Professional Service for the S&P Utilities Index, an expected return of 8.97% was derived based on expected dividend yields and long-term growth estimates as a proxy for market appreciation. Subtracting the expected A rated public utility bond yield of 3.74%, calculated on line 3 of page 3 of this Schedule results in an equity risk premium of 5.23%. (8.97% - 3.74% = 5.23%)
(6) Average of lines 1 through 5.

Utilities, Inc of Florida
Indicated Common Equity Cost Rate Through Use
of the Traditional Capital Asset Pricing Model (CAPM) and Empirical Capital Asset Pricing Model (ECAPM)

Proxy Group of Seven Water Companies	[1] Value Line Adjusted Beta	[2] Bloomberg Adjusted Beta	[3] Average Beta	[4] Market Risk Premium (1)	[5] Risk-Free Rate (2)	[6] Traditional CAPM Cost Rate	[7] ECAPM Cost Rate	[8] Indicated Common Equity Cost Rate (3)
American States Water Co.	0.60	0.52	0.56	11.94 %	2.03 %	8.72 %	10.03 %	9.37 %
American Water Works Company Inc	0.50	1.00	0.75	11.94	2.03	10.99	11.73	11.36
California Water Service Group	0.60	0.51	0.55	11.94	2.03	8.60	9.94	9.27
Essential Utilities, Inc.	0.60	0.96	0.78	11.94	2.03	11.34	12.00	11.67
Middlesex Water Co.	0.70	0.73	0.72	11.94	2.03	10.63	11.46	11.05
SJW Group	0.60	0.83	0.71	11.94	2.03	10.51	11.37	10.94
York Water Co.	0.65	0.89	0.77	11.94	2.03	11.22	11.91	11.57
Mean			0.69			10.29 %	11.21 %	10.75 %
Median			0.72			10.63 %	11.46 %	11.05 %
Average of Mean and Median			0.71			10.46	11.34	10.90 %

Notes on page 2 of this Schedule.

Utilities, Inc of Florida
Notes to Accompany the Application of the CAPM and ECAPM

Notes:

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

Historical Data MRP Estimates:

Measure 1: Ibbotson Arithmetic Mean MRP (1926-2019)

Arithmetic Mean Monthly Returns for Large Stocks 1926-2019:	12.10	%
Arithmetic Mean Income Returns on Long-Term Government Bonds:	5.09	
MRP based on Ibbotson Historical Data:	7.01	%

Measure 2: Application of a Regression Analysis to Ibbotson Historical Data (1926-2019)	10.26	%

Measure 3: Application of the PRPM to Ibbotson Historical Data: (January 1926 - April 2020)	13.44	%

Value Line MRP Estimates:

Measure 4: Value Line Projected MRP (Thirteen weeks ending May 01, 2020)

Total projected return on the market 3-5 years hence*:	18.71	%
Projected Risk-Free Rate (see note 2):	2.03	
MRP based on Value Line Summary & Index:	16.68	%

*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:	14.79	%
Projected Risk-Free Rate (see note 2):	2.03	
MRP based on Value Line data	12.76	%

Measure 6: Bloomberg Projected MRP

Total return on the Market based on the S&P 500:	13.53	%
Projected Risk-Free Rate (see note 2):	2.03	
MRP based on Bloomberg data	11.50	%
Average of Value Line, Ibbotson, and Bloomberg MRP:	11.94	%

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

Second Quarter 2020	1.30	%
Third Quarter 2020	1.40	
Fourth Quarter 2020	1.50	
First Quarter 2021	1.60	
Second Quarter 2021	1.70	
Third Quarter 2021	1.80	
2021-2025	3.20	
2026-2030	3.70	
	2.03	%

(3) Average of Column 6 and Column 7.

Sources of Information:

Value Line Summary and Index
Blue Chip Financial Forecasts, May 1, 2020 and December 1, 2019
Stocks, Bonds, Bills, and Inflation - 2020 SBBI Yearbook, John Wiley & Sons, Inc.
Bloomberg Professional Services

Utilities, Inc. of Florida
Basis of Selection of the Group of Non-Price Regulated Companies
Comparable in Total Risk to the Utility Proxy Group

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

The Non-Price Regulated Proxy Group was then selected based on the unadjusted beta range of 0.17 – 0.61 and residual standard error of the regression range of 2.6429 – 3.1521 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 0.1273. 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

$$\text{Thus, } 0.1273 = \frac{2.8975}{\sqrt{518}} = \frac{2.8975}{22.7596}$$

Source of Information: Value Line, Inc., March 2020
Value Line Investment Survey (Standard Edition)

Utilities, Inc of Florida
Basis of Selection of Comparable Risk
Domestic Non-Price Regulated Companies

Proxy Group of Seven Water Companies	[1] Value Line Adjusted Beta	[2] Unadjusted Beta	[3] Residual Standard Error of the Regression	[4] Standard Deviation of Beta
American States Water Co.	0.60	0.36	2.6563	0.0986
American Water Works Company Inc	0.50	0.23	2.2596	0.0839
California Water Service Group	0.60	0.38	2.3220	0.0862
Essential Utilities, Inc.	0.60	0.39	2.9281	0.1087
Middlesex Water Co.	0.70	0.54	3.4080	0.1265
SJW Group	0.60	0.38	3.2407	0.1203
York Water Co.	0.65	0.46	3.4676	0.1287
Average	0.61	0.39	2.8975	0.1076

Beta Range (+/- 2 std. Devs. of Beta)	0.17	0.61
2 std. Devs. of Beta	0.22	
Residual Std. Err. Range (+/- 2 std. Devs. of the Residual Std. Err.)	2.6429	3.1521
Std. dev. of the Res. Std. Err.	0.1273	
2 std. devs. of the Res. Std. Err.	0.2546	

Source of Information: Valueline Proprietary Database, March 2020

Utilities, Inc of Florida
Proxy Group of Non-Price Regulated Companies
Comparable in Total Risk to the
Proxy Group of Seven Water Companies

Proxy Group of Twelve Non-Price Regulated Companies	[1] VL Adjusted Beta	[2] Unadjusted Beta	[3] Residual Standard Error of the Regression	[4] Standard Deviation of Beta
Casey's Gen'l Stores	0.70	0.53	2.9602	0.1099
Cboe Global Markets	0.65	0.46	2.7206	0.1010
Cracker Barrel	0.70	0.54	3.0507	0.1132
Campbell Soup	0.65	0.40	2.9785	0.1105
Dunkin' Brands Group	0.70	0.51	2.7046	0.1004
Darden Restaurants	0.75	0.60	2.9890	0.1109
Hormel Foods	0.60	0.34	2.6862	0.0997
Lancaster Colony	0.70	0.48	2.6628	0.0988
Lilly (Eli)	0.75	0.54	2.6484	0.0983
Lamb Weston Holdings	0.65	0.43	2.8592	0.1543
Altria Group	0.70	0.50	2.6455	0.0982
Valvoline Inc.	0.75	0.57	3.1081	0.1659
Average	0.69	0.49	2.8300	0.1100
Proxy Group of Seven Water Companies	0.61	0.39	2.8975	0.1076

Source of Information: Valueline Proprietary Database, March 2020

Utilities, Inc of Florida
Summary of Cost of Equity Models Applied to
Proxy Group of Twelve Non-Price Regulated Companies
Comparable in Total Risk to the
Proxy Group of Seven Water Companies

Principal Methods	Proxy Group of Twelve Non-Price Regulated Companies
Discounted Cash Flow Model (DCF) (1)	8.41 %
Risk Premium Model (RPM) (2)	13.12
Capital Asset Pricing Model (CAPM) (3)	11.83
Mean	11.12 %
Median	11.83 %
Average of Mean and Median	11.48 %

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

Utilities, Inc of Florida
DCF Results for the Proxy Group of Non-Price-Regulated Companies Comparable in Total Risk to the
Proxy Group of Seven Water Companies

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Proxy Group of Twelve Non-Price Regulated Companies	Average Dividend Yield	Value Line Projected Five Year Growth in EPS	Zack's Five Year Projected Growth Rate in EPS	Yahoo! Finance Projected Five Year Growth in EPS	Bloomberg Projected Five Year Growth in EPS	Average Projected Five Year Growth Rate in EPS	Adjusted Dividend Yield	Indicated Common Equity Cost Rate (1)
Casey's Gen'l Stores	0.83 %	6.50 %	8.30 %	9.27 %	11.53 %	8.90 %	0.87 %	9.77 %
Cboe Global Markets	1.39	12.50	2.30	3.24	6.15	6.05	1.43	7.48
Cracker Barrel	-	7.50	NA	0.30	(4.99)	3.90	-	NA
Campbell Soup	2.89	2.00	7.20	2.75	7.48	4.86	2.96	7.82
Dunkin' Brands Group	-	9.50	9.90	4.76	6.14	7.58	-	NA
Darden Restaurants	-	11.00	10.00	NA	5.82	8.94	-	NA
Hormel Foods	2.02	8.50	6.00	4.00	4.63	5.78	2.08	7.86
Lancaster Colony	1.96	5.00	NA	3.00	NA	4.00	2.00	6.00
Lilly (Eli)	2.09	10.00	12.30	12.52	11.31	11.53	2.21	13.74
Lamb Weston Holdings	1.31	9.50	3.40	3.40	(1.85)	5.43	1.35	6.78
Altria Group	8.29	8.50	5.00	3.53	5.25	5.57	8.52	14.09
Valvoline Inc.	2.71	8.50	2.60	2.60	4.84	4.63	2.77	7.40
							Mean	8.99 %
							Median	7.82 %
							Average of Mean and Median	8.41 %

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 30, 2020. 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.reuters.com, www.zacks.com, and www.yahoo.com (excluding any negative growth rates) and then adding that growth rate to the adjusted dividend yield.

Source of Information:
Value Line Investment Survey
www.reuters.com Downloaded on 04/30/2020
www.zacks.com Downloaded on 04/30/2020
www.yahoo.com Downloaded on 04/30/2020
Bloomberg Professional Services

Utilities, Inc of Florida
Indicated Common Equity Cost Rate
Through Use of a Risk Premium Model
Using an Adjusted Total Market Approach

Line No.		Proxy Group of Twelve Non-Price Regulated Companies	
1.	Prospective Yield on Baa Rated Corporate Bonds (1)	4.55	%
2.	Equity Risk Premium (2)	8.57	
3.	Risk Premium Derived Common Equity Cost Rate	13.12	%

Notes: (1) Average forecast of Baa corporate bonds based upon the consensus of nearly 50 economists reported in Blue Chip Financial Forecasts dated May 1, 2020 and December 1, 2019 (see pages 10 and 11 of Schedule 4). The estimates are detailed below.

Second Quarter 2020	4.30	%
Third Quarter 2020	4.30	
Fourth Quarter 2020	4.20	
First Quarter 2021	4.30	
Second Quarter 2021	4.20	
Third Quarter 2021	4.30	
2021-2025	5.20	
2026-2030	5.60	
Average	4.55	%

(2) From page 5 of this Schedule.

Utilities, Inc of Florida
Comparison of Long-Term Issuer Ratings for the
Proxy Group of Twelve Non-Price Regulated Companies of Comparable risk to the
Proxy Group of Seven Water Companies

	Moody's Long-Term Issuer Rating April 2020		Standard & Poor's Long-Term Issuer Rating April 2020	
Proxy Group of Twelve Non-Price Regulated Companies	Long-Term Issuer Rating	Numerical Weighting (1)	Long-Term Issuer Rating	Numerical Weighting (1)
Casey's Gen'l Stores	NA	--	NA	--
Cboe Global Markets	A3	7.0	A-	7.0
Cracker Barrel	WR	--	NR	--
Campbell Soup	Baa2	9.0	BBB-	10.0
Dunkin' Brands Group	NA	--	NA	--
Darden Restaurants	Baa3	10.0	BBB-	10.0
Hormel Foods	A1	5.0	A	6.0
Lancaster Colony	NA	--	NA	--
Lilly (Eli)	A2	6.0	A+	5.0
Lamb Weston Holdings	Ba2	12.0	BB+	11.0
Altria Group	A3	7.0	BBB	9.0
Valvoline Inc.	Ba3	13.0	BB	12.0
Average	Baa2	8.6	BBB+	8.8

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

Source of Information:
Bloomberg Professional Services

Utilities, Inc of Florida
Derivation of Equity Risk Premium Based on the Total Market Approach
Using the Beta for
Proxy Group of Twelve Non-Price Regulated Companies of Comparable risk to the
Proxy Group of Seven Water Companies

Line No.	Equity Risk Premium Measure	Proxy Group of Twelve Non-Price Regulated Companies
	Ibbotson-Based Equity Risk Premiums:	
1.	Ibbotson Equity Risk Premium (1)	5.78 %
2.	Regression on Ibbotson Risk Premium Data (2)	9.12
3.	Ibbotson Equity Risk Premium based on PRPM (3)	11.95
4.	Equity Risk Premium Based on Value Line Summary and Index (4)	15.50
5	Equity Risk Premium Based on Value Line S&P 500 Companies (5)	11.58
6.	Equity Risk Premium Based on Bloomberg S&P 500 Companies (6)	10.32
7.	Conclusion of Equity Risk Premium	10.71 %
8.	Adjusted Beta (7)	0.80
9.	Forecasted Equity Risk Premium	8.57 %

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

Sources of Information:
Stocks, Bonds, Bills, and Inflation - 2020 SBBI Yearbook, John Wiley & Sons, Inc.
Value Line Summary and Index
Blue Chip Financial Forecasts, May 1, 2020 and December 1, 2019
Bloomberg Professional Services

Utilities, Inc of Florida
Traditional CAPM and ECAPM Results for the Proxy Group of Non-Price-Regulated Companies Comparable in Total Risk to the
Proxy Group of Seven Water Companies

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Proxy Group of Twelve 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)
Casey's Gen'l Stores	0.70	0.81	0.75	11.94 %	2.03 %	10.99 %	11.73 %	11.36 %
Cboe Global Markets	0.65	0.83	0.74	11.94	2.03	10.87	11.64	11.25
Cracker Barrel	0.70	1.31	1.01	11.94	2.03	14.09	14.06	14.08
Campbell Soup	0.65	0.55	0.60	11.94	2.03	9.19	10.39	9.79
Dunkin' Brands Group	0.70	1.36	1.03	11.94	2.03	14.33	14.24	14.28
Darden Restaurants	0.75	1.72	1.23	11.94	2.03	16.72	16.03	16.37
Hormel Foods	0.60	0.41	0.51	11.94	2.03	8.12	9.58	8.85
Lancaster Colony	0.70	0.57	0.64	11.94	2.03	9.67	10.75	10.21
Lilly (Eli)	0.75	0.79	0.77	11.94	2.03	11.22	11.91	11.57
Lamb Weston Holdings	0.65	1.09	0.87	11.94	2.03	12.42	12.81	12.61
Altria Group	0.70	0.82	0.76	11.94	2.03	11.11	11.82	11.46
Valvoline Inc.	0.75	1.22	0.99	11.94	2.03	13.85	13.88	13.87
Mean			0.83			11.88 %	12.40 %	12.14 %
Median			0.77			11.17 %	11.87 %	11.52 %
Average of Mean and Median			0.80			11.53 %	12.14 %	11.83 %

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

Utilities, Inc of Florida
Derivation of Investment Risk Adjustment Based upon
Ibbotson Associates' Size Premia for the Decile Portfolios of the NYSE/AMEX/NASDAQ

		[1]		[2]	[3]	[4]
Line No.		Market Capitalization on April 30, 2020 (1)		Applicable Decile of the NYSE/AMEX/ NASDAQ (2)	Applicable Size Premium (3)	Spread from Applicable Size Premium (4)
		(millions)	(times larger)			
1.	Utilities, Inc of Florida	$ 196.004		10	4.99%	
2.	Proxy Group of Seven Water Companies	$ 5,657.608	28.9 x	4	0.79%	4.20%

	[A]	[B]	[C]	[D]
	Decile	Market Capitalization of Smallest Company (millions)	Market Capitalization of Largest Company (millions)	Size Premium (Return in Excess of CAPM)*
Largest	1	$ 31,090.379	$ 1,061,355.011	-0.28%
	2	13,142.606	30,542.936	0.50%
	3	6,618.604	13,100.225	0.73%
	4	4,312.546	6,614.962	0.79%
	5	2,688.889	4,311.252	1.10%
	6	1,669.856	2,685.865	1.34%
	7	993.855	1,668.282	1.47%
	8	515.621	993.847	1.59%
	9	230.024	515.602	2.22%
Smallest	10	1.973	299.748	4.99%

*From 2020 Duff & Phelps Cost of Capital Navigator

Notes:
(1) From page 2 of this Schedule.
(2) Gleaned from Columns [B] and [C] on the bottom of this page. The appropriate decile (Column [A]) corresponds to the market capitalization of the proxy group, which is found in Column [1].
(3) Corresponding risk premium to the decile is provided in Column [D] on the bottom of this page.
(4) Line No. 1 Column [3] – Line No. 2 Column [3]. For example, the 4.20% in Column [4], Line No. 2 is derived as follows 4.20% = 2.22% - 0.79%.

Utilities, Inc of Florida
Market Capitalization of Utilities, Inc of Florida and the
Proxy Group of Seven Water Companies

Company	Exchange	[1] Common Stock Shares Outstanding at Fiscal Year End 2019 (millions)	[2] Book Value per Share at Fiscal Year End 2019 (1)	[3] Total Common Equity at Fiscal Year End 2019 (millions)	[4] Closing Stock Market Price on April 30, 2020	[5] Market-to-Book Ratio on April 30, 2020 (2)	[6] Market Capitalization on April 30, 2020 (3) (millions)
Utilities, Inc of Florida		NA	NA	$ 60.48 (4)	NA		
Based upon Proxy Group of Seven Water Companies						324.1 (5)	$ 196.004 (6)
Proxy Group of Seven Water Companies							
American States Water Co.	NYSE	36.847	$ 16.325	$ 601.530	$ 79.370	486.2 %	$ 2,924.516
American Water Works Company Inc	NYSE	180.813	33.853	6,121.000	121.690	359.5	$ 22,003.118
California Water Service Group	NYSE	48.532	16.070	779.906	44.920	279.5	$ 2,180.066
Essential Utilities, Inc.	NYSE	220.759	17.580	3,880.860	41.790	237.7	$ 9,225.507
Middlesex Water Co.	NASDAQ	17.434	18.572	323.792	60.300	324.7	$ 1,051.270
SJW Group	NYSE	28.457	31.275	889.984	59.530	190.3	$ 1,694.016
York Water Co.	NASDAQ	13.015	10.310	134.185	40.320	391.1	$ 524.761
Average		77.979	$ 20.569	$ 1,818.751	$ 63.989	324.1 %	$ 5,657.608

NA= Not Available

Notes:
(1) Column 3 / Column 1.
(2) Column 4 / Column 2.
(3) Column 1 * Column 4.
(4) Book common equity UIF's 2019 Annual Report to the FL PSC multiplied by the requested common equity ratio.
(5) The market-to-book ratio of Utilities, Inc of Florida on April 30, 2020 is assumed to be equal to the market-to-book ratio of Proxy Group of Seven Water Companies on April 30, 2020 as appropriate.
(6) Column [3] multiplied by Column [5].

Source of Information: 2019 Annual Forms 10K
yahoo.finance.com

CERTIFICATE OF SERVICE

HEREBY CERTIFY that on the 30th day of June 2020, a true and correct copy of the foregoing Prefiled Direct Testimony has been served via email to:

Walter Trierweiler, Esquire
Office of General Counsel
wtrierwe@psc.state.fl.us

Stephanie Morse, Esquire
Office of Public Counsel
morse.stephanie@leg.state.fl.us

/s/ Martin S. Friedman

MARTIN S. FRIEDMAN

STAFF-DR-03-012

REQUEST:

Refer to Duke Kentucky's Response to Staff's Second Request, Item 29, and to D'Ascendis Testimony, page 37, lines 8-12.

a. Explain whether Mr. D'Ascendis has utilized the two-year Bloomberg Betas in any other regulatory proceedings.

b. Explain whether the two-year Bloomberg Betas are reflective of the temporary risks associated with the COVID-19 pandemic, or if they are reflective of a more permanent shift in utility stock performance in relation to the market.

RESPONSE:

a. Mr. D'Ascendis has relied on beta coefficients from Bloomberg since he first obtained access to them, which was in early 2015. Those testimonies are documented in Appendix A to Mr. D'Ascendis' Direct Testimony.

b. Any beta coefficient is reflective of the prevailing market conditions during the calculation period. As discussed on page 34, lines 8-10 of Mr. D'Ascendis' Direct Testimony, the beta coefficient measures a security's systematic risk, or variability, relative to the market. Any changes in the co-variance between a utility stock and the market index would be reflected in the beta coefficient.

PERSON RESPONSIBLE: Dylan W. D'Ascendis

STAFF-DR-03-013

REQUEST:

Refer to Duke Kentucky's Response to Staff's Second Request, Attachment STAFF-DR-02-016 Attachment.xlsm, tabs "PRPM WP 3" – "PRPM WP 12". Explain the meaning of negative closing prices under column E.

RESPONSE:

The data presented in tabs "PRPM WP3" through "PRPM WP12" are presented in the original format from the Center for Research in Securities Prices ("CRSP"). As one can see in the "total return" column, the prices are understood to be positive.

PERSON RESPONSIBLE: Dylan W. D'Ascendis

STAFF-DR-03-014

REQUEST:

Refer to Duke Kentucky's Response to Staff's Second Request, Item 31. If a landlord has a property not enrolled in the Revert-to-Owner program and also has a deposit on file for that property, explain whether the deposit is returned to the landlord when service is transferred out of their name into their tenant's name.

RESPONSE:

Yes, the deposit is returned to the landlord. In the above scenario when service in the landlord's name is transferred out of their name into the tenant's name, the deposit is applied to the final bill in the landlord's name.

PERSON RESPONSIBLE: Retha Hunsicker

Duke Energy Kentucky
Case No. 2021-00190
STAFF Third Set Data Requests
Date Received: August 4, 2021

STAFF-DR-03-015

REQUEST:

Refer to Duke Kentucky's Response to Staff's Second Request, Item 37. For 2017 through present, indicate, by year, what percentage of reconnections were handled by Duke Kentucky employees and what percentage were handled by third-party contractors.

RESPONSE:

Please see table below. 2021 YTD is January 1, 2021 through August 4, 2021.

	Total	Contractor		Employee	
	Reconnections	Reconnections	%	Reconnections	%
2017	4,940	2,550	52%	2,390	48%
2018	4,753	3,581	75%	1,172	25%
2019	4,189	3,632	87%	557	13%
2020	982	923	94%	59	6%
2021 YTD	438	321	73%	97	27%

PERSON RESPONSIBLE: Jeff L. Kern

STAFF-DR-03-016

REQUEST:

Refer to Duke Kentucky's Response to Staff's Second Request, Item 38, Attachment STAFF-DR-02-038(a), page 3 of 3. Explain why the proposed amounts of $1,000 and $700 were not adjusted given the lower cost justification amounts.

RESPONSE:

Although the revised calculations resulted in lower estimated costs than what was originally filed in this case, these are estimated costs and subject to numerous assumptions. The proposed amounts remain reasonable based on these estimates if the amounts are rounded to the nearest $100. However, the Company is willing to base the proposed amounts on rounding to the nearest $10, such that the fees would be $970 for Meter Pulse Equipment and $680 for Meter Index.

PERSON RESPONSIBLE: Jeff L. Kern

STAFF-DR-03-017

REQUEST:

Refer to Duke Kentucky's Response to Staff's Second Request, Item 50. The response provided does not answer the request for information. Provide a full response to the previous request of Staff's Second Request, Item 50.

RESPONSE:

Staff's Second Request, Item 50 requested detailed cost support for Duke Energy Kentucky's late payment charge. As provided in the Company's response to that request, the Company did not perform a cost analysis for the late payment charge for this case. The charge has been present and unchanged for decades. Any cost analysis performed at the time the charge was first established is no longer available. The Company established the late-payment fee policy many years ago to encourage timely customer payments and to assist in managing the overall financial burden on all customers that occurs from bad debt and collection costs. The charge serves an important role in the bill collection strategy and it is imposed to counteract the cost of collecting the liability. The company is not proposing a change to its fee.

As stated in Quick testimony (page 10, lines 3-7), late fees are common business practices. The Company's late-payment fee is in-line with or below the rates established by the Kentucky Department of Revenue related to liabilities. It is also much lower than the "cost-of-collection fee" imposed of 25% on taxes unpaid by the original Notice Date.

Uniform civil penalties, provided by KRS 131.440 Cost of Collection

(1) (a) For purposes of the program described in KRS 131.400(4)(a), in addition to all other penalties provided under KRS 131.180, 131.410 to 131.445, and 131.990 and any other law, there is hereby imposed after the expiration of the tax amnesty period the following cost-of-collection fees:

1. A cost-of-collection fee of twenty-five percent (25%) on all taxes which are or become due and owing to the department for any reporting period, regardless of when due. This fee shall be in addition to any other applicable fee provided in this paragraph.

PERSON RESPONSIBLE: Lesley G. Quick

Duke Energy Kentucky
Case No. 2021-00190
STAFF Third Set Data Requests
Date Received: August 4, 2021

STAFF-DR-03-018

REQUEST:

Refer to Duke Kentucky's Response to Staff's Second Request, Item 52.

a. Provide a narrative description of how the amount of $369,396 was derived.

b. Provide the amount of the $369,396 that is attributable to residential customers.

RESPONSE:

a. The ($369,396) was derived by multiplying total revenue subject to the uncollectible expense factor, $70,644,406, times the late charges component of the total discount factor (-0.5229%). The ($369,396) represents the amount of the annualized uncollectible expense that is related to late payment charges.

b. In the Company's filed cost of service study, uncollectible expense was allocated to customer classes using an allocation factor based on the number of customers. Allocation factor K406 allocates 92.333957% to residential customers. Therefore ($341,078) of the amount would be applicable to residential customers.

PERSON RESPONSIBLE: Jay P. Brown
James Ziolkowski

Duke Energy Kentucky
Case No. 2021-00190
STAFF Third Set Data Requests
Date Received: August 4, 2021

STAFF-DR-03-019

REQUEST:

Refer to Duke Kentucky's Response to Staff's Second Request, Item 59. Confirm that the $34,642 of the Executive Long Term Incentive (LTI) plan is included in the revenue requirement.

RESPONSE:

Confirmed. This amount relates to Safety measures only. It is calculated by taking $138,569 (Line 7 of WPD-2.26b) times 25% (Line 5). In other words, WPD-2.26 shows that Total LTI expense of $138,569 has been reduced by $103,927 (75% relating to EPS and Total Shareholder Return), leaving only $34,642 related to safety measures in the test period.

PERSON RESPONSIBLE: Jay P. Brown

STAFF-DR-03-020

REQUEST:

Confirm that Duke Energy must achieve predetermined Earnings per Share (EPS) "Circuit Breaker" in order for the LTI to be granted.

a. If included, state what the EPS Circuit Breaker level is.

b. State in detail how the payout will be reduced if Duke Energy's EPS is less than or equal to the EPS circuit Breaker.

RESPONSE:

The EPS circuit breaker is only applicable to the STI plan. Refer to the response to STAFF-DR-02-058 for how the EPS circuit breaker applies to the STI plan.

PERSON RESPONSIBLE: Jake J. Stewart

Duke Energy Kentucky
Case No. 2021-00190
STAFF Third Set Data Requests
Date Received: August 4, 2021

STAFF-DR-03-021

REQUEST:

Refer to the Direct Testimony of Jake J. Stewart, page 28, Table 2. Provide the metrics used to determine the Non-EPS components of the Short Term Incentive (STI).

a. Provide the conditions and levels used to determine the 5 percent weight for the Reliability portion of STI.

b. Provide the conditions and levels used to determine the 5 percent weight for the Safety/Environmental portion of STI.

c. Provide the conditions and levels used to determine the 5 percent weight for the O&M portion of STI.

d. Provide the conditions and levels used to determine the 10 percent weight for the Customer Satisfaction portion of STI.

RESPONSE:

The weights of the non-EPS components are distributed amongst measures that reflect the top priorities for the company. O&M, weighted at 5%, emphasizes the importance of disciplined cost management. Achieving Operational Excellence is important for our employees, customers, and communities. This section of the scorecard is weighted at 10% and is split between an index measuring the Reliability of our operations and Safety/Environmental. Safety is a core value of the company and Environmental Events emphasizes the importance of the communities we serve. Finally, Customer Satisfaction is weighted at 10% to increase line of sight to how our customers are experiencing the company.

PERSON RESPONSIBLE: Jake J. Stewart

Duke Energy Kentucky
Case No. 2021-00190
STAFF Third Set Data Requests
Date Received: August 4, 2021

STAFF-DR-03-022

REQUEST:

Provide the conditions and levels used to determine the 25 percent weight for the Teams portion of STI.

RESPONSE:

Team goals vary by team and are typically more specific operational goals that provide direction for employees. This section of the scorecard is weighted at 25% to emphasize the importance of how each team contributes to the overall experience of our customers and communities while aligning the work of each team to the company's overall priorities. As a result, part of the incentive payout for most employees is dependent on achieving team goals.

The team goals directly benefit customers by tying employee compensation to reliability, outage frequency, time required to restore service, lost-time accidents, customer satisfaction scores, O&M expense levels and capital expenditures. Superior performance relating to these goals directly benefits customers through safe and reliable service, customer service quality, and low energy costs.

PERSON RESPONSIBLE: Jake J. Stewart

STAFF-DR-03-023

REQUEST:

Refer to Duke Kentucky's Response to Staff's Second Request, Item 67a.

a. Provide a Revised Schedule M and N based upon the revised cost of service study (COSS).

b. Refer to the final Order in Case No. 2018-00261,[1] page 15. The Commission stated it did not support the residential class subsidizing another rate classes. In both COSSs, the residential class is over contributing to the propose rate of return and thus is subsidizing other rate classes.

   1) Provide a revised revenue allocation that will remove the residential subsidy based upon the filed COSS with the minimum system methodology applied to the mains.

   2) Provide a revised revenue allocation that will remove the residential subsidy based upon the revised COSS with the zero-intercept method applied to the mains.

RESPONSE:

a. Please see STAFF-DR-03-023a DEK Gas Sch M and N.xlsm.

b. Please see STAFF-DR-03-023b1 Attachment.

c. Please see STAFF-DR-03-023b2 Attachment.

[1] Case No. 2018-00261, *Electronic Application of Duke Energy Kentucky, Inc., for Authority to 1) Adjust Natural Gas Rates 2) Approval of a Decoupling Mechanism 3) Approval of New Tariffs 4) and for All Other Required Approvals, Waivers, and Relief* (Ky. PSC Mar. 27, 2019).

PERSON RESPONSIBLE:

a. Jeff L. Kern
b. James E. Ziolkowski
c. James E. Ziolkowski

DUKE ENERGY KENTUCKY
CASE NO. 2021-00190
REVENUES AT PRESENT AND PROPOSED RATES
FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2022
(GAS SERVICE)

DATA: ___ BASE PERIOD _X_FORECASTED PERIOD
TYPE OF FILING: _X_ ORIGINAL ___UPDATED ___ REVISED
WORK PAPER REFERENCE NO(S).:
12 MONTHS FORECASTED

SCHEDULE M
PAGE 1 OF 1
WITNESS:
J.L. Kern

INCLUDES ALL RIDERS

LINE NO.	RATE CLASSIFICATION *(A)*	REVENUE AT PRESENT RATES *(B)* *($)*	REVENUE AT PROPOSED RATES *(C)* *($)*	REVENUE CHANGE (AMOUNT) *(D=C-B)* *($)*	% OF REVENUE CHANGE *(E=D / B)*
1	***SALES SERVICE:***				
2	RS RESIDENTIAL	78,691,507	86,967,381	8,275,874	10.52%
3	*TOTAL RS*	78,691,507	86,967,381	8,275,874	10.52%
4	GS COMMERCIAL	23,890,508	28,206,657	4,316,149	18.07%
5	GS INDUSTRIAL	2,459,804	2,910,650	450,846	18.33%
6	GS OTHER PUB AUTH	2,147,642	2,541,240	393,598	18.33%
7	*TOTAL GS*	28,497,954	33,658,547	5,160,593	18.11%
8	*TOTAL SALES SERVICE*	107,189,461	120,625,928	13,436,467	12.54%
9	***TRANSPORTATION:***				
10	FT LARGE	5,444,212	6,898,220	1,454,008	26.71%
11	IT	1,782,710	2,225,007	442,297	24.81%
12	*TOTAL TRANSPORTATION*	7,226,922	9,123,227	1,896,305	26.24%
13	*TOTAL THROUGHPUT*	114,416,383	129,749,155	15,332,772	13.40%
14	***MISCELLANEOUS REVENUES:***				
15	LATE PAYMENT CHARGES	0	0	0	0.00%
16	BAD CHECK CHARGES	27,420	27,420	0	0.00%
17	RECONNECTION CHARGES	23,364	28,037	4,673	20.00%
18	FIELD COLLECTION CHARGES	684	684	0	0.00%
19	INTERDEPARTMENTAL	27,765	32,825	5,060	18.22%
20	MINIMUM USE CONTRACT	258,228	143,554	(114,674)	-44.41%
21	REVENUE TRANSP OF GAS-INTERCO	0	0	0	0.00%
22	PROVISION FOR RATE REFUNDS	0	0	0	0.00%
23	OTHER MISC	528	528	0	0.00%
24	*TOTAL MISCELLANEOUS*	337,989	233,048	(104,941)	-31.05%
25	*TOTAL COMPANY REVENUE*	114,754,372	129,982,203	15,227,831	13.27%

DUKE ENERGY KENTUCKY
CASE NO. 2021-00190
TEST PERIOD REVENUES AT CURRENT AVERAGE RATES
FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2022
(GAS SERVICE)

DATA: ___ BASE PERIOD _X_FORECASTED PERIOD
TYPE OF FILING: _X_ ORIGINAL ___UPDATED ___ REVISED
WORK PAPER REFERENCE NO(S).:
12 MONTHS FORECASTED

INCLUDES ALL RIDERS

SCHEDULE M-2.1
PAGE 1 OF 1
WITNESS:
J.L. Kern

TEST PERIOD

LINE NO.	RATE CODE (A)	CLASS / DESCRIPTION (B)	CUSTOMER BILLS (C)	SALES (D)	TEST PERIOD REVENUE LESS GAS COST REVENUE (E)	CURRENT AVERAGE RATE (F=E/D)	% OF REV TO TOTAL EXCLUSIVE OF GAS COST (G)	GAS COST REVENUE (H)	TEST PERIOD REVENUE TOTAL (I)	% OF REV TO TOTAL (J)
				(MCF)	($)	($/MCF)	(%)	($)	($)	(%)
1	RS	RESIDENTIAL SERVICE	1,130,041	6,481,298	52,364,475	8.0793	70.47	26,327,032	78,691,507	68.57
2	GS	GENERAL SERVICE COMMERCIAL	78,612	2,857,007	12,285,346	4.3001	16.54	11,605,162	23,890,508	20.82
3	GS	GENERAL SERVICE INDUSTRIAL	2,879	331,485	1,113,312	3.3586	1.50	1,346,492	2,459,804	2.14
4	GS	GENERAL SERVICE OTHER PUB AUTH	2,541	289,222	972,822	3.3636	1.31	1,174,820	2,147,642	1.87
5	FT-L	FIRM TRANSPORTATION-LARGE	1,092	2,736,182	5,452,147	1.9926	7.34	(7,935)	5,444,212	4.74
6	IT	INTERRUPTIBLE TRANSPORTATION	264	1,672,200	1,782,710	1.0661	2.40	0	1,782,710	1.55
7		LATE PAYMENT CHARGES	0	0	0	-	-	0	0	-
8		BAD CHECK CHARGES	0	0	27,420	-	0.04	0	27,420	0.02
9		RECONNECTION CHARGES	0	0	23,364	-	0.03	0	23,364	0.02
10		FIELD COLLECTION CHARGES	0	0	684	-	-	0	684	-
11		INTERDEPARTMENTAL	0	4,158	10,875	2.6154	0.01	16,890	27,765	0.02
12		MINIMUM USE CONTRACT	0	0	258,228	-	0.35	0	258,228	0.23
13		REVENUE TRANSP OF GAS-INTERCO	0	0	0	-	-	0	0	-
14		PROVISION FOR RATE REFUNDS	0	0	0	-	-	0	0	-
15		OTHER MISCELLANEOUS	0	0	528	-	-	0	528	-
16	TOTAL		1,215,429	14,371,552	74,291,911	5.1694	99.99	40,462,461	114,754,372	99.98

NOTE: DETAIL CONTAINED ON SCHEDULES M-2.2 AND M-2.3.

DUKE ENERGY KENTUCKY
CASE NO. 2021-00190
ANNUALIZED REVENUES AT PROPOSED VS. MOST CURRENT RATES
FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2022
(GAS SERVICE)

DATA: ___ BASE PERIOD _X_FORECASTED PERIOD
TYPE OF FILING: _X_ ORIGINAL ___UPDATED ___ REVISED
WORK PAPER REFERENCE NO(S).:
12 MONTHS FORECASTED

INCLUDES ALL RIDERS

SCHEDULE M-2.2
PAGE 1 OF 7
WITNESS:
J.L. Kern

CURRENT ANNUALIZED

LINE NO.	RATE CODE (A)	CLASS / DESCRIPTION (B)	CUSTOMER BILLS(1) (C)	SALES(2) (D)	MOST CURRENT RATES (J)	CURRENT REVENUE LESS GAS COST REVENUE(4) (K)	% OF REV TO TOTAL LESS GAS COST REVENUE (L)	REVENUE INCR LESS GAS COST REV (F - K) (M)	% INCR IN REV LESS GAS COST REV (M / K) (N)	GAS COST REVENUE(3) (H)	CURRENT TOTAL REVENUE (K + H) (K1)	TOTAL REVENUE % INCREASE (M / K1) (O)
				(MCF)	($/MCF)	($)	(%)	($)	(%)	($)	($)	(%)
1	*SALES SERVICE:*											
2	RS	RESIDENTIAL	1,130,041	6,481,298	8.0793	52,364,475	100.00	8,275,874	15.8	26,327,032	78,691,507	10.5
3		*TOTAL RS*	1,130,041	6,481,298	8.0793	52,364,475	70.49	8,275,874	15.8	26,327,032	78,691,507	10.5
4	GS	COMMERCIAL	78,612	2,857,007	4.3001	12,285,346	85.48	4,316,149	35.1	11,605,162	23,890,508	18.1
5	GS	INDUSTRIAL	2,879	331,485	3.3586	1,113,312	7.75	450,846	40.5	1,346,492	2,459,804	18.3
6	GS	OTH PUB AUTH	2,541	289,222	3.3636	972,822	6.77	393,598	40.5	1,174,820	2,147,642	18.3
7		*TOTAL GS*	84,032	3,477,714	4.1325	14,371,480	19.34	5,160,593	35.9	14,126,474	28,497,954	18.1
8	*TOTAL SALES SERVICE*		1,214,073	9,959,012	6.7011	66,735,955	89.83	13,436,467	20.1	40,453,506	107,189,461	12.5
9	*TRANSPORTATION SERVICE:*											
10	FT-L	FIRM TRANSP - LARGE	1,092	2,736,182	1.9926	5,452,147	75.36	1,454,008	26.7	(7,935)	5,444,212	26.7
11	IT	INTERRUPTIBLE TRANSP	264	1,672,200	1.0661	1,782,710	24.64	442,297	24.8	0	1,782,710	24.8
12	*TOTAL TRANSP SERVICE*		1,356	4,408,382	1.6412	7,234,857	9.74	1,896,305	26.2	(7,935)	7,226,922	26.2
13		TOTAL THROUGHPUT	1,215,429	14,367,394	5.1485	73,970,812	99.57	15,332,772	20.7	40,445,571	114,416,383	13.4
14	*MISCELLANEOUS REVENUES:*											
15	LATE PAYMENT CHARGES		0	0		0	0.00	0		0	0	
16	BAD CHECK CHARGES		0	0		27,420	8.54	0		0	27,420	
17	RECONNECTION CHARGES		0	0		23,364	7.28	4,673		0	23,364	
18	FIELD COLLECTION CHARGES		0	0		684	0.21	0		0	684	
19	INTERDEPARTMENTAL		0	4,158		10,875	3.39	5,060		16,890	27,765	
20	MINIMUM USE CONTRACT		0	0		258,228	80.42	(114,674)		0	258,228	
21	REVENUE TRANSP OF GAS-INTERCO		0	0		0	0.00	0		0	0	
22	PROVISION FOR RATE REFUNDS		0	0		0	0.00	0		0	0	
23	OTHER MISC		0	0		528	0.16	0		0	528	
24	*TOTAL MISC*		0	4,158		321,099	0.43	(104,941)	(32.7)	16,890	337,989	(31.0)
25	*TOTAL COMPANY*		1,215,429	14,371,552	5.1694	74,291,911	100.00	15,227,831	20.5	40,462,461	114,754,372	13.3

(1) DETAIL CONTAINED ON SCHEDULES M-2.2, PAGES 2 THROUGH 7
(2) REFLECTS NORMALIZED VOLUMES.
(3) REFLECTS AVERAGE EXPECTED GAS COST OF $4.062/MCF

DUKE ENERGY KENTUCKY
CASE NO. 2021-00190
ANNUALIZED REVENUES AT PROPOSED VS. MOST CURRENT RATES
FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2022
(GAS SERVICE)

DATA: ___ BASE PERIOD _X_FORECASTED PERIOD
TYPE OF FILING: _X_ ORIGINAL ___UPDATED ___ REVISED
WORK PAPER REFERENCE NO(S).:
12 MONTHS FORECASTED

SCHEDULE M-2.3
PAGE 1 OF 7
WITNESS:
J.L. Kern

INCLUDES ALL RIDERS

PROPOSED ANNUALIZED

LINE NO.	RATE CODE (A)	CLASS / DESCRIPTION (B)	CUSTOMER BILLS(1) (C)	SALES(2) (D)	PROPOSED RATES (E)	PROPOSED REVENUE LESS GAS COST REVENUE(4) (F)	% OF REV TO TOTAL LESS GAS COST REVENUE (G)	GAS COST REVENUE(3) (H)	PROPOSED TOTAL REVENUE (F + H) (I)
				(MCF)	($/MCF)	($)	(%)	($)	($)
1	*SALES SERVICE:*								
2	RS	RESIDENTIAL	1,130,041	6,481,298	9.3562	60,640,349	100.00	26,327,032	86,967,381
3		*TOTAL RS*	1,130,041	6,481,298	9.3562	60,640,349	67.74	26,327,032	86,967,381
4	GS	COMMERCIAL	78,612	2,857,007	5.8108	16,601,495	85.00	11,605,162	28,206,657
5	GS	INDUSTRIAL	2,879	331,485	4.7186	1,564,158	8.01	1,346,492	2,910,650
6	GS	OTH PUB AUTH	2,541	289,222	4.7245	1,366,420	7.00	1,174,820	2,541,240
7		*TOTAL GS*	84,032	3,477,714	5.6164	19,532,073	21.82	14,126,474	33,658,547
8	*TOTAL SALES SERVICE*		1,214,073	9,959,012	8.0502	80,172,422	89.56	40,453,506	120,625,928
9	*TRANSPORTATION SERVICE:*								
10	FT-L	FIRM TRANSP - LARGE	1,092	2,736,182	2.5240	6,906,155	75.63	(7,935)	6,898,220
11	IT	INTERRUPTIBLE TRANSP	264	1,672,200	1.3306	2,225,007	24.37	0	2,225,007
12	*TOTAL TRANSP SERVICE*		1,356	4,408,382	2.0713	9,131,162	10.20	(7,935)	9,123,227
13		TOTAL THROUGHPUT	1,215,429	14,367,394	6.2157	89,303,584	99.76	40,445,571	129,749,155
14	*MISCELLANEOUS REVENUES:*								
15	LATE PAYMENT CHARGES		0	0		0	0.00	0	0
16	BAD CHECK CHARGES		0	0		27,420	12.69	0	27,420
17	RECONNECTION CHARGES		0	0		28,037	12.97	0	28,037
18	FIELD COLLECTION CHARGES		0	0		684	0.32	0	684
19	INTERDEPARTMENTAL		0	4,158		15,935	7.37	16,890	32,825
20	MINIMUM USE CONTRACT		0	0		143,554	66.41	0	143,554
21	REVENUE TRANSP OF GAS-INTERCO		0	0		0	0.00	0	0
22	PROVISION FOR RATE REFUNDS		0	0		0	0.00	0	0
23	OTHER MISC		0	0		528	0.24	0	528
24	*TOTAL MISC*		0	4,158		216,158	0.24	16,890	233,048
25	*TOTAL COMPANY*		1,215,429	14,371,552	6.2290	89,519,742	100.00	40,462,461	129,982,203

(1) DETAIL CONTAINED ON SCHEDULES M-2.3, PAGES 2 THROUGH 7.
(2) REFLECTS NORMALIZED VOLUMES.
(3) REFLECTS AVERAGE EXPECTED GAS COST OF $4.062/MCF.

DUKE ENERGY KENTUCKY
CASE NO. 2021-00190
ANNUALIZED REVENUES AT PROPOSED VS. MOST CURRENT RATES
FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2022
(GAS SERVICE)

DATA: ___ BASE PERIOD _X_FORECASTED PERIOD
TYPE OF FILING: _X_ ORIGINAL ___UPDATED ___ REVISED
WORK PAPER REFERENCE NO(S).:
12 MONTHS FORECASTED

SCHEDULE M-2.3
PAGE 2 OF 7
WITNESS:
J.L. Kern

PROPOSED ANNUALIZED

LINE NO.	RATE CODE (A)	CLASS / DESCRIPTION (B)	CUSTOMER BILLS(1) (C)	SALES(2) (D)	PROPOSED RATES (E)	PROPOSED REVENUE LESS GAS COST REVENUE (F)	% OF REV TO TOTAL LESS GAS COST REVENUE (G)	GAS COST REVENUE(3) (H)	PROPOSED TOTAL REVENUE (F + H) (I)
				(MCF)	($/MCF)	($)	(%)	($)	($)
1	*RS*	*RESIDENTIAL*							
2	*CUSTOMER CHARGE:*								
3	RESIDENTIAL								
4		TOTAL MONTHLY BILLS x :							
5		CUSTOMER CHARGE PER MONTH	1,130,041		$19.00	21,470,779	35.4		21,470,779
6	*COMMODITY CHARGE:*								
7		ALL CONSUMPTION		6,481,298	5.5330	35,861,022	59.1	26,327,032	62,188,054
8		*RATE RS EXCLUDING RIDERS*	1,130,041	6,481,298		57,331,801	94.5	26,327,032	83,658,833
9	*RIDERS:*								
10		HOME ENERGY ASSISTANCE PROGRAM (HEA)			$0.30	339,012	0.6		339,012
11		DEMAND SIDE MANAGEMENT RATE (DSMR)			0.458170	2,969,536	4.9		2,969,536
12		WEATHER NORMALIZATION ADJUSTMENT (WNA)			0.000000	0	0.0		0
13		*TOTAL RIDERS*				3,308,548	5.5		3,308,548
14	*TOTAL RATE RS RESIDENTIAL INCLUDING RIDERS*		1,130,041	6,481,298		60,640,349	100.0	26,327,032	86,967,381

(1) BILLS THAT TERMINATE IN RESPECTIVE RATE STEPS.
(2) REFLECTS NORMALIZED VOLUMES.
(3) REFLECTS AVERAGE EXPECTED GAS COST OF $4.062/MCF.

DUKE ENERGY KENTUCKY
CASE NO. 2021-00190
ANNUALIZED REVENUES AT PROPOSED VS. MOST CURRENT RATES
FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2022
(GAS SERVICE)

DATA: ___ BASE PERIOD _X_FORECASTED PERIOD
TYPE OF FILING: _X_ ORIGINAL ___UPDATED ___ REVISED
WORK PAPER REFERENCE NO(S).:
12 MONTHS FORECASTED

SCHEDULE M-2.3
PAGE 3 OF 7
WITNESS:
J.L. Kern

PROPOSED ANNUALIZED

LINE NO.	RATE CODE *(A)*	CLASS / DESCRIPTION *(B)*	CUSTOMER BILLS(1) *(C)*	SALES(2) *(D)*	PROPOSED RATES *(E)*	PROPOSED REVENUE LESS GAS COST REVENUE *(F)*	% OF REV TO TOTAL LESS GAS COST REVENUE *(G)*	GAS COST REVENUE(3) *(H)*	PROPOSED TOTAL REVENUE *(F + H)* *(I)*
				(MCF)	*($/MCF)*	*($)*	*(%)*	*($)*	*($)*
1	*GS*	*COMMERCIAL*							
2	*CUSTOMER CHARGE:*								
3	NON-RESIDENTIAL								
4		TOTAL MONTHLY BILLS x :							
5		CUSTOMER CHARGE PER MONTH	78,612		$58.00	4,559,496	27.5		4,559,496
6	*COMMODITY CHARGE:*								
7		ALL CONSUMPTION		2,857,007	4.2149	12,041,999	72.5	11,605,162	23,647,161
8		*RATE GS COMMERCIAL EXCLUDING RIDERS*	78,612	2,857,007		16,601,495	100.0	11,605,162	28,206,657
9	*RIDERS:*								
10		DEMAND SIDE MANAGEMENT RATE (DSMR)			0.000000	0	0.0		0
11		WEATHER NORMALIZATION ADJUSTMENT (WNA)			0.000000	0	0.0		0
12		*TOTAL RIDERS*				0	0.0		0
13	*TOTAL RATE GS COMMERCIAL INCLUDING RIDERS*		78,612	2,857,007		16,601,495	100.0	11,605,162	28,206,657

(1) BILLS THAT TERMINATE IN RESPECTIVE RATE STEPS.
(2) REFLECTS NORMALIZED VOLUMES.
(3) REFLECTS AVERAGE EXPECTED GAS COST OF $4.062/MCF.

DUKE ENERGY KENTUCKY
CASE NO. 2021-00190
ANNUALIZED REVENUES AT PROPOSED VS. MOST CURRENT RATES
FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2022
(GAS SERVICE)

DATA: ___ BASE PERIOD _X_FORECASTED PERIOD
TYPE OF FILING: _X_ ORIGINAL ___UPDATED ___ REVISED
WORK PAPER REFERENCE NO(S).:
12 MONTHS FORECASTED

SCHEDULE M-2.3
PAGE 4 OF 7
WITNESS:
J.L. Kern

PROPOSED ANNUALIZED

LINE NO.	RATE CODE (A)	CLASS / DESCRIPTION (B)	CUSTOMER BILLS(1) (C)	SALES(2) (D)	PROPOSED RATES (E)	PROPOSED REVENUE LESS GAS COST REVENUE (F)	% OF REV TO TOTAL LESS GAS COST REVENUE (G)	GAS COST REVENUE(3) (H)	PROPOSED TOTAL REVENUE (F + H) (I)
				(MCF)	($/MCF)	($)	(%)	($)	($)
1	GS	*INDUSTRIAL*							
2	*CUSTOMER CHARGE:*								
3	NON-RESIDENTIAL								
4		TOTAL MONTHLY BILLS x :							
5		CUSTOMER CHARGE PER MONTH	2,879		$58.00	166,982	10.7		166,982
6	*COMMODITY CHARGE:*								
7		ALL CONSUMPTION		331,485	4.2149	1,397,176	89.3	1,346,492	2,743,668
8		*RATE GS INDUSTRIAL EXCLUDING RIDERS*	2,879	331,485		1,564,158	100.0	1,346,492	2,910,650
9	*RIDERS:*								
10		DEMAND SIDE MANAGEMENT RATE (DSMR)			0.000000	0	0.0		0
11		WEATHER NORMALIZATION ADJUSTMENT (WNA			0.000000	0	0.0		0
12		*TOTAL RIDERS*				0	0.0		0
13	*TOTAL RATE GS INDUSTRIAL INCLUDING RIDERS*		2,879	331,485		1,564,158	100.0	1,346,492	2,910,650

(1) BILLS THAT TERMINATE IN RESPECTIVE RATE STEPS.
(2) REFLECTS NORMALIZED VOLUMES.
(3) REFLECTS AVERAGE EXPECTED GAS COST OF $4.062/MCF.

DUKE ENERGY KENTUCKY
CASE NO. 2021-00190
ANNUALIZED REVENUES AT PROPOSED VS. MOST CURRENT RATES
FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2022
(GAS SERVICE)

DATA: ___ BASE PERIOD _X_FORECASTED PERIOD
TYPE OF FILING: _X_ ORIGINAL ___UPDATED ___ REVISED
WORK PAPER REFERENCE NO(S).:
12 MONTHS FORECASTED

SCHEDULE M-2.3
PAGE 5 OF 7
WITNESS:
J.L. Kern

PROPOSED ANNUALIZED

LINE NO.	RATE CODE *(A)*	CLASS / DESCRIPTION *(B)*	CUSTOMER BILLS(1) *(C)*	SALES(2) *(D)*	PROPOSED RATES *(E)*	PROPOSED REVENUE LESS GAS COST REVENUE *(F)*	% OF REV TO TOTAL LESS GAS COST REVENUE *(G)*	GAS COST REVENUE(3) *(H)*	PROPOSED TOTAL REVENUE *(F + H)* *(I)*
				(MCF)	*($/MCF)*	*($)*	*(%)*	*($)*	*($)*
1	*GS*	*OTHER PUBLIC AUTHORITIES*							
2	*CUSTOMER CHARGE:*								
3	NON-RESIDENTIAL								
4		TOTAL MONTHLY BILLS x :							
5		CUSTOMER CHARGE PER MONTH	2,541		$58.00	147,378	10.8		147,378
6	*COMMODITY CHARGE:*								
7		ALL CONSUMPTION		289,222	4.2149	1,219,042	89.2	1,174,820	2,393,862
8		*RATE GS OPA EXCLUDING RIDERS*	2,541	289,222		1,366,420	100.0	1,174,820	2,541,240
9	*RIDERS:*								
10		DEMAND SIDE MANAGEMENT RATE (DSMR)			0.000000	0	0.0		0
11		WEATHER NORMALIZATION ADJUSTMENT (WNA)			0.000000	0	0.0		0
12		*TOTAL RIDERS*				0	0.0		0
13	*TOTAL RATE GS OPA INCLUDING RIDERS*		2,541	289,222		1,366,420	100.0	1,174,820	2,541,240

(1) BILLS THAT TERMINATE IN RESPECTIVE RATE STEPS.
(2) REFLECTS NORMALIZED VOLUMES.
(3) REFLECTS AVERAGE EXPECTED GAS COST OF $4.062/MCF.

DUKE ENERGY KENTUCKY
CASE NO. 2021-00190
ANNUALIZED TEST YEAR REVENUES AT PROPOSED VS. MOST CURRENT RATES
FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2022
(GAS SERVICE)

DATA: ___ BASE PERIOD _X_FORECASTED PERIOD
TYPE OF FILING: _X_ ORIGINAL ___UPDATED ___ REVISED
WORK PAPER REFERENCE NO(S).:
12 MONTHS FORECASTED

SCHEDULE M-2.2
PAGE 6 OF 7
WITNESS:
J.L. Kern

CURRENT ANNUALIZED

LINE NO.	RATE CODE *(A)*	CLASS / DESCRIPTION *(B)*	CUSTOMER BILLS *(C)*	SALES(1) *(D)*	MOST CURRENT RATES *(J)*	CURRENT REVENUE LESS GAS COST REVENUE *(K)*	% OF REV TO TOTAL LESS GAS COST REVENUE *(L)*	REVENUE INCR LESS GAS COST REV *(F - K)* *(M)*	% INCR IN REV LESS GAS COST REV *(M / K)* *(N)*	GAS COST REVENUE *(H)*	CURRENT TOTAL REVENUE *(K + H)* *(K1)*	TOTAL REVENUE % INCREASE *(M / K1)* *(O)*
				(MCF)	*($/MCF)*	*($)*	*(%)*	*($)*	*(%)*	*($)*	*($)*	*(%)*
1	*FT - L*											
2		*FIRM TRANSPORTATION - LARGE*										
3	ADMINISTRATIVE CHARGE		1,092		$430.00	469,560	8.6	0	0.0		469,560	0.0
4	*TRANSPORTATION CHARGE:*											
5		ALL CONSUMPTION		2,736,182	1.8210	4,982,587	91.4	1,454,008	29.2		4,982,587	29.2
6		*RATE FT-LARGE EXCLUDING RIDERS*	1,092	2,736,182		5,452,147	100.0	1,454,008	26.7		5,452,147	26.7
7	*RIDERS:*											
8		GAS COST ADJUSTMENT TRANSITION (GCAT)(2)			(0.0580)		0.0	0	0.0	(7,935)	(7,935)	0.0
9		*TOTAL RIDERS*				0	0.0	0	0.0	(7,935)	(7,935)	0.0
10	*TOTAL RATE FT - LARGE INCLUDING RIDERS*		1,092	2,736,182		5,452,147	100.0	1,454,008	26.7	(7,935)	5,444,212	26.7

(1) REFLECTS NORMALIZED VOLUMES.
(2) GCAT only applies to FT-L customers during the first 12 months after they switch from sales service. Usage for this rider estimated at 5%

DUKE ENERGY KENTUCKY
CASE NO. 2021-00190
ANNUALIZED REVENUES AT PROPOSED VS. MOST CURRENT RATES
FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2022
(GAS SERVICE)

WITNESS:
J.L. Kern

DATA: ___ BASE PERIOD _X_FORECASTED PERIOD
TYPE OF FILING: _X_ ORIGINAL ___UPDATED ___ REVISED
WORK PAPER REFERENCE NO(S).:
12 MONTHS FORECASTED

PROPOSED ANNUALIZED

LINE NO.	RATE CODE (A) / CLASS / DESCRIPTION (B)	CUSTOMER BILLS (C)	SALES (D)	PROPOSED RATES (E)	PROPOSED REVENUE LESS GAS COST REVENUE (F)	% OF REV TO TOTAL LESS GAS COST REVENUE (G)	GAS COST REVENUE (H)	PROPOSED TOTAL REVENUE (F + H) (I)
			(MCF)	($/MCF)	($)	(%)	($)	($)
1	*IT*							
2	*INTERRUPTIBLE TRANSPORTATION*							
3	ADMINISTRATIVE CHARGE	264		$430.00	113,520	5.1		113,520
4	*COMMODITY CHARGE:*							
5	ALL CONSUMPTION		1,672,200	1.2627	2,111,487	94.9		2,111,487
6	*RATE IT EXCLUDING RIDERS*	264	1,672,200		2,225,007	100.0		2,225,007
7	*RIDERS:*							
8	N/A			0.0000	0	0.0		0
9	*TOTAL RIDERS*				0	0.0		0
10	*TOTAL RATE IT TRANSPORTATION*	264	1,672,200		2,225,007	100.0		2,225,007

DUKE ENERGY KENTUCKY
CASE NO. 2021-00190
EFFECTS OF PROPOSED FIRM TRANSPORTATION-LARGE RATES
AND INTERRUPTIBLE TRANSPORTATION RATES ON TYPICAL CUSTOMER BILLS
(GAS SERVICE)

DATA: ___ BASE PERIOD _X_FORECASTED PERIOD
TYPE OF FILING: _X_ ORIGINAL ___UPDATED ___ REVISED
WORK PAPER REFERENCE NO(S).:
12 MONTHS FORECASTED

SCHEDULE N
PAGE 2 OF 2
WITNESS:
J.L. Kern

LINE NO.	RATE CODE	LEVEL of DEMAND (A)	LEVEL of USE (B)	BILL DATA INCLUDING RIDERS LESS COST of GAS: CURRENT BILL (C)	PROPOSED BILL (D)	DOLLAR INCREASE (D - C) (E)	PERCENT INCREASE (E / C) (F)	GAS COST (1) (G)	TOTAL CURRENT BILL (C + G) (H)	TOTAL PROPOSED BILL (D + G) (I)	PERCENT INCREASE (I-H) /H (L)
			(MCF)	($)	($)	($)	(%)	($)	($)	($)	(%)
			(MCF)	($)	($)	($)	(%)	($)	($)	($)	(%)
1	(FT-L)	Not									
2	FIRM	Applicable	1,000	2,251.00	2,782.40	531.40	23.6	(58.00)	2,193.00	2,724.40	24.2
3	TRANSPORTATION		1,500	3,161.50	3,958.60	797.10	25.2	(87.00)	3,074.50	3,871.60	25.9
4			2,000	4,072.00	5,134.80	1,062.80	26.1	(116.00)	3,956.00	5,018.80	26.9
5			3,000	5,893.00	7,487.20	1,594.20	27.1	(174.00)	5,719.00	7,313.20	27.9
6			5,000	9,535.00	12,192.00	2,657.00	27.9	(290.00)	9,245.00	11,902.00	28.7
7			10,000	18,640.00	23,954.00	5,314.00	28.5	(580.00)	18,060.00	23,374.00	29.4
8			20,000	36,850.00	47,478.00	10,628.00	28.8	(1,160.00)	35,690.00	46,318.00	29.8
9			30,000	55,060.00	71,002.00	15,942.00	29.0	(1,740.00)	53,320.00	69,262.00	29.9
10			40,000	73,270.00	94,526.00	21,256.00	29.0	(2,320.00)	70,950.00	92,206.00	30.0
11			50,000	91,480.00	118,050.00	26,570.00	29.0	(2,900.00)	88,580.00	115,150.00	30.0
12			75,000	137,005.00	176,860.00	39,855.00	29.1	(4,350.00)	132,655.00	172,510.00	30.0
13			100,000	182,530.00	235,670.00	53,140.00	29.1	(5,800.00)	176,730.00	229,870.00	30.1
14			150,000	273,580.00	353,290.00	79,710.00	29.1	(8,700.00)	264,880.00	344,590.00	30.1
15			200,000	364,630.00	470,910.00	106,280.00	29.1	(11,600.00)	353,030.00	459,310.00	30.1
16	(IT)	Not									
17	INTERRUPTIBLE	Applicable	2,000	2,426.40	2,955.40	529.00	21.8	-	2,426.40	2,955.40	21.8
18	TRANSPORTATION		5,000	5,421.00	6,743.50	1,322.50	24.4	-	5,421.00	6,743.50	24.4
19			10,000	10,412.00	13,057.00	2,645.00	25.4	-	10,412.00	13,057.00	25.4
20			15,000	15,403.00	19,370.50	3,967.50	25.8	-	15,403.00	19,370.50	25.8
21			20,000	20,394.00	25,684.00	5,290.00	25.9	-	20,394.00	25,684.00	25.9
22			25,000	25,385.00	31,997.50	6,612.50	26.0	-	25,385.00	31,997.50	26.0
23			30,000	30,376.00	38,311.00	7,935.00	26.1	-	30,376.00	38,311.00	26.1
24			40,000	40,358.00	50,938.00	10,580.00	26.2	-	40,358.00	50,938.00	26.2
25			50,000	50,340.00	63,565.00	13,225.00	26.3	-	50,340.00	63,565.00	26.3
26			100,000	100,250.00	126,700.00	26,450.00	26.4	-	100,250.00	126,700.00	26.4
27			200,000	200,070.00	252,970.00	52,900.00	26.4	-	200,070.00	252,970.00	26.4
28			300,000	299,890.00	379,240.00	79,350.00	26.5	-	299,890.00	379,240.00	26.5

(1) INCLUDES CURRENT RIDER GCAT OF ($0.058)/MCF

REVENUE REQUIREMENTS FROM COST OF SERVICE STUDY

DUKE ENERGY KENTUCKY
CASE NO. 2021-00190
SCHEDULE M - CURRENT RATE REVENUES
No Riders - With Fuel

	Customer Bills	Current Rate Revenues - No Riders - Including Fuel
RS	1,130,041	75,382,959
GS	84,032	28,497,954
FT-Large	1,092	5,444,212
IT	264	1,782,710
OTHER		337,989
TOTAL	1,215,429	111,445,824

DUKE ENERGY KENTUCKY
CASE NO. 2021-00190
COST OF SERVICE STUDY
Proposed Revenue Requirements
CASE NO. 2021-00190

Rate	Customer Component RRs	COS - no riders - includes fuel and FAC	% Change	Increase
RS	28,611,566	83,658,696	11.0%	8,275,737
GS	4,095,886	33,691,438	18.2%	5,193,484
FT-Large	132,688	6,791,839	24.8%	1,347,627
IT	85,499	2,225,050	24.8%	442,340
Additional FT for Min use		114,674		
OTHER		233,048	-31.0%	
TOTAL	32,925,639	126,714,745	13.7%	15,268,921

Comparison of Schedule M Calculated Proposed Revenues
Less COS Revenue Requirement
CASE NO. 2021-00190

Rate	+ value is high & - value is low	
RS	$	137
GS	$	(32,891)
FT-Large		-358.3256
IT	$	(43)
Total	$	(33,155)

PROPOSED RATE CALCULATIONS

DUKE ENERGY KENTUCKY
CASE NO. 2021-00190
PROPOSED RATE CALCULATION
Rate: RS

		Test Period
Customer Bills		1,130,041
COSS - RS Customer Component	$	28,611,566
COSS Customer Charge	$	25.32
Current Customer Charge	$	16.50
Gap	$	8.82
Migration @ % of Justified	$	3.53
Customer Charge at % Migration to COSS	$	20.03
Proposed Customer Charge	$	19.00
Proposed Customer Charge Revenues	$	21,470,779
COSS - RS Revenue Requirement	$	83,658,696
Less Proposed Customer Charge Revenues		
Less GCA	$	35,860,885
Test Period MCF		6,481,298
Proposed Delivery Charge		5.5330
Check to Revenue Requirements	$	137

Migration Percentage	40%

129,982,203
126,681,928
3,300,275

DUKE ENERGY KENTUCKY
CASE NO. 2021-00190
PROPOSED RATE CALCULATION
Rate: GS

		Test Period
Customer Bills		84,032
COSS - GS Customer Component	$	4,095,886
COSS Customer Charge	$	48.74
Current Customer Charge	$	50.00
Gap	$	(1.26)
Migration @ % of Justified	$	(0.50)
Customer Charge at % Migration to COSS	$	49.50
Proposed Customer Charge	$	58.00
Proposed Customer Charge Revenues	$	4,873,856
COSS - GS Revenue Requirement	$	33,691,438
Less Proposed Customer Charge Revenues		
Less GCA	$	14,691,108
Less Interdeptartmental	$	32,824.91
GS Rev Requirement	$	14,658,283
Test Period MCF		3,477,714
Proposed Energy Charge		4.2149
Check to Revenue Requirements	$	(66)

Current Interdept Rev	$	27,765
GS Increase %		18.2%
Interdept Increase	$	5,060
Proposed Intdept Rev	$	32,825

DUKE ENERGY KENTUCKY
CASE NO. 2021-00190
PROPOSED RATE CALCULATION
Rate: FT-Large

		Test Period
Customer Bills		1,092
COSS - FT-L Customer Component	$	132,688
COSS Customer Charge	$	121.51
Current Customer Charge	$	430.00
Gap	$	(308.49)
Migration @ % of Justified	$	(123.40)
Customer Charge at % Migration to COSS	$	306.60
Proposed Customer Charge	$	430.00
Proposed Customer Charge Revenues	$	469,560
COSS - FT-L Revenue Requirement	$	6,791,839
Less Proposed Customer Charge Revenues Less GCA/GCAT	$	6,322,279
Change in Min Amazon	$	(114,674)
FT-L Rev Requirement	$	6,436,953
Test Period MCF		2,736,182
Proposed Energy Charge		2.3524
Check to Revenue Requirements	$	(358)

Amazon Annual Delivery Component		$655,877
Annual Usage Required		276,618
Estimated Annual Usage		215,594
Projected Shortfall		61,024
New Minumum Usage Revenue		$143,554
Original Min Usage Revenue		$258,228
Change in Min Usage Revenue		($114,674)
	$	2.3524

DUKE ENERGY KENTUCKY
CASE NO. 2021-00190
PROPOSED RATE CALCULATION
Rate: IT

Customer Bills		264
COSS - IT Customer Component	$	85,499
COSS Customer Charge	$	323.86
Current Customer Charge	$	430.00
Gap	$	(106.14)
Migration @ % of Justified	$	(42.46)
Customer Charge at % Migration to COSS	$	387.54
Proposed Customer Charge	$	430.00
Proposed Customer Charge Revenues	$	113,520
COSS - IT Revenue Requirement	$	2,225,050
Less Proposed Customer Charge Revenues		
Less GCA	$	2,111,530
Test Period MCF		1,672,200
Proposed Energy Charge		1.2627
Check to Revenue Requirements	$	(43)

GS-Ind	**1,151**	115.1	386.59	543.13	**156.54**	40.5	467.54	854.13	1,010.67	**18.3%**
GS-OPA	**1,138**	113.8	382.79	537.66	**154.87**	40.5	462.26	845.05	999.92	**18.3%**
FT-L	**25,057**	2,505.7	4,847.55	6,179.08	**1,331.53**	27.5	0.00	4,847.55	6,179.08	**27.5%**
IT	**63,341**	6,334.1	6,752.70	8,428.07	**1,675.37**	24.8	0.00	6,752.70	8,428.07	**24.8%**
IMBS	**88,398**	8,839.8	969.73	1,207.52	**237.79**	24.5	0.00	969.73	1,207.52	**24.5%**

DUKE ENERGY KENTUCKY, INC.
GAS COST OF SERVICE STUDY
CASE NO: 2021-00190
ALLOCATION FACTORS FOR COST OF SERVICE STUDY
TWELVE MONTHS ENDING DECEMBER 31, 2020
GENERAL & COMMON PLANT, ACCUMULATED DEPRECIATION, A & G EXPENSES

WP FR-16(7)(v)
Witness Responsible:
James E. Ziolkowski
Page 1 of 1
8/18/2021

Functionalized based on Functional Payroll Costs for the Twelve Months ended December 2020

Updated

Function	Labor Dollars (a)	Functional Labor Ratio	Original Cost General Plant (b)	Accumulated Depreciation General Plant (b)	Original Cost Common Plant (b)	Accumulated Depreciation Common Plant (b)	Functional A & G Expenses Less Reg Commission Exp. (c)
Prod Plant	483,769	8.941%	2,861,675	1,408,783	920,366	644,301	658,571
Prod Plant Com Related	356,433	6.589%	2,108,436	1,037,967	678,111	474,711	485,224
Trans Plant	-	0.000%	-	-	-	-	-
Dist Plant	3,186,482	58.902%	18,849,244	9,279,343	6,062,254	4,243,873	4,337,864
Customer Acctg	1,261,074	23.311%	7,459,729	3,672,369	2,399,182	1,679,545	1,716,742
Cust Service & Info	122,085	2.257%	722,179	355,523	232,266	162,597	166,198
Sales	-	0.000%	-	-	-	-	-
Total O&M excl A&G	5,409,843	100.000%	32,001,263	15,753,985	10,292,179	7,205,027	7,364,599
A&G	1,693,300		32,001,263	15,753,985	10,292,179	7,205,027	7,364,599
Total O&M	7,103,143						

(a) Source: FERC Form 2 - p. 354-355.
(b) Source: Schedule B-3.2
(c) Source: Schedule C-2.1

DUKE ENERGY KENTUCKY, INC.
GAS COST OF SERVICE STUDY
COMPUTATION OF PRESENT RETURN EARNED (PRESENT NOI;
TWELVE MONTHS ENDING DECEMBER 31, 2022
CASE NO: 2021-00190
DATA: 12 MONTH FORECASTED PERIOC

WP FR-16(7)(v)
WITNESS RESPONSIBLE:
JAMES E. ZIOLKOWSKI
PAGE 1 OF 1
8/18/2021

Line No.	SUMMARY OF RESULTS		TOTAL GAS	RS RESIDENTIAL	GS GEN SERV	FT-L FIRM TRANS	IT INTERUPT TRANS	TOTAL AT ISSUE	ALL OTHER
	Schedule 1								
1	NET INCOME COMPUTATION								
2	GROSS GAS PLANT IN SERVICE		771,808,162	493,438,868	189,656,180	67,201,966	21,511,148	771,808,162	0
3	TOTAL DEPRECIATION RESERVE		(206,903,281)	(133,530,689)	(48,731,655)	(18,747,351)	(5,893,586)	(206,903,281)	0
4	TOTAL RATE BASE ADJUSTMENTS		(96,583,675)	(61,512,130)	(23,679,452)	(8,614,678)	(2,777,415)	(96,583,675)	0
5	TOTAL RATE BASE		468,321,206	298,396,049	117,245,073	39,839,937	12,840,147	468,321,206	0
6									
7	OPERATING EXPENSES								
8	TOTAL O&M EXPENSE		62,796,024	40,778,122	19,892,033	1,553,301	572,568	62,796,024	0
9	TOTAL DEPRECIATION EXPENSE		19,004,235	12,162,320	4,715,415	1,632,389	494,111	19,004,235	(0)
10	TOTAL OTHER TAX & MISC EXPENSE		4,716,796	3,030,944	1,170,831	389,788	125,233	4,716,796	0
11	TOTAL OP EXP EXCL INC & REV TAX		86,517,055	55,971,386	25,778,279	3,575,478	1,191,912	86,517,055	(0)
12	NET FED INCOME TAX EXP ALLOWABLE		5,596,540	3,566,167	1,527,772	370,986	131,615	5,596,540	0
13	REVENUE TAX		1,504,852	957,895	383,837	122,181	40,939	1,504,852	0
14	TOTAL OPERATING EXPENSE		93,618,447	60,495,448	27,689,888	4,068,645	1,364,466	93,618,447	(0)
15									
16	RETURN ON RATE BASE		33,063,477	21,066,761	8,277,502	2,812,700	906,514	33,063,477	0
17	TOTAL OTHER OPERATING REVENUES		(310,224)	(222,777)	(66,017)	(16,333)	(5,097)	(310,224)	0
18	TOTAL GAS COST OF SERVICE		126,371,700	81,339,432	35,901,373	6,865,012	2,265,883	126,371,700	(0)
19									
20	PROPOSED REVENUES - ELIM 100.00% OF SUBSIDY		126,434,590	85,341,377	32,736,157	6,308,299	2,048,757	126,434,590	0
21	EXCESS REVENUES		62,890	4,001,945	(3,165,216)	(556,713)	(217,126)	62,890	0
22									
23	TOTAL RETURN EARNED (TO WPE-3.2k)	Line 16 + Line 41	21,630,932	16,594,938	2,740,230	1,751,992	543,772	21,630,932	0
24	RATE OF RETURN EARNED		0.04619	0.05561	0.02337	0.04398	0.04235	0.04619	5.17257
25	TOTAL RATE OF RETURN ALLOWABLE		0.070600	0.070600	0.070600	0.070600	0.070600		0.070600
26	RETURN EARNED ON COMMON EQUITY		0.05486	0.07344	0.00984	0.05050	0.04728	0.05486	10.16722
27	ALLOWED RETURN ON COMMON EQUITY		0.10301	0.10301	0.10301	0.10301	0.10301		0.10301
28									
29	PRESENT REVENUES		111,143,535	75,382,959	28,525,719	5,452,147	1,782,710	111,143,535	0
30	REVENUE INCREASE JUSTIFIED		15,228,165	5,956,473	7,375,654	1,412,865	483,173	15,228,165	(0)
31	PER UNIT PRES REV		0.13701	0.07902	0.25856	0.25914	0.27103	0.13701	0
32	REVENUE INCREASE REQUESTED		15,291,055	9,958,418	4,210,438	856,152	266,047	15,291,055	0
33	PER UNIT PRES REV		0.13758	0.13210	0.14760	0.15703	0.14924	0.13758	0
34									
35	PROPOSED REVENUES = CURRENT REVENUES								
36	PROPOSED REVENUES		111,143,535	75,382,959	28,525,719	5,452,147	1,782,710	111,143,535	0
37	TOTAL GAS COST OF SERVICE		(126,371,700)	(81,339,432)	(35,901,373)	(6,865,012)	(2,265,883)	(126,371,700)	0
38	EXCESS REVENUES		(15,228,165)	(5,956,473)	(7,375,654)	(1,412,865)	(483,173)	(15,228,165)	0
39	COMPOSITE TAX RATE		0.24925	0.24925	0.24925	0.24925	0.24925	0.24925	0.24925
40	EXCESS TAX		(3,795,620)	(1,484,650)	(1,838,382)	(352,157)	(120,431)	(3,795,620)	0
41	EXCESS RETURN		(11,432,545)	(4,471,823)	(5,537,272)	(1,060,708)	(362,742)	(11,432,545)	0

DUKE ENERGY KENTUCKY, INC.
GAS COST OF SERVICE STUDY
CASE NO: 2021-00190
CALCULATION PROPOSED REVENUE DISTRIBUTION
REFLECTING A PROPOSED REVENUE SUBSIDY/EXCESS ELIMINATION COMPONENT

WORK PAPER REFERENCE:
WP FR-16(7)(v)-8
WITNESS RESPONSIBLE:
JAMES E. ZIOLKOWSKI
PAGE 1

Line No	Rate Class	Rate Base (A)	Present Revenues (B)	Net Operating Income (C)	Present ROR (D)	Present Revenues At Average ROR (E)	Inter Class Subsidization Overcollected (Undercollected) (F)	Inter Class Subsidization times 100.00% (G)	Rate Increase (allocated to class based on Rate Base) (H)	Proposed Revenues 0.00% Interclass Subsidization (I)	Proposed Percent Increase (J)	ROR At Proposed Rates (K)	Proposed Increase Less (Subsidy) Excess (L)
		FR-16(7)(v)-8	FR-16(7)(v)-8	WP - Pres NOI	(C) / (A)	(B) + (((D) Line 5 * (C))/(1-FIT))	(B) - (E)	(F) * 100.00%	(H) Line 5 * ((A) / (A) Line 5)	(B) - (G) + (H)	((H) - (G)) / (B)	((((H) - (G))*(1-FIT)+ (C)) / (A)	(H) - (G)
1	Rate RS	$ 298,396,049	$ 75,382,959	$ 16,594,938	5.5614%	$ 71,822,769	$ 3,560,190	$ 3,560,190	$ 9,699,813	$ 81,522,582	8.145%	7.186838%	$ 6,139,623
2	Rate GS	117,245,073	28,525,719	2,740,230	2.3372%	31,911,939	(3,386,220)	(3,386,220)	3,811,231	35,723,170	25.231%	7.186840%	7,197,451
3	Rate FT-L	39,839,937	5,452,147	1,751,992	4.3976%	5,563,722	(111,575)	(111,575)	1,295,062	6,858,784	25.800%	7.186847%	1,406,637
4	Rate IT	12,840,147	1,782,710	543,772	4.2349%	1,845,105	(62,395)	(62,395)	417,382	2,262,487	26.913%	7.186803%	479,777
5	Total	$ 468,321,206	$ 111,143,535	$ 21,630,932	4.6188%	$ 111,143,535	$ -	$ -	$ 15,223,488	$ 126,367,023	13.697%	7.186838%	$ 15,223,488
									Reduced by increase in reconnection charges				
	MISCELLANEOUS REVENUES:								Increase Including Incr to Recon Chg				
6	Interdepartmental (Incl in GS)		0						$ 15,228,161	0			
7	Bad Check Charges		27,420							27,420			
8	Reconnection Charges		23,364							28,037			
9	Rents		0							0			
10	Special Contracts (Rate FT-L)		258,228							258,228	$67,567 decr in Spec Contract included in FT-L above		
11	Other Misc		1,212							1,212			
12	Revenue Transp of Gas - Interco		0							0			
13	Total Misc		310,224							314,897			
14	Total Company		111,453,759							126,681,920	13.663%		

DUKE ENERGY KENTUCKY, INC.
GAS COST OF SERVICE STUDY
CASE NO: 2021-00xxx
ALLOCATION FACTORS FOR COST OF SERVICE STUDY
TWELVE MONTHS ENDING DECEMBER 31, 2020
GENERAL & COMMON PLANT, ACCUMULATED DEPRECIATION, A & G EXPENSES

Functionalized based on Functional Payroll Costs for the Twelve Months ended December 2020

Updated

Function	Labor Dollars (a)	Functional Labor Ratio	Original Cost General Plant (b)	Accumulated Depreciation General Plant (b)	Original Cost Common Plant (b)	Accumulated Depreciation Common Plant (b)	Functional A & G Expenses Less Reg Commission Exp. (c)
Prod Plant	483,769	8.941%	2,861,675	1,408,783	920,366	644,301	658,571
Prod Plant Com Related	356,433	6.589%	2,108,436	1,037,967	678,111	474,711	485,224
Trans Plant	-	0.000%	-	-	-	-	-
Dist Plant	3,186,482	58.902%	18,849,244	9,279,343	6,062,254	4,243,873	4,337,864
Customer Acctg	1,261,074	23.311%	7,459,729	3,672,369	2,399,182	1,679,545	1,716,742
Cust Service & Info	122,085	2.257%	722,179	355,523	232,266	162,597	166,198
Sales	-	0.000%	-	-	-	-	-
Total O&M excl A&G	5,409,843	100.000%	32,001,263	15,753,985	10,292,179	7,205,027	7,364,599
A&G	1,693,300		32,001,263	15,753,985	10,292,179	7,205,027	7,364,599
Total O&M	7,103,143						

(a) Source: FERC Form 2 - p. 354-355.
(b) Source: Schedule B-3.2
(c) Source: Schedule C-2.1

DUKE ENERGY KENTUCKY, INC.
GAS COST OF SERVICE STUDY
COMPUTATION OF PRESENT RETURN EARNED (PRESENT NOI)
TWELVE MONTHS ENDING DECEMBER 31, 2022
CASE NO: 2021-00xxx
DATA: 12 MONTH FORECASTED PERIOD

WP FR-16(7)(v)
WITNESS RESPONSIBLE:
JAMES E. ZIOLKOWSKI

8/18/2021

Line No.	SUMMARY OF RESULTS		TOTAL GAS	RS RESIDENTIAL	GS GEN SERV	FT-L FIRM TRANS	IT INTERUPT TRANS	TOTAL AT ISSUE	ALL OTHER
	Schedule 1								
1	NET INCOME COMPUTATION								
2	GROSS GAS PLANT IN SERVICE		771,808,162	527,735,426	170,180,982	55,974,942	17,916,812	771,808,162	0
3	TOTAL DEPRECIATION RESERVE		(206,903,281)	(143,723,016)	(42,943,982)	(15,410,889)	(4,825,394)	(206,903,281)	0
4	TOTAL RATE BASE ADJUSTMENTS		(96,583,675)	(65,792,971)	(21,248,649)	(7,213,268)	(2,328,787)	(96,583,675)	0
5	TOTAL RATE BASE		468,321,206	318,219,439	105,988,351	33,350,785	10,762,631	468,321,206	0
6									
7	OPERATING EXPENSES								
8	TOTAL O&M EXPENSE		62,796,024	41,532,142	19,463,879	1,306,497	493,506	62,796,024	0
9	TOTAL DEPRECIATION EXPENSE		19,004,235	12,940,826	4,273,356	1,377,546	412,507	19,004,235	(0)
10	TOTAL OTHER TAX & MISC EXPENSE		4,716,796	3,227,621	1,059,154	325,402	104,619	4,716,796	0
11	TOTAL OP EXP EXCL INC & REV TAX		86,517,055	57,700,589	24,796,389	3,009,445	1,010,632	86,517,055	(0)
12	NET FED INCOME TAX EXP ALLOWABLE		5,596,540	3,760,041	1,417,680	307,521	111,299	5,596,541	(1)
13	REVENUE TAX		1,504,852	1,019,899	348,628	101,883	34,441	1,504,851	1
14	TOTAL OPERATING EXPENSE		93,618,447	62,480,529	26,562,697	3,418,849	1,156,372	93,618,447	(0)
15									
16	RETURN ON RATE BASE		33,063,477	22,466,292	7,482,778	2,354,565	759,842	33,063,477	0
17	TOTAL OTHER OPERATING REVENUES		(310,224)	(231,974)	(60,796)	(13,323)	(4,131)	(310,224)	0
18	TOTAL GAS COST OF SERVICE		126,371,700	84,714,847	33,984,679	5,760,091	1,912,083	126,371,700	(0)
19									
20	PROPOSED REVENUES - ELIM 100.00% OF SUBSIDY		126,434,590	85,341,377	32,736,157	6,308,299	2,048,757	126,434,590	0
21	EXCESS REVENUES		62,890	626,530	(1,248,522)	548,208	136,674	62,890	0
22									
23	TOTAL RETURN EARNED (TO WPE-3.2k)	Line 16 + Line 41	21,630,933	15,460,377	3,384,464	2,123,376	662,715	21,630,932	1
24	RATE OF RETURN EARNED		0.04619	0.04858	0.03193	0.06367	0.06158	0.04619	15.60114
25	TOTAL RATE OF RETURN ALLOWABLE		0.070600	0.070600	0.070600	0.070600	0.070600		0.070600
26	RETURN EARNED ON COMMON EQUITY		0.05486	0.05957	0.02673	0.08934	0.08522	0.05486	30.73874
27	ALLOWED RETURN ON COMMON EQUITY		0.10301	0.10301	0.10301	0.10301	0.10301		0.10301
28									
29	PRESENT REVENUES		111,143,535	75,382,959	28,525,719	5,452,147	1,782,710	111,143,535	0
30	REVENUE INCREASE JUSTIFIED		15,228,165	9,331,888	5,458,960	307,944	129,373	15,228,165	(0)
31	PER UNIT PRES REV		0.13701	0.12379	0.19137	0.05648	0.07257	0.13701	0
32	REVENUE INCREASE REQUESTED		15,291,055	9,958,418	4,210,438	856,152	266,047	15,291,055	0
33	PER UNIT PRES REV		0.13758	0.13210	0.14760	0.15703	0.14924	0.13758	0
34									
35	PROPOSED REVENUES = CURRENT REVENUES								
36	PROPOSED REVENUES		111,143,535	75,382,959	28,525,719	5,452,147	1,782,710	111,143,535	0
37	TOTAL GAS COST OF SERVICE		(126,371,700)	(84,714,847)	(33,984,679)	(5,760,091)	(1,912,083)	(126,371,701)	1
38	EXCESS REVENUES		(15,228,165)	(9,331,888)	(5,458,960)	(307,944)	(129,373)	(15,228,165)	1
39	COMPOSITE TAX RATE		0.24925	0.24925	0.24925	0.24925	0.24925	0.24925	0.24925
40	EXCESS TAX		(3,795,620)	(2,325,973)	(1,360,646)	(76,755)	(32,246)	(3,795,620)	0
41	EXCESS RETURN		(11,432,544)	(7,005,915)	(4,098,314)	(231,189)	(97,127)	(11,432,545)	1

DUKE ENERGY KENTUCKY, INC.
GAS COST OF SERVICE STUDY
CASE NO: 2021-00xxx
CALCULATION PROPOSED REVENUE DISTRIBUTION
REFLECTING A PROPOSED REVENUE SUBSIDY/EXCESS ELIMINATION COMPONENT

WORK PAPER REFERENCE:
WP FR-16(7)(v)-8
WITNESS RESPONSIBLE:
JAMES E. ZIOLKOWSKI
PAGE 1

Line No.	Rate Class	Rate Base (A)	Present Revenues (B)	Net Operating Income (C)	Present ROR (D)	Present Revenues At Average ROR (E)	Inter Class Subsidization Overcollected (Undercollected) (F)	Inter Class Subsidization times 100.00% (G)	Rate Increase (allocated to class based on Rate Base) (H)	Proposed Revenues 0.00% Interclass Subsidization (I)	Proposed Percent Increase (J)	ROR At Proposed Rates (K)	Proposed Increase Less (Subsidy) Excess (L)
		FR-16(7)(v)-8	FR-16(7)(v)-8	WP - Pres NOI	(C) / (A)	(B) + (((D) Line 5 * (C))/(1-FIT))	(B) - (E)	(F) * 100.00%	(H) Line 5 * ((A) / (A) Line 5)	(B) - (G) + (H)	((H) - (G)) / (B)	((((H) - (G))*(1-FIT)+ (C)) / (A)	(H) - (G)
1	Rate RS	$ 318,219,439	$ 75,382,959	$ 15,460,377	4.8584%	$ 74,417,919	$ 965,040	$ 965,040	$ 10,344,208	$ 84,762,127	12.442%	7.186839%	$ 9,379,168
2	Rate GS	105,988,351	28,525,719	3,384,464	3.1932%	30,438,316	(1,912,597)	(1,912,597)	3,445,319	33,883,635	18.783%	7.186844%	5,357,916
3	Rate FT-L	33,350,785	5,452,147	2,123,376	6.3668%	4,714,220	737,927	737,927	1,084,110	5,798,330	6.350%	7.186820%	346,183
4	Rate IT	10,762,631	1,782,710	662,715	6.1576%	1,573,080	209,630	209,630	349,851	1,922,931	7.866%	7.186808%	140,221
5	Total	$ 468,321,206	$ 111,143,535	$ 21,630,932	4.6188%	$ 111,143,535	$ -	$ -	$ 15,223,488	$ 126,367,023	13.697%	7.186838%	$ 15,223,488
									Reduced by increase in reconnection charges				
									Increase Including Incr to Recon Chg				
	MISCELLANEOUS REVENUES:												
6	Interdepartmental (Incl in GS)		0						$ 15,228,161	0			
7	Bad Check Charges		27,420							27,420			
8	Reconnection Charges		23,364							28,037			
9	Rents		0							0			
10	Special Contracts (Rate FT-L)		258,228							258,228	$67,567 decr in Spec Contract included in FT-L above		
11	Other Misc		1,212							1,212			
12	Revenue Transp of Gas - Interco		0							0			
13	Total Misc		310,224							314,897			
14	Total Company		111,453,759							126,681,920	13.663%		

Duke Energy Kentucky
Case No. 2021-00190
STAFF Third Set Data Requests
Date Received: August 4, 2021

STAFF-DR-03-024

REQUEST:

Refer to Duke Kentucky's Response to Staff's Second Request, Item 70b.

a. Explain why a customer would request electronic gas meter information.

b. Indicate the amount charge to a customer when they request electronic gas meter information.

c. Identify the tariff provision that allows for the assessment of a fee when a customer requests electronic gas meter information.

RESPONSE:

a. The Company does not require customers to provide their rationale for requesting electronic gas meter information. However, it is likely that the customer desires precise monitoring of their energy usage for cost analysis and so that they can see how their usage is affected while specific equipment is on or off.

b. Currently, the amount charged to customers when they request electronic gas meter information is a one-time fee of $860.00 for installation of the pulse meter equipment, with an additional charge of $635.00 if replacement of the Meter Index is necessary. The $15 per month that was included in Miscellaneous Revenue and referenced in the response to STAFF-DR-02-70 was for a single customer and predates the current tariff. This charge has been discontinued.

c. Rate MPS, Meter Pulse Service (Sheet No. 84) contains the current charges for Meter Pulse Service.

PERSON RESPONSIBLE: Jeff L. Kern

Duke Energy Kentucky
Case No. 2021-00190
STAFF Third Set Data Requests
Date Received: August 4, 2021

STAFF-DR-03-025

REQUEST:

Refer to Duke Kentucky's response to Staff's Second Request, Item 71.

a. The response to part b. does not answer the request for information. Provide a full response to the previous request of Staff's Second Request, Item 71b.

b. Confirm that Duke Kentucky has been charging the $15 field collection fee since at least 2009 without having the fee in the tariff.

c. Provide the amount Duke Kentucky has collected for the field collection fee by year since 2009.

d. Indicate whether Duke Kentucky is proposing to include the field collection fee in its tariff.

RESPONSE:

a. Page 3 of STAFF-DR-02-037(b) Attachment shows the calculation of the $90 hourly cost to perform a gas reconnection. Field collections are performed by employees who travel to the site to disconnect service. Assuming that a field collection is based on one-half hour of labor, the calculation on page 3 supports a $45 charge. The field collection charge that appears in Sheet No. 91 of the electric tariff is based on one-half hour of labor.

b. Duke Kentucky has been charging the $15 gas field collection fee since at least 2009 without having the fee in the tariff.

c. The following table shows the gas field collection fees by year since 2009:

YEAR	FIELD COLLECTION FEE
2009	$3,960
2010	$3,435
2011	$3,060
2012	$1,860
2013	$1,860
2014	$1,050
2015	$960
2016	$555
2017	$1,125
2018	$390
2019	$345
2020	$75
2021	$60
Total	$18,735

d. Duke Energy Kentucky proposes to add the field collection fee to Sheet No. 81 (Charge for Reconnection of Service) in the gas tariff. The charge would be set at $15. The response to question a. provides cost support for the hourly rate. The Company proposes to add the following language as paragraph D in the CHARGE section of Sheet No. 81: "If a Company employee, whose original purpose was to disconnect the service, has provided the customer a means to avoid disconnection, service which otherwise would have been disconnected shall remain intact, and no reconnection charge shall be assessed. However, a collection charge of fifteen dollars ($15.00) may be assessed, but only if a Company employee actually makes a field visit to the customer's premises."

PERSON RESPONSIBLE: James E. Ziolkowski

Duke Energy Kentucky
Case No. 2021-00190
STAFF Third Set Data Requests
Date Received: August 4, 2021

STAFF-DR-03-026

REQUEST:

Refer the response to the Attorney General's First Request, Item 15(k).

a. For the projects listed in the response, provide a list of the projects that were included in the base period.

b. For the difference in capital spend between the base period and the list of additions by work order noted in the response above, state which amounts are attributable to projects less than one million dollars, and, any amounts that would be included in the forecasted portion of the base period.

RESPONSE:

a. Every project listed in the response to Attorney General's First Request, Item 15(k) is in the base period.

b. Please note that the amounts provided in response to AG-DR-01-15(k) were assets placed in-service, not capital spend, as the request specified. Actual plant placed in-service for December 2018 through June 2021 (the same period provided in response to AG-DR-01-15(k) for projects totaling less than $1 million was $33,536,229. The actuals provided in response to AG-DR-01-15(k) plus the actuals placed in-service for projects less than $1 million for the months March, April, May and June (which were forecasted months in the base period) total $9,118,607. This compares to $5,170,956 of forecasted plant in-service for those same four months in the base period.

PERSON RESPONSIBLE: David Raiford
Abby Motsinger