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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

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

		Start S	ervice		
	0				
	Move In	Verify Identity	Contact Info	Review	
	Where are	you moving?			
	Tell us the loca	tion of your new service	e address.		
Street Address					
Apt/Floor/Suite/Lot					
City					
State			•	Zip Code	
Do you rent or own this pro	operty?				
○ Own					
○ Rent					
This property is a mobi	le home.				
What services are needed?					
Electric					
Gas					
		CONTI	NUE		
		L]		

Cancel

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

		Start S	Service		
		Ο			
	Move In	Verify Identity	Contact Info	Review	
	Whose nai	me should be on	this account?		
		ed to verify your identity e name associated with		al name, since	
Legal First Name			Legal Last Name		
Social Security Number					
Before starting new service, we run a	credit check.				
Date of Birth (MM / DD / Y	(YYY)				
Current Street Address					
Apt/Floor/Suite/Lot					
City					
State			•	Zip Code	
Don't have a Social Securit	y Number? <u>Conta</u>	act Us (/customer-serv	ice/contact-us).		
		CONT	TINUE		
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		L]		

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

		Start S	ervice		
	Move In	Verify Identity	O Contact Info	Review	
		d we contact you			
Email					
Confirm Email					
Phone Number			Phone Type		
What's your mailing addr (This is where we'll send Same as Service Addr Street Address	your bill.)				
Apt/Floor/Suite/Lot					
City					
State			•	Zip Code	
		CONT	INUE		
		PREVI	IOUS		

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

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.

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

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

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

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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 Economist and candemic plantersity 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-ofreturn analyses, including the development of rate-analyse apital 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, hhe 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,

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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.

■ he 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, consumptionbased 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.

S ince publication, more exhaustive empirical testing of the PRPM was conducted for the four utility industry groups which comprise the AUS Utility Reports³ 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

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.

original *Journal of Regulatory Economics* article: the PRPM produces stable results which are consistent over time.

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 longterm 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.

May 2013, Vol. 26, Issue 4 1040-6190/\$-see front matter © 2013 Elsevier Inc. All rights reserved., http://dx.doi.org/10.1016/j.tej.2013.04.005 {

III. Estimation Method

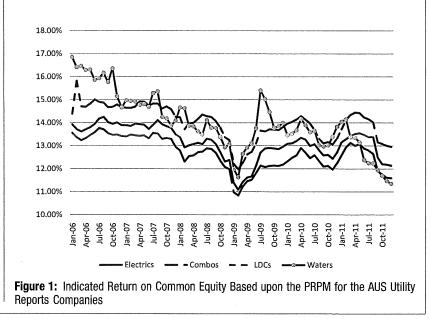
The statistical details of the estimation method of the PRPM can be found in the original article in the Journal of Regulatory Economics, "New Approach to Estimating the Cost of Common Equity Capital for Public Utilities." Essentially, there are two steps to the application of the PRPM. First, predicted 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.

sing EViews Version 7.2, the PRPM coefficients and predicted monthly variances were estimated as described in the *IRE* 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 onemonth predicted dividend yield was then added to the concurrent month's I/B/E/S consensus



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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.

■ he 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.

F inally, 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

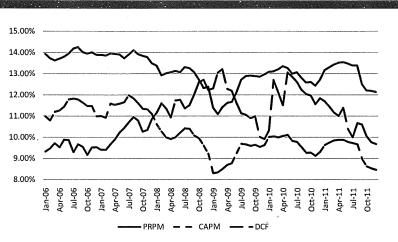


Figure 2: Indicated Return on Common Equity Based upon the PRPM, CAPM and DCF Methodologies for the AUS Utility Reports Electric Companies

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

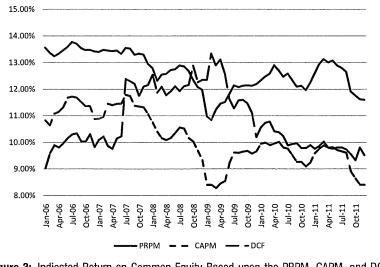


Figure 3: Indicated Return on Common Equity Based upon the PRPM, CAPM, and DCF Methodologies for the AUS Utility Reports Combination Companies

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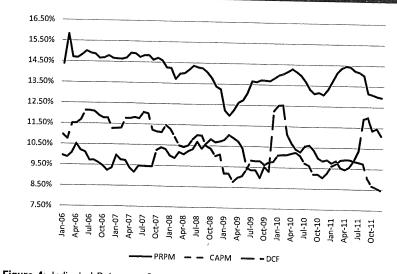


Figure 4: Indicated Return on Common Equity Based upon the PRPM, CAPM and DCF Methodologies for the AUS Utility Reports Gas Companies

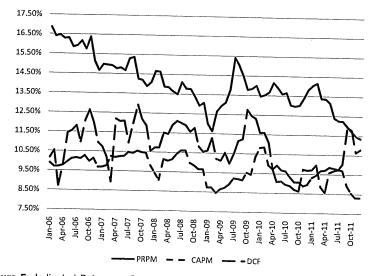


Figure 5: Indicated Return on Common Equity Based upon the PRPM, CAPM and DCF Methodologies for the AUS Utility Reports Water Companies

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

ts 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.

I n 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.

F or 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.

May 2013, Vol. 26, Issue 4 1040-6190/\$-see front matter © 2013 Elsevier Inc. All rights reserved., http://dx.doi.org/10.1016/j.tej.2013.04.005 89

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

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

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

KyPSC Case No. 2021-00190 STAFF-DR-03-010(a) Attachment Page 1 of 117

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

OFFICIAL COPY

March 22, 2021

KyPSC Case No. 2021-00190 STAFF-DR-03-010(a) Attachment Page 2 of 117

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1 I. INTRODUCTION

2 A. <u>Witness Identification</u>

3 Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

- 4 A. My name is Dylan W. D'Ascendis. My business address is 3000 Atrium Way, Suite
- 5 241, Mount Laurel, NJ 08054.

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

- 7 A. I am a Director at ScottMadden, Inc.
- 8

B. <u>Background and Qualifications</u>

9 Q. PLEASE SUMMARIZE YOUR PROFESSIONAL EXPERIENCE AND 10 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.

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

5 Q. PLEASE SUMMARIZE YOUR RECOMMENDED COMMON EQUITY 6 COST RATE.

7 My recommended common equity cost rate of 10.25% is summarized on page 2 of A. Schedule DWD-1. I have assessed the market-based common equity cost rates of 8 companies of relatively similar, but not necessarily identical, risk to Piedmont. 9 10 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. 11 No proxy group can be identical in risk to any single company. Consequently, there 12 must be an evaluation of relative risk between the company and the proxy group to 13 determine if it is appropriate to adjust the proxy group's indicated rate of return. 14

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 Mar 22 2021

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.

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1	DCF model, RPM, and CAPM to a proxy group of 47 domestic, non-price regulated
2	companies comparable in total risk to the Utility Proxy Group ("Non-Price
3	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	<u>12.18%</u>
Indicated Range	9.46% - 12.18%
Size Adjustment	0.00%
Flotation Cost Adjustment	<u>0.12%</u>
Recommended Range	9.58% - 12.30%
Recommended Cost of Common Equity	10.25%

5	The indicated range of common equity cost rates applicable to the Utility
6	Proxy Group is between 9.46% and 12.18% before any adjustment for flotation
7	costs, which were 0.12%. ⁴ My Company-specific indicated range of common
8	equity cost rates, adjusted for flotation costs, is between 9.58% and 12.30%. Given
9	the Utility Proxy Group and Company-specific ranges of common equity cost rates,
10	my recommended ROE for the Company is 10.25%. I have selected the lower end
11	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.

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1		recommendation should be considered a conservative measure of the Company's
2		required ROE at this time.
3	Q.	HOW IS THE REMAINDER OF YOUR DIRECT TESTIMONY
4		ORGANIZED?
5	A.	The remainder of my Direct Testimony is organized as follows:
6		• <u>Section III</u> – Provides a summary of financial theory and regulatory principles
7		pertinent to the development of the cost of common equity;
8		• <u>Section IV</u> – Explains my selection of the Utility Proxy Group used to develop
9		my Cost of Common Equity analytical results;
10		• <u>Section V</u> – Describes the analyses on which my Cost of Common Equity
11		recommendation is based;
12		• <u>Section VI</u> – Summarizes my common equity cost rate before adjustments to
13		reflect Company-specific factors;
14		• <u>Section VII</u> – Explains my consideration of adjustments to my common equity
15		cost rate to reflect Company-specific factors;
16		• <u>Section VIII</u> – Discusses economic conditions in North Carolina; and
17		• <u>Section IX</u> – Presents my conclusions.

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1 III. <u>GENERAL PRINCIPLES</u>

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

5 A. In unregulated industries, marketplace competition is the principal determinant of the price of products or services. For regulated public utilities, regulation must act 6 as a substitute for marketplace competition. Assuring that the utility can fulfill its 7 obligations to the public, while providing safe and reliable service at all times, 8 9 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 10 reasonable cost, for which the utility must compete with other firms of comparable 11 risk, consistent with the fair rate of return standards established by the U.S. 12 13 Supreme Court in the previously cited *Hope* and *Bluefield* cases.

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

15 when it stated:

14

The rate-making process under the Act, *i.e.*, the fixing of 'just and 16 reasonable' rates, involves a balancing of the investor and the 17 consumer interests. Thus we stated in the Natural Gas Pipeline Co. 18 case that 'regulation does not insure that the business shall produce 19 net revenues.' 315 U.S. at page 590, 62 S.Ct. at page 745. But such 20 considerations aside, the investor interest has a legitimate concern 21 with the financial integrity of the company whose rates are being 22 regulated. From the investor or company point of view it is 23 24 important that there be enough revenue not only for operating expenses but also for the capital costs of the business. These include 25 26 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. 27 By that standard the return to the equity owner should be 28 commensurate with returns on investments in other enterprises 29

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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 4 attract capital at reasonable terms enables the utility to provide service while 5 maintaining its financial integrity. As discussed above, and in keeping with 6 established regulatory standards, that return should be commensurate with the 7 returns expected elsewhere for investments of equivalent risk. The Commission's 8 decision in this proceeding, therefore, should provide the Company with the 9 opportunity to earn a return that is: (1) adequate to attract capital at reasonable cost 10 and terms; (2) sufficient to ensure their financial integrity; and (3) commensurate 11 with returns on investments in enterprises having corresponding risks. 12

Lastly, the required return for a regulated public utility is established on a 13 stand-alone basis, i.e., for the utility operating company at issue in a rate case. 14 Parent entities, like other investors, have capital constraints and must look at the 15 attractiveness of the expected risk-adjusted return of each investment alternative in 16 their capital budgeting process. That is, utility holding companies that own many 17 18 utility operating companies have choices as to where they will invest their capital within the holding company family. Therefore, the opportunity cost concept 19 applies regardless of the source of the funding, public funding or corporate funding. 20 When funding is provided by a parent entity, the return still must be 21 22 sufficient to provide an incentive to allocate equity capital to the subsidiary or

5

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

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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.

6 It therefore is important that the authorized ROE reflects the risks and 7 prospects of the utility's operations and supports the utility's financial integrity 8 from a stand-alone perspective as measured by their combined business and 9 financial risks. Consequently, the ROE authorized in this proceeding should be 10 sufficient to support the operational (*i.e.*, business risk) and financing (*i.e.*, financial 11 risk) of the Company's North Carolina utility operations on a stand-alone basis.

12 Q. WITHIN THAT BROAD FRAMEWORK, HOW IS THE COST OF

13 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.

19 The cost of capital is the return investors require to make an investment in 20 a firm. Investors will provide funds to a firm only if the return that they *expect* is 21 equal to, or greater than, the return that they *require* to accept the risk of providing 22 funds to the firm.

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The cost of capital (that is, the combination of the costs of debt and equity) 1 is based on the economic principle of "opportunity costs." Investing in any asset 2 (whether debt or equity securities) represents a forgone opportunity to invest in 3 alternative assets. For any investment to be sensible, its expected return must be at 4 least equal to the return expected on alternative, comparable risk investment 5 opportunities. Because investments with like risks should offer similar returns, the 6 opportunity cost of an investment should equal the return available on an 7 investment of comparable risk. 8

9 Whereas the cost of debt is contractually defined and can be directly 10 observed as the interest rate or yield on debt securities, the cost of common equity 11 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 12 determine it are typically applied to a group of "comparable" or "proxy" companies. 13 In the end, the estimated cost of capital should reflect the return that 14 investors require in light of the subject company's business and financial risks, and 15 the returns available on comparable investments. 16

17

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

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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>

5

6 Q. PLEASE DEFINE BUSINESS RISK AND EXPLAIN WHY IT IS 7 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

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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 7 nature. Whereas near-term business risks are reflected in year-to-year variability in 8 9 earnings and cash flow brought about by economic or regulatory factors, long-term 10 business risks reflect the prospect of an impaired ability of investors to obtain both 11 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 12 exchange for a reasonable opportunity to earn a fair return on their investment), 13 they generally do not have the option to delay, defer, or reject capital investments. 14 Because those investments are capital-intensive, utilities generally do not have the 15 option to avoid raising external funds during periods of capital market distress, if 16 17 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.

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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.

5 **B.** Financial Risk

6 Q. PLEASE DEFINE FINANCIAL RISK AND EXPLAIN WHY IT IS 7 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.

14 Q. CAN BOND AND CREDIT RATINGS BE A PROXY FOR A FIRM'S

15 COMBINED BUSINESS AND FINANCIAL RISKS TO EQUITY OWNERS

16 (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

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.

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

3 Q. DO RATING AGENCIES ACCOUNT FOR COMPANY SIZE IN THEIR 4 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.

9 IV. PIEDMONT'S OPERATIONS AND THE UTILITY PROXY GROUP

10 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

18 Q. PLEASE EXPLAIN HOW YOU CHOSE THE COMPANIES IN THE 19 UTILITY PROXY GROUP.

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

⁷ Duke Energy Corporation, SEC Form 8-K, February 13, 2020, at 40.

⁸ Company provided.

⁹ Source: S&P Global Market Intelligence.

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	(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>i.e.</i> , 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
	Corpo	ration, New Jersey Resources Corp., NiSource Inc., Northwest Natural Gas
	Comp	any, ONE Gas, Inc., South Jersey Industries, Inc., Southwest Gas Holdings,
	Inc., a	nd Spire, Inc.
Q.	WHY	IS IT NECESSARY TO DEVELOP A PROXY GROUP WHEN
	ESTI	MATING THE ROE FOR THE COMPANY?
A.	Becau	se the Company is not publicly traded and does not have publicly traded
	equity	securities, it is necessary to develop groups of publicly traded, comparable
	compa	anies to serve as "proxies" for the Company. In addition to the analytical
	neces	sity of doing so, the use of proxy companies is consistent with the <i>Hope</i> and
		 (ii) (iii) (iii) (iv) (v) (v) (vi) (vii) (vii) Corpo Corpo Comp Inc., a Q. WHY ESTII A. Becau equity compa

Piedmont Natural Gas, Inc. Docket No. G-9, Sub 781 Direct Testimony of Dylan W. D'Ascendis Page 15 of 61

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 5 results to vary from company to company. Despite the care taken to ensure 6 comparability, because no two companies are identical, market expectations 7 regarding future risks and prospects will vary within the proxy group. It therefore 8 9 is common for analytical results to reflect a seemingly wide range, even for a group 10 of similarly situated companies. At issue is how to estimate the ROE from within 11 that range. That determination will be best informed by employing a variety of sound analyses that necessarily must consider the sort of quantitative and 12 qualitative information discussed throughout my Direct Testimony. Additionally, 13 a relative risk analysis between the Company and the Utility Proxy Group must be 14 made to determine whether or not explicit Company-specific adjustments need to 15 be made to the Utility Proxy Group indicated results. 16

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.

10

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

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

3 V. <u>COMMON EQUITY COST RATE MODELS</u>

4 Q. IS IT IMPORTANT THAT COST OF COMMON EQUITY MODELS BE 5 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.

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

Yes. The DCF model uses market prices in developing the model's dividend yield 14 A. component. Regarding the RPM, the Predictive Risk Premium Model ("PRPM") 15 16 uses monthly market returns in addition to expectations of the risk-free rate and the 17 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 18 19 coefficients (" β "), which reflect the market/systematic risk component of equity risk premium, are derived from regression analyses of market prices. The CAPM 20 21 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 22

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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 8 9 and do not rely exclusively on a single source of information or single model. 10 Moreover, the models on which I rely focus on different aspects of return 11 requirements, and provide different insights to investors' views of risk and return. The DCF model, for example, estimates the investor-required return assuming a 12 constant expected dividend yield and growth rate in perpetuity, while Risk 13 Premium-based methods (*i.e.*, the RPM and CAPM approaches) provide the ability 14 to reflect investors' views of risk, future market returns, and the relationship 15 between interest rates and the cost of common equity. Just as the use of market 16 data for the Utility Proxy Group adds the reliability necessary to inform expert 17 judgment in arriving at a recommended common equity cost rate, the use of 18 multiple generally accepted common equity cost rate models also adds reliability 19 and accuracy when arriving at a recommended common equity cost rate. 20

1		A. <u>Discounted Cash Flow Model</u>
2	Q.	WHAT IS THE THEORETICAL BASIS OF THE DCF MODEL?
3	A.	The theory underlying the DCF model is that the present value of an expected future
4		stream of net cash flows during the investment holding period can be determined
5		by discounting those cash flows at the cost of capital, or the investors' capitalization
6		rate. DCF theory indicates that an investor buys a stock for an expected total return
7		rate, which is derived from the cash flows received from dividends and market price
8		appreciation. Mathematically, the dividend yield on market price plus a growth
9		rate equals the capitalization rate; <i>i.e.</i> , the total common equity return rate expected
10		by investors as shown below:
11		$K_e = (D_0 (1+g))/P + g$
12		where:
13 14 15 16		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.
17	Q.	WHICH VERSION OF THE DCF MODEL DID YOU USE?
18	A.	I used the single-stage constant growth DCF model in my analyses.
19	Q.	PLEASE DESCRIBE THE DIVIDEND YIELD YOU USED IN APPLYING
20		THE CONSTANT GROWTH DCF MODEL.
21	A.	The unadjusted dividend yields are based on the proxy companies' dividends as of
22		January 29, 2021, divided by the average closing market price for the 60 trading
23		days ended January 29, 2021. ¹¹

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

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1 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 D₁, in calculating the 5 model's dividend yield component. Since the companies in the Utility Proxy Group 6 increase their quarterly dividends at various times during the year, a reasonable 7 assumption is to reflect one-half the annual dividend growth rate in the dividend 8 9 yield component, or $D_{1/2}$. Because the dividend should be representative of the next 10 12-month period, this adjustment is a conservative approach that does not overstate 11 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 12 projected growth rate shown in Column 6. 13

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

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regulations, and ever-changing economic and market conditions. For these reasons, 1 I used analysts' five-year forecasts of EPS growth in my DCF analysis. 2 Over the long run, there can be no growth in DPS without growth in EPS. 3 Security analysts' earnings expectations have a more significant influence on 4 market prices than dividend expectations. Thus, using earnings growth rates in a 5 6 DCF analysis provides a better match between investors' market price appreciation expectations and the growth rate component of the DCF. 7 **O**. PLEASE SUMMARIZE THE CONSTANT GROWTH DCF MODEL 8 **RESULTS.** 9 10 A. As shown on page 1 of Schedule DWD-2, for the Utility Proxy Group, the mean

A. As shown on page 1 or schedule DWD-2, for the Cutity Proxy Group, the median
 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.

17

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

18 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

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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' 3 required common equity returns cannot be directly determined or observed. 4 According to RPM theory, one can estimate a common equity risk premium over 5 bonds (either historically or prospectively) and use that premium to derive a cost 6 rate of common equity. The cost of common equity equals the expected cost rate 7 for long-term debt capital, plus a risk premium over that cost rate, to compensate 8 9 common shareholders for the added risk of being unsecured and last-in-line for any 10 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 riskreturn relationship directly, while the total market approach indirectly derives a risk premium by using known metrics as a proxy for risk.

18 **1. The Predictive Risk Premium Model**

O.

19

PLEASE EXPLAIN THE PRPM.

- 20 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.

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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 3 ("ARCH")".¹³ Engle found that volatility changes over time and is related from 4 one period to the next, especially in financial markets. Engle discovered that 5 volatility of prices and returns clusters over time and is therefore highly predictable 6 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 <u>estimate</u> 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 11 each Utility Proxy Group company minus the historical monthly yield on long-term 12 U.S. Treasury securities through January 2021. Using a generalized form of ARCH, 13 known as GARCH, I calculated each Utility Proxy Group company's projected 14 equity risk premium using Eviews[©] statistical software. When the GARCH model 15 is applied to the historical return data, it produces a predicted GARCH variance 16 series¹⁴ and a GARCH coefficient.¹⁵ Multiplying the predicted monthly variance 17 by the GARCH coefficient and then annualizing it¹⁶ produces the predicted annual 18 equity risk premium. I then added the forecasted 30-year U.S. Treasury bond yield 19

¹³ <u>www.nobelprize.org</u>.

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

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1	of 2.31% ¹⁷ to each company's PRPM-derived equity risk premium to arrive at an
2	indicated cost of common equity. The 30-year U.S. Treasury bond yield is a
3	consensus forecast derived from Blue Chip Financial Forecasts ("Blue Chip").18
4	The mean PRPM indicated common equity cost rate for the Utility Proxy Group is
5	9.69%, the median is 9.94%, and the average of the two is 9.82%. Consistent with
6	my reliance on the average of the median and mean results of the DCF models, I
7	relied on the average of the mean and median results of the Utility Proxy Group
8	PRPM to calculate a cost of common equity rate of 9.82%.

9 Q. PLEASE DESCRIBE YOUR SELECTION OF A RISK-FREE RATE OF 10 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

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.

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1		base to which the allowed fair rate of return (<i>i.e.</i> , cost of capital) will be applied.		
2		In contrast, short-term U.S. Treasury yields are more volatile and largely a function		
3		of Federal Reserve monetary policy.		
4	Q.	DID YOU INCLUDE CURRENT INTEREST RATES IN YOUR		
5		ANALYSES?		
6	A.	Yes. Even though I do not agree with using current interest rates in a rate of return		
7		analysis, I recognize that the Commission has stated its preference for the use of		
8		current, and not projected, interest rates. ¹⁹ As such, in addition to my normal		
9		practice of relying on projected interest rates, I have also presented my ROE		
10		analyses based on current interest rates.		
11		2. The Total Market Risk Premium Approach		
12	Q.	PLEASE EXPLAIN THE TOTAL MARKET APPROACH RPM.		
13	A.	The total market approach RPM adds a prospective public utility bond yield to an		
14		average of: 1) an equity risk premium that is derived from a Beta-adjusted total		
15		market equity risk premium, 2) an equity risk premium based on the S&P Utilities		
16		Index, and 3) an equity risk premium based on authorized ROEs for gas distribution		
17		utilities.		
18	Q.	PLEASE EXPLAIN THE BASIS OF THE EXPECTED BOND YIELD OF		
19		3.56% APPLICABLE TO THE UTILITY PROXY GROUP.		
20	A.	The first step in the total market approach RPM analysis is to determine the		
21		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.

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1	common equity cost rate, are prospective in nature, a prospective yield on similarly-
2	rated long-term debt is essential. I relied on a consensus forecast of about 50
3	economists of the expected yield on Aaa-rated corporate bonds for the six calendar
4	quarters ending with the second calendar quarter of 2022, and Blue Chip's long-
5	term projections for 2022 to 2026, and 2027 to 2031. As shown on line 1, page 3
6	of Schedule DWD-3, the average expected yield on Moody's Aaa-rated corporate
7	bonds is 3.06%. To derive an expected yield on Moody's A2-rated public utility
8	bonds, I made an upward adjustment of 0.50%, which represents a recent spread
9	between Aaa-rated corporate bonds and A2-rated public utility bonds, in order to
10	adjust the expected Aaa-rated corporate bond yield to an equivalent A2-rated public
11	utility bond yield. ²⁰ Adding that recent 0.50% spread to the expected Aaa-rated
12	corporate bond yield of 3.06% results in an expected A2-rated public utility bond
13	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.

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4	Table 2: Summary of the Calculation of the Utility Proxy Group Projected
3	yield applicable to the Utility Proxy Group.
2	prospective A2-rated public utility bond yield results in a 3.66% expected bond
1	applicable to an A3-rated public utility bond. ²¹ Adding the 0.10% to the 3.56%

5

Bond Yield²²

Prospective Yield on Moody's Aaa-Rated Corporate Bonds (<i>Blue Chip</i>)	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	<u>0.10%</u>
Prospective Bond Yield Applicable to the Utility Proxy Group	<u>3.66%</u>

To develop the indicated ROE using the total market approach RPM, this 6 7 prospective bond yield is then added to the average of the three different equity risk 8 premiums described below.

9

The Beta-Derived Risk Premium a.

10 Q. PLEASE EXPLAIN HOW THE BETA-DERIVED EQUITY RISK

- PREMIUM IS DETERMINED. 11
- The components of the Beta-derived risk premium model are: 1) an expected 12 A. market equity risk premium over corporate bonds, and 2) the Beta coefficient. The 13 14 derivation of the Beta-derived equity risk premium that I applied to the Utility

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 onethird 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.

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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.

6 Q. HOW DID YOU DERIVE A MARKET EQUITY RISK PREMIUM BASED
7 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 <u>Stocks, Bonds, Bills,</u>
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%.

²³ SBBI Appendix A Tables: Morningstar Stocks, Bonds, Bills, & Inflation 1926-2019.

²⁴ As explained in note 1, page 9 of Schedule DWD-3.

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1	I used the arithmetic mean monthly total return rates for the large company
2	stocks and yields (income returns) for the Moody's Aaa/Aa corporate bonds,
3	because they are appropriate for the purpose of estimating the cost of capital as
4	noted in <u>SBBI - 2020.²⁵</u> Using the arithmetic mean return rates and yields is
5	appropriate because historical total returns and equity risk premiums provide
6	insight into the variance and standard deviation of returns needed by investors in
7	estimating future risk when making a current investment. If investors relied on the
8	geometric mean of historical equity risk premiums, they would have no insight into
9	the potential variance of future returns, because the geometric mean relates the
10	change over many periods to a constant rate of change, thereby obviating the year-
11	to-year fluctuations, or variance, which is critical to risk analysis.

Q. PLEASE EXPLAIN THE DERIVATION OF THE REGRESSION-BASED 12 MARKET EQUITY RISK PREMIUM. 13

A. To derive the regression-based market equity risk premium of 9.30% shown on line 14 2, page 8 of Schedule DWD-3, I used the same monthly annualized total returns on 15 large company common stocks relative to the monthly annualized yields on 16 Moody's Aaa/Aa-rated corporate bonds as mentioned above. I modeled the 17 relationship between interest rates and the market equity risk premium using the 18 observed monthly market equity risk premium as the dependent variable, and the 19 monthly yield on Moody's Aaa/Aa-rated corporate bonds as the independent 20 variable. I then used a linear Ordinary Least Squares ("OLS") regression, in which 21

25

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the market equity risk premium is expressed as a function of the Moody's Aaa/Aa-1 rated corporate bonds yield: 2 $RP = \alpha + \beta (R_{Aaa/Aa})$ 3 PLEASE EXPLAIN THE DERIVATION OF THE PRPM EQUITY RISK Q. 4 PREMIUM. 5 I used the same PRPM approach described above as applied to the Utility Proxy A. 6 7 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 8 9 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 10 11 ARCH, known as GARCH, the projected equity risk premium is determined using Eviews[©] statistical software. The resulting PRPM predicted a market equity risk 12 premium of 9.65%.²⁷ 13 14 **O**. PLEASE EXPLAIN THE DERIVATION OF A PROJECTED EQUITY RISK PREMIUM BASED ON VALUE LINE DATA FOR YOUR RPM ANALYSIS. 15 As noted above, because both ratemaking and the cost of capital are prospective, a 16 A. prospective market equity risk premium is needed. The derivation of the forecasted 17 or prospective market equity risk premium can be found in note 4, page 8 of 18 Schedule DWD-3. Consistent with my calculation of the dividend yield component 19 in my DCF analysis, this prospective market equity risk premium is derived from 20

Data from January 1928 to December 2019 is from <u>SBBI - 2020</u>. Data from January 2020 to January 2021 is from Bloomberg.

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

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1		an average of the three- to five-year median market price appreciation potential by
2		Value Line for the 13 weeks ended January 29, 2021, plus an average of the median
3		estimated dividend yield for the common stocks of the 1,700 firms covered in Value
4		Line's Standard Edition. ²⁸
5		The average median expected price appreciation is 35%, which translates to
6		a 7.79% annual appreciation, and, when added to the average of Value Line's
7		median expected dividend yields of 2.04%, equates to a forecasted annual total
8		return rate on the market of 9.83%. The forecasted Moody's Aaa-rated corporate
9		bond yield of 3.06% is deducted from the total market return of 9.83%, resulting in
10		an equity risk premium of 6.77%, as shown on line 4, page 8 of Schedule DWD-3.
11	Q.	PLEASE EXPLAIN THE DERIVATION OF AN EQUITY RISK PREMIUM
11 12	Q.	PLEASE EXPLAIN THE DERIVATION OF AN EQUITY RISK PREMIUM BASED ON THE S&P 500 COMPANIES.
	Q. A.	
12		BASED ON THE S&P 500 COMPANIES.
12 13		BASED ON THE S&P 500 COMPANIES. Using data from <i>Value Line</i> , I calculated an expected total return on the S&P 500
12 13 14		BASED ON THE S&P 500 COMPANIES. Using data from <i>Value Line</i> , I calculated an expected total return on the S&P 500 companies using expected dividend yields and long-term growth estimates as a
12 13 14 15		BASED ON THE S&P 500 COMPANIES. Using data from <i>Value Line</i> , 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%.
12 13 14 15 16		BASED ON THE S&P 500 COMPANIES. Using data from <i>Value Line</i> , 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%
12 13 14 15 16 17	A.	BASED ON THE S&P 500 COMPANIES. Using data from <i>Value Line</i> , 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.

21 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.

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1		capital appreciation, identical to the method described above. The expected total
2		return for the S&P 500 is 17.78%. Subtracting the prospective yield on Moody's
3		Aaa-rated corporate bonds of 3.06% results in a 14.72% projected equity risk
4		premium.
5	Q.	WHAT IS YOUR CONCLUSION OF A BETA-DERIVED EQUITY RISK
6		PREMIUM FOR USE IN YOUR RPM ANALYSIS?
7	A.	I gave equal weight to all six equity risk premiums based on each source - historical,
8		Value Line, and Bloomberg - in arriving at a 9.54% equity risk premium.
9 10		Table 3: Summary of the Calculation of the Equity Risk Premium UsingTotal Market Returns29

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 <i>Value Line</i> Summary & Index less Projected Aaa Corporate Bond Yields	6.77%
Prospective Equity Risk Premium using Measures of Capital Appreciation and Income Returns from <i>Value Line</i> for the S&P 500 less Projected Aaa Corporate Bond Yields	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	<u>14.72%</u>
Average	<u>9.54%</u>

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.

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

6

30

b. The S&P Utility Index Derived Risk Premium

Q. HOW DID YOU DERIVE THE EQUITY RISK PREMIUM BASED ON THE 8 S&P UTILITY INDEX AND MOODY'S A-RATED PUBLIC UTILITY 9 BONDS?

I estimated three equity risk premiums based on S&P Utility Index holding period 10 A. returns, and two equity risk premiums based on the expected returns of the S&P 11 Utilities Index, using Value Line and Bloomberg data, respectively. Turning first to 12 the S&P Utility Index holding period returns, I derived a long-term monthly 13 arithmetic mean equity risk premium between the S&P Utility Index total returns 14 of 10.74%, and monthly Moody's A-rated public utility bond yields of 6.53% from 15 1928 to 2019, to arrive at an equity risk premium of 4.21%.³⁰ I then used the same 16 historical data to derive an equity risk premium of 6.83% based on a regression of 17 the monthly equity risk premiums. The final S&P Utility Index holding period 18 equity risk premium involved applying the PRPM using the historical monthly 19 equity risk premiums from January 1928 to January 2021 to arrive at a PRPM-20 21 derived equity risk premium of 5.59% for the S&P Utility Index.

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

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

Table 4: Summary of the Calculation of the Equity Risk Premium UsingS&P Utility Index Holding Returns32

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 <i>Value Line</i> 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	<u>4.11%</u>
Average	5.51%

10

8

9

Authorized Return-Derived Equity Risk Premium

11

Q. HOW DID YOU DERIVE AN EQUITY RISK PREMIUM OF 5.83% BASED

12 ON AUTHORIZED ROES FOR GAS DISTRIBUTION UTILITIES?

13 A. The equity risk premium of 5.83% shown on line 3, page 7 of Schedule DWD-3 is

14 the result of a regression analysis based on regulatory awarded ROEs related to the

15 yields on Moody's A-rated public utility bonds. That analysis is shown on page 13

c.

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

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

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

14 Q. WHAT IS YOUR CONCLUSION OF AN EQUITY RISK PREMIUM FOR

USE IN YOUR TOTAL MARKET APPROACH RPM ANALYSIS? 15

The equity risk premium I apply to the Utility Proxy Group is 6.74%, which is the 16 A. average of the Beta-adjusted equity risk premium for the Utility Proxy Group, the 17 S&P Utilities Index, and the authorized return utility equity risk premiums of 18 8.87%, 5.51%, and 5.83%, respectively.³⁴ 19

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

1 Q. WHAT IS THE INDICATED RPM COMMON EQUITY COST RATE

2 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
- 5 RPM.
- 6

Table 5: Summary of the Total Market Return Risk Premium Model³⁵

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

7 Q. WHAT ARE THE RESULTS OF YOUR APPLICATION OF THE PRPM

8 AND THE TOTAL MARKET APPROACH RPM?

- 9 A. As shown on page 1 of Schedule DWD-3, the indicated RPM-derived common
 10 equity cost rate is 10.11%, which gives equal weight to the PRPM (9.82%) and the
- 11 adjusted-market approach results (10.40%).

12 C. <u>The Capital Asset Pricing Model</u>

13 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.
- 18 The CAPM assumes that all non-market or unsystematic risk can be 19 eliminated through diversification. The risk that cannot be eliminated through

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

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1	diversificatio	on is ca	alled m	arket, or systematic, risk. In addition, the CAPM
2	presumes that	at invest	ors only	require compensation for systematic risk, which is the
3	result of mad	croecon	omic an	d other events that affect the returns on all assets. The
4	model is app	lied by a	adding a	risk-free rate of return to a market risk premium, which
5	is adjusted p	oroportio	onately	to reflect the systematic risk of the individual security
6	relative to th	ne total	market	as measured by the Beta coefficient. The traditional
7	CAPM mode	el is exp	oressed a	as:
8		Rs	=	$R_{f} + \beta (R_{m} - R_{f})$
9	Where:	Rs	=	Return rate on the common stock
10		\mathbf{R}_{f}	=	Risk-free rate of return
11		\mathbf{R}_{m}	=	Return rate on the market as a whole
12		β	=	Adjusted Beta coefficient (volatility of the
13				security relative to the market as a whole)
14	Num	erous te	ests of tl	he CAPM have measured the extent to which security
15	returns and I	Beta coe	efficient	s are related as predicted by the CAPM, confirming its

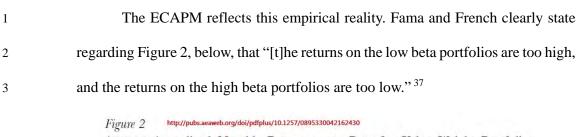
returns and Beta coefficients are related as predicted by the CAPM, confirming its validity. The empirical CAPM ("EC") reflects the reality that while the results of these tests support the notion that the Beta coefficient is related to security returns, the empirical Security Market Line ("SML") described by the CAPM formula is

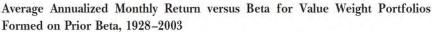
19 not as steeply sloped as the predicted SML.³⁶

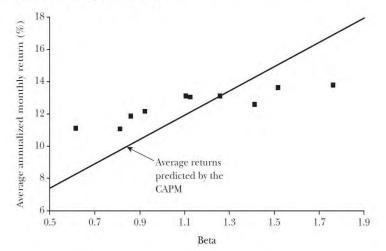
36

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

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5	In addition, Morin observes that while the results of these tests support the
6	notion that Beta is related to security returns, the empirical SML described by the
7	CADM formula is not as stearly slaved as the gradient of SML. Marin states:
7	CAPM formula is not as steeply sloped as the predicted SML. Morin states:
8	With few exceptions, the empirical studies agree that low-beta
9	securities earn returns somewhat higher than the CAPM would
10	predict, and high-beta securities earn less than predicted. ³⁸
10	predict, and high-beta securities early less than predicted.
11	* * *
12	Therefore, the empirical evidence suggests that the expected return
13	on a security is related to its risk by the following approximation:
14	$K = R_F + x \beta(R_M - R_F) + (1 - x) \beta(R_M - R_F)$

4

 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.

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1 2 3 4	where x is a fraction to be determined empirically. The value of x that best explains the observed relationship [is] Return = $0.0829 + 0.0520 \beta$ is between 0.25 and 0.30. If x = 0.25, the equation becomes:
5	$K = R_F + 0.25(R_M - R_F) + 0.75 \ \beta(R_M - R_F)^{39}$
6	Fama and French provide similar support for the ECAPM when they state:
7	The early tests firmly reject the Sharpe-Lintner version of the
8	CAPM. There is a positive relation between beta and average return,
9	but it is too 'flat.' The regressions consistently find that the
10	intercept is greater than the average risk-free rate and the
11	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-
12 13	section regressions tests, like Fama and French (1992). ⁴⁰
15	section regressions tests, like Fana and French (1992).
14	Finally, Fama and French further note:
15	Confirming earlier evidence, the relation between beta and average
16	return for the ten portfolios is much flatter than the Sharpe-Linter
17	CAPM predicts. The returns on low beta portfolios are too high,
18	and the returns on the high beta portfolios are too low. For example,
19	the predicted return on the portfolio with the lowest beta is 8.3
20	percent per year; the actual return as 11.1 percent. The predicted
21	return on the portfolio with the t beta is 16.8 percent per year; the
22	actual is 13.7 percent. ⁴¹
23	Clearly the justification from Marin Forms and French clone with their
24	Clearly, the justification from Morin, Fama, and French, along with their
25	reviews of other academic research on the CAPM, validate the use of the ECAPM.
26	In view of theory and practical research, I have applied both the traditional CAPM
27	and the ECAPM to the companies in the Utility Proxy Group and averaged the
28	results.

³⁹ Morin, at 190.

⁴⁰ Fama & French, at 32.

⁴¹ *Ibid.*, at 33.

1 Q. WHAT BETA COEFFICIENTS DID YOU USE IN YOUR CAPM 2 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.

9 Q. PLEASE DESCRIBE YOUR SELECTION OF A RISK-FREE RATE OF 10 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.

16Q.PLEASE EXPLAIN THE ESTIMATION OF THE EXPECTED RISK17PREMIUM 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.

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1	The long-term income return on U.S. Government securities of 5.09% was
2	deducted from the <u>SBBI - 2020</u> monthly historical total market return of 12.10%,
3	which results in an historical market equity risk premium of 7.01%. ⁴² I applied a
4	linear OLS regression to the monthly annualized historical returns on the S&P 500
5	relative to historical yields on long-term U.S. Government securities from SBBI -
6	2020. That regression analysis yielded a market equity risk premium of 9.98%.
7	The PRPM market equity risk premium is 10.76% and is derived using the PRPM
8	relative to the yields on long-term U.S. Treasury securities from January 1926
9	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 <u>SBBI - 2020</u>, at Appendix A-1 (1) through A-1 (3) and Appendix A-7 (19) through A-7 (21).

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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 <i>Value Line</i> Summary & Index less Projected 30-Year Treasury Bond Yields	7.52%
Prospective Equity Risk Premium using Measures of Capital Appreciation and Income Returns from <i>Value Line</i> for the S&P 500 less Projected 30-Year Treasury Bond Yields	11.79%
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	<u>15.47%</u>
Average	<u>10.42%</u>

Table 6: Summary of the Calculation of the Market Risk Premium for Use in
the CAPM43

3 Q. WHAT ARE THE RESULTS OF YOUR APPLICATION OF THE
4 TRADITIONAL AND EMPIRICAL CAPM TO THE UTILITY PROXY
5 GROUP?
6 A. As shown on page 1 of Schedule DWD-4, the mean result of my CAPM/ECAPM

7 analyses is 12.09%, the median is 12.00%, and the average of the two is 12.05%.

8 Consistent with my reliance on the average of mean and median DCF results

9 discussed above, the indicated common equity cost rate using the CAPM/ECAPM

10 is 12.05%.

1

2

43

As shown on page 2 of Schedule DWD-4.

D. <u>Common Equity Cost Rates for a Proxy Group of Domestic, Non-</u> Price Regulated Companies Based on the DCF, RPM, and CAPM

3 Q. WHY DO YOU ALSO CONSIDER A PROXY GROUP OF DOMESTIC,

4 NON-PRICE REGULATED COMPANIES?

1

2

In the *Hope* and *Bluefield* cases, the U.S. Supreme Court did not specify that 5 A. comparable risk companies had to be utilities. Since the purpose of rate regulation 6 7 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 8 comparable in total risk to the Utility Proxy Group being used to estimate the cost 9 10 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 11 12 total risk to the Utility Proxy Group, since all of these companies compete for capital in the exact same markets. 13

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

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1		diversifiable company-specific risks. The criteria used in selecting the domestic,
2		non-price regulated firms was:
3		(i) They must be covered by <i>Value Line</i> (Standard Edition);
4		(ii) They must be domestic, non-price regulated companies, <i>i.e.</i> , not utilities;
5		(iii) Their Beta coefficients must lie within plus or minus two standard
6		deviations of the average unadjusted Beta coefficients of the Utility Proxy
7		Group; and
8		(iv) The residual standard errors of the <i>Value Line</i> regressions which gave rise
9		to the unadjusted Beta coefficients must lie within plus or minus two
10		standard deviations of the average residual standard error of the Utility
11		Proxy Group.
12		Beta coefficients measure market, or systematic, risk, which is not
13		diversifiable. The residual standard errors of the regressions measure each firm's
14		company-specific, diversifiable risk. Companies that have similar Beta coefficients
15		and similar residual standard errors resulting from the same regression analyses
16		have similar total investment risk.
17	Q.	HAVE YOU PREPARED A SCHEDULE WHICH SHOWS THE DATA
18		FROM WHICH YOU SELECTED THE 47 DOMESTIC, NON-PRICE
19		REGULATED COMPANIES THAT ARE COMPARABLE IN TOTAL RISK
20		TO THE UTILITY PROXY GROUP?
21	A.	Yes, the basis of my selection and both proxy groups' regression statistics are shown
22		in Schedule DWD-5.

1Q.DID YOU CALCULATE COMMON EQUITY COST RATES USING THE2DCF MODEL, RPM, AND CAPM FOR THE NON-PRICE REGULATED3PROXY 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%.

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.

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		5
1		Page 6 of Schedule DWD-6 contains the inputs and calculations that support
2		my indicated CAPM/ECAPM common equity cost rate of 12.07%.
3	Q.	HOW IS THE COST RATE OF COMMON EQUITY BASED ON THE NON-
4		PRICE REGULATED PROXY GROUP COMPARABLE IN TOTAL RISK
5		TO THE UTILITY PROXY GROUP?
6	A.	As shown on page 1 of Schedule DWD-6, the results of the common equity models
7		applied to the Non-Price Regulated Proxy Group which group is comparable in
8		total risk to the Utility Proxy Group are as follows: 11.97% (DCF), 12.82%
9		(RPM), and 12.07% (CAPM). The average of the mean and median of these models
10		is 12.18%, which I used as the indicated common equity cost rates for the Non-
11		Price Regulated Proxy Group.
12 13	VI.	<u>CONCLUSION OF COMMON EQUITY COST RATE BEFORE</u> <u>ADJUSTMENTS</u>
	VI. Q.	
13		ADJUSTMENTS
13 14		ADJUSTMENTS WHAT ARE THE INDICATED COMMON EQUITY COST RATES
13 14 15	Q.	ADJUSTMENTS WHAT ARE THE INDICATED COMMON EQUITY COST RATES BEFORE ADJUSTMENTS?
 13 14 15 16 	Q.	ADJUSTMENTS WHAT ARE THE INDICATED COMMON EQUITY COST RATES BEFORE ADJUSTMENTS? By applying multiple cost of common equity models to the Utility Proxy Group and
 13 14 15 16 17 	Q.	ADJUSTMENTS WHAT ARE THE INDICATED COMMON EQUITY COST RATES BEFORE ADJUSTMENTS? 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
 13 14 15 16 17 18 	Q.	ADJUSTMENTS WHAT ARE THE INDICATED COMMON EQUITY COST RATES BEFORE ADJUSTMENTS? 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
 13 14 15 16 17 18 19 	Q.	ADJUSTMENTS WHAT ARE THE INDICATED COMMON EQUITY COST RATES BEFORE ADJUSTMENTS? 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
 13 14 15 16 17 18 19 20 	Q.	ADJUSTMENTS WHAT ARE THE INDICATED COMMON EQUITY COST RATES BEFORE ADJUSTMENTS? 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
 13 14 15 16 17 18 19 20 21 	Q.	ADJUSTMENTS WHAT ARE THE INDICATED COMMON EQUITY COST RATES BEFORE ADJUSTMENTS? 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.

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1		both the financial literature and regulatory precedent.
2		Based on these common equity cost rate results, I conclude that a common
3		equity cost rate between 9.46% and 12.18% is reasonable and appropriate before
4		any adjustments for relative risk differences between Piedmont and the Utility
5		Proxy Group are made. ⁴⁶
6	VII.	ADJUSTMENTS TO THE COMMON EQUITY COST RATE
7		A. <u>Size Adjustment</u>
8	Q.	DOES A COMPANY'S SIZE RELATIVE TO THE UTILITY PROXY
9		GROUP COMPANIES IMPACT ITS BUSINESS RISK?
10	A.	Yes. A smaller size relative to the Utility Proxy Group companies indicates greater
11		relative business risk for a utility because, all else being equal, size has a material
12		bearing on risk.
13		Size affects business risk because smaller companies generally are less able
14		to cope with significant events that affect sales, revenues and earnings. For
15		example, smaller companies face more risk exposure to business cycles and
16		economic conditions, both nationally and locally. Additionally, the loss of revenues
17		from a few larger customers would have a greater effect on a small company than
18		on a bigger company with a larger, more diverse, customer base.

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.

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1		Consistent with the financial principle of risk and return discussed above,
2		increased relative risk due to small size must be considered in the allowed rate of
3		return on common equity.
4	Q.	HAVE YOU APPLIED A RELATIVE RISK ADJUSTMENT DUE TO
5		PIEDMONT'S SMALL SIZE RELATIVE TO THE UTILITY PROXY
6		GROUP?
7	A.	No. While Piedmont has greater relative risk than the average utility in the Utility
8		Proxy Group as measured by its estimated market capitalization of common equity,
9		the difference is not large enough to merit a relative risk adjustment as shown on
10		Table 7, below.
11		Table 7: Size as Measured by Market Capitalization for Piedmont

12

lole 7: Size as Measured by Market Capitalization for Pledmo

and the	Utility	Proxy	Group
---------	---------	-------	-------

	Market <u>Capitalization*</u>	Times Greater than <u>The Company</u>
	(\$ 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

^{\$4,004.929}M = \$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.

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1 of January 29, 2021. The average company in the Utility Proxy Group has a market

2 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.

7

B.

Flotation Cost Adjustment

8 Q. WHAT ARE FLOTATION COSTS?

9 A. Flotation costs are those costs associated with the sale of new issuances of common
10 stock. They include market pressure and the mandatory unavoidable costs of
11 issuance (*e.g.*, underwriting fees and out-of-pocket costs for printing, legal,
12 registration, etc.). For every dollar raised through debt or equity offerings, the
13 Company receives less than one full dollar in financing.

14 Q. WHY IS IT IMPORTANT TO RECOGNIZE FLOTATION COSTS IN THE

15 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:
- 20The costs of issuing these securities are just as real as operating and21maintenance expenses or costs incurred to build utility plants, and22fair regulatory treatment must permit recovery of these costs....

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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

4

5

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3

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 7 ratemaking paradigm other than an adjustment to the allowed common equity cost 8 rate. Flotation costs are charged to capital accounts and are not expensed on a 9 utility's income statement. As such, flotation costs are analogous to capital 10 investments, albeit negative, reflected on the balance sheet. Recovery of capital 11 investments relates to the expected useful lives of the investment. Since common 12 equity has a very long and indefinite life (assumed to be infinity in the standard 13 regulatory DCF model), flotation costs should be recovered through an adjustment 14 to common equity cost rate, even when there has not been an issuance during the 15 test year, or in the absence of an expected imminent issuance of additional shares 16 of common stock. 17

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

⁴⁸ Morin, at 321.

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1	expenses are charged to capital accounts and not expensed on the income statement,
2	the only way to restore the full value of that dollar of issuing price with an assumed
3	investor required return of 10% is for the net investment, \$0.95, to earn more than
4	10% to net back to the investor a fair return on that dollar. In other words, if a
5	company issues stock at \$1.00 with 5% in flotation costs, it will net \$0.95 in
6	investment. Assuming the investor in that stock requires a 10% return on his or her
7	invested \$1.00 (i.e., a return of \$0.10), the company needs to earn approximately
8	10.5% on its invested \$0.95 to receive a \$0.10 return.

9 Q. DO THE COMMON EQUITY COST RATE MODELS YOU HAVE USED 10 ALREADY REFLECT INVESTORS' ANTICIPATION OF FLOTATION 11 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

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

⁵⁰ Morin, at pp. 327-30.

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

3 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.

11 Q. WHAT IS THE INDICATED COST OF COMMON EQUITY AFTER YOUR

- 12 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%.

18 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

1	return on common equity. As the Commission has stated, it "is and must always
2	be mindful of the North Carolina Supreme Court's command that the
3	Commission's task is to set rates as low as possible consistent with the dictates of
4	the United States and North Carolina Constitutions." ⁵¹ In that regard, the return
5	should be neither excessive nor confiscatory; it should be the minimum amount
6	needed to meet the Hope and Bluefield Comparable Risk, Capital Attraction, and
7	Financial Integrity standards.
8	The Commission also has found the role of cost of capital experts is to
9	determine the investor-required return, not to estimate increments or decrements of
10	return in connection with consumers' economic environment:
11 12	adjusting investors' required costs based on factors upon which investors do not base their willingness to invest is an unsupportable
13	theory or concept. The proper way to take into account customer
14	ability to pay is in the Commission's exercise of fixing rates as low
15 16	as reasonably possible without violating constitutional proscriptions against confiscation of property. This is in accord with the "end
16 17	result' test of Hope. This the Commission has done. ⁵²
18	The North Carolina Supreme Court agreed, and upheld the Commission's
19	Order on Remand. ⁵³ The North Carolina Supreme Court has also, however, made
20	clear that the Commission "must make findings of fact regarding the impact of

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").

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

9 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;

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).

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

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1		• Unemployment at both the state and county level remains highly correlated
2		with national rates of unemployment;
3		• Real Gross Domestic Product ("GDP") in North Carolina also remains
4		highly correlated with U.S. real GDP growth; and
5		• Median household income in North Carolina has grown at a rate consistent
6		with the rest of the U.S. and remains strongly correlated with national levels.
7	Q.	PLEASE NOW DESCRIBE THE SPECIFIC MEASURES OF ECONOMIC
8		CONDITIONS THAT YOU REVIEWED.
9	A.	Turning first to the seasonally adjusted unemployment rate, prior to April 2020, the
10		unemployment rate had fallen substantially in North Carolina and the U.S. since
11		the 2008/2009 financial crisis. Although the unemployment rate in North Carolina
12		exceeded the national rate during and after the 2008/2009 financial crisis, by the
13		latter portion of 2013, the two were largely consistent. As the COVID-19 pandemic
14		hit the U.S., unemployment in North Carolina and across the U.S. spiked in April
15		2020 as many communities closed non-essential businesses to contain the spread
16		of the COVID-19 virus. Notably, North Carolina's unemployment rate has fared
17		better than the overall U.S., even as both fell considerably by the end of 2020 (see
18		Chart 1, below).

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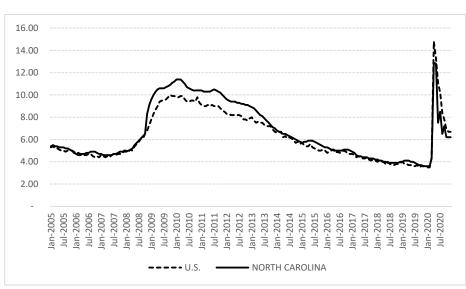


Chart 1: Unemployment Rate (Seasonally Adjusted)59

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 5 counties served by Piedmont. As with the seasonally adjusted statistics described 6 above, the unemployment rate in those counties spiked in April 2020 at 11.58% 7 8 (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 9 (6.10%) and below the overall rate in the U.S. (6.40%). From 2005 through 10 November 2020, the correlation in unemployment rates between the counties 11 12 served by Piedmont and the U.S., as well as North Carolina, were approximately 13 93.76% and 98.91%, respectively. In summary, county-level unemployment has

1

2

3

⁵⁹

Source: Bureau of Labor Statistics.

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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.

4

5

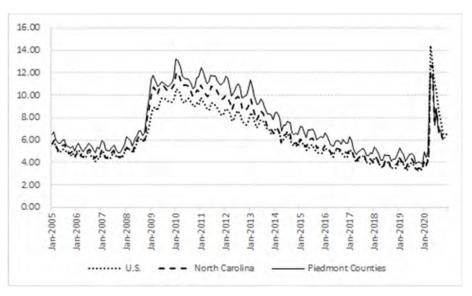


Chart 2: Seasonally Unadjusted Unemployment Rates⁶⁰

Looking to real Gross Domestic Product growth, there also has been a 6 relatively strong correlation between North Carolina and the national economy 7 (approximately 81.50%). While the national rate of growth at times outpaced North 8 Carolina between 2010 and 2014, since the first quarter of 2015, North Carolina's 9 economic growth has been relatively consistent with U.S. economic growth. 10 Moreover, North Carolina's real GDP growth fared better than the overall U.S. in 11 12 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 13 and third quarters. 14

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

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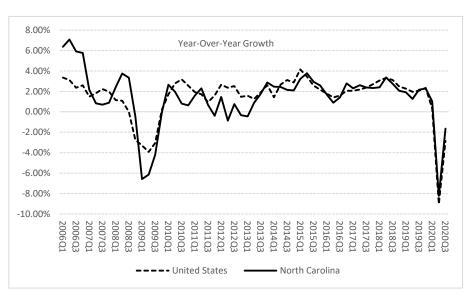


Chart 3: Real Gross Domestic Product Growth Rate (Year over Year)⁶¹

As to median household income, the correlation between North Carolina 3 and the U.S. is relatively strong (94.00% from 2005 through 2019). Since 2009 4 5 (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 6 median income (3.85% vs. 3.27%, respectively; see Chart 4, below). To put 7 household income in perspective, the Missouri Economic Research and 8 Information Center reports that in the second quarter of 2019, North Carolina had 9 the 22nd lowest cost of living index among the 50 states, the District of Columbia, 10 and Puerto Rico.62 11

1

⁶¹ Source: Bureau of Economic Analysis.

⁶² Source: <u>meric.mo.gov/data/cost-living-data-series</u> accessed January 27, 2021.

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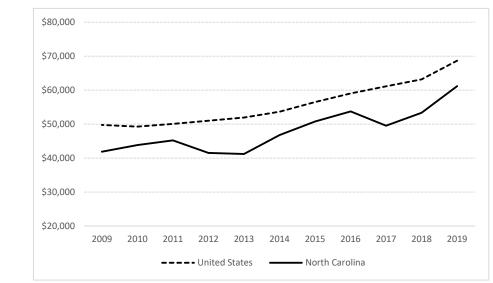


Chart 4: Median Household Income⁶³

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

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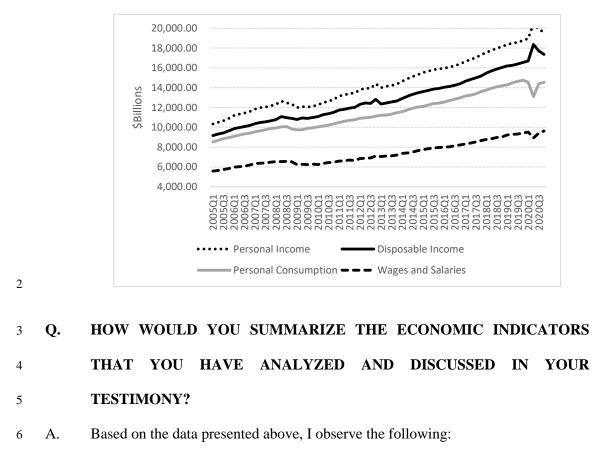


Chart 5: United States Income and Consumption⁶⁴

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.

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1		Carolina and has grown at a rate slightly faster than the national average.
2		Additionally, the overall cost of living in North Carolina also is below
3		the national average. Furthermore, at the national level, income has
4		generally been increasing since the financial crisis.
5		The U.S. and North Carolina economies both experienced an historically
6		difficult and challenging year as a result of the COVID-19 pandemic; yet the data
7		show that economic conditions have improved significantly. Moreover, although
8		economic conditions remain uncertain, North Carolina and the counties contained
9		within Piedmont's service area have fared better than the rest of the U.S. during the
10		COVID-19 pandemic.
11		IN YOUR OPINION, IS AN ROE OF 10.25% FAIR AND REASONABLE TO
11	Q.	IN TOUR OF INION, IS AN KOE OF 10.25% FAIR AND REASONABLE TO
11	Q.	PIEDMONT, ITS SHAREHOLDERS, AND ITS CUSTOMERS, AND NOT
	Q.	
12	Q.	PIEDMONT, ITS SHAREHOLDERS, AND ITS CUSTOMERS, AND NOT
12 13	Q. A.	PIEDMONT, ITS SHAREHOLDERS, AND ITS CUSTOMERS, AND NOT UNDULY BURDENSOME TO PIEDMONT'S CUSTOMERS
12 13 14		PIEDMONT, ITS SHAREHOLDERS, AND ITS CUSTOMERS, AND NOT UNDULY BURDENSOME TO PIEDMONT'S CUSTOMERS CONSIDERING THE CHANGING ECONOMIC CONDITIONS?
12 13 14 15		PIEDMONT, ITS SHAREHOLDERS, AND ITS CUSTOMERS, AND NOTUNDULYBURDENSOMETOPIEDMONT'SCUSTOMERSCONSIDERING THE CHANGING ECONOMIC CONDITIONS?Yes. Based on the factors I have discussed here, I believe that an ROE of 10.25%
12 13 14 15 16		PIEDMONT, ITS SHAREHOLDERS, AND ITS CUSTOMERS, AND NOTUNDULYBURDENSOMETOPIEDMONT'SCUSTOMERSCONSIDERING THE CHANGING ECONOMIC CONDITIONS?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
12 13 14 15 16 17	А.	PIEDMONT, ITS SHAREHOLDERS, AND ITS CUSTOMERS, AND NOTUNDULYBURDENSOMETOPIEDMONT'SCUSTOMERSCONSIDERING THE CHANGING ECONOMIC CONDITIONS?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 theuncertainty surrounding the COVID-19 recovery.
12 13 14 15 16 17 18	A. IX.	PIEDMONT, ITS SHAREHOLDERS, AND ITS CUSTOMERS, AND NOTUNDULYBURDENSOMETOPIEDMONT'SCUSTOMERSCONSIDERING THE CHANGING ECONOMIC CONDITIONS?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 theuncertainty surrounding the COVID-19 recovery.CONCLUSION
12 13 14 15 16 17 18 19	А. IX. Q.	PIEDMONT, ITS SHAREHOLDERS, AND ITS CUSTOMERS, AND NOT UNDULY BURDENSOME TO PIEDMONT'S CUSTOMERS CONSIDERING THE CHANGING ECONOMIC CONDITIONS? 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. CONCLUSION WHAT IS YOUR RECOMMENDED OVERALL ROE FOR PIEDMONT?

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1 Q. IN YOUR OPINION, IS YOUR PROPOSED ROE OF 10.25% FAIR AND

2 **REASONABLE TO PIEDMONT AND ITS CUSTOMERS?**

3 A. Yes, it is.

4 Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

5 A. Yes, it does.

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

APPENDIX A



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

Capital Market Risk

Utilities

- Financial ModelingValuation
- Valuation
 Regulation
 - Regulatory Strategy
- Rate Case Support

Recent Expert Testimony Submission/Appearances

Jurisdiction

- Massachusetts Department of Public Utilities
- New Jersey Board of Public Utilities
- Hawaii Public Utilities Commission

Mutual Fund Benchmarking

- South Carolina Public Service Commission
- American Arbitration Association

- g Rate of Return
 - Cost of ServiceRate Design
 - Торіс

Rate of Return Rate of Return Cost of Service, Rate Design Return on Common Equity 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.

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Sponsor	Date	Case/Applicant	Docket No.	SUBJECT
Regulatory Commission of A	laska			
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 Commis	sion	•	·	
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 Con	1			1
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 Com	nmission			
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	of the Dist	rict of Columbia		
Washington Gas Light Company	09/20	Washington Gas Light Company	Formal Case No. 1162	Rate of Return
Federal Energy Regulatory C	ommissio	n		
LS Power Grid California, LLC	10/20	LS Power Grid California, LLC	Docket No. ER21-195-000	Rate of Return
Florida Public Service Comm	ission			
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 Comm	ission			•
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 Commissi	on			
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



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 Co	mmission			
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 Commis	sion			
Atmos Energy	07/19	Atmos Energy	19-ATMG-525-RTS	Rate of Return
Kentucky Public Service Con	nmission			
Bluegrass Water Utility Operating Company	10/20	Bluegrass Water Utility Operating Company	2020-00290	Return on Equity
Louisiana Public Service Cor	nmission			
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 Com	mission		·	
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 o	of Public U	tilities		
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 Co	mmission			
Northern States Power Company	11/20	Northern States Power Company	Docket No. E002/GR-20-723	Rate of Return
Mississippi Public Service Co	ommissior	1		
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 Com	mission		1	1
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	of Nevada			
Southwest Gas Corporation	08/20	Southwest Gas Corporation	Docket No. 20-02023	Return on Equity
New Hampshire Public Utilitie	es Commi		1	
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 L	Jtilities			
Atlantic City Electric Company	12/20	Atlantic City Electric Company	Docket No. ER20120746	Return on Equity



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 Regulatio				
Southwestern Public Service		Southwestern Public Service		
Company	01/21	Company	Case No. 20-00238-UT	Return on Equity
North Carolina Utilities Comn	nission	•		
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		•		
Northern States Power				
Company	11/20	Northern States Power Company	Case No. PU-20-441	Rate of Return
Public Utilities Commission of	of Ohio	· · · · ·		•
Aqua Ohio, Inc.	05/16	Aqua Ohio, Inc.	Docket No. 16-0907-WW-AIR	Rate of Return
Pennsylvania Public Utility Co	ommissio	•		•
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
				Capital Structure / Long-Term Debt Cost
Penn Estates Utilities, Inc.	12/11	Penn Estates, Utilities, Inc.	Docket No. R-2011-2255159	Rate
South Carolina Public Service			Desket No. 2010 202 M/C	Data of Datum
Blue Granite Water Co.	12/19	Blue Granite Water Company	Docket No. 2019-292-WS	Rate of Return
Carolina Water Service, Inc.	02/18	Carolina Water Service, Inc.	Docket No. 2017-292-WS	Rate of Return
Carolina Water Service, Inc.	06/15	Carolina Water Service, Inc.	Docket No. 2015-199-WS	Rate of Return
Carolina Water Service, Inc.	11/13	Carolina Water Service, Inc.	Docket No. 2013-275-WS	Rate of Return
United Utility Companies, Inc.	09/13	United Utility Companies, Inc.	Docket No. 2013-199-WS	Rate of Return



Sponsor	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
Utility Services of South Carolina, Inc.	09/13	Utility Services of South Carolina, Inc.	Docket No. 2013-201-WS	Rate of Return
Tega Cay Water Services, Inc.	11/12	Tega Cay Water Services, Inc.	Docket No. 2012-177-WS	Capital Structure
Tennessee Public Utility Com	mission			
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 Co	mmissior	1		
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

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

	<u>Schedule</u>
Summary of Cost of Capital	DWD-1
Indicated Common Equity Cost Rate Using the Discounted Cash Flow Model	DWD-2
Indicated Common Equity Cost Rate Using the Risk Premium Model	DWD-3
Indicated Common Equity Cost Rate Using the Capital Asset Pricing Model	DWD-4
Basis of selection for the Non-Price Regulated Companies Comparable in Total Risk to the Utility Proxy Group	DWD-5
Cost of Common Equity Models Applied to the Non-Price Regulated Proxy Group	DWD-6
Estimated Market Capitalization for Piedmont Natural Gas Company and the Utility Proxy Group	DWD-7
Derivation of the Flotation Cost Adjustment to the Cost of Common Equity	DWD-8

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

SCHEDULE DWD-1

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Schedule DWD-1 Page 1 of 1

<u>Piedmont Natural Gas Company</u> 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%	
) 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

	Indica	•	5	g the Discounte	d Cash Flow Model f	or			
		Proxy Group	p 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)	Indicate Commo Equity Co Rate (5	on ost
Atmos Energy Corporation New Jersey Resources Corporation NiSource, Inc. Northwest Natural Holding Company ONE Gas, Inc. South Jersey Industries, Inc. Southwest Gas Holdings, Inc. Spire Inc.	2.64 % 3.80 3.81 4.10 3.05 5.42 3.59 4.13	7.00 % 2.00 13.00 NMF 6.50 12.50 9.00 5.50	$\begin{array}{ccc} 7.10 & \% \\ 6.00 \\ 5.60 \\ 3.10 \\ 6.00 \\ 24.50 \\ 5.00 \\ 16.50 \end{array}$	6.77 % 6.00	$\begin{array}{ccc} 7.22 & \% \\ 6.63 \\ 5.92 \\ 2.96 \\ 5.67 \\ 13.75 \\ 4.50 \\ 5.00 \end{array}$	7.02 % 5.16 6.54 3.05 5.79 18.81 5.63 8.09	2.73 % 3.90 3.93 4.16 3.14 5.93 3.69 4.30	9.76 9.06 10.48 7.22 8.93 24.74 9.32 12.39	% (6)
							Average Median	9.59 9.32	=
						Average of Me	ean 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, $2.64\% \times (1+(1/2 \times 7.02\%)) = 2.73\%$.
- (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**

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Schedule DWD-2 Page 2 of 9

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

 (A) Fiscal year ends Sept. Solit.
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KyPSC Case No. 2021-00190 STAFF-DR-03-010(a) Attachment Page 77 of 117

Schedule DWD-2 Page 4 of 9

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 | 13480
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16017 | 9792.0
12112 | 10129
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 | 5.2% | 5.3% | 4.0% | 5.0%
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Schedule DWD-2 Page 5 of 9

	V. N	ATUF	₹AL⊧	NYSE-N	1WN		R	PRICE	49.69	9 ^{P/E} Ratio	o 21 .2	2 (Traili Medi	ng: 24.1 an: 23.0)	RELATIV		1 div'd Yld	3.9% VALUE				
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3.92				5.31 2.57	5.20 2.83	5.18 2.73	5.00 2.39	4.94 2.22	5.04 2.24	5.05	4.91	4.93 2.12	1.04 d1.94	5.28 2.33	5.15 2.19	4.70 2.25	5.15		low" per s		6.
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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 Sp	ending pe	er sh	6.
20.64			22.52	23.71 26.50	24.88 26.53	26.08 26.58	26.70 26.76	27.23 26.92	27.77 27.08	28.12 27.28	28.47	29.71 28.63	25.85 28.74	26.41	28.42 30.47	29.70 31.00	31.85 31.00	Book Val			38. 32.
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Fotal i	interest c	coverage:	3.1x)			8.9%	7.5%	8.2%	8.0%	7.8%	7.4%	8.7%	NMF	9.5%	8.8%	9.1%	9.5%	Net Profi			10.9
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fd St	ock Non	е				1854.2	1893.9	1973.6	2062.9	2121.6	2182.7	2260.9	2255.0	2421.4	2438.9	2535	2640	Net Plan	t (\$mill)		30
		k 30,568,5	578 share	S		7.0%	6.2%	5.7%	5.8%	5.8%	5.5%	5.1%	NMF	5.8%	5.2%	5.0%	5.0%		n Total Ca		5.5
s of 1	10/29/20					10.5% 10.5%	8.9% 8.9%	8.2% 8.2%	8.1% 8.1%	7.6% 7.6%	6.9% 6.9%	6.9% 6.9%	NMF NMF	8.8% 8.8%	7.5% 7.5%	7.5% 7.5%	8.0% 8.0%	Return o Return o			8.5 8.5
		\$1.5 billio		• •		4.0%	2.4%	1.6%	1.5%	1.1%	.6%	.9%	NMF	2.1%	1.4%	1.0%	2.0%	Retained	to Com E	q	3.0
(\$N	ENT POS IILL.)	SITION	2018		9/30/20	61%	73%	80%	81%	85%	92%	87%	NMF	76%	82%	85%	77%	All Div'ds			61
ash . Dther	Asséts	:	12.6 283.3	9.6 284.1	35.9 206.9				Natural Ho 50,000 cus									derground cial, 22%			
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Earnings Predictability 40 5 To subscribe call 1-800-VALUELINE

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KyPSC Case No. 2021-00190 STAFF-DR-03-010(a) Attachment Page 79 of 117

Schedule DWD-2 Page 6 of 9

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TIMELINESS 4 Lowered 11/27/20		
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 | | | | High:
Low: | 44.3
31.9
 | 51.8
38.9 | 67.4
48.0 | 79.5
61.4 | 87.8
62.2
 | 96.7
75.8 | 97.0
63.7 |
 | Target Price | |
| AFETY 2 New 6/2/17
 | LEGENDS

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 | 2023 2024 | 204 |
| ECHNICAL 4 Lowered 11/27/20
 | O.50 x Divid divided by Ii

 | interest Rate | , | | |
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| ETA .80 (1.00 = Market)
 | Options: Yes

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| 8-Month Target Price Range
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| Price Gain Return
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ow 105 (+35%) 10%
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 | 3 yr4.1 8.2
5 yr. 58.6 39.8 | + |
| The shares of ONE Gas, Ir
 |

 | 2010 | 2011 2 | 2012 | |
 | 2015 | 2016 | 2017 | 2018
 | | 2020 | 2021
 | © VALUE LINE PUB. LLC | 23-2 |
| ng "regular-way" on the Ne
 |

 | | | | | 34.92
 | 29.62 | 27.30 | 29.43 | 31.08
 | 31.32 | 28.30 | 30.20
 | Revenues per sh | 40. |
| Exchange on February 3, 20
 |

 | | | | | 4.52
 | 4.82 | 5.43 | 5.96 | 6.32
 | 6.96 | 7.15 | 7.50
 | "Cash Flow" per sh | 9. |
| ened as a result of the
 |

 | | | | | 2.07
 | 2.24 | 2.65 | 3.02 | 3.25
 | 3.51 | 3.56 | 3.70
 | Earnings per sh A | 4. |
| NEOK's natural gas distribut
 |

 | | | | | .84
 | 1.20 | 1.40 | 1.68 | 1.84
 | 2.00 | 2.16 | 2.32
 | Div'ds Decl'd per sh B■ | 2. |
| tegarding the details of the s
ary 31, 2014, ONEOK d
 |

 | | | | | 5.70
34.45
 | 5.63
35.24 | 5.91
36.12 | 6.81
37.47 | 7.50
38.86
 | 7.91
40.35 | 8.80
42.70 | 8.95
45.80
 | Cap'l Spending per sh
Book Value per sh | 9.
54. |
| hare of OGS common stock
 |

 | | | | | 34.45
52.08
 | 35.24
52.26 | 52.28 | 52.31 | 52.57
 | 40.35 | 42.70 | 45.80
 | Common Shs Outst'g C | 55. |
| hares of ONEOK common
 |

 | | | | | 17.8
 | 19.8 | 22.7 | 23.5 | 23.1
 | 25.3 | Bold figu |
 | Avg Ann'l P/E Ratio | 26 |
| NEOK shareholders of rec
 | cord as of the

 | | | | | .94
 | 1.00 | 1.19 | 1.18 | 1.25
 | 1.37 | Value | Line
 | Relative P/E Ratio | 1. |
| lose of business on January
 |

 | | | | | 2.3%
 | 2.7% | 2.3% | 2.4% | 2.5%
 | 2.3% | estim | ates
 | Avg Ann'l Div'd Yield | 2.2 |
| e mentioned that ONEOK
 |

 | | | | 1 | 818.9
 | 1547.7 | 1427.2 | 1539.6 | 1633.7
 | 1652.7 | 1500 | 1615
 | Revenues (\$mill) | 22 |
| ny ownership interest in the r
 | 1 ,

 | | | | | 109.8
 | 119.0 | 140.1 | 159.9 | 172.2
 | 186.7 | 190 |
 | Net Profit (\$mill) | 2 |
| APITAL STRUCTURE as of 9/30
 |

 | | | | | 88.4%
 | 38.0% | 37.8% | 36.4% | 23.7%
 | 18.7% | 18.0% | 18.5%
 | Income Tax Rate | 22.0 |
| otal Debt \$1890.2 mill. Due in 5 1
T Debt \$1582.2 mill. LT Interes
 |

 | | | | | 6.0%
 | 7.7% | 9.8% | 10.4% | 10.5%
 | 11.3% | 12.7% | 12.4%
 | Net Profit Margin | 11.8 |
| T interest earned: 4.7x; total inter
 |

 | | | | | 40.1%
59.9%
 | 39.5%
60.5% | 38.7%
61.3% | 37.8%
62.2% | 38.6%
61.4%
 | 37.7%
62.3% | 42.0%
58.0% | 40.0%
60.0%
 | Long-Term Debt Ratio
Common Equity Ratio | 38.0
62.0 |
| overage: 4.7x)
 | ntolo ©7 6 mill

 | | | | | 995.3
 | 3042.9 | 3080.7 | 3153.5 | 3328.1
 | 3415.5 | 3900 | 4085
 | Total Capital (\$mill) | 48 |
| eases, Uncapitalized Annual ren
Pfd Stock None
 | itais \$7.0 mill.

 | | | | | 293.7
 | 3511.9 | 3731.6 | 4007.6 | 4283.7
 | 4565.2 | 4830 | 5060
 | Net Plant (\$mill) | 57 |
| Pension Assets-12/19 \$908.0 mill
 |

 | | | | | 4.4%
 | 4.7% | 5.2% | 5.8% | 5.9%
 | 6.4% | 6.0% | 6.0%
 | Return on Total Cap'l | 6.5 |
| Oblig. \$10
Common Stock 53,096,893 shs.
 | 1001.4 mill.

 | | | | | 6.1%
 | 6.5% | 7.4% | 8.2% | 8.4%
 | 8.8% | 8.5% | 8.0%
 | Return on Shr. Equity | 8.5 |
| is of 10/26/20
 |

 | | | | | 6.1%
 | 6.5% | 7.4% | 8.2% | 8.4%
 | 8.8% | 8.5% | 8.0%
 | Return on Com Equity | 8.5 |
| ARKET CAP: \$4.1 billion (Mid C
 | .,

 | | | | | 3.7%
 | 3.1% | 3.5% | 3.7% | 3.7%
 | 3.8% | 3.5% | 3.0%
 | Retained to Com Eq
All Div'ds to Net Prof | 3.5 |
| URRENT POSITION 2018
 | 2019 9/30/20

 | | | | | 40%
 | 53% | 52% | 55% | 56%
 | 56% | 60% |
 | | 59 |
|
 | 47.6

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illion custon |
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 | | |
 | ONE Gas has around 3,6
of common stock; The Va | |
| (\$MILL.)
Cash Assets 21.3
 | 17.9 6.2

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 | ociates, 7.0%; officers an | |
| (\$MILL.)
Cash Assets 21.3
Dther <u>522.0</u>
 | 488.3 363.5

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 | e, anu i | exas Ga | |
 | 2% (4/20 | Proxy). |
 | ierce H. Norton II. Incor | oorate |
| (\$MILL.) Cash Assets 21.3 Other 522.0 Current Assets 543.3 Accts Payable 174.5
 | 488.3 363.5 506.2 369.7 120.5 65.3

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 | tural gas | supply in | |
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 | 488.3 363.5 506.2 369.7 120.5 65.3 516.5 308.0

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 | 488.3 363.5 506.2 369.7 120.5 65.3 516.5 308.0 235.7 202.4 872.7 575.7

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 | 488.3 363.5 506.2 369.7 120.5 65.3 516.5 308.0 235.7 202.4 872.7 563% stet Est'd '17-'19 575.7 55.7% 563% .0% 7.0% .5% 4.5% .0% 7.5% .5% 5.5% (\$mill.) Full Dec.31 Year 462.4 1539.6 462.4 1539.7 1500 460 464.4 1633.7 452.5 1652.7 452.5 1500 460 1615 St EA .93 3.02 .83 3.25 .96 3.51 .97 3.56 .99 3.70 PAID ^B Full Dec.31 Year .35 1.40

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Schedule DWD-2 Page 9 of 9

		<u>NC.</u> 1		SR			P	ecent Rice	63.7	6 P/E RATI	017.	6 (Traili Media	ng:NMF) an: 18.0)	RELATIVE P/E RATI	0.8	4 YLD	4.1	70	ALU		
IMELIN		Lowered		High: Low:	48.3 29.3	37.8 30.8	42.8 32.9	44.0 36.5	48.5 37.4	55.2 44.0	61.0 49.1	71.2 57.1	82.9 62.3	81.1 60.1	88.0 71.7	88.0 50.6				Price	
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lld's(000)	42195 2005	42039 2006	40679 2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	5 yr. ©VΔI	12.0 UE LINE P	39.8	23-2
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			es per sh		58.
2.79 1.82	2.98 1.90	3.81 2.37	3.87 2.31	4.22 2.64	4.56 2.92	4.11 2.43	4.62 2.86	4.58 2.79	3.12 2.02	3.87 2.35	6.15 3.16	6.16 3.24	6.54 3.43	7.55 4.33	7.12 3.52	5.50 1.44	7.25 3.30		low" per : s per sh 4		9. 5.
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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		Commo	n Shs Out	tst'g E	55.
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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%			'l Div'd Y		2.9
		CTURE a		/20 (rs \$725.)	0 mill	1735.0	1603.3	1125.5	1017.0 52.8	1627.2	1976.4 136.9	1537.3	1740.7	1965.0 214.2	1952.4 184.6	1855.4 88.6		Revenue Net Prof	es (\$mill)	A	32 2
T Debt	\$2478.3		T Interes	st \$120.0		54.0 33.4%	63.8 31.4%	62.6 29.6%	25.0%	84.6 27.6%	31.2%	144.2 32.5%	161.6 32.4%	32.4%	15.7%	12.3%		Income			23.5
Uldi IIIli		werage. a). IX)			3.1% 40.5%	4.0% 38.9%	5.6% 36.1%	5.2% 46.6%	5.2% 55.1%	6.9% 53.0%	9.4% 50.9%	9.3% 50.0%	10.9% 45.7%	9.5% 45.0%	4.8% 49.0%		Net Prof	it Margin rm Debt F	atio .	8.9 45.0
				tals \$8.2	mill.	40.5% 59.5%	56.9% 61.1%	63.9%	40.0% 53.4%	44.9%	47.0%	49.1%	50.0%	45.7% 54.3%	45.0% 55.0%	49.0% 51.0%			n Equity F		45.0 55.0
ension	Assets	-9/19 \$52		blig. \$ 751	1.4 mill.	899.9 884.1	937.7 928.7	941.0 1019.3	1959.0 1776.6	3359.4 2759.7	3345.1 2941.2	3601.9 3300.9	3986.3 3665.2	4155.5 3970.5	4625.6 4352.0	4945 4680		Total Ca Net Plan	pital (\$mi	II)	72 65
	k \$242. n Stock	0 mill. 51,482,4		i v'd \$3.4	mill.	7.4%	8.1%	7.9%	3.3%	3.1%	5.1%	4.9%	5.0%	6.3%	5.1%	3.5%			on Total C	ap'l	5.5
s of 7/3		- , - ,				10.1%	11.1% 11.1%	10.4% 10.4%	5.0% 5.0%	5.6% 5.6%	8.7% 8.7%	8.2% 8.2%	8.1% 8.1%	9.5% 9.5%	7.3% 7.9%	3.5% 3.5%			on Shr. Eq on Com Ec		7.0 7.0
		\$3.3 billio		.,		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	Éq	3.0
(\$MIL	NT POS	ITION	2018		6/30/20	64%	56%	59%	81%	73%	58%	59%	60%	51%	66%	NMF			s to Net F		60
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017 018	.99 2.39	2.36 2.03	.45 .52	d.28 d.51	3.43 4.33	comp	bared	to the	e fiscal	2020) figur	e of \$	1.44.	ly, S	pire's	decei	nt fin	ances	mak	e aco	quis
019	1.32	3.04	d.09	d.74	3.52				rgins v nother					tions fortu							
2020	1.24 1.27	2.54 2.61	d1.87 .20	d.45 d.78	1.44 3.30	the f	ollowi	ing ye	ar.	,			,	ruptu	ires.						
Cal-		ERLY DIV			Full				nditur l \$63		for I millio			The appe							
ndar 2016	Mar.31 .49	Jun.30 .49	Sep.30 .49	Dec.31 .49	Year 1.96	marl	xed a	signif	icant o	decrea	ase fr	om th	e fis-	dend	yield	and	payo	ut gr	owth	prosp	pect
2017	.525	.525	.525	.525	2.10				of \$8 of the												
	.5625	.5625	.5625	.5625	2.25				ocated	to si											
2018 2019	.5925	.5925	.5925	.5925	2.37			re un	oradaa	at t	he 11+	ilitioe	and	Frode	rich 1	, Har	ris II	I Nor	ember	- 27 ·	209
2018 2019 2020	.5925 .6225	.6225	.6225	.5925 .6225 Based o		frast	ructu	-	grades d in early					Frede					ember Il Strengt		202 B++

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

SCHEDULE DWD-3

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

		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	%	%
	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

	[1]	[2]	[3]	[4]	[5]	[6]	[7]
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 (4)	Indicated ROE (6)
Atmos Energy Corporation New Jersey Resources Corporation NiSource, Inc. Northwest Natural Holding Company ONE Gas, Inc. South Jersey Industries, Inc. Southwest Gas Holdings, Inc. Spire Inc.	0.33% 0.38% 0.49% 0.22% 0.27% 0.39% 0.44% 0.71%	0.25% 0.52% 0.39% 0.40% 0.31% 0.82% 0.39% 0.48%	$\begin{array}{c} 0.33\% \\ 0.38\% \\ 0.49\% \\ 0.32\% \\ 0.27\% \\ 0.39\% \\ 0.44\% \\ 0.71\% \end{array}$	2.13052 2.01870 0.72854 1.47770 3.76881 1.59683 1.32031 0.92510	8.75% 9.70% 4.40% 5.90% 12.93% 7.63% 7.11% 8.19%	2.31% 2.31% 2.31% 2.31% 2.31% 2.31% 2.31%	$11.06\% \\ 12.01\% \\ 6.71\% \\ 8.21\% \\ 15.24\% (7) \\ 9.94\% \\ 9.42\% \\ 10.50\%$
						Average Median	<u>9.69%</u> 9.94%
					Average of Mea	an 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) $(1+(Column [3] * Column [4])^{^{12}}) 1.$
- (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.

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

<u>Line No.</u>		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	<u> 10.40 </u> %	%

- 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.

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

Selected Bond Yields - Moody's

[1]	[3]	[4]

	Aaa Rated Corporate Bond	A2 Rated Public Utility Bond	Baa2 Rated Public Utility Bond
Jan-2021 Dec-2020 Nov-2020	2.45 % 2.26 2.30	2.91 % 2.77 2.85	3.19 % 3.05 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

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

Moody's		Standard & Poor's	
Long-Term Issue	er Rating	Long-Term Issuer Rating	
January 20	21	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	А	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	А	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

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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
nda	1	АЛА
Aa1	2	AA+
Aa2	3	AA
Aa3	4	AA-
	_	_
A1	5	A+
A2	6	А
A3	7	A-
D 1	0	
Baa1	8	BBB+
Baa2	9	BBB
Baa3	10	BBB-
Ba1	11	BB+
Ba2	12	BB
Ba3	13	BB-
B1	14	B+
B2	15	В
B2 B3	16	B-
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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	<u> </u>	7.13 %

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

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(2) From page 12 of this Schedule.

(3) From page 13 of this Schedule.

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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 o Eight Natural G Distribution Companies		Results using Cu Interest Rat	
Ibl	botson-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.

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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:

- 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

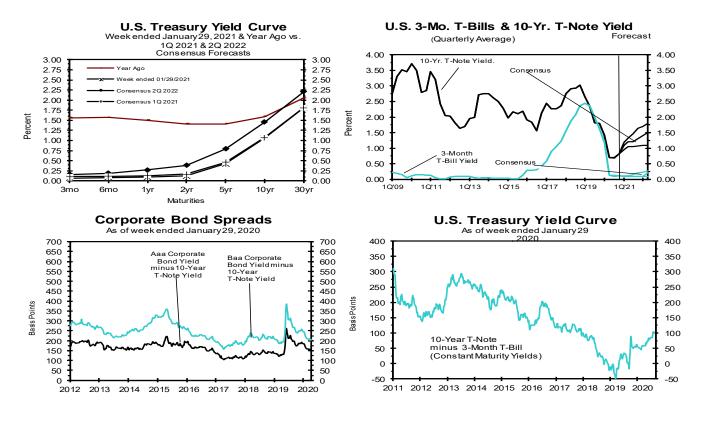
2 ■ BLUE CHIP FINANCIAL FORECASTS ■ FEBRUARY 3, 2021

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

	History				Cons	ensus l	Forecas	sts-Qua	arterly	Avg.				
		erage For							1Q	2Q	3Q	4Q	1Q	$2\mathbf{Q}$
Interest Rates	Jan 22	Jan 15	<u>Jan 8</u>	Jan 1	Dec	Nov	Oct	<u>4Q 2020</u>	<u>2021</u>	<u>2021</u>	<u>2021</u>	<u>2021</u>	<u>2022</u>	<u>2022</u>
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
				Histor	ry				Co	onsensi	is Fore	casts-Q	Juarte	rly
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q
Key Assumptions	2019	2019	2019	2019	2020	2020	2020	2020	<u>2021</u>	<u>2021</u>	<u>2021</u>	<u>2021</u>	<u>2022</u>	<u>2022</u>
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).



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.

			Ave	erage For The \	(ear		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
5 Transmith Dill Vial 4.2 Ma	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 2.0	1.5 2.4	0.8	1.9 2.5
	Top 10 Average Bottom 10 Average	0.3 0.1	0.7 0.1	1.5 0.2	2.0 0.5	2.4 0.7	1.4 0.3	2.5
6. Treasury Bill Yield, 6-Mo	CONSENSUS	0.1	0.1	0.2	0.3 1.3	0.7 1.6	0.3 0.9	2.0
0. Heastry Bill Held, 0-100	Top 10 Average	0.2	0.8	1.6	2.1	2.5	1.5	2.6
	Bottom 10 Average	0.3	0.8	0.3	0.5	0.8	0.4	1.4
7. Treasury Bill Yield, 1-Yr	CONSENSUS	0.3	0.2	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
, j	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
14 State 9 Level Devel Weld	Bottom 10 Average	3.5	3.9	4.1	4.3	4.5	4.1	4.9
14. State & Local Bonds Yield	Top 10 Average	2.8	3.1	3.4	3.6	3.8	3.3	3.9
	Bottom 10 Average	3.1 2.5	3.5 2.8	3.8 2.9	4.1 3.2	4.3 3.4	3.8 2.9	4.3 3.6
15. Home Mortgage Rate	CONSENSUS	2.5 3.2	2.8 3.5	3.9	3.2 4.2	3.4 4.5	3.9	3.0 4.7
15. Home Mongage Rate	Top 10 Average	3.5	3.5 3.9	3.9 4.4	4. 2 4.9	4.5 5.2	3.9 4.4	4. 7 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
	6			Over-Year, % C				Averages
	-	2022	2023	2024	2025	2026	2022-2026	2027-2031
B. Real GDP	CONSENSUS	3.2	2.5	2.3	2.2	2.1	2.4	2.1
	Top 10 Average	3.8	3.0	2.6	2.5	2.4	2.9	2.4
	Bottom 10 Average	2.6	2.1	1.9	1.9	1.8	2.1	1.8
C. GDP Chained Price Index	CONSENSUS	1.9	2.0	2.1	2.1	2.1	2.0	2.1
	Top 10 Average	2.2	2.3	2.3	2.3	2.3	2.3	2.3
	Bottom 10 Average	1.7	1.8	1.9	1.9	1.9	1.8	1.9
D. Consumer Price Index	CONSENSUS	2.1	2.2	2.2	2.1	2.2	2.1	2.2
	Top 10 Average	2.4	2.4	2.4	2.4	2.4	2.4	2.4
	Bottom 10 Average	1.8	1.9	1.9	1.9	1.9	1.9	1.9
E. PCE Price Index	CONSENSUS	1.9	2.0	2.1	2.1	2.1	2.0	2.1
	Top 10 Average	2.2	2.2	2.2	2.2	2.3	2.2	2.4
	Bottom 10 Average	1.7	1.8	1.9	1.9	1.9	1.8	1.9

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<u>Piedmont Natural Gas Company</u> Derivation of Mean Equity Risk Premium Based Studies Using Holding Period Returns and <u>Projected Market Appreciation of the S&P Utility Index</u>

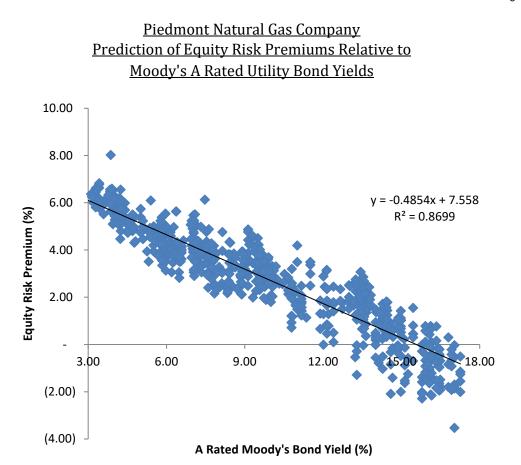
Line No.		Implied Equity Risk Premium	Results using Current Interest Rates
	Equity Risk Premium based on S&P Utility Index Holding Period Returns (1):		
1.	Historical Equity Risk Premium	4.21 %	4.21 %
2.	Regression of Historical Equity Risk Premium	6.83 (2)	7.44 (3)
3.	Forecasted Equity Risk Premium 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.

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Prospective A2 Rated Prospective Utility Bond **Equity Risk** Premium (1)Constant Slope 7.558 % -0.4854 5.83 % 3.56 % **Current A2 Rated Utility Equity Risk** Slope Bond (2) Premium Constant 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

<u>Piedmont Natural Gas Company</u> 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 New Jersey Resources Corporation NiSource, Inc. Northwest Natural Holding Company ONE Gas, Inc. South Jersey Industries, Inc. Southwest Gas Holdings, Inc. Spire Inc.	0.80 0.95 0.85 0.80 1.05 0.95 0.85	0.90 0.97 1.00 0.87 0.99 0.99 1.10 0.97	0.85 0.96 0.93 0.84 0.90 1.02 1.03 0.91	10.42 % 10.42 10.42 10.42 10.42 10.42 10.42 10.42 10.42 10.42	2.31 % 2.31 2.31 2.31 2.31 2.31 2.31 2.31 2.31	11.17 % 12.32 12.00 11.07 11.69 12.94 13.05 11.79	11.56 % 12.42 12.19 11.48 11.95 12.89 12.97 12.03	11.36 % 12.37 12.09 11.27 11.82 12.92 13.01 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 %
		<u>U</u> :	sing Current In	terest 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 New Jersey Resources Corporation NiSource, Inc. Northwest Natural Holding Company ONE Gas, Inc. South Jersey Industries, Inc. Southwest Gas Holdings, Inc. Spire Inc.	0.80 0.95 0.85 0.80 1.05 0.95 0.85	0.90 0.97 1.00 0.87 0.99 0.99 1.10 0.97	0.85 0.96 0.93 0.84 0.90 1.02 1.03 0.91	10.83 % 10.83 10.83 10.83 10.83 10.83 10.83 10.83 10.83 10.83 10.83	1.70%1.701.701.701.701.701.701.70	$\begin{array}{ccc} 10.91 & \% \\ 12.10 \\ 11.77 \\ 10.80 \\ 11.45 \\ 12.75 \\ 12.85 \\ 11.56 \end{array}$	11.31 % 12.20 11.96 11.23 11.72 12.69 12.77 11.80	11.11 % 12.15 11.87 11.01 11.58 12.72 12.81 11.68
Mean			0.93			11.77 %	11.96 %	<u>11.87</u> %
Median			0.92			11.66 %	11.88 %	11.78 %
Average of Mean and Median			0.93			11.72	11.92	<u>11.83</u> %

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 Stock Arithmetic Mean Income Returns on Long-Term C MRP based on Ibbotson Historical Data:		12.10 % 5.09 7.01 %	12.10 % 5.09 7.01 %
Measure 2: Application of a Regression Analysis to (1926-2019)	o Ibbotson Historical Data	9.98 %	10.59 %
Measure 3: Application of the PRPM to Ibbotson F (January 1926 - January 2021)	listorical Data:	<u>10.76</u> %	10.76 %
Value Line MRP Estimates:			
Measure 4: Value Line Projected MRP (Thirteen w	eeks ending January 29, 2021)		
Total projected return on the market 3-5 years he Projected Risk-Free Rate (see note 2): MRP based on Value Line Summary & Index: *Forcasted 3-5 year capital appreciation		9.83 % 2.31 7.52 %	9.83 % 1.70 8.13 %
Measure 5: Value Line Projected Return on the Ma	rket based on the S&P 500		
Total return on the Market based on the S&P 500: Projected Risk-Free Rate (see note 2): MRP based on Value Line data		14.10 % 2.31 11.79 %	14.10 % 1.70 12.40 %
Measure 6: Bloomberg Projected MRP			
Total return on the Market based on the S&P 500: Projected Risk-Free Rate (see note 2):	MRP based on Bloomberg data	17.78 % 2.31 15.47 %	17.78 % 1.70 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	06

(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

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

The criteria for selection of the proxy group of forty-seven non-price regulated companies was that the non-price regulated companies be domestic and reported in <u>Value Line</u> <u>Investment Survey</u> (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:

Standard Deviation of the Std. Err. of the Regr. = 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

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)

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<u>Piedmont Natural Gas Company</u> Basis of Selection of Comparable Risk <u>Domestic Non-Price Regulated Companies</u>

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

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[2]

[3]

[4]

[1]

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 0.07724 Brown-Format Corporation 0.85 0.76 2.6720 0.0667 Brown-Format Corporation 0.85 0.72 2.7392 0.0689 Cadence Design Sys. 0.90 0.82 2.9867 0.0751 Cadence Design Sys. 0.90 0.83 2.7514 0.0680 CSW Industrials 0.85 0.76 2.9154 0.0672 Cadence Design Sys. 0.90 0.83 2.7514 0.0672 Coper Cos. 0.95 0.87 2.6659 0.6672 Coper Cos. 0.95 0.87 2.6659 0.6672	Proxy Group of Forty Seven Non- Price Regulated Companies	VL Adjusted Beta	Unadjusted Beta	Residual Standard Error of the Regression	Standard Deviation of Beta
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 0.0772 Becton, Dickinson, and Co. 0.80 0.67 2.8794 0.0724 Brown-Forman Corporation 0.85 0.76 2.6920 0.06689 Cadence Design Sys. 0.90 0.82 2.9867 0.0751 Corper Cos. 0.95 0.87 2.7913 0.0702 Coper Cos. 0.95 0.87 2.7913 0.0702 Quest Diagnostics 0.90 0.80 2.6677 0.0671 Dilutabs 0.95 0.87 2.6659 0.0670 Exponent, Inc. 0.85 0.76 2.914 0.0733 FirstCash, Inc. 0.85 0.72 2.7087 0.0681 Ingredion Inc. 0.90 0.78 2.9266 0.0736 Ingredion	Abbet Leberatories	0.05	0.01	2 7460	0.0600
Assummer 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 Boox Allen Hamilton 0.90 0.82 3.0724 0.07724 Brown-Forman Corporation 0.85 0.76 2.6920 0.0667 Cadence Design Sys. 0.90 0.82 2.9867 0.0751 Cadence Design Sys. 0.90 0.82 2.9867 0.0751 Cooper Cos. 0.95 0.87 2.6659 0.0670 Cooper Cos. 0.95 0.87 2.6659 0.0670 Cadence Design Sys. 0.90 0.83 2.7514 0.0690 Quest Diagnostics 0.90 0.83 2.7514 0.0670 Exponent, Inc. 0.85 0.76 2.9154 0.0733 FirstCash, Inc. 0.85 0.72 3.1426 0.0790 Genete Corporation 0.95 0.91 2.74844 0.0661					
ANSYS, Inc. 0.85 0.76 2.8279 0.0711 Smith (A.O.) 0.90 0.83 2.7524 0.0772 Booz Allen Hamilton 0.90 0.82 3.0724 0.0772 Becton, Dickinson, and Co. 0.80 0.67 2.8794 0.0772 Brown-Forman Corporation 0.85 0.76 2.6920 0.0677 Brown-Forman Corporation 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 0.87 2.7913 0.0702 Quest Diagnostics 0.90 0.83 2.67514 0.0692 Exponent, Inc. 0.85 0.76 2.9154 0.0733 FirstGash, Inc. 0.85 0.72 3.1426 0.0791 Gentex Corporation 0.95 0.81 3.1117 0.0782 Ingredion Inc. 0.90 0.81 3.1117 0.0782	8				
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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	Northrop Grumman	0.85	0.71	2.8969	0.0728
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	Old Dominion Freight	0.95	0.86	3.0843	0.0775
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	Progressive Corp.	0.80	0.65	2.6455	0.0665
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		0.95	0.92	2.6809	0.0674
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		0.90	0.82	2.9389	0.0739
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	Post Holdings, Inc.	0.95	0.88	2.9687	0.0746
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				2.8807	
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	Starbucks Corporation			2.6496	
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 0.90 0.80 2.8457 0.0715					
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				2.9490	
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 0.00 0.80 0.80 0.815					
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 Image: Comparison of Comparis					
Average0.900.802.84570.0715Proxy Group of Eight Natural Gas					
Proxy Group of Eight Natural Gas	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				
		0.88	0.79	2.8972	0.0728

Valueline Proprietary Database, January 2021

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

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

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.

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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							
[1]	[2]	[3]	[4]	[5]	[6]			

Proxy Group of Forty Seven Non- Price Regulated Companies	Average Dividend Yield	Value Line Projected Five Year Growth in EPS	Zack's Five Year Projected Growth Rate in EPS	Yahoo! Finance Projected Five Year Growth in EPS	Bloomberg Projected Five Year Growth in EPS	Average Projected Five Year Growth Rate in EPS	Adjusted Dividend Yield	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 14.61
Exponent, Inc.	0.88 1.67	11.00 9.50	NA NA	15.00 (0.93)	15.00 NA	13.67 9.50	0.94 1.75	14.61
FirstCash, Inc. Gentex Corporation	1.43	9.50	2.60	15.00	5.86	9.50	1.75	9.73
Hershey Co.	2.15	5.00	7.70	7.78	7.07	6.89	2.22	9.73
Int'l Flavors & Frag	2.13	6.00	3.50	1.88	13.74	6.28	2.22	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 (I.B.)	0.81	6.50	15.00	20.73	17.23	14.87	0.87	15.74
[&] 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 United Parcel Serv.	- 2.44	1.50 8.00	NA 7.90	15.00 9.61	NA 10.23	8.25 8.93	- 2.55	NA 11.48
Waters Corp.	2.44 -	6.00	7.90	9.61 4.90	5.32	8.93 5.33	2.55	11.48 NA
Waters Corp. Western Union	4.09	6.00	NA NA	8.88	11.90	8.93	4.27	13.20
							Mean	12.39 %
							Median	11.54 %

<u>11.97</u>%

Average of Mean and Median

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

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	Indicated Common E Through Use of a Risk		
	Using an Adjusted Total	Market Approach	
<u>Line No.</u>		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 %	<u> 12.43 </u> %

Piedmont Natural Gas Company

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.

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<u>Piedmont Natural Gas Company</u> 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	А	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	А	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. Starbucks Corporation	NA Paa1	8.0	NA		
Starbucks Corporation Selective Ins. Group	Baa1 Baa2	8.0 9.0	BBB+ BBB	8.0 9.0	
Tetra Tech	NA	9.0	NA	9.0	
AMERCO	WR		NA NR		
AMERCO United Parcel Serv.	A2	6.0	NR A-	 7.0	
Waters Corp.	NA	6.0	A- NA	7.0	
Waters Corp. 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

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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 <u>Proxy Group of Eight Natural Gas Distribution Companies</u>

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 <u>Value Line</u> Summary and Index	6.77 (5)	7.41 (6)
5	Equity Risk Premium Based on <u>Value Line</u> S&P 500 Companies	11.04 (7)	11.68 (8)
6.	Equity Risk Premium Based on Bloomberg S&P 500 Companies	(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	<u>8.78</u> %	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

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

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 70	2.31 70	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		0.97	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 0.93	10.42	2.31 2.31	12.32	12.42 12.19	12.37
Cerner Corp. Cooper Cos.	0.95 0.95	0.91 0.93	0.93	10.42 10.42	2.31	12.00 12.11	12.19	12.09 12.19
Cooper Cos. CSW Industrials	0.95	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	12.20	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.) J & J Snack Foods Corp.	0.95 0.90	0.91 0.78	0.93 0.84	10.42 10.42	2.31 2.31	12.00 11.07	12.19 11.48	12.09 11.27
Jack Henry & Associates, Inc		0.78	0.84	10.42	2.31	11.38	11.48	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. PerkinElmer, Inc.	0.80 0.95	0.77 0.85	0.79 0.90	10.42 10.42	2.31 2.31	10.54 11.69	11.09 11.95	10.82 11.82
Pool Corp.	0.90	0.85	0.92	10.42	2.31	11.90	12.11	12.00
Post Holdings, Inc.	0.95	0.91	0.92	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 %
Aver	age of Mea	n and Median	0.92			<u>11.92</u> %	12.12 %	12.07 %

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OFFICIAL COPY

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	
Trocy of oup of Eight Natural das Distribution companies	
Using Current Interest Rates	

		<u>.</u>	Jsing Curren	It fillerest Ka	les			
	[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 (3)	Traditional CAPM Cost Rate	ECAPM Cost Rate	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. Brown-Forman Corporation	0.80 1 0.85	0.62 0.97	0.71 0.91	10.83 10.83	1.70 1.70	9.39 11.56	10.17 11.80	9.78 (5) 11.68
Broadridge Fin'l	0.85	0.97	0.91	10.83	1.70	10.80	11.23	11.00
Cadence Design Sys.	0.05	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. Gentex Corporation	0.80 0.95	0.97 1.05	0.88 1.00	10.83 10.83	1.70 1.70	11.23 12.53	11.56 12.53	11.39 12.53
Hershey Co.	0.93	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		0.90	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. Altria Group	0.85 0.90	0.69 0.87	0.77 0.89	10.83 10.83	1.70 1.70	10.04 11.34	10.66 11.64	10.35 (5) 11.49
MSCI Inc.	0.90	0.87	0.89	10.83	1.70	11.34	11.04	11.49
Motorola Solutions, Inc.	0.90	0.92	0.93	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 0.95	0.67 1.07	0.76 1.01	10.83 10.83	1.70 1.70	9.93 12.64	10.58 12.61	10.26 (5) 12.62
Starbucks Corporation Selective Ins. Group	0.95	0.97	0.91	10.83	1.70	11.56	12.81	11.68
Tetra Tech	0.85	1.02	0.96	10.83	1.70	12.10	12.20	12.15
AMERCO	0.95	1.02	1.02	10.83	1.70	12.75	12.69	12.13
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 %
Ave	rage of Mea	n and Median	0.92			11.68 %	11.89 %	11.84 %

Notes:

From Schedule DWD-4, note 1.
 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

Derivation of Investment Risk Adjustment Based upon Ibbotson Associates' Size Premia for the Decile Portfolios of the NYSE/AMEX/NASDAQ [2] [3] [4]

Line No.			ket Capitalizati 2021	on on January 29, (1)	Applicable Decile of the NYSE/AMEX/ NASDAQ (2)	Applicable Size Premium (3)	Spread from Applicable Size Premium (4)
		(millions)	(times larger)			
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]

[1]

Piedmont Natural Gas Company

-	Decile	Sma	Market Capitalization of Smallest Company (millions)		Market apitalization of urgest 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%.

		Market Capitalizati Proxy Group of	on of Pi		al Gas Co	1 2						
		[1]		[2]		[3]		[4]	[5]			[6]
Company	Exchange	Common Stock Shares Outstanding at Fiscal Year End 2019 (millions)	Sha	k Value per re at Fiscal r End 2019 (1)		Common Equity Fiscal Year End 2019 (millions)	Ма	sing Stock rket Price anuary 29, 2021	Market-to- Book Ratio on January 29, 2021 (2)	_	on	Market apitalization 1 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 Proxy Group of Eight Natural Gas									159.7	(5)	\$	4,004.929 (6)
Distribution Companies												
Atmos Energy Corporation	NYSE	119.339 89.338	\$	48.184 17.369	\$	5,750.223	\$	89.000 35.010	184.7 201.6	%	\$	10,621.164
New Jersey Resources Corporation NiSource, Inc.	NYSE NYSE	382.136		17.369	\$ \$	1,551.717 5,986.700		35.010 22.150	201.6		\$ \$	3,127.725 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

Piedmont Natural Gas Company

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

<u>Piedmont Natural Gas Company</u> Derivation of the Flotation Cost Adjustment to the Cost of Common Equity

Equity Issuances since 2010

		[Column 1]	[Co	olumn 2]	[Co	lumn 3]	[Co	lumn 4]	[Co	olumn 5]	[C	olumn 6]	[Column 7]		[Column 8]		[Column 9]	[Column 10	4
Date of Offering	Transaction (1)	Shares Issued		ket Price er Share	Offe	verage ring Price r Share		larket sure (2)	Exp	l Offering ense per Share		Proceeds Share (3)	oss Equity Issue efore Costs (4)	То	tal Net Proceeds (5)	Т	otal 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%	6
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%	6
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%	6
													\$ 4,942,869,625	\$	4,789,575,300	\$	153,294,325	3.10%	6

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 %	ó <u>5.90</u>	%	<u>3.69</u> %	9.59	%	9.71 %	0.12 %

See page 2 of this Schedule for notes.

Source of Information: Company SEC filings

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Schedule DWD-8 Page 2 of 2

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

- (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

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APPLICATION OF ATMOS ENERGY

CORPORATION FOR AN ADJUSTMENT

Case No. 2021-00214

OF RATES AND TARIFF MODIFICATIONS

DIRECT TESTIMONY OF DYLAN W. D'ASCENDIS

RATE OF RETURN

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Exhibit

Exhibit DWD-1

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1 I. INTRODUCTION AND PURPOSE

2 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.

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

6 A. I am a Partner at ScottMadden, Inc.

7 Q. PLEASE SUMMARIZE YOUR PROFESSIONAL EXPERIENCE AND 8 EDUCATIONAL BACKGROUND.

9 A. I have offered expert testimony on behalf of investor-owned utilities before over 25
10 state regulatory commissions in the United States, the Federal Energy Regulatory
11 Commission, the Alberta Utility Commission, and one American Arbitration
12 Association panel on issues including, but not limited to, common equity cost rate,
13 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.

1		I am also a member of the National Association of Certified Valuation
2		Analysts ("NACVA") and was awarded the professional designation "Certified
3		Valuation Analyst" by the NACVA in 2015.
4		I am a graduate of the University of Pennsylvania, where I received a
5		Bachelor of Arts degree in Economic History. I have also received a Master of
6		Business Administration with high honors and concentrations in Finance and
7		International Business from Rutgers University.
8		The details of my educational background and expert witness appearances
9		are shown in Appendix A.
10	Q.	WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS
11		PROCEEDING?
12	A.	The purpose of my testimony is to present evidence and provide a recommendation
13		regarding Atmos Energy Corporation's ("Atmos Energy" or the "Company") return
14		on common equity ("ROE") for its natural gas distribution operations in Kentucky.
15	Q.	HAVE YOU PREPARED AN EXHIBIT IN SUPPORT OF YOUR
16		RECOMMENDATION?
17	A.	Yes. I have prepared Exhibit No. DWD-1, consisting of Schedules DWD-1 through
18		DWD-8, which were prepared by me or under my direction.
19	Q.	WHAT IS YOUR RECOMMENDED ROE FOR ATMOS ENERGY?
20	A.	I recommend that the Commission authorize Atmos Energy the opportunity to earn
21		an ROE of 10.35% on its rate base. The ratemaking capital structure and cost of
22		long-term debt is sponsored by Company Witness Christian. The overall rate of
23		return is summarized on page 1 of Schedule DWD-1 and in Table 1 below:

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	<u>57.05%</u>	<u>10.35%</u>	<u>5.90%</u>
Total	<u>100.00%</u>		<u>7.66%</u>

Table 1: Summary of Recommended Weighted Average Cost of Capital

2

1

SUMMARY OF TESTIMONY

3

4

Q. PLEASE SUMMARIZE YOUR RECOMMENDED COMMON EQUITY COST RATE.

II.

My recommended common equity cost rate of 10.35% is summarized on page 2 of 5 A. Schedule DWD-1. I have assessed the market-based common equity cost rates of 6 companies of relatively similar, but not necessarily identical, risk to Atmos Energy. 7 Using companies of relatively comparable risk as proxies is consistent with the 8 9 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 10 must be an evaluation of relative risk between the company and the proxy group to 11 12 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).

1 companies comparable in total risk to the Utility Proxy Group ("Non-Price

Regulated Proxy Group"). The results derived from each are as follows:

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	<u>12.42%</u>
Indicated Range	9.44% - 12.42%
Size Adjustment	0.20%
Credit Risk Adjustment	-0.10%
Flotation Cost Adjustment	<u>0.04%</u>
Recommended Range	9.58% - 12.66%
Recommended Cost of Common Equity	<u>10.35%</u>

 Table 2: Summary of Common Equity Cost Rates

The indicated range of common equity cost rates applicable to the Utility 4 Proxy Group is between 9.44% and 12.42% before any Company-specific 5 adjustments. As ROE models are based on market data, the indicated results of the 6 7 models would reflect current and expected capital markets, including the impacts 8 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 9 the Utility Proxy Group companies, and by 0.04% for flotation costs.³ These 10 adjustments resulted in a Company-specific indicated range of common equity cost 11 12 rates between 9.58% and 12.66%.

13The wide range of model results may reflect increased uncertainty related14to the COVID-19 pandemic and unknown timeframe for when economic conditions

3

2

3

See Section VII for a detailed discussion of my cost of common equity adjustments.

1		will normalize as vaccinations ramp up and the public health crises subsides.
2		Because of this uncertainty, I recommend an ROE for the Company toward the
3		lower end of my Company-specific range, specifically 10.35%.
4	Q.	HOW IS THE REMAINDER OF YOUR DIRECT TESTIMONY
5		ORGANIZED?
6	A.	The remainder of my Direct Testimony is organized as follows:
7		• <u>Section III</u> – Provides a summary of financial theory and regulatory principles
8		pertinent to the development of the cost of common equity;
9		• <u>Section IV</u> – Explains my selection of the Utility Proxy Group used to develop
10		my Cost of Common Equity analytical results;
11		• Section V – Describes the analyses on which my Cost of Common Equity
12		recommendation is based;
13		• <u>Section VI</u> – Summarizes my common equity cost rate before adjustments to
14		reflect Company-specific factors;
15		• <u>Section VII</u> – Explains my adjustments to my common equity cost rate to reflect
16		Company-specific factors; and
17		• <u>Section VIII</u> – Presents my conclusions.
18		III. <u>GENERAL PRINCIPLES</u>
19	Q.	WHAT GENERAL PRINCIPLES HAVE YOU CONSIDERED IN
20		ARRIVING AT YOUR RECOMMENDED COMMON EQUITY COST
21		RATE OF 10.35%?
22	A.	In unregulated industries, marketplace competition is the principal determinant of
23		the price of products or services. For regulated public utilities, regulation must act

1	as a substitute for marketplace competition. Assuring that the utility can fulfill its
2	obligations to the public, while providing safe and reliable service at all times,
3	requires a level of earnings sufficient to maintain the integrity of presently invested
4	capital. Sufficient earnings also permit the attraction of needed new capital at a
5	reasonable cost, for which the utility must compete with other firms of comparable
6	risk, consistent with the fair rate of return standards established by the U.S.
7	Supreme Court in the previously cited Hope and Bluefield cases.
8	The U.S. Supreme Court affirmed the fair rate of return standards in Hope,
9	when it stated:
10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26	The rate-making process under the Act, <i>i.e.</i> , 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
27	Consistent with the findings in Hope, the Commission's decision in this
28	proceeding should provide the Company with the opportunity to earn a return that
29	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 3 stand-alone basis, i.e., for the utility operating company at issue in a rate case. 4 When funding is provided by a corporate entity to an operating division or business 5 6 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 7 external investment opportunities. That is, the regulated operating division must 8 compete for capital with all the operating divisions within the corporate entity, and 9 10 with other, similarly situated companies. In that regard, investors value corporate 11 entities on a sum-of-the-parts basis and expect each division within the parent company to provide an appropriate risk-adjusted return. 12

13 It therefore is important that the authorized ROE reflects the risks and 14 prospects of the utility's operations and supports the utility's financial integrity 15 from a stand-alone perspective as measured by their combined business and 16 financial risks. Consequently, the ROE authorized in this proceeding should be 17 sufficient to support the operational (*i.e.*, business risk) and financing (*i.e.*, financial 18 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) 7 is based on the economic principle of "opportunity costs." Investing in any asset 8 (whether debt or equity securities) represents a forgone opportunity to invest in 9 10 alternative assets. For any investment to be sensible, its expected return must be at 11 least equal to the return expected on alternative, comparable risk investment opportunities. Because investments with like risks should offer similar returns, the 12 opportunity cost of an investment should equal the return available on an 13 14 investment of comparable risk.

15 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 16 must be estimated based on market data and various financial models. Because the 17 18 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. 19 In the end, the estimated cost of capital should reflect the return that 20 investors require in light of the subject company's business and financial risks, and 21 2.2 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 3 process should provide the utility a reasonable opportunity to recover its return of, 4 and return on, its prudently incurred investments, but it does not guarantee that 5 6 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 7 maintenance expenses, etc.), there are several factors beyond a utility's control that 8 affect its ability to earn its authorized return. Those may include factors such as 9 weather, the economy, and the prevalence and magnitude of regulatory lag. 10

11 A. <u>Business Risk</u>

12 Q. PLEASE DEFINE BUSINESS RISK AND EXPLAIN WHY IT IS 13 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

1 economic growth, market demand, risks and uncertainties of supply, operations, 2 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, 3 may categorize business risks individually, as a practical matter, such risks are 4 interrelated and not wholly distinct from one another. Therefore, it is difficult to 5 6 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 7 common equity, the relevant issue is where investors see the subject company as 8 falling within a spectrum of risk. To the extent investors view a company as being 9 exposed to high risk, the required return will increase, and vice versa. 10

11 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 12 earnings and cash flow brought about by economic or regulatory factors, long-term 13 14 business risks reflect the prospect of an impaired ability of investors to obtain both 15 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 16 exchange for a reasonable opportunity to earn a fair return on their investment), 17 18 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 19 option to avoid raising external funds during periods of capital market distress, if 20 21 necessary.

22 Because utilities invest in long-lived assets, long-term business risks are of 23 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.

8 B. <u>Financial Risk</u>

9 Q. PLEASE DEFINE FINANCIAL RISK AND EXPLAIN WHY IT IS 10 IMPORTANT IN DETERMINING A FAIR RATE OF RETURN.

Financial risk is the additional risk created by the introduction of debt and preferred 11 A. stock into the capital structure. The higher the proportion of debt and preferred 12 13 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, 14 15 consistent with the basic financial principle of risk and return, common equity 16 investors demand higher returns as compensation for bearing higher financial risk. 17 **Q**. CAN BOND AND CREDIT RATINGS BE A PROXY FOR A FIRM'S **COMBINED BUSINESS AND FINANCIAL RISKS TO EQUITY OWNERS** 18 (I.E., INVESTMENT RISK)? 19

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

1		companies, the same bond/credit rating indicates that the combined risks are
2		roughly similar from a debtholder perspective. The caveat is that these debtholder
3		risk measures do not translate directly to risks for common equity.
4	Q.	DO RATING AGENCIES ACCOUNT FOR COMPANY SIZE IN THEIR
5		BOND RATINGS?
6	A.	No. Neither Standard & Poor's ("S&P") nor Moody's have minimum company
7		size requirements for any given rating level. This means, all else equal, a relative
8		size analysis must be conducted for equity investments in companies with similar
9		bond ratings.
10 11	IV.	ATMOS ENERGY'S KENTUCKY OPERATIONS AND THE UTILITY <u>PROXY GROUP</u>
12	Q.	ARE YOU FAMILIAR WITH ATMOS ENERGY'S OPERATIONS?
13	A.	Yes. Atmos Energy's Kentucky operations serve approximately 183,000
14		customers. ⁶ Atmos Energy's Kentucky gas operations are not publicly-traded as
15		they comprise an operating division of Atmos Energy Corporation ("ATO" or the
16		"Company"), which operates in eight states ⁷ and serves approximately 3.3 million
17		gas ⁸ and is publicly-traded under symbol ATO.
18	Q.	PLEASE EXPLAIN HOW YOU CHOSE THE COMPANIES IN THE
19		UTILITY PROXY GROUP.
20		
	A.	The companies selected for the Utility Proxy Group met the following criteria:
	A.	The companies selected for the Utility Proxy Group met the following criteria:

- ⁶ Atmos Energy Corporation, 2020 SEC Form 10-K, at 4.
- *Ibid.*, In addition to Kentucky, ATO also serves customers in Texas, Louisiana, Mississippi, Virginia, Colorado, Kansas, and Tennessee.
- ⁸ Ibid.

1		(i)	They were included in the Natural Gas Utility Group of Value Line's
2			Standard Edition (Value Line) (May 28, 2021);
3		(ii)	They have 60% or greater of fiscal year 2020 total operating income derived
4			from, and 60% or greater of fiscal year 2020 total assets attributable to,
5			regulated gas distribution operations;
6		(iii)	At the time of preparation of this testimony, they had not publicly
7			announced that they were involved in any major merger or acquisition
8			activity (<i>i.e.</i> , one publicly-traded utility merging with or acquiring another);
9		(iv)	They have not cut or omitted their common dividends during the five years
10			ended 2020 or through the time of preparation of this testimony;
11		(v)	They have Value Line and Bloomberg Professional Services ("Bloomberg")
12			adjusted betas;
13		(vi)	They have positive Value Line five-year dividends per share ("DPS")
14			growth rate projections; and
15		(vii)	They have Value Line, Zacks, Yahoo! Finance, or Bloomberg consensus
16			five-year earnings per share ("EPS") growth rate projections.
17			The following seven companies met these criteria: Atmos Energy
18		Corpo	oration, New Jersey Resources Corp., Northwest Natural Holding Company,
19		One (Gas, Inc., South Jersey Industries, Inc., Southwest Gas Holdings, Inc., and
20		Spire,	Inc.
21	Q.	WHY	IS IT NECESSARY TO DEVELOP A PROXY GROUP WHEN
22		ESTI	MATING THE ROE FOR THE COMPANY?
23	A.	Becau	se the Company is not publicly traded and does not have publicly traded
24		equity	v securities, it is necessary to develop groups of publicly traded, comparable
25		compa	anies to serve as "proxies" for the Company. In addition to the analytical
26		necess	sity of doing so, the use of proxy companies is consistent with the Hope and
27		Bluefi	eld 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 4 results to vary from company to company. Despite the care taken to ensure 5 6 comparability, because no two companies are identical, market expectations regarding future risks and prospects will vary within the proxy group. It therefore 7 is common for analytical results to reflect a seemingly wide range, even for a group 8 9 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 10 11 sound analyses that necessarily must consider the sort of quantitative and qualitative information discussed throughout my Direct Testimony. Additionally, 12 a relative risk analysis between the Company and the Utility Proxy Group must be 13 made to determine whether or not explicit Company-specific adjustments need to 14 be made to the Utility Proxy Group indicated results. 15

16

V. <u>COMMON EQUITY COST RATE MODELS</u>

17 Q. IS IT IMPORTANT THAT COST OF COMMON EQUITY MODELS BE 18 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.

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

Yes. The DCF model uses market prices in developing the model's dividend yield 4 A. component. The RPM uses bond ratings and expected bond yields that reflect the 5 6 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 7 from regression analyses of market prices. The Predictive Risk Premium Model 8 ("PRPM") uses monthly market returns in addition to expectations of the risk-free 9 rate. The CAPM is market based for many of the same reasons that the RPM is 10 11 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 12 market prices and reflect the market's assessment of total risk. 13

14 Q. WHAT ANALYTICAL APPROACHES DID YOU USE TO DETERMINE

15 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

1 constant expected dividend yield and growth rate in perpetuity, while Risk 2 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 3 between interest rates and the cost of common equity. Just as the use of market 4 data for the Utility Proxy Group adds the reliability necessary to inform expert 5 6 judgment in arriving at a recommended common equity cost rate, the use of multiple generally accepted common equity cost rate models also adds reliability 7 and accuracy when arriving at a recommended common equity cost rate. 8

9

A. Discounted Cash Flow Model

10 Q. WHAT IS THE THEORETICAL BASIS OF THE DCF MODEL?

The theory underlying the DCF model is that the present value of an expected future 11 A. stream of net cash flows during the investment holding period can be determined 12 13 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 14 rate, which is derived from the cash flows received from dividends and market price 15 16 appreciation. Mathematically, the dividend yield on market price plus a growth 17 rate equals the capitalization rate; *i.e.*, the total common equity return rate expected by investors as shown below: 18

- 19 $K_e = (D_0 (1+g))/P + g$
- 20 where:
- 21 K_e = the required Return on Common Equity;
- 22 D_0 = the annualized Dividend Per Share;
- 23 P = the current stock price; and
- 24 g =the growth rate.

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1	Q.	WHICH VERSION OF THE DCF MODEL DID YOU USE?
2	A.	I used the single-stage constant growth DCF model in my analyses.
3	Q.	PLEASE DESCRIBE THE DIVIDEND YIELD YOU USED IN APPLYING
4		THE CONSTANT GROWTH DCF MODEL.
5	А.	The unadjusted dividend yields are based on the proxy companies' dividends as of
6		May 28, 2021, divided by the average closing market price for the 60 trading days
7		ended May 28, 2021. ¹⁰
8	Q.	PLEASE EXPLAIN YOUR ADJUSTMENT TO THE DIVIDEND YIELD.
9	А.	Because dividends are paid periodically (e.g. quarterly), as opposed to continuously
10		(daily), an adjustment must be made to the dividend yield. This is often referred to
11		as the discrete, or the Gordon Periodic, version of the DCF model.
12		DCF theory calls for using the full growth rate, or D1, in calculating the
13		model's dividend yield component. Since the companies in the Utility Proxy Group
14		increase their quarterly dividends at various times during the year, a reasonable
15		assumption is to reflect one-half the annual dividend growth rate in the dividend
16		yield component, or $D_{1/2}$. Because the dividend should be representative of the next
17		12-month period, this adjustment is a conservative approach that does not overstate
18		the dividend yield. Therefore, the actual average dividend yields in Column 1, page
19		1 of Schedule DWD-2 have been adjusted upward to reflect one-half the average
20		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.

16 Q. PLEASE SUMMARIZE THE CONSTANT GROWTH DCF MODEL 17 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

- 1 considers all the proxy utilities' results, while mitigating the high and low outliers
- 2 of those individual results.

3

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

4 Q. PLEASE DESCRIBE THE THEORETICAL BASIS OF THE RPM.

5 A. The RPM is based on the fundamental financial principle of risk and return; namely, 6 that investors require greater returns for bearing greater risk. The RPM recognizes 7 that common equity capital has greater investment risk than debt capital, as 8 common equity shareholders are behind debt holders in any claim on a company's 9 assets and earnings. As a result, investors require higher returns from common 10 stocks than from bonds to compensate them for bearing the additional risk.

While it is possible to directly observe bond returns and yields, investors' 11 required common equity returns cannot be directly determined or observed. 12 13 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 14 rate of common equity. The cost of common equity equals the expected cost rate 15 for long-term debt capital, plus a risk premium over that cost rate, to compensate 16 17 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. 18

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-

1		return relationship directly, while the total market approach indirectly derives a risk
2		premium by using known metrics as a proxy for risk.
3		1. The Predictive Risk Premium Model
4	Q.	PLEASE EXPLAIN THE PRPM.
5	А.	The PRPM, published in the Journal of Regulatory Economics, ¹¹ was developed
6		from the work of Robert F. Engle, who shared the Nobel Prize in Economics in
7		2003 "for methods of analyzing economic time series with time-varying volatility
8		("ARCH")". ¹² Engle found that volatility changes over time and is related from
9		one period to the next, especially in financial markets. Engle discovered that
10		volatility of prices and returns cluster over time and is therefore highly predictable
11		and can be used to predict future levels of risk and risk premiums.
12		The PRPM estimates the risk-return relationship directly, as the predicted
13		equity risk premium is generated by predicting volatility or risk. The PRPM is not
14		based on an estimate of investor behavior, but rather on an evaluation of the results
15		of that behavior (<i>i.e.</i> , the variance of historical equity risk premiums).
16		The inputs to the model are the historical returns on the common shares of
17		each Utility Proxy Group company minus the historical monthly yield on long-term
18		U.S. Treasury securities through May 2021. Using a generalized form of ARCH,
19		known as GARCH, I calculated each Utility Proxy Group company's projected
20		equity risk premium using $\operatorname{Eviews}^{\mathbb{C}}$ statistical software. When the GARCH model

 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.

is applied to the historical return data, it produces a predicted GARCH variance

¹² <u>www.nobelprize.org</u>.

21

1		series ¹³ and a GARCH coefficient ¹⁴ . Multiplying the predicted monthly variance
2		by the GARCH coefficient and then annualizing it ¹⁵ produces the predicted annual
3		equity risk premium. I then added the forecasted 30-year U.S. Treasury bond yield
4		of 2.88% ¹⁶ to each company's PRPM-derived equity risk premium to arrive at an
5		indicated cost of common equity. The 30-year U.S. Treasury bond yield is a
6		consensus forecast derived from Blue Chip Financial Forecasts (Blue Chip). ¹⁷ The
7		mean PRPM indicated common equity cost rate for the Utility Proxy Group is
8		11.67%, the median is 11.19%, and the average of the two is 11.43%. Consistent
9		with my reliance on the average of the median and mean results of the DCF models,
10		I relied on the average of the mean and median results of the Utility Proxy Group
11		PRPM to calculate a cost of common equity rate of 11.43%.
12	Q.	PLEASE DESCRIBE YOUR SELECTION OF A RISK-FREE RATE OF
13		RETURN.
14	A.	As shown in Schedules DWD-3 and 4, the risk-free rate adopted for applications of
15		the RPM and CAPM is 2.88%. This risk-free rate is based on the average of the
16		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-

18 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.

10

2. The Total Market Risk Premium Approach

11 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.

17 Q. PLEASE EXPLAIN THE BASIS OF THE EXPECTED BOND YIELD OF 18 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 similarlyrated 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

1	projections for 2023 to 2027, and 2028 to 2032. As shown on line 1, page 3 of
2	Schedule DWD-3, the average expected yield on Moody's Aaa-rated corporate
3	bonds is 3.56%. To derive an expected yield on Moody's A2-rated public utility
4	bonds, I made an upward adjustment of 0.39%, which represents a recent spread
5	between Aaa-rated corporate bonds and A2-rated public utility bonds, in order to
6	adjust the expected Aaa-rated corporate bond yield to an equivalent A2-rated public
7	utility bond yield. ¹⁸ Adding that recent 0.39% spread to the expected Aaa-rated
8	corporate bond yield of 3.56% results in an expected A2-rated public utility bond
9	yield of 3.95%.
10	I then reviewed the average credit rating for the Utility Proxy Group from
11	Moody's to determine if an adjustment to the estimated A2-rated public utility bond
12	was necessary. Since the Utility Proxy Group's average Moody's long-term issuer
13	rating is A2/A3, another adjustment to the expected A2-rated public utility bond is
14	needed to reflect the difference in bond ratings. An upward adjustment of 0.04%,
15	which represents one-sixth of a recent spread between A2-rated and Baa2-rated
16	public utility bond yields, is necessary to make the A2 prospective bond yield
17	applicable to an A2/A3-rated public utility bond. ¹⁹ Adding the 0.04% to the 3.96%
18	prospective A2-rated public utility bond yield results in a 3.99% expected bond
19	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

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 ProjectedBond Yield²⁰

Prospective Yield on Moody's Aaa-Rated Corporate Bonds (<i>Blue Chip</i>)	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	<u>0.04%</u>
Prospective Bond Yield Applicable to the Utility Proxy Group	<u>3.99%</u>

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.

6

1

2

The Beta-Derived Risk Premium

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

9 A. The components of the beta-derived risk premium model are: 1) an expected market 10 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 11 Group is shown on lines 1 through 9, page 8 of Schedule DWD-3. The total beta-12 derived equity risk premium I applied is based on an average of three historical 13 14 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 15 16 below.

- 20
- As shown on page 3 of Schedule DWD-3.

a.

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.

10 SBBI's long-term arithmetic mean monthly total return rate on large 11 company common stocks was 11.94%, and the long-term arithmetic mean monthly 12 yield on Moody's Aaa/Aa-rated corporate bonds was 6.02%.²² As shown on line 1, 13 page 8 of Schedule DWD-3, subtracting the mean monthly bond yield from the 14 total return on large company stocks results in a long-term historical equity risk 15 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 <u>SBBI - 2021</u>.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 <u>SBBI - 2021</u>, 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 <u>constant</u> rate of change, thereby obviating the yearto-year fluctuations, or variance, which is critical to risk analysis.

6 Q. PLEASE EXPLAIN THE DERIVATION OF THE REGRESSION-BASED 7 MARKET EQUITY RISK PREMIUM.

A. To derive the regression-based market equity risk premium of 8.69% shown on line 8 9 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 10 11 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 12 observed monthly market equity risk premium as the dependent variable, and the 13 14 monthly yield on Moody's Aaa/Aa-rated corporate bonds as the independent 15 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-16 rated corporate bonds yield: 17

18 $\mathbf{RP} = \alpha + \beta \left(\mathbf{R}_{\text{Aaa/Aa}} \right)$

19Q.PLEASE EXPLAIN THE DERIVATION OF THE PRPM EQUITY RISK20PREMIUM.

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

6 PREMIUM BASED ON VALUE LINE DATA FOR YOUR RPM ANALYSIS.

As noted above, because both ratemaking and the cost of capital are prospective, a 7 A. prospective market equity risk premium is needed. The derivation of the forecasted 8 9 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 10 11 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 12 Value Line for the 13 weeks ended May 28, 2021, plus an average of the median 13 estimated dividend yield for the common stocks of the 1,700 firms covered in Value 14 Line's Standard Edition.²⁶ 15

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 <u>SBBI - 2021</u>. Data from January 2021 to May 2021 is from Bloomberg.

5

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.

8 Q. PLEASE EXPLAIN THE DERIVATION OF AN EQUITY RISK PREMIUM 9 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.

16 Q. WHAT IS YOUR CONCLUSION OF A BETA-DERIVED EQUITY RISK

17 **PREMIUM FOR USE IN YOUR RPM ANALYSIS?**

- 18 A. I gave equal weight to all six equity risk premiums based on each source historical,
- 19 *Value Line*, and Bloomberg in arriving at a 8.63% equity risk premium.

Table 4: Summary of the Calculation of the Equity Risk Premium UsingTotal Market Returns27

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 <i>Value Line</i> Summary & Index less Projected Aaa Corporate Bond Yields	4.60%
Prospective Equity Risk Premium using Measures of Capital Appreciation and Income Returns from <i>Value Line</i> for the S&P 500 less Projected Aaa Corporate Bond Yields	10.76%
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	<u>12.78%</u>
Average	<u>8.63%</u>

After calculating the average market equity risk premium of 8.63%, I adjusted it by 3 the beta coefficient to account for the risk of the Utility Proxy Group. As discussed 4 below, the beta coefficient is a meaningful measure of prospective relative risk to 5 the market as a whole, and is a logical way to allocate a company's, or proxy 6 7 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 8 9 median beta coefficient for the Utility Proxy Group is 0.93. Multiplying the 0.93 10 average by the market equity risk premium of 8.63% results in a beta-adjusted 11 equity risk premium for the Utility Proxy Group of 8.03%.

27

1 2

As shown on page 8 of Schedule DWD-3.

1		b. The S&P Utility Index Derived Risk Premium
2	Q.	HOW DID YOU DERIVE THE EQUITY RISK PREMIUM BASED ON THE
3		S&P UTILITY INDEX AND MOODY'S A-RATED PUBLIC UTILITY
4		BONDS?
5	A.	I estimated three equity risk premiums based on S&P Utility Index holding period
6		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 7 the S&P Utility Index holding period returns, I derived a long-term monthly 8 9 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 10 1928 to 2020, to arrive at an equity risk premium of 4.16%.²⁸ I then used the same 11 historical data to derive an equity risk premium of 6.37% based on a regression of 12 13 the monthly equity risk premiums. The final S&P Utility Index holding period equity risk premium involved applying the PRPM using the historical monthly 14 15 equity risk premiums from January 1928 to May 2021 to arrive at a PRPM-derived 16 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

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

²⁹ Derived on line 3, page 3 of Schedule DWD-3.

Direct Testimony of Dylan W. D'Ascendis

- (i.e., historical, Value Line, and Bloomberg) to arrive at my utility-specific equity
- 2 risk premium of 5.84%.

1

3

4

Table 5: Summary of the Calculation of the Equity Risk Premium UsingS&P Utility Index Holding Returns30

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 <i>Value Line</i> 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	<u>5.82%</u>
Average	<u>5.84%</u>

5		c. <u>Authorized Return-Derived Equity Risk Premium</u>
6	Q.	HOW DID YOU DERIVE AN EQUITY RISK PREMIUM OF 5.64% BASED
7		ON AUTHORIZED ROES FOR GAS DISTRIBUTION UTILITIES?
8	A.	The equity risk premium of 5.64% shown on line 3, page 7 of Schedule DWD-3 is
9		the result of a regression analysis based on regulatory awarded ROEs related to the
10		yields on Moody's A-rated public utility bonds. That analysis is shown on page 13
11		of Schedule DWD-3 which contains the graphical results of a regression analysis
12		of 800 rate cases for gas distribution utilities which were fully litigated during the
13		period from January 1, 1980 through May 28, 2021. It shows the implicit equity
14		risk premium relative to the yields on A-rated public utility bonds immediately prior
15		to the issuance of each regulatory decision. It is readily discernible that there is an
16		inverse relationship between the yield on A-rated public utility bonds and equity
17		risk premiums. In other words, as interest rates decline, the equity risk premium

³⁰ As shown on page 12 of Schedule DWD-3.

1	rises a	and vice versa, a result consistent with financial literature on the second	ubject. ³¹ I
2	used t	the regression results to estimate the equity risk premium application	able to the
3	projec	eted yield on Moody's A2-rated public utility bonds of 3.95%.	Given the
4	expect	ted A-rated utility bond yield of 3.95%, it can be calculated that the	e indicated
5	equity	risk premium applicable to that bond yield is 5.64%, which is sho	wn on line
6	3, page	e 7 of Schedule DWD-3.	
- 0	XX7TT A 7	T IS NOTE CONCLUSION OF AN EQUITY DISK PREM	

7 Q. WHAT IS YOUR CONCLUSION OF AN EQUITY RISK PREMIUM FOR

8 USE IN YOUR TOTAL MARKET APPROACH RPM ANALYSIS?

- 9 A. The equity risk premium I apply to the Utility Proxy Group is 6.50%, which is the
- 10 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

13 Q. WHAT IS THE INDICATED RPM COMMON EQUITY COST RATE

14 **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
- 17 RPM.
- 18

Table 6: Summary of the Total Market Return Risk Premium Model³³

Prospective Moody's A2/A3-Rated Utility Bond Applicable to the Utility Proxy Group	3.99%
Prospective Equity Risk Premium	<u>6.50%</u>
Indicated Cost of Common Equity	<u>10.49%</u>

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

Q. WHAT ARE THE RESULTS OF YOUR APPLICATION OF THE PRPM

2 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%).

6

C. <u>The Capital Asset Pricing Model</u>

7 Q. PLEASE EXPLAIN THE THEORETICAL BASIS OF THE CAPM.

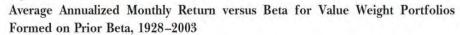
A. CAPM theory defines risk as the co-variability of a security's returns with the
market's returns as measured by the beta coefficient (β). A beta coefficient less
than 1.0 indicates lower variability than the market as a whole, while a beta
coefficient greater than 1.0 indicates greater variability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

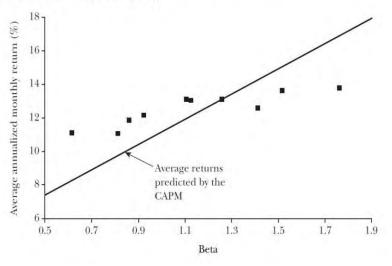
The CAPM assumes that all non-market or unsystematic risk can be 12 13 eliminated through diversification. The risk that cannot be eliminated through diversification is called market, or systematic, risk. In addition, the CAPM 14 presumes that investors only require compensation for systematic risk, which is the 15 16 result of macroeconomic and other events that affect the returns on all assets. The 17 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 18 relative to the total market as measured by the beta coefficient. The traditional 19 CAPM model is expressed as: 20

	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
	Where:	Where: Rs Rf	Where: $R_s = R_f =$

1	β = Adjusted beta coefficient (volatility of the
2	security relative to the market as a whole)
3	Numerous tests of the CAPM have measured the extent to which security
4	returns and beta coefficients are related as predicted by the CAPM, confirming its
5	validity. The empirical CAPM ("ECAPM") reflects the reality that while the results
6	of these tests support the notion that the beta coefficient is related to security
7	returns, the empirical Security Market Line ("SML") described by the CAPM
8	formula is not as steeply sloped as the predicted SML. ³⁴
9	The ECAPM reflects this empirical reality. Fama and French clearly state
10	regarding Figure 2, below, that "[t]he returns on the low beta portfolios are too high,
11	and the returns on the high beta portfolios are too low." ³⁵

Figure 2 http://pubs.aeaweb.org/doi/pdfplus/10.1257/0895330042162430





12

 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).

1		In addition, Morin observes that while the results of these tests support the
2		notion that beta is related to security returns, the empirical SML described by the
3		CAPM formula is not as steeply sloped as the predicted SML. Morin states:
4		With four executions, the empirical studies egree that low beta
4 5		With few exceptions, the empirical studies agree that low-beta securities earn returns somewhat higher than the CAPM would
6		predict, and high-beta securities earn less than predicted. ³⁶
7		* * *
8		Therefore, the empirical evidence suggests that the expected return
9		on a security is related to its risk by the following approximation:
10		$K = R_F + x \beta(R_M - R_F) + (1-x) \beta(R_M - R_F)$
11		where x is a fraction to be determined empirically. The value of x
12		that best explains the observed relationship [is] Return = $0.0829 +$
13		0.0520 β is between 0.25 and 0.30. If x = 0.25, the equation
14		becomes:
15		$K = R_F + 0.25(R_M - R_F) + 0.75 \ \beta (R_M - R_F)^{37}$
16		Fama and French provide similar support for the ECAPM when they state:
17		The early tests firmly reject the Sharpe-Lintner version of the
18		CAPM. There is a positive relation between beta and average return,
19		but it is too 'flat.' The regressions consistently find that the
20		intercept is greater than the average risk-free rate and the
21		coefficient on beta is less than the average excess market return
22		This is true in the early tests as well as in more recent cross-
23		section regressions tests, like Fama and French (1992). ³⁸
24		Finally, Fama and French further note:
25		Confirming earlier evidence, the relation between beta and average
26		return for the ten portfolios is much flatter than the Sharpe-Linter
27		CAPM predicts. The returns on low beta portfolios are too high,
28		and the returns on the high beta portfolios are too low. For example,
29		the predicted return on the portfolio with the lowest beta is 8.3
30		percent per year; the actual return as 11.1 percent. The predicted
31		return on the portfolio with the t beta is 16.8 percent per year; the
32		actual is 13.7 percent. ³⁹
	36	Morin at 175
	37	Morin, at 175. Morin, at 190.
	38	Fama & French, at 32.
	39	<i>Ibid.</i> , at 33.

1 2		Clearly, the justification from Morin, Fama, and French, along with their
3		reviews of other academic research on the CAPM, validate the use of the ECAPM.
4		In view of theory and practical research, I have applied both the traditional CAPM
5		and the ECAPM to the companies in the Utility Proxy Group and averaged the
6		results.
7	Q.	WHAT BETA COEFFICIENTS DID YOU USE IN YOUR CAPM
8		ANALYSIS?
9	A.	For the beta coefficients in my CAPM analysis, I considered two sources: Value
10		Line and Bloomberg Professional Services. While both of those services adjust
11		their calculated (or "raw") beta coefficients to reflect the tendency of the beta
12		coefficient to regress to the market mean of 1.00, Value Line calculates the beta
13		coefficient over a five-year period, while Bloomberg calculates it over a two-year
14		period.
15	Q.	PLEASE DESCRIBE YOUR SELECTION OF A RISK-FREE RATE OF
16		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 7 deducted from the SBBI - 2021 monthly historical total market return of 12.20%, 8 which results in an historical market equity risk premium of 7.15%.⁴⁰ I applied a 9 linear OLS regression to the monthly annualized historical returns on the S&P 500 10 11 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%. 12 The PRPM market equity risk premium is 10.04% and is derived using the PRPM 13 relative to the yields on long-term U.S. Treasury securities from January 1926 14 through May 2021. 15

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).

- 1The S&P 500 projected market equity risk premium using Bloomberg data2is derived by subtracting the projected risk-free rate of 2.88% from the projected3total return of the S&P 500 of 16.34%. The resulting market equity risk premium4is 13.46%. These six measures, when averaged, result in an average total market5equity risk premium of 9.46%.6Table 7: Summary of the Calculation of the Market Risk Premium for Use in
- 7

Table 7: Summary of the Calculation of the Market Risk Premium for Use inthe CAPM41

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 <i>Value Line</i> 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	<u>13.46%</u>
Average	<u>9.46%</u>

8 Q. WHAT ARE THE RESULTS OF YOUR APPLICATION OF THE 9 TRADITIONAL AND EMPIRICAL CAPM TO THE UTILITY PROXY 10 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.

1 2

D.

<u>Common Equity Cost Rates for a Proxy Group of Domestic, Non-Price Regulated Companies Based on the DCF, RPM, and CAPM</u>

3 Q. WHY DO YOU ALSO CONSIDER A PROXY GROUP OF DOMESTIC,

4 NON-PRICE REGULATED COMPANIES?

5 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 6 7 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 8 9 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 10 11 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 12 capital in the exact same markets. 13

14 Q. HOW DID YOU SELECT NON-PRICE REGULATED COMPANIES THAT

15ARE COMPARABLE IN TOTAL RISK TO THE UTILITY PROXY16GROUP?

In order to select a proxy group of domestic, non-price regulated companies similar 17 A. in total risk to the Utility Proxy Group, I relied on the beta coefficients and related 18 statistics derived from Value Line regression analyses of weekly market prices over 19 the most recent 260 weeks (i.e., five years). These selection criteria resulted in a 20 21 proxy group of 48 domestic, non-price regulated firms comparable in total risk to 22 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, 23 24 non-price regulated firms was:

1		(i)	They must be covered by Value Line Investment Survey (Standard
2			Edition);
3		(ii)	They must be domestic, non-price regulated companies, <i>i.e.</i> , not utilities;
4		(iii)	Their beta coefficients must lie within plus or minus two standard deviations
5			of the average unadjusted beta coefficients of the Utility Proxy Group; and
6		(iv)	The residual standard errors of the Value Line regressions which gave rise
7			to the unadjusted beta coefficients must lie within plus or minus two
8			standard deviations of the average residual standard error of the Utility
9			Proxy Group.
10			Beta coefficients measure market, or systematic, risk, which is not
11		divers	sifiable. The residual standard errors of the regressions measure each firm's
12		comp	any-specific, diversifiable risk. Companies that have similar beta coefficients
13		and s	imilar residual standard errors resulting from the same regression analyses
14		have s	similar total investment risk.
15	Q.	HAV	E YOU PREPARED AN SCHEDULE WHICH SHOWS THE DATA
16		FRO	M WHICH YOU SELECTED THE 48 DOMESTIC, NON-PRICE
17		REG	ULATED COMPANIES THAT ARE COMPARABLE IN TOTAL RISK
18		TO T	HE UTILITY PROXY GROUP?
19	A.	Yes, the	he basis of my selection and both proxy groups' regression statistics are shown
20		in Scł	nedule DWD-5.
21	Q.	DID	YOU CALCULATE COMMON EQUITY COST RATES USING THE
22		DCF	MODEL, RPM, AND CAPM FOR THE NON-PRICE REGULATED
23		PRO	XY GROUP?
24	А.	Yes.	Because the DCF model, RPM, and CAPM have been applied in an identical
25		mann	er as described above, I will not repeat the details of the rationale and

1		application of each model. One exception is in the application of the RPM, where
2		I did not use public utility-specific equity risk premiums, nor did I apply the PRPM
3		to the individual non-price regulated companies.
4		Page 2 of Schedule DWD-6 derives the constant growth DCF model
5		common equity cost rate. As shown, the indicated common equity cost rate, using
6		the constant growth DCF for the Non-Price Regulated Proxy Group comparable in
7		total risk to the Utility Proxy Group, is 12.83%.
8		Pages 3 through 5 of Schedule DWD-6 contain the data and calculations
9		that support the 12.49% RPM common equity cost rate. As shown on line 1, page
10		3 of Schedule DWD-6, the consensus prospective yield on Moody's Baa-rated
11		corporate bonds for the six quarters ending in the third quarter of 2022, and for the
12		years 2023 to 2027 and 2028 to 2032, is 4.46%. ⁴²
13		When the beta-adjusted risk premium of 8.03% ⁴³ relative to the Non-Price
14		Regulated Proxy Group is added to the prospective Baa2-rated corporate bond yield
15		of 4.46%, the indicated RPM common equity cost rate is 12.49%.
16		Page 6 of Schedule DWD-6 contains the inputs and calculations that support
17		my indicated CAPM/ECAPM common equity cost rate of 11.69%.
18	Q.	HOW IS THE COST RATE OF COMMON EQUITY BASED ON THE NON-
19		PRICE REGULATED PROXY GROUP COMPARABLE IN TOTAL RISK
20		TO THE UTILITY PROXY GROUP?
21	А.	As shown on page 1 of Schedule DWD-6, the results of the common equity models
22		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.

1	total risk to the Utility Proxy Group are as follows: 12.83% (DCF), 12.49%
2	(RPM), and 11.69% (CAPM). The average of the mean and median of these models
3	is 12.42%, which I used as the indicated common equity cost rates for the Non-
4	Price Regulated Proxy Group.

VI. <u>CONCLUSION OF COMMON EQUITY COST RATE BEFORE</u> <u>ADJUSTMENTS</u>

7 Q. WHAT ARE THE INDICATED COMMON EQUITY COST RATES 8 BEFORE ADJUSTMENTS?

9 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 10 rates before any relative risk adjustment is between 9.44% and 12.42%. The spread 11 between the high and low values in the range (298 basis points) indicates that there 12 13 is still a fair amount of uncertainty around the recovery from the COVID-19 14 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 15 so inherently precise that it can be relied on to the exclusion of other theoretically 16 sound models. Using multiple models adds reliability to the estimated common 17 18 equity cost rate, with the prudence of using multiple cost of common equity models 19 supported in both the financial literature and regulatory precedent.

5

6

1 VII. ADJUSTMENTS TO THE COMMON EQUITY COST RATE

2 A. <u>Size Adjustment</u>

3 Q. DOES ATMOS ENERGY'S SMALLER SIZE RELATIVE TO THE 4 UTILITY PROXY GROUP COMPANIES INCREASE ITS BUSINESS 5 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.
- 9 Size affects business risk because smaller companies generally are less able 10 to cope with significant events that affect sales, revenues and earnings. For 11 example, smaller companies face more risk exposure to business cycles and 12 economic conditions, both nationally and locally. Additionally, the loss of revenues 13 from a few larger customers would have a greater effect on a small company than 14 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</u> of Capital - Market Results through 2019 (D&P - 2020) 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

1 2	size has been shown to be a <i>predictor</i> of equity returns. In other words, there is a significant (negative) relationship between size and
3	historical equity returns - as size <i>decreases</i> , returns tend to <i>increase</i> ,
4	and vice versa. (footnote omitted) (emphasis in original) ⁴⁴
5	Furthermore, in "The Capital Asset Pricing Model: Theory and Evidence,"
6	Fama and French note size is indeed a risk factor which must be reflected when
7	estimating the cost of common equity. On page 14, they note:
8	the higher average returns on small stocks and high book-to-
9	market stocks reflect unidentified state variables that produce
10	undiversifiable risks (covariances) in returns not captured in the
11	market return and are priced separately from market betas. ⁴⁵
12	Based on this evidence, Fama and French proposed their three-factor model
13	which includes a size variable in recognition of the effect size has on the cost of
14	common equity.
15	Also, it is a basic financial principle that the use of funds invested, and not
16	the source of funds, is what gives rise to the risk of any investment. ⁴⁶ Eugene
17	Brigham, a well-known authority, states:
18	A number of researchers have observed that portfolios of small-
19	firms (sic) have earned consistently higher average returns than
20	those of large-firm stocks; this is called the "small-firm effect." On
21	the surface, it would seem to be advantageous to the small firms to
22	provide average returns in a stock market that are higher than those
23	of larger firms. In reality, it is bad news for the small firm; what the
24	small-firm effect means is that the capital market demands
25	higher returns on stocks of small firms than on otherwise similar
26	stocks of the large firms. $(emphasis added)^{47}$

⁴⁴ Duff & Phelps <u>Valuation Handbook – U.S. Guide to Cost of Capital</u>, 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., <u>Principles of Corporate Finance</u> (McGraw-Hill Book Company, 1996), at 204-205, 229.

⁴⁷ Brigham, Eugene F., <u>Fundamentals of Financial Management, Fifth Edition</u> (The Dryden Press, 1989), at 623.

1	Consistent with the financial principle of risk and return discussed above,
2	increased relative risk due to small size must be considered in the allowed rate of
3	return on common equity. Therefore, the Commission's authorization of a cost rate
4	of common equity in this proceeding must appropriately reflect the unique risks of
5	Atmos Energy, including its small size, which is justified and supported above by
6	evidence in the financial literature.

7 Q. IS THERE A WAY TO QUANTIFY A RELATIVE RISK ADJUSTMENT DUE

8 TO ATMOS ENERGY'S SMALL SIZE RELATIVE TO THE UTILITY 9 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 andthe Utility Proxy Group

	Market <u>Capitalization*</u> (\$ Millions)	Times Greater than <u>The Company</u>
Atmos Energy Utility Proxy Group *From page 1 of Schedule DWD-7.	\$597.101 \$4,615.314	7.7x

16	Atmos Energy's estimated market capitalization was \$597.101 million as of
17	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.

14 15 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 4 equity cost rates between 9.44% to 12.42% to reflect Atmos Energy's greater risk 5 6 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 7 NASDAQ listed companies ranked by deciles for the 1926 to 2020 period. The 8 average size premium for the Utility Proxy Group with a market capitalization of 9 \$4.6 billion falls in the 4th decile, while the Company's estimated market 10 capitalization of \$597.101 million places it in the 8th decile. The size premium 11 spread between the 4th decile and the 8th decile is 0.71%. Even though a 0.71% 12 upward size adjustment is indicated, I applied a size premium of 0.20% to the 13 14 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.

6

B. <u>Credit Risk Adjustment</u>

7 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%.

1

C. Flotation Cost Adjustment

2 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.

8 Q. WHY IS IT IMPORTANT TO RECOGNIZE FLOTATION COSTS IN THE

- 9 ALLOWED COMMON EQUITY COST RATE?
- 10 A. It is important because there is no other mechanism in the ratemaking paradigm
- 11 through which such costs can be recognized and recovered. Because these costs
- 12 are real, necessary, and legitimate, recovery of these costs should be permitted. As
- 13 noted by Morin:
- 14The costs of issuing these securities are just as real as operating and15maintenance expenses or costs incurred to build utility plants, and16fair regulatory treatment must permit recovery of these costs....
- 17The simple fact of the matter is that common equity capital is not18free....[Flotation costs] must be recovered through a rate of return19adjustment.⁵²

20 Q. SHOULD FLOTATION COSTS BE RECOGNIZED ONLY IF THERE WAS

21 AN ISSUANCE DURING THE TEST YEAR OR THERE IS AN IMMINENT

22 **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.

1 rate. Flotation costs are charged to capital accounts and are not expensed on a 2 utility's income statement. As such, flotation costs are analogous to capital investments, albeit negative, reflected on the balance sheet. Recovery of capital 3 investments relates to the expected useful lives of the investment. Since common 4 equity has a very long and indefinite life (assumed to be infinity in the standard 5 6 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 7 test year, or in the absence of an expected imminent issuance of additional shares 8 of common stock. 9

Historical flotation costs are a permanent loss of investment to the utility 10 11 and should be accounted for. When any company, including a utility, issues common stock, flotation costs are incurred for legal, accounting, printing fees and 12 the like. For each dollar of issuing market price, a small percentage is expensed 13 and is permanently unavailable for investment in utility rate base. Since these 14 expenses are charged to capital accounts and not expensed on the income statement, 15 the only way to restore the full value of that dollar of issuing price with an assumed 16 investor required return of 10% is for the net investment, \$0.95, to earn more than 17 18 10% to net back to the investor a fair return on that dollar. In other words, if a 19 company issues stock at \$1.00 with 5% in flotation costs, it will net \$0.95 in 20 investment. Assuming the investor in that stock requires a 10% return on his or her

- 1 invested \$1.00 (*i.e.*, a return of \$0.10), the company needs to earn approximately
- 2 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.

13 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, <u>Intermediate Financial Management</u>, 9th Edition, Thomson/Southwestern, at p. 342.

⁵⁴ Morin, at pp. 327-30.

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VIII. CONCLUSION 1 WHAT IS YOUR RECOMMENDED ROE FOR ATMOS ENERGY? 2 Q. Given the indicated ROE range applicable to the Utility Proxy Group of 9.44% to 3 A. 12.42% and the Company-specific ROE range of 9.58% to 12.42%, I conclude that 4 an appropriate ROE for the Company is 10.35%. 5 IN YOUR OPINION, IS YOUR PROPOSED ROE OF 10.35% FAIR AND Q. 6 **REASONABLE TO ATMOS ENERGY AND ITS CUSTOMERS?** 7 Yes, it is. 8 A. 9 Q. **DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?**

10 A. Yes, it does.

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COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

IN THE MATTER OF RATE APPLICATION OF ATMOS ENERGY CORPORATION

Case No. 2021-00214

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.

W. D'Ascendis Vlan

STATE OF NEW JERSEY COUNTY OF BURLINGTON

SUBSCRIBED AND SWORN to before me by Dylan W. D'Ascendis on this the ______ HHM day of June, 2021.

Margaret A Clancy Notary Public of New Jersey My Commission Expires 6/9/2024

Margaret a Notary Public

My Commission Expires: 692024

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
- Financial Modeling Valuation
- Regulatory Strategy
- Capital Market Risk
 - Rate Case Support

Recent Expert Testimony Submission/Appearances

Jurisdiction

- Massachusetts Department of Public Utilities
- New Jersey Board of Public Utilities
- Hawaii Public Utilities Commission
- South Carolina Public Service Commission
- American Arbitration Association

- Cost of Service Rate Design

Rate of Return

Topic

Rate of Return Rate of Return Cost of Service, Rate Design Return on Common Equity 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 Al	Regulatory Commission of Alaska					
		Alaska Power Company; Goat Lake	Tariff Nos. TA886-2; TA6-521;			
Alaska Power Company	09/20	Hydro, Inc.; BBL Hydro, Inc.	TA4-573	Capital Structure		
Alaska Power Company	07/16	Alaska Power Company	Docket No. TA857-2	Rate of Return		
Alberta Utilities Commission	1		1	1		
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 Commis	sion					
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 Com	mission	•		·		
CenterPoint Energy Resources Corp.	05/21	CenterPoint Arkansas Gas	Docket No. 21-004-U	Return on Equity		
Colorado Public Utilities Com	mission					
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 Com	mission					
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 o	f the Distr	ict of Columbia	1	1		
Washington Gas Light Company	09/20	Washington Gas Light Company	Formal Case No. 1162	Rate of Return		
Federal Energy Regulatory Co	ommissio	1		•		
LS Power Grid California, LLC	10/20	LS Power Grid California, LLC	Docket No. ER21-195-000	Rate of Return		
Florida Public Service Comm	1	1	I	1		
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		



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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 Commissio							
Utility Services of Illinois, Inc.	02/21	Utility Services of Illinois, Inc.	Docket No. 21-0198	Rate of Return			
Ameren Illinois Company	02/21	Ameren Illinois Company d/b/a	DUCKCT NO. 21-0170				
d/b/a Ameren Illinois	07/20	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 Co	mmission						
		Aqua Indiana, Inc. Aboite					
Aqua Indiana, Inc.	03/16	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 Commis	sion			•			
Atmos Energy	07/19	Atmos Energy	19-ATMG-525-RTS	Rate of Return			
Kentucky Public Service Com	mission						
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 Con		company	2020 00270				
Southwestern Electric Power		Southwestern Electric Power					
Company	12/20	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 Com	nmission						
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 o							
	1			Rate of Return			
Unitil Corporation	12/19	Fitchburg Gas & Electric Co. (Elec.)	D.P.U. 19-130				
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 Co							
Northern States Power	<u> </u>						
Company	11/20	Northern States Power Company	Docket No. E002/GR-20-723	Rate of Return			
Mississippi Public Service Co	ommissior	1					
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		Raccoon Creek Utility Operating		
Operating Company, Inc.	09/16	Company, Inc.	Docket No. SR-2016-0202	Rate of Return
Public Utilities Commission of	f Nevada		1	
Southwest Gas Corporation	08/20	Southwest Gas Corporation	Docket No. 20-02023	Return on Equity
New Hampshire Public Utilitie	es Commis	ssion		-
Aquarion Water Company of		Aquarion Water Company of New		
New Hampshire, Inc.	12/20	Hampshire, Inc.	Docket No. DW 20-184	Rate of Return
New Jersey Board of Public L	1	Γ		
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	n Commis	sion		· ·
Southwestern Public Service		Southwestern Public Service		
Company	01/21	Company	Case No. 20-00238-UT	Return on Equity
North Carolina Utilities Comm	nission			
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	Commissi			
Northern States Power				
Company	11/20	Northern States Power Company	Case No. PU-20-441	Rate of Return
Public Utilities Commission of	of Ohio			
Aqua Ohio, Inc.	05/16	Aqua Ohio, Inc.	Docket No. 16-0907-WW-AIR	Rate of Return
Pennsylvania Public Utility Co	ommissio	n		
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



KyPSC Case No. 2021-00190 STAFF-DR-03-010(b) Attachment Page 59 of 86 Resume & Testimony Listing of: Dylan W. D'Ascendis, CRRA, CVA Partner

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	e Commis	sion		
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 Com	mission			
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 Co	mmission	l i i i i i i i i i i i i i i i i i i i		
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

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Exhibit DWD-1 Schedule DWD-1.1

Atmos Energy Corporation Recommended Capital Structure and Cost Rates <u>for Ratemaking Purposes</u>

Type Of Capital	Ratios (1)	Cost Rate	Weighted Cost Rate
Long-Term Debt Short-Term Debt Common Equity	42.77% 0.18% 57.05%	4.00% (1) 25.17% (1) 10.35% (2)	1.71% 0.05% 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

<u>Atmos Energy Corporation</u> <u>Brief Summary of Common Equity Cost Rate</u>

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:	 From page 1 of Schedule DWD-2. From page 1 of Schedule DWD-3. From page 1 of Schedule DWD-4. From page 1 of Schedule DWD-6. Adjustment to reflect the Company's greater business risk due 	

- 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.

	Indicated	Common Equity C	ost Rate Using the	-	Flow Model fo	or the		
		Proxy Group of	Seven Natural Ga	s Distribution Con	npanies_			
	[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 a	nd Median	9.44_%

Atmos Energy Corporation

NMF= Not Meaningful Figure

NA= Not Available

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

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> Exhibit DWD-1 Schedule DWD-3.1

<u>Atmos Energy Corporation</u> Summary of Risk Premium Models for the <u>Proxy Group of Seven Natural Gas Distribution Companies</u>

		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)		%
	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]
	LT Average	Spot			Predicted		
Proxy Group of Seven Natural Gas	Predicted	Predicted	Recommended	GARCH	Risk	Risk-Free	Indicated
Distribution Companies	Variance	Variance	Variance (2)	Coefficient	Premium (3)	Rate (4)	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) $(1+(Column [3] * Column [4])^{12}) 1.$
- (4) From note 2 on page 2 of Schedule DWD-4.
- (5) Column [5] + Column [6].

<u>Atmos Energy Corporation</u> Indicated Common Equity Cost Rate Through Use of a Risk Premium Model <u>Using an Adjusted Total Market Approach</u>

<u>Line No.</u>		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.

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Exhibit DWD-1 Schedule DWD-3.4

Atmos Energy Corporation Interest Rates and Bond Spreads for Moody's Corporate and Public Utility Bonds Selected Bond Yields - Moody's [1] [2] [3] [4] Baa2 Rated Aa2 Rated Public A2 Rated Public Aaa Rated **Public Utility** Utility Bond Corporate Bond Utility Bond 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

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Exhibit DWD-1 Schedule DWD-3.5

<u>Atmos Energy Corporation</u> Comparison of Long-Term Issuer Ratings for <u>Proxy Group of Seven Natural Gas Distribution Companies</u>

	Мо	oody's	Standard & Poor's		
	Long-Term	Issuer Rating	Long-Term Issuer Rating May 2021		
	Ма	y 2021			
	Long-Term		Long-Term		
Proxy Group of Seven Natural Gas	Issuer	Numerical	Issuer Rating	Numerical	
Distribution Companies	Rating (1)	Weighting (2)	(1)	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

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Exhibit DWD-1 Schedule DWD-3.6

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	А
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	В
B3	16	B-

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

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> Exhibit DWD-1 Schedule DWD-3.7

<u>Atmos Energy Corporation</u> Judgment of Equity Risk Premium for <u>Proxy Group of Seven Natural Gas Distribution Companies</u>

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. 	

(2) From page 12 of this Schedule.(3) From page 13 of this Schedule.

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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 <u>Proxy Group of Seven Natural Gas Distribution Companies</u>

		Proxy Group of Seven Natural Gas Distribution
<u>Line No.</u>	Equity Risk Premium Measure	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.

Exhibit DWD-1 Schedule DWD-3.8-3.9

<u>Atmos Energy Corporation</u> Derivation of Equity Risk Premium Based on the Total Market Approach Using the Beta for the <u>Proxy Group of Seven Natural Gas Distribution Companies</u>

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

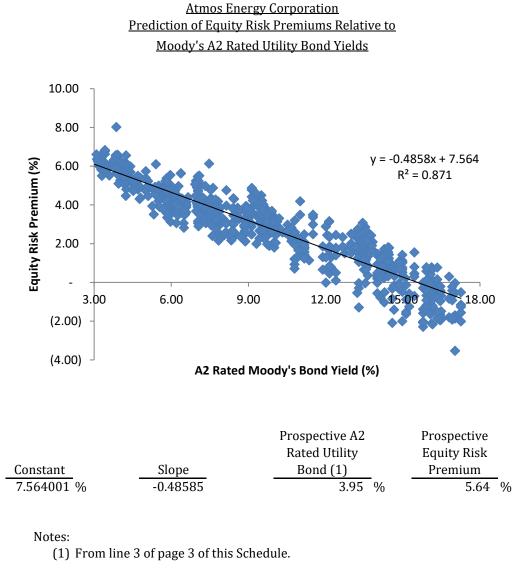
<u>Atmos Energy Corporation</u> Derivation of Mean Equity Risk Premium Based Studies Using Holding Period Returns and <u>Projected Market Appreciation of the S&P Utility Index</u>

<u>Line No.</u>			Implied Equity Risk Premium
		iity Risk Premium based on S&P Utility Index ding 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 return Bond average monthly yields from 1928-2020. Holdin calculated based upon income received (dividends and change in the market value of a security over a one-yea	g period returns are l interest) plus the relative
	(2)	This equity risk premium is based on a regression of th premiums of the S&P Utility Index relative to Moody's	

- 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.

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> Exhibit DWD-1 Schedule DWD-3.13



Source of Information:

Regulatory Research Associates Bloomberg Professional Services

Exhibit DWD-1 Schedule DWD-4.1

	Atmos Energy Corporation								
(.). T	Indicated Common Equity Cost Rate Through Use <u>of the Traditional Capital Asset Pricing Model (CAPM) and Empirical Capital Asset Pricing Model (ECAPM)</u>								
of the T	raditional Capi	tal Asset Pricing M	odel (CAPM) a	and Empirical Capi	tal Asset Pricing	<u>Model (ECAPM)</u>			
	[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			<u>11.73</u> %	<u>11.88</u> %	<u>11.81</u> %	
Median			0.92			<u>11.58</u> %	<u>11.77</u> %	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: Arithmetic Mean Income Returns on Long-Term Government Bonds: MRP based on Ibbotson Historical Data:	12.20 % 5.05 7.15 %
Measure 2: Application of a Regression Analysis to Ibbotson Historical Data (1926-2020)	<u> </u>
Measure 3: Application of the PRPM to Ibbotson Historical Data: (January 1926 - May 2021)	<u> 10.04 </u> %
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*: Projected Risk-Free Rate (see note 2): MRP based on Value Line Summary & Index: *Forcasted 3-5 year capital appreciation plus expected dividend yield	8.16 % 2.88 5.28 %
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: Projected Risk-Free Rate (see note 2): MRP based on Value Line data	$ \begin{array}{r} 14.32 & \% \\ \underline{2.88} \\ \underline{11.44} & \% \end{array} $
Measure 6: Bloomberg Projected MRP	
Total return on the Market based on the S&P 500: Projected Risk-Free Rate (see note 2): MRP based on Bloomberg data	16.34 % 2.88 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 aver	age forecast of 30

(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 %
verage of Column 6 and Column 7		

(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

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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 New Jersey Resources Corporation Northwest Natural Holding Company ONE Gas, Inc. South Jersey Industries, Inc. Southwest Gas Holdings, Inc. Spire Inc.	0.80 0.95 0.80 0.80 1.05 0.95 0.85	0.66 0.92 0.69 0.67 1.00 0.88 0.71	2.7453 3.0205 3.1454 2.7077 3.4767 3.0244 2.8287	$\begin{array}{c} 0.0685\\ 0.0754\\ 0.0785\\ 0.0676\\ 0.0868\\ 0.0755\\ 0.0706\\ \end{array}$
Average	0.89	0.79	2.9927	0.0747
Beta Range (+/- 2 std. Devs. of Beta) 2 std. Devs. of Beta	0.64 0.15	0.94		
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

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Schedule DWD-5.3

Atmos Energy Corporation 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]
Proxy Group of Forty-Eight Non-Price Regulated Companies	VL Adjusted Beta	Unadjusted Beta	Residual Standard Error of the Regression	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. CSW Industrials	0.90 0.90	0.84 0.81	2.7309 2.8884	0.0681 0.0721
Quest Diagnostics	0.90	0.81	2.8884	0.0684
Lauder (Estee)	0.85	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 0.95	0.88	3.1939	0.0797
Maxim Integrated Northrop Grumman	0.95	0.87 0.71	2.9404 2.9032	0.0734 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
L T	0.07	0.7)	6.7761	0.07 17

Valueline Proprietary Database, March 2021

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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 <u>Proxy Group of Seven Natural Gas Distribution Companies</u>

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 %
	<u> 12.49 </u> %
	%

Notes:

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

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[7]

Exhibit DWD-1 Schedule DWD-6.2

[8]

<u>Atmos Energy Corporation</u> DCF Results for the Proxy Group of Non-Price-Regulated Companies Comparable in Total Risk to the <u>Proxy Group of Seven Natural Gas Distribution Companies</u>

[4]

[5]

[6]

[3]

	[1]	[2]	[5]	[1]	[5]	[0]	[/]	[0]
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 1.70	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.) J&J Snack Foods	0.71 1.55	8.00 10.00	15.00 NA	15.00 NA	21.53 6.00	14.88 8.00	0.76 1.61	15.64 9.61
Henry (Jack) & Assoc	1.55	9.00	10.90	12.47	10.64	10.75	1.81	11.99
ManTech Int'l 'A'	1.79	9.00	5.10	5.53	3.87	5.88	1.24	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 <u>12.33</u>%

12.83 %

Average of Mean and Median

NA= Not Available

[1]

[2]

(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

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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

<u>Line No.</u>		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	<u> 12.49 </u> %

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.

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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 <u>Proxy Group of Seven Natural Gas Distribution Companies</u>

	Mood Long-Term Is: May 20	suer Rating	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	А	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 <u>Proxy Group of Seven Natural Gas Distribution Companies</u>

<u>Line No.</u>	Equity Risk Premium Measure	Proxy Group o Forty-Eight No Price Regulate Companies	n-
I	botson-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 <u>Value Line</u> Summary and Index (4)	4.60	
5	Equity Risk Premium Based on <u>Value Line</u> 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	_%
() () () () () ()	 From note 1 of page 9 of Schedule DWD-3. From note 2 of page 9 of Schedule DWD-3. From note 3 of page 9 of Schedule DWD-3. From note 4 of page 9 of Schedule DWD-3. From note 5 of page 9 of Schedule DWD-3. From note 6 of page 9 of Schedule DWD-3. From note 6 of page 9 of Schedule DWD-3. Average of mean and median beta from page 6 of this Schedule. Stocks, Bonds, Bills, and Inflation - 2021 SBBI Yearbook, John Wiley Value Line Summary and Index Blue Chip Financial Forecasts, June 1, 2021 Bloomberg Professional Services 	y & Sons, Inc.	

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Exhibit DWD-1 Schedule DWD-6.6

<u>Atmos Energy Corporation</u> Traditional CAPM and ECAPM Results for the Proxy Group of Non-Price-Regulated Companies Comparable in Total Risk to the <u>Proxy Group of Seven Natural Gas Distribution Companies</u>

		Pr	oxy Group of Seve	en Natural Gas Distrib	ution 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)
Annia Inc	0.90	1.01	0.96	0.46 0/	2.88 %	11.96 %	12.0/ 0/	12.01 0/
Apple Inc. Abbott Labs.	0.90	1.01 0.85	0.96	9.46 % 9.46	2.88 %	11.96 % 11.20	12.06 % 11.49	12.01 % 11.35
Abbott Labs. Assurant Inc.	0.90	1.00	0.88	9.46 9.46	2.88	11.20	11.49	11.55
ANSYS, Inc.	0.90	0.97	0.93	9.46	2.88	11.87	11.99	11.55
Booz Allen Hamilton	0.83	0.97	0.91	9.46	2.88	11.49	11.70	11.59
Becton, Dickinson	0.90	0.92	0.69	9.46	2.88	9.41	10.14	9.77
Brown-Forman 'B'	0.80	0.38	0.89	9.46	2.88	11.77	11.91	11.84
Broadridge Fin'l	0.90	0.97	0.94	9.46	2.88	10.64	11.91	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	1.03	0.98	9.46	2.88	12.15	12.40	12.51
Casey's Gen'l Stores	0.90	0.91	0.98	9.46	2.88	11.49	11.70	11.59
Cadence Design Sys.	0.90	0.91	0.94	9.46	2.88	11.77	11.91	11.84
Cerner Corp.	0.90	0.89	0.94	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	<u>11.55</u> %	11.75 %	11.65 %
Median	0.93	<u>11.63</u> %	11.81 %	11.72 %
Average of Mean and Median	0.93	<u>11.59</u> %	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.

[4]

[3]

<u>Atmos Energy Corporation</u> Derivation of Investment Risk Adjustment Based upon <u>Ibbotson Associates' Size Premia for the Decile Portfolios of the NYSE/AMEX/NASDAO</u>

Line No.		Marl	xet Capitalizatio (1	n on May 28, 2021)	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	\$	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]	[B]	[C]	[D]

[1]

	Decile	Sma	Market bitalization of llest Company (millions)		Market apitalization of irgest 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 20	21 Duff & Phelps Co	ost of Caj	oital Navigator	

[2]

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%.

			Market Capital <u>Proxy Group o</u>	ization		gy Corpo					
			[1]		[2]		[3]		[4]	[5]	[6]
Company	Exchange	Shares at Fise	mon Stock Outstanding cal Year End 2020 nillions)	Shar	value per re at Fiscal End 2020 (1)	Equity	tal Common 7 at Fiscal Year End 2020 millions)	Ma	losing Stock rket Price on ay 28, 2021	Market-to- Book Ratio on May 28, 2021 (2)	Market bitalization on y 28, 2021 (3) (millions)
Atmos Energy Corporation			NA		NA		340.035 (4	ł)	NA		
Based upon Proxy Group of Seven Natural Gas Distribution Companies										<u> </u>	\$ 597.101 (6)
Proxy Group of Seven Natural Gas Distribution Companies Atmos Energy Corporation New Jersey Resources Corporation Northwest Natural Holding Company ONE Gas, Inc.	NYSE NYSE NYSE NYSE	\$	125.882 95.949 30.589 53.167	\$	53.949 19.226 29.054 42.006	\$	6,791.203 1,844.692 888.733 2,233.311	\$	99.170 42.720 52.880 74.320	183.8 % 222.2 182.0 176.9	\$ 12,483.765 4,098.949 1,617.546 3,951.352
South Jersey Industries, Inc. Southwest Gas Holdings, Inc. Spire Inc.	NYSE NYSE NYSE		100.592 57.193 51.612		16.571 46.771 44.182	. <u> </u>	1,666.876 2,674.953 2,280.300		26.660 66.010 71.660	160.9 141.1 162.2	 2,681.781 3,775.305 3,698.501
Average		\$	73.569	\$	35.966	\$	2,625.724	\$	61.917	175.6 %	\$ 4,615.314

Atmos Energy Corporation

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

<u>Atmos Energy Corporation</u> 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 Projected EPS		Adjusted	Average DCF Cost Rate Unadjusted for Flotation	DCF Cost Rate Adjusted for	Flotation Cost
	Average Dividend Yield		Growth Rate	_	Dividend Yield	(6)	Flotation (7)	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

													æ	7.	6.	'n	.4	ω	;2	1		Line No.	
													Proxy Group of Seven Natural Gas Distribution Companies	Spire Inc.	Southwest Gas Holdings, Inc.	South Jersey Industries, Inc.	ONE Gas, Inc.	Northwest Natural Holding Company	New Jersey Resources Corporation	Atmos Energy Corporation			
													ج ج	Ş	\$	\$	\$	64	\$	\$	(Mar	
Smallest									Largest				4,574.713	3,813.595	3,929.726	2,271.366	4,089.053	1,650.277	3,825.494	12,443.483	(millions)	ket Capitalization on 30, 2020 (1)	[1]
3* DT	¢ 0	8	7	6	л	4	ω	2	1		Decile	[A]		1.2 x	1.2 x	2.0 x	1.1 x	2.8 x	1.2 x	0.4 x	(times larger)	Market Capitalization on September 30, 2020 (1)	<u> </u>
2.194 [2.194] 2.194 [2.194] 2.194	190.019	451.955	911.586	1,591.865	2,445.693	3,861.858	6,743.361	13,178.743	\$ 29,025.803	(millions)	Market Capitalization of Smallest Company	[8]	4	ы	4	6	4	6	ъ	з		Applicable Decile of the NYSE/AMEX/ NASDAQ (2)	[2]
189.831	451.800	911.103	1,591.765	2,444.745	3,836.536	6,710.676	13,177.828	28,808.073	\$ 1,966,078.882	(millions)	Market Capitalization of Largest Company	[C]	0.75%	1.09%	0.75%	1.37%	0.75%	1.37%	1.09%	0.71%		Applicable Size Premium (3)	[3]
5.01%	2.29%	1.46%	1.54%	1.37%	1.09%	0.75%	0.71%	0.49%	-0.22%		Size Premium (Return in Excess of CAPM)*	[a]		0.34%	0.00%	0.62%	0.00%	0.62%	0.34%	-0.04%		Spread from Applicable Size Premium (4)	[4]

Notes:

*From 2021 Duff & Phelps Cost of Capital Navigator

From page 2 of this Attachment.
 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].

(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%.

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

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Duke Energy Kentucky, Inc. Market Capitalization of Duke Energy Kentucky, Inc. and the Proxy Group of Seven Natural Gas Distribution Companies.

										NA- Not Amilable	
\$ 4,574.713	172.8 %	\$ 62.109		2,625.724		35.966	ŝ	73.569	\$		Average
1	167.2	73.890	ē	2,280.300	' I	44.182		51.612		NYSE	Spire Inc.
	146.9	68.710	ω	2,674.953		46.771		57.193		NYSE	Southwest Gas Holdings, Inc.
	136.3	22.580	6	1,666.876		16.571		100.592		NYSE	South Jersey Industries, Inc.
	183.1	76.910		2,233.311		42.006		53.167		NYSE	ONE Gas, Inc.
	185.7	53.950	ω	888.733		29.054		30.589		NYSE	Northwest Natural Holding Company
	207.4	39.870	Ñ	1,844.692		19.226		95.949		NYSE	New Jersey Resources Corporation
\$	183.2 %	\$ 98.850	ü	6,791.203	\$	53.949	\$	125.882	\$	NYSE	Atmos Energy Corporation
											Proxy Group of Seven Natural Gas Distribution Companies
				(millions)				(millions)	_		
Market Capitalization on March 31, 2021 (3)	Market-to- Book Ratio on March 31, 2021 (2)	Closing Stock Market Price on March 31, 2021	'	Total Common Equity at Fiscal Year End 2020	' I	Book Value per Share at Fiscal Year End 2020 (1)	Boo Sh	Common Stock Shares Outstanding at Fiscal Year End 2020	Comm Outst Ye	Exchange	Company
	[5]	[4]		[3]		[2]		[1]			

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

65.39	26.82	21.08	88.47	96'81	78.67	19.26	1/2/505	09
\$7.58	96'09	55.06	64.77	42.27	£9.2£	17.59	1/6/2021	65
62.24	25.22	21.63	14.47	28.64	\$5.34	77.68	1/1/5051	85
62.13	15'85	19.12	19.27	\$9.93	32.44	92.68	1/8/2021	2 S
\$6.08	11.82	98.12	26.17	78.E b	87.2£	79.78	1/11/2021	95
10.13	62.62	51.95	95'TZ	43.64	\$8.9E	29.78	1/15/5051	SS
Þ5'19	09.62	22.02	64.17	05.44	85.75	97.88	1/13/2021	1/5
12'19 59'19	68.62 11.03	22.52 22.72	90.17	04.40	\$7.74	\$9.78	1/14/2051	83
2919	68.85	27.52	66'TZ SE'TZ	17.44 44.71	22.75 25.95	80.0e £0.0e	1702/S1/T 1707/S1/T	25
52.09	28.27	51.20	25.17	42.44	22.25	60.06	1/202/07/1	TS OS
60.19	55.72	01.15	29'02	75.92	96.45	57.68	1202/12/1	617
52.19	29.82	51.64	62.07	43.24	50 65	60.68	1/37/2021	87
65.19	95.09	57.66	84.27	00.44	08'58	\$\$.06	1/32/5021	L7
60.32	\$8.09	50.22	12.27	91.24	92.26	\$6.06	1/36/3031	97
68.09	20.42	23.08	09.44	05'917	917.58	£8.06	1/202/27/1	51
97.09	60.33	51.22	50.67	11.44	16.45	25.88	1/58/5051	**
61.19	96.65	23'10	51.57	17.34	10.25	00.68	1/20/2021	EV
95'32	92.09	53 [.] 06	£8.£7	92'5#	99°5E	59.88	5/1/2051	45
26.53	29.09	52.64	94.87	85.44	¥6.25	99'88	5/5/5051	τŧ
97'79	15:09	32.36	16.17	57.54	25'58	50.78	1202/8/2	01/
20.43	16.18	55.76	14.27	60°S‡⁄	30.35	87.88	5/4/2021	66
01.28	\$5.55	53.04	72.90	46.14	39.62	50.68	1202/5/2	86
SZ.48	61.39	52.76	55'72	62°S1⁄2	36.30	80.68	1202/8/2	75
64.24	52.13	53'60	15'24	17.34	12.75	09.68	1202/6/2	96
63.22	£7.13	23.48	£7.£7	29°9‡	85.75	58'16	5/10/5051	SE
28.£ð	62.53	23.46	58.87	47.32	81.75	\$0.1e	1202/11/2	34
26'89	61.83	23.66	69'72	46.32	36.62	S0'T 6	5/15/5051	66
18.48	95.36	23.55	72.23	46.83	18.7.6	51.19	5/16/5051	35
74.88	99.69	\$6.ES	72.97	28.74	78.85	55.43	1202/21/2	ŢΕ
19'29	46.48	23.92	82.57	48.22	76.85	69.66	5/18/2021	30
29.78	08.43	24.26	90.47	88.84	09.6£	95'86	1202/61/2	56
⊅ ∠`99	97`79	24.50	20.07	69'11	39.26	I1-9.8	5/22/2021	58
69'89	98.29	75.37	10.07	90.64	15.95	£9.68	5/53/2021	22
90.89	10.28	52.25	\$8.69	91.64	\$1.95	78.88	5/24/2021	56
\$6.78	11.149	15'52	10.68	67.84	84.65	88.23	5/52/5051	52
66.42	93'32	11.25	26.99	66'2*	39.29	19.48	5/56/5051	54
26 [.] 99	193.64	19'52	SS'69	48.25	40'56	52.28	3/1/2051	53
18'99 82'29	85.Eð	28'52 56'53	27.8a	74.74 08.74	65.65 29.65	\$2.78	3/5/5051	55
86.73	21.29	11.25	62.89	25'87	72.95	06.88 24.88	3/3/2051 3/4/2051	53 50
26.07	82.69	89.92	02.89	17.12	20.05	17.10	1202/9/8	02 61
12.27	80.17	28.34	20.27	12:15	SO'T P	12 16	1202/8/8	81
26'TZ	69.89	50.85	65.57	52.25	40.24	Þ£.68	1202/6/2	21
12.57	S6'29	28.80	pp.p7	10.52	98.04	18.06	1202/07/2	91
18.27	15'59	97.746	52.57	21.52	69'01	88.68	1202/11/2	ST
£1'5/	66.33	25.93	£1.27	23.22	87.15	2 Þ .16	1202/21/8	74 74
14.64	22.99	\$9'8Z	£0'22	51.42	45.42	61'E6	1202/51/8	13
£5'5Z	92.76	28.75	£5.77	98.62	42.14	08.66	3/16/2021	75
84.87	20.99	55.50	11.41	25.02	89.65	£\$°76	3/1//2051	ττ
74.10	67.12	12.151	14.71	\$\$°TS	\$0.25	85'86	3/18/2021	στ
73.74	08.7.8	22.57	47.47	96.52	19.14	60.46	1202/61/2	6
72.35	05'99	52.79	11.57	50.02	15.04	\$ 5.56	3/22/2021	8
09'IL	22.73	55'26	15.57	51.23	39.38	81.14	1202/82/8	۷
92.27	95.89	55°¢I	L\$.\$T	11.52	79.97	\$8.26	3\54\5051	9
66.57	12.89	22.58	75.22	02.52	40.12	80.7.6	1202/52/2	5
S0.47	92.76	\$2.25	66°₽Z	£9.5S	22.95	\$Y.24	3/56/5051	¥
29.57	69.33	22.67	75.27	88.62	99.04	\$8'86	3\56\5051	ε
88.67	01.69	22.94	90.97	69'85	05.04	68.86	3/30/2021	z
68.57	T7.89	52.58	16.97	56.62	78.95	58.86	3/31/2021	_ τ
Viup3 2U		W2 VJiup3 21 W2 VJiup3 21			NWN Yfiup3 Sl			T2AJ_X9
					NMN	ALN	OTA	Tickers

EBITDA	NETOPGFC + CHGOPASLIAB - AFUDC	Preferred Stk + Sink Fund Req.	Total Capital	Total Debt	Average Price	Total Permanent Capital	Com Eq / Shares Out.	Calculations	Income Bef Extra Items-S&U Net Operating Cash Flow Change in op'g Assets + Liabilities Depreciation & Amonization Income Tax Expense	Common Dividends	Preferred Stock Dividends	CE income before Extra.	Net Income before Extra.	Total Interest	AFUDC	DPS by payable date	EPS excluding extra Price - High Price - Low	Short Term Debt	Common Shares Outst. Common Equity Sinking Fund Requirements	Long Term Debt Preferred Stock	Capital Structure	Ticker ATO
calc	calc	calc	calc		calc	calc	calc		INCBEFEXT NETOPGFC CHGOPASLIAB DEPAMORT INCTAX	COMDIVS1	PFDDIV	INCAVAILCOMM	NETINC	INTEXP	AFUDC	Bioomberg	EPSAPPCOMM Bloomberg Bloomberg	STDEBT	input Data TOTEQ Input Data	ltoëbt PFD	FYE: 9/30/2020	
1,261,098,000.000	872,394,000,000	0.000	11,322,982,165.000	4,531,779,165.000	100.535	11,322,982,165.000	53.949		601,443,000,000 1,037,999,000,000 -133,676,000,000 429,828,000,000 145,353,000,000	282,444,000.000	0.000	601,443,000.00	601,443,000.00	84,474,000.00	31,929,000.00	2.300	4.890 120.570 80.500	0.000	125,882,477,000 6,791,203,000,000 0,000	4,531,779,165.000 0.000	2020	
1,144,918,000,000	873,275,000,000	0.000	9,744,590,000.000	3,994,367,000.000	101.990	9,279,675,000.000	48.184		511,406,000,000 968,769,000,000 -76,686,000,000 391,456,000,000 138,903,000,000	245,717,000.000	0.000	511,406,000 00	511,406,000.00	103,153,000.00	18,808,000.00	2.100	4.350 114.650 89.330	464,915,000.000	119,338,925.000 5,750,223,000.000 0.000	3,529,452,000.000 0.000	<u>2019</u>	
1,078,873,000.000	1,252,723,000.000	0 000	8,414,396,000.000	3,644,445,000.000	86.400	7,838,616,000.000	42.867		603,064,000,000 1,124,662,000,000 1,34,861,000,000 361,083,000,000 8,080,000,000	214,906,000.000	0.000	603,064,000.000	603,064,000.000	106,646,000.000	6,800,000 000	1.940	5 430 94,770 78,030	575,780,000 000	111,273,683.000 4,769,951,000.000 0.000	3,068,665,000.000 0,000	<u>2018</u>	<u>Atmos Energy</u> CAPITALIZATION AND FINANCIAL STATISTICS <u>2015 - 2020. Inclusive</u>
1,057,434,000.000	791,413,000.000	0 000	7,413,456,000.000	3,514,790,000.000	78.825	6,965,711,000.000	36.744		396,421,000,000 867,090,000,000 -73,177,000,000 319,448,000,000 221,383,000,000	191,931,000.000	0.000	396,421,000.000	396,421,000.000	120,182,000.000	2,500,000 000	1.800	3.600 88.690 68.960	447,745,000 000	106, 104,634,000 3,898,666,000,000 0 000	3,067,045,000.000 0.000	2017	ergy NANCIAL STATISTICS (1)
959,521,000.000	728,978,000.000	0.000	6,731,649,000.000	3,268,590,000.000	69.570	5,901,838,000.000	33 321		350,104,000,000 794,990,000,000 -63,212,000,000 293,096,000,000 200,373,000,000	175,126,000 000	0.000	350,104,000.000	350,104,000.000	115,948,000.000	2,800,000.000	1.680	3 380 81.320 57.820	829,811,000.000	103,930,560.000 3,463,059,000.000 0.000	2,438,779,000.000 0.000	<u>2016</u>	J
901,802,000 000	816,529,000.000	0.000	6,108,112,000.000	2,913,315,000.000	53.080	5,650,185,000.000	31,482		315,075,000,000 836,519,000,000 -19,990,000,000 274,796,000,000 195,690,000,000	160,018,000.000	0.000	315,075,000.000	315,075,000.000	116,241,000.000	0.000	1.560	3.090 58.810 47.350	457,927,000.000	101,478,818.000 3,194,797,000.000 0.000	2,455,388,000.000 0,000	2015	

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Atmos Energy CAPITALIZATION AND FINANCIAL STATISTICS (1) 2015 - 2020, Inclusive

TOTAL DEBT / TOTAL CAPITAL	FUNDS FROM OPERATIONS / TOTAL DEBT (4)	TOTAL DEBT / EBITDA (3)	RATE OF RETURN ON AVERAGE BOOK COMMON EQUITY	EINANCIAL RATIOS - MARKET BASED EARNINGS / PRICE RATIO MARKET / AVERAGE BOOK RATIO CIVIDEND YIELD DIVIDEND PAYOUT RATIO	FINANCIAL STATISTICS	BASED ON TOTAL CAPITAL: TOTAL DEBT, INCLUDING SHORT-TERM PREFERRED STOCK COMMON EQUITY TOTAL	CAPITAL STRUCTURE RATIOS BASED ON TOTAL PERMANENT CAPITAL: LONG-TERM DEBT PREFERRED STOCK COMMON EQUITY TOTAL	INDICATED AVERAGE CAPITAL COST RATES .(2) TOTAL DEBT PREFERRED STOCK	AMOUNT OF CAPITAL EMPLOYED TOTAL PERMANENT CAPITAL SHORT-TERM DEBT TOTAL CAPITAL EMPLOYED	CAPITALIZATION STATISTICS
40.02 %	19.25 %	3.59 x	9.59 %	4.86 % 196.87 2.29 46.96		40 02 % 0.00 <u>59 98</u> <u>100 00</u> %	40.02 % 0.00 <u>59.98</u> 1 <u>00.00</u> %	1.98 %	\$11,322,982 <u>\$0.000</u> \$11,322,982	2020
40.99 %	21.86 %	3.49 x	9.72 %	4.27 % 224.03 2.06 48.05		40.99 % 0.00 <u>59.01</u> 1 <u>00.00</u> %	38.03 % 0.00 <u>61.97</u> <u>100.00</u> %	2.70 %	\$9,279.675 <u>\$464.915</u> \$9,744.590	<u>2019</u> (MtLL
43.31 %	34.37 %	3.38 x	13.91 %	6.28 % 217.06 2.25 35.64		43 31 % 0 00 <u>56 69</u> <u>100 00</u> %	39.15 % 0.00 <u>60.85</u> 1 <u>00.00</u> %	2.98 %	\$7,838 616 <u>\$575 780</u> <u>\$8 414 396</u>	2018 (MILLIONS OF DOLLARS)
47.41 %	22.52 %	3.32 x	10.77 %	4.57 % 225.01 2.28 48.42		47.41 % 0.00 <u>52.59</u> 100.00 %	44 .03 % 0.00 <u>55.97</u> 1 <u>00.00</u> %	3.54 %	\$6,965.711 <u>\$447.745</u> <u>\$7,413,456</u>	<u>2017</u> RS)
48.56 %	22.30 %	3.41 x	10.52 %	4.86 % 214.71 2.41 50.02		48.56 % 0.00 <u>51.44</u> <u>100.00</u> %	41.32 % 0.00 <u>5868</u> 100.00 %	3.75 %	\$5,901,838 <u>\$829,811</u> <u>\$6,731,649</u>	<u>2016</u>
44.06 %	24.06 %	3 44 x	10.90 %	4.97 % 215.54 2.26 45.82		44 06 % 0.00 <u>55 94</u> <u>100 00</u> %	AVERAGE 40.51 % 0.00 59.49 100.00 %	n < 0		

EBITDA	NETOPGFC + CHGOPASLIAB - AFUDC	Preferred Stk + Sink Fund Req.	Total Capital	Total Debt	Average Price	Total Permanent Capital	Com Eq / Shares Out.	Calculations	income Bef Extra Items-S&U Net Operating Cash Flow Change in op'g Assets + Liabilities Depreciation & Amortization Income Tax Expense	Common Dividends	Preferred Stock Dividends	CE Income before Extra.	Net Income before Extra.	Total Interest	AFUDC	DPS by payable date	EPS excluding extra Price - High Price - Low	Short Term Debt	Common Shares Outst. Common Equity Sinking Fund Requirements	Long Term Debt Preferred Stock	Capital Structure	Ticker NJR
calc	calc	calc	calc		calc	calc	calc		INCBEFEXT NETOPGFC CHGOPASLIAB DEPAMORT INCTAX	COMDIVS1	PFDDIV	INCAVAILCOMM	NETINC	INTEXP	AFUDC	Bloomberg	EPSAPPCOMM Bloomberg Bloomberg	STDEBT	Input Data TOTEQ Input Data	LTDEBT PFD	FYE: 09/30/2020	
374,466,000,000	185,652,000.000	0.000	4,256,744,000.000	2,412,052,000.000	35.035	4,131,394,000.000	19 226		193,919,000,000 213,481,000,000 -8,096,000,000 119,894,000,000 -6,944,000,000	117,804,000 000	0.000	193,919,000.000	193,919,000,000	67,597,000.000	19,733,000.000	1.270	2.040 45.460 24.610	125,350,000.00	95,949,183.00 1,844,692,000.00 0.000	2,286,702,000.00 0.000	2020	
270,566,000.000	151,389,000.000	0.000	3,135,763,000.000	1,584,046,000.000	47.475	3,110,313,000.000	17.369		169,505,000,000 189,350,000,000 -27,759,000,000 91,730,000,000 -37,751,000,000	104,059,000.000	0.000	169,505,000.000	169,505,000,000	47,082,000.000	10,202,000.000	1.190	1.890 51.130 43.820	25,450,000,000	89,338,054,000 1,551,717,000,000 0,000	1,558,596,000.000 0,000	<u>2019</u>	
311,638,000.000	487,780,000,000	0.000	2,875,092,000.000	1,456,114,000.000	41.900	2,723,142,000.000	16 479		233,436,000,000 398,286,000,000 97,004,000,000 85,701,000,000 -53,785,000,000	95,835,000,000	0.000	233,436,000.000	233,436,000.000	46,286,000.000	7,510,000.000	1.110	2 640 47.550 36.250	151,950,000.000	86,107,943,000 1,418,978,000,000 0,000	1,304,164,000.000 0,000	2018	New Jersey Resource CAPITALIZATION AND FINANCIAL 2015 - 2020, Inclusive
277,135,000 000	259,949,000.000	0.000	2,665,098,000.000	1,428,455,000.000	37.660	2,399,098,000.000	14,287		132,065,000,000 248,046,000,000 17,081,000,000 81,841,000,000 18,343,000,000	87,988,000.000	0.000	132,065,000.000	132,065,000.000	44,886,000.000	5,178,000.000	1.038	1,520 44,250 31,070	266,000,000.000	86,555,507.000 1,236,643,000.000 0.000	1,162,455,000.000 0.000	2017	New Jersey Resources CAPITALIZATION AND FINANCIAL STATISTICS (1) 2015 - 2020. Inclusive
258,994,000 000	9,921,000.000	0.000	2,413,293,000.000	1,246,702,000.000	33,425	2,291,593,000.000	13.551		131,672,000,000 142,630,000,000 -123,325,000,000 72,748,000,000 23,530,000,000	82,445,000.000	0.000	131,672,000 000	131,672,000.000	31,044,000.000	9,384,000.000	0.975	1.520 38.710 28.140	121,700,000.000	86,086,355.000 1,166,591,000.000 0.000	1,125,002,000.000 0.000	<u>2016</u>	E
329,804,000.000	458,376,000,000	0.000	2,028,039,000,000	921,083,000.000	29.140	1,961,689,000.000	12.942		180,960,000,000 387,920,000,000 76,753,000,000 61,399,000,000 59,724,000,000	76,532,000.000	0.000	180,960,000.000	180,960,000.000	27,721,000,000	6,297,000.000	0.915	2.100 33.475 24.805	66,350,000,000	85,531,423,000 1,106,956,000,000 0,000	854,733,000.000 0.000	2015	

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New Jersey Resources CAPITALIZATION AND FINANCIAL STATISTICS (1) 2015 - 2020_inclusive

	<u> Avisnaui "nžnž - c1 nž</u>	IUSIVE				
CAPITALIZATION STATISTICS	2020	2019 (MILL	(MILLIONS OF DOLLARS)	4RS)	<u>2016</u>	
AMOUNT OF CAPITAL EMPLOYED TOTAL PERMANENT CAPITAL SHORT-TERM DEBT TOTAL CAPITAL EMPLOYED	S4 ,131.394 <u>\$125.350</u> <u>\$4,256.744</u>	\$3,110.313 <u>\$25.450</u> \$3.135.763	\$2,723,142 <u>\$151,950</u> \$2,875,092	\$2,399.098 <u>\$266.000</u> \$2.665.098	\$2,291.593 <u>\$121.700</u> \$2,413,293	
INDICATED AVERAGE CAPITAL COST RATES (2) TOTAL DEBT PREFERRED STOCK	3.38 %	3.10 %	3.21 %	3.36 %	2.86 %	
CAPITAL STRUCTURE RATIOS BASED ON TOTAL PERMANENT CAPITAL: LONG-TERM DEBT PREFERRED STOCK COMMON EQUITY TOTAL	55.35 % 0.00 <u>44.65</u> 100.00 %	50.11 % 0.00 <u>49.89</u> 100.00 %	47.89 % 0.00 <u>52.11</u> 100.00 %	48.45 % 0.00 <u>51.55</u> 1 <u>00.00</u> %	49.09 % 0.00 <u>50.91</u> 1 <u>00.00</u> %	<u>9 TEAK</u> <u>AVERAGE</u> 50.18 % 0.00 <u>49.82</u> 100.00 %
BASED ON TOTAL CAPITAL: TOTAL DEBT, INCLUDING SHORT-TERM PREFERED STOCK COMMON EQUITY TOTAL	56.66 % 0.00 <u>43.34</u> 1 <u>00.00</u> %	50.52 % 0.00 <u>49.48</u> <u>100.00</u> %	50.65 % 0.00 <u>49.35</u> <u>100.00</u> %	53.60 % 0 00 <u>46 40</u> %	51.66 % 0.00 <u>48.34</u> <u>100.00</u> %	52.62 % 0.00 <u>47.38</u> 100.00 %
FINANCIAL STATISTICS						
FINANCIAL RATIOS - MARKET BASED EARNINGS / PRICE RATIO MARKET / AVERAGE BOOK RATIO DIVIDEND YIELD DIVIDEND PAYOUT RATIO	5.82 % 191.48 3.62 60.75	3.98 % 280.52 2.51 61.39	6.30 % 272 38 2.65 41.05	4.04 % 270.56 2.75 66.62	4.55 % 252.33 2.92 62.61	4.94 % 253.45 2.89 58.48
RATE OF RETURN ON AVERAGE BOOK COMMON EQUITY	11.42 %	11.41 %	17.58 %	10.99 %	11.58 %	12.60 %
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 %

EBITDA	NETOPGFC + CHGOPASLIAB - AFUDC	Preferred Stk + Sink Fund Req.	Total Capital	Total Debt	Average Price	Total Permanent Capital	Com Eq / Shares Out.	Calculations	income Bef Extra Items-S&U Net Operating Cash Flow Change in op'g Assets + Liabilities Depreciation & Amortization Income Tax Expense	Common Dividends	Preferred Stock Dividends	CE Income before Extra.	Net Income before Extra	Total Interest	AFUDC	DPS by payable date	EPS excluding extra Price - High Price - Low	Short Term Debt	Common Shares Outst Common Equity Sinking Fund Requirements	Long Term Debt Preferred Stock	Capital Structure	Ticker NWN
calc	calc	calc	calc		calc	calc	calc		INCBEFEXT NETOPGFC CHGOPASLIAB DEPAMORT INCTAX	COMDIVS1	PFODIV	INCAVAILCOMM	NETINC	INTEXP	AFUDC	Bloomberg	EPSAPPCOMM Bloomberg Bloomberg	STDEBT	Input Data TOTEQ Input Data	LTDEBT PFD	FYE: 12/31/2020	
244,598,000.000	118,453,000.000	0.000	2,148,683,000.000	1,259,950,000.000	60.155	1,844,158,000.000	29.054		76,781,000,000 143,020,000,000 -24,567,000,000 103,683,000,000 21,082,000,000	58,708,000.000	0.000	76,781,000.000	76,781,000.000	43,052,000.000	0.000	1.910	2.510 76.900 43.410	304,525,000.000	30,589,000.000 888,733,000.000 0.000	955,425,000.000 0.000	2020	
208,558,000.000	149,190,000 000	0.000	1,896,163,000.000	1,030,164,000.000	65.660	1,747,063,000.000	28.419		61,735,000,000 185,298,000,000 -35,408,000,000 91,496,000,000 12,642,000,000	56,833,000.000	0.000	61,735,000.000	61,735,000.000	42,685,000 000	700,000,000	1,900	2.070 73.860 57.460	149,100,000.000	30,472,000.000 865,999,000.000 0.000	881,064,000.000 0,000	<u>2019</u>	2
210,975,000 000	154,630,000,000	0.000	1,716,490,000 000	953,856,000.000	61.330	1,498,870,000.000	26 407		64,569,000,000 168,771,000,000 -10,041,000,000 85,156,000,000 24,191,000,000	54,736,000.000	0.000	64,569,000.000	64,569,000 000	37,059,000.000	4,100,000 000	1.890	2.240 70.710 51.950	217,620,000.000	28,880,000.000 762,634,000.000 0.000	736,236,000.000 0.000	2018	<u>Northwest Nat Gas</u> CAPITALIZATION AND FINANCIAL STATISTICS <u>2015 - 2020, Inclusive</u>
37,699,000.000	232,102,000.000	0.000	1,576,863,000.000	834,087,000.000	63.000	1,522,663,000,000	25.848		-55,623,000,000 206,704,000,000 30,696,000,000 85,578,000,000 -30,757,000,000	53,957,000.000	0.000	-55,623,000.000	-55,623,000.000	38,501,000.000	5,298,000 000	1.883	-1.940 69.150 56.850	54,200,000.000	28,736,000.000 742,776,000.000 0.000	779,887,000.000 0.000	2017	<u>Nat Gas</u> NANCIAL STATISTICS (1) <u>Inclusive</u>
221,026,000.000	255,384,000.000	0.000	1,623,120,000.000	772,623,000.000	57.520	1,569,820,000.000	29.706		58,895,000,000 222,147,000,000 33,237,000,000 82,289,000,000 40,714,000,000	51,508,000.000	0.000	58,895,000.000	58,895,000.000	39, 128,000.000	0.000	1.873	2,120 65,600 49,440	53,300,000.000	28,630,000.000 850,497,000.000 0.000	719,323,000.000 0,000	2016	5
212,918,000,000	177,498,000.000	0.000	1,652,707,000.000	871,735,000.000	47.080	1,382,672,000,000	28.475		53,703,000,000 184,688,000,000 -7,190,000,000 80,923,000,000 35,753,000,000	49,243,000 000	0.000	53,703,000.000	53,703,000,000	42,539,000.000	0.000	1.863	1.960 51.980 42.180	270,035,000.000	27,427,000.000 780,972,000,000 0.000	601,700,000.000 0.000	2015	

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Northwest Nat. Gas CAPITALIZATION AND FINANCIAL STATISTICS (1) 2015 - 2020, Indusive

	<u>2010 - 2020, Inclusive</u>	IUSIVE					
CAPITALIZATION STATISTICS	2020	2019 (MILL	2018 (MILLIONS OF DOLLARS)	<u>2017</u> ARS)	2016		
AMOUNT OF CAPITAL EMPLOYED TOTAL PERMANENT CAPITAL SHORT-TERM DEBT TOTAL CAPITAL EMPLOYED	\$1,844,158 <u>\$304,525</u> <u>\$2,148,683</u>	\$1,747.063 <u>\$149.100</u> \$1.896.163	\$1,498.870 <u>\$217.620</u> <u>\$1,716.490</u>	\$1,522.663 <u>\$54,200</u> \$1,576.863	\$1,569,820 <u>\$53,300</u> \$1,623,120		
INDICATED AVERAGE CAPITAL COST RATES (2) TOTAL DEBT PREFERRED STOCK	3.76 %	4.30 %	4.15 %	4.79 %	4.76 %	n < 1 2	
CAPITAL STRUCTURE RATIOS BASED ON TOTAL PERMANENT CAPITAL: LONG-TERM DEBT PREFERRED STOCK COMMON EQUITY TOTAL	51.81 % 0.00 <u>48.19</u> 1 <u>00.00</u> %	50.43 % 0.00 <u>49.57</u> <u>100.00</u> %	49.12 % 0.00 <u>50.88</u> 100.00 %	51.22 % 0.00 <u>48.78</u>	45.82 % 0.00 <u>54.18</u>	<u>AVERAGE</u> 49.68 % 0.00 <u>50.32</u> 100.00 %	
BASED ON TOTAL CAPITAL: TOTAL DEBT. INCLUDING SHORT-TERM PREFERRED STOCK COMMON EQUITY TOTAL	58.64 % 0.00 <u>41.36</u> 1 <u>00.00</u> %	54.33 % 0.00 <u>45.67</u> 1 <u>00.00</u> %	55.57 % 0.00 <u>44.43</u> 1 <u>00.00</u> %	52.90 % 0.00 <u>47.10</u> 1 <u>00.00</u> %	47.60 % 0.00 <u>52.40</u> 1 <u>00.00</u> %	53.81 % 0.00 <u>46.19</u> 100.00 %	
FINANCIAL STATISTICS							
FINANCIAL RATIOS - MARKET BASED EARNINGS / PRICE RATIO MARKET / AVERAGE BOOK RATIO DIVIDEND VIELD DIVIDEND PAYOUT RATIO	4.17 % 209.33 3.18 76.46	3.15 % 239.52 2.89 92.06	3.65 % 234.73 3.08 84.77	-3.08 % 226.80 2.99 -97.00	3.69 % 197.73 3.26 87.46	2.32 % 221.62 3.08 48.75	
RATE OF RETURN ON AVERAGE BOOK COMMON EQUITY	8.75 %	7.58 %	8.58 %			5.03 %	
TOTAL DEBT / EBITDA (3) FUNDS FROM OPERATIONS / TOTAL DEBT (4)	5.15 x 9.40 %	4.94 x 14.48 %	4.52 x 16.21 %	22.12 × 27.83 %	3.50 ×	8.05 x 20.19 %	
TOTAL DEBT / TOTAL CAPITAL	58.64 %	54 33 %	55.57 %	52.90 %	47.60 %	53.81 %	

EBITDA	NETOPGFC + CHGOPASLIAB - AFUDC	Preferred Stk + Sink Fund Req.	Total Capital	Total Debt	Average Price	Total Permanent Capital	Com Eq / Shares Out	Calculations	Income Bef Extra Items-S&U Net Operating Cash Flow Change in op'g Assets + Liabilities Deprecation & Amonization Income Tax Expense	Common Dividends	Preferred Stock Dividends	CE Income before Extra.	Net Income before Extra.	Total Interest	AFUDC	DPS by payable date	EPS excluding extra Price - High Price - Low	Short Term Debt	Common Shares Outst. Common Equity Sirking Fund Requirements	Long Term Debt Preferred Stock	Capital Structure:	Ticker OGS
calc	calc	calc	calc		calc	calc	calc		INCBEFEXT NETOPGFC CHGOPASLIAB DEPAMORT INCTAX	COMDIVS1	PFODIV	INCAVAILCOMM	NETINC	INTEXP	AFUDC	Bloomberg	EPSAPPCOMM Bloomberg Bloomberg	STDEBT	Input Data TOTEQ Input Data	LTDEBT PFD	FYE: 12/31/2020	
495,377,000.000	289,769,000.000	0.000	4,252,836,000.000	2,019,525,000.000	81.620	3,834,611,000.000	42.006		196,412,000,000 364,500,000,000 -70,531,000,000 194,881,000,000 41,579,000,000	114,372,000.00	0.00	196,412,000.00	196,412,000.000	62,505,000.000	4,200,000.000	2.160	3.680 96.690 66.550	418,225,000.000	53,166,733.000 2,233,311,000.000 0.000	1.601,300,000,000 0.000	2020	
472,677,000.000	217,331,000.000	0.000	3,931,954,000.000	1,802,564,000.000	86.200	3,415,454,000.000	40.351		186,749,000,000 310,345,000,000 -88,414,000,000 189,395,000,000 42,852,000,000	105,424,000.000	0.000	186,749,000.000	186,749,000.000	62,681,000 000	4,600,000.000	2.000	3.510 96.270 76.130	516,500,000.000	52,771,749,000 2,129,390,000,000 0,000	1,286,064,000.000 0.000	2019	0
437,156,000.000	529,725,000.000	0 000	3,627,639,000.000	1,584,983,000.000	74.890	3,328,139,000.000	38.860		172,234,000,000 467,694,000,000 65,431,000,000 160,086,000,000 53,531,000,000	96,594,000.000	0.000	172,234,000.000	172,234,000.000	51,305,000 000	3,400,000,000	1.840	3 250 87.030 62.750	299,500,000,000	52,564,902.000 2,042,655,000.000 0.000	1,285,483,000.000 0.000	2018	<u>ONE Gas Inc</u> CAPITALIZATION AND FINANCIAL STATISTICS (1) <u>2015 - 2020, Inclusive</u>
454,092,000 000	232,692,000 000	0.000	3,510,681,000.000	1,550,472,000.000	70.775	3,153,466,000,000	37.471		162, 995,000,000 253,800,000,000 -18,108,000,000 151,889,000,000 93,143,000,000	87,951,000.000	0.000	162,995,000.000	162,995,000 000	46,065,000,000	3,000,000,000	1.680	3 080 79.250 62.300	357,215,000,000	52,312,516.000 1,960,209,000.000 0.000	1,193,257,000.000 0.000	2017	<u>s Inc</u> ANCIAL STATISTICS (1) Inclusiv <u>e</u>
412,906,000,000	247,314,000.000	0.000	3,225,733,000.000	1,337,453,000.000	57,495	3,080,733,000.000	35.900		140,095,000,000 281,567,000,000 -30,653,000,000 143,829,000,000 85,243,000,000	73,209,000.000	0.000	140,095,000.000	140,095,000.000	43,739,000,000	3,600,000,000	1.400	2.650 66.590 48.400	145,000,000.000	52,598,005.000 1,888,280,000.000 0.000	1,192,453,000.000 0.000	<u>2016</u>	
369,602,000 000	432,934,000.000	0 000	3,055,367,000.000	1,213,812,000.000	45.360	3,042,867,000.000	35.239		119,030,000,000 394,207,000,000 41,327,000,000 133,023,000,000 72,979,000,000	62,826,000.000	0.000	119,030,000.000	119,030,000.000	44,570,000.000	2,600,000,000	1.200	2.240 51.340 39.380	12,500,000.000	52,259,224.000 1,841,555,000.000 0.000	1,201,312,000.000 0.000	2015	

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ONE Gas. Inc.: CAPITALIZATION AND FINANCIAL STATISTICS (1) 2015 - 2020. Inclusive

	2015 - 2020, Inclusive	lusive				
CAPITALIZATION STATISTICS	2020	2019 (MILLI	2018 (MILLIONS OF DOLLARS)	RS)	<u>2016</u>	
AMOUNT OF CAPITAL EMPLOYED TOTAL PERMANENT CAPITAL SHORT-TERM DEBT TOTAL CAPITAL EMPLOYED	\$3,834.611 \$418.225 \$4,252.836	\$3,415,454 <u>\$516,500</u> \$3,931,954	\$3,328.139 <u>\$299.500</u> \$3.627.639	\$3,153,466 <u>\$357,215</u> \$3, <u>510,681</u>	\$3,080,733 <u>\$145,000</u> \$3,225,733	
INDICATED AVERAGE CAPITAL COST RATES (2) TOTAL DEBT PREFERRED STOCK	3.27 %	3.70 %	3.27 %	3.19 %	3.43 %	
CAPITAL STRUCTURE RATIOS BASED ON TOTAL PERMANENT CAPITAL: LONG-TERM DEBT PREFERRED STOCK COMMON FOLITY	41.76 % 0.00 58.24	37.65 % 0.00	38.62 % 0.00 61.38	37.84 % 0.00	38.71 % 0.00 61 29	<u>AVERAGE</u> 38.92 % 0.00 61.08
BASED ON TOTAL CAPITAL: TOTAL DEBT. INCLUDING SHORT-TERM PREFERED STOCK COMMON EQUITY TOTAL	47.49 % 0.00 <u>52.51</u> 100.00 %	45.84 % 0.00 <u>54.16</u> 100.00	43.69 % 0.00 <u>56.31</u> 1 <u>00.00</u> %	44.16 % 0.00 <u>55.84</u> 1 <u>00.00</u> %	41.46 % 0.00 <u>58.54</u> 100.000 %	44.53 % 0.00 <u>55.47</u> <u>100.00</u> %
FINANCIAL STATISTICS						
EINANCIAL RATIOS - MARKET BASED EARNINGS / PRICE RATIO	4.51 %	4.07 %	4.34 %	4.35 %	4.61 %	4.38 %
MARKET / AVERAGE BOOK RATIO DIVIDEND YIELD DIVIDEND PAYOUT RATIO	198.21 2.65 58.23	217.65 2.32 56.45	196.22 2.46 56.08	192.92 2.37 53.96	161.64 2.43 52.26	193.33 2.45 55.40
RATE OF RETURN ON AVERAGE BOOK COMMON EQUITY	% 00.6	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 ×	3.63 x
FUNDS FROM OPERATIONS / TOTAL DEBT (4)	14.35 %	12.06 %	33.42 %	15.01 %	18.49 %	18.67 %
<u>TOTAL DEBT / TOTAL CAPITAL</u>	47.49 %	45.84 %	43.69 %	44,16 %	41.46 %	44.53 %

NETOPGFC + CHGOPASLIAB - AFUDC	Preferred Stk + Sink Fund Req.	Total Capital	Total Debt	Average Price	Total Permanent Capital	Com Eq / Shares Out	Calculations	Income Bef Extra Items-S&U Net Operating Cash Flow Change in op'g Assets + Liabilities Depreciation & Amortization Income Tax Expense	Common Dividends	Preferred Stock Dividends	CE Income before Extra.	Net Income before Extra.	Total Interest	AFUDC	DPS by payable date	EPS excluding extra Price - High Price - Low	Short Term Debt	Common Shares Outst Common Equity Sinking Fund Requirements	Long Term Debt Preferred Stock	Capital Structure:	SJI
calc	calc	calc		calc	calc	calc		INCBEFEXT NETOPGFC CHGOPASLIAB DEPAMORT DEPAMORT INCTAX	COMDIVS1	PFDDIV	INCAVAILCOMM	NETINC	INTEXP	AFUDC	Yahoo	EPSAPPCOMM Yahoo Yahoo	STDEBT	Input Data TOTEQ Input Data	LTDEBT PFD	FYE: 12/31/2020	
293,563,000.000	0.000	5,182,477,000.000	3,515,601,000.000	25.845	4,586,077,000.000	16.571		157.042.000.000 311.639.000.000 -16.175.000.000 170.647.000.000 22.664.000.000	114,643,000.000	0.000	157,084,000.000	157,042,000.000	118,534,000.000	1,901,000.000	1.190	1.620 33.210 18.480	596,400,000.000	100,591,940,000 1,666,876,000,000 0,000	2,919,201,000,000 0,000	2020	
28,110,000.000	0.000	4,810,480,000.000	3,386,695,000.000	30.580	3,961,780,000.000	15.410		76,917,000,000 121,052,000,000 -91,396,000,000 133,385,000,000 21,061,000,000	106,938,000.000	0.000	76,917,000.000	76,917,000.000	114,477,000.000	1,546,000.000	1.160	0.840 34.270 26.890	848,700,000.000	92,394,155.000 1,423,785,000.000 0.000	2,537,995,000.000 0.000	2019	
142,029,000.000	0.000	4,378,294,000.000	3,111,272,000.000	31.120	4,107,794,000.000	14.818		17,663,000,000 143,583,000,000 281,000,000 132,914,000,000 561,000,000	94,756,000.000	0.000	17,663,000.000	17,663,000.000	90,296,000.000	1,835,000 000	1,130	0.210 36.130 26.110	270,500,000.000	85,506,218.000 1,267,022,000.000 0.000	2,840,772,000.000 0.000	<u>2018</u>	CAPITALIZATI
222,329,000.000	0.000	2,725,617,000.000	1,533,208,000 000	34,450	2,379,217,000,000	14,990		-3,404,000,000 190,321,000,000 35,102,000,000 109,818,000,000 -24,937,000,000	87,308,000 000	0.000	-3,404,000 000	-3,404,000 000	54,019,000 000	3,094,000.000	1.100	-0.040 38.120 30.780	346,400,000.000	79,549,080,000 1,192,409,000,000 0,000	1,186,808,000.000 0 000	2017	South Jersey Industries, Inc. CAPITALIZATION AND FINANCIAL STA 2015 - 2020, Inclusive
315,232,000.000	0.000	2,625,254,000.000	1,336,014,000.000	28.655	2,329,154,000.000	16 221		119,061,000 000 262,240,000 000 60,492,000 000 91,042,000 000 54,151,000 000	82,380,000.000	0.000	119.061.000.000	119,061,000 000	31,449,000.000	7,500,000,000	1.070	1,560 34,680 22,630	296,100,000.000	79,478,055.000 1,289,240,000.000 0 000	1,039,914,000.000 0.000	2016	(TISTICS (1)
196,578,000.000	0.000	2,505,087,000.000	1,467,548,000.000	25 833	2,073,387,000.000	14.620		105,610,000,000 186,794,000,000 10,893,000,000 91,042,000,000 1,360,000,000	70,158,000,000	0.000	105,107,000,000	105,107,000.000	31,622,000.000	1,109,000.000	1.018	1.520 30.295 21.370	431,700,000.000	70,965,622.000 1,037,539,000.000 0.000	1,035,848,000.000 0.000	2015	

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

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South Jersey Industries, Inc. CAPITALIZATION AND FINANCIAL STATISTICS (1) 2015.-2020. Inclusive

FUNDS FROM OPERATIONS / TOTAL DEBT (4)	TOTAL DEBT / EBITDA (3)	RATE OF RETURN ON AVERAGE BOOK COMMON EQUITY	FINANCIAL RATIOS - MARKET BASED EARNINGS / PRICE RATIO MARKET / AVERAGE BOOK RATIO DIVIDEND YIELD DIVIDEND PAYOUT RATIO	FINANCIAL STATISTICS	BASED ON TOTAL CAPITAL: TOTAL DEBT. INCLUDING SHORT-TERM PREFERED STOCK COMMON EQUITY TOTAL	CAPITAL STRUCTURE RATIOS BASED ON TOTAL PERMANENT CAPITAL: LONG-TERM DEBT PREFERRED STOCK COMMON EQUITY TOTAL	INDICATED AVERAGE CAPITAL COST RATES (2) TOTAL DEBT PREFERRED STOCK	AMOUNT OF CAPITAL EMPLOYED TOTAL PERMANENT CAPITAL SHORT-TERM DEBT TOTAL CAPITAL EMPLOYED	CAPITALIZATION STATISTICS
8.35 %	7.50 x	10.17 %	6.27 % 161.63 4.60 72.98		67.84 % 0.00 <u>32.16</u> <u>100.00</u> %	63.65 % 0.00 <u>36.35</u>	3.43 %	\$4,586.077 <u>\$596.400</u> \$5,182.477	2020
0.83 %	9.79 x	5.72 %	2.75 % 202.33 3.79 139.03		70.40 % 0.00 <u>29.60</u> 1 <u>00.00</u> %	64.06 % 0.00 <u>35.94</u> 1 <u>00.00</u> %	3.52 %	\$3,961.780 <u>\$848 700</u> \$4,810.480	<u>2019</u> (MILLI
4.56 %	12.89 x	1.44 %	0.67 % 208.81 3.63 536.47		71.06 % 0.00 <u>28.94</u> 1 <u>00.00</u> %	69.16 % 0.00 <u>30.84</u> 1 <u>00.00</u> %	3.89 %	\$4,107.794 <u>\$270.500</u> \$4,378.294	2018 (MILLIONS OF DOLLARS)
14.50 %	11.32 x	-0.27 %	-0.12 % 220.76 3.19 NA		56 25 % 0 00 <u>43 75</u> 100 00 %	49.88 % 0.00 <u>50.12</u> 100.00 %	3.77 %	\$2,379,217 <u>\$346,400</u> \$2,725,617	2017 RS)
23.59 %	4.52 x	10.23 %	5.44 % 185.82 3.73 69.19		50.89 % 0.00 <u>49.11</u> 100.00 %	44 .65 % 0.00 <u>55.35</u> 1 <u>00.00</u> %	2.24 %	\$2,329,154 <u>\$296,100</u> \$2,625,254	<u>2016</u>
10.37 %	9.20 x	5.46 %	3.00 % 195.87 3.79 204.42		63.29 % 0.00 <u>36.71</u> 100.00 %	AVERAGE 58.28 % 0.00 41.72 100.00 %	5 YEAR		

TOTAL DEBT / TOTAL CAPITAL

8.35 % 67.84 %

70 40 %

4.56 % 71.06 %

56.25 %

50.89 % 63.29 %

EBITDA	NETOPGFC + CHGOPASLIAB - AFUDC	Preferred Stk + Sink Fund Req.	Total Capital	Total Debt	Average Price	Total Permanent Capital	Com Eq / Shares Out.	Calculations	Income Bef Extra Items-S&U Net Operating Cash Flow Change in op'g Assets + Liabilities Depreciation & Amontzation Income Tax Expense	Common Dividends	Preferred Stock Dividends	CE Income before Extra.	Net Income before Extra.	Total Interest	AFUDC	DPS by payable date	EPS excluding extra Price - High Price - Low	Short Term Debt	Common Shares Outst Common Equity Sinking Fund Requirements	Long Term Debt Preferred Stock	Canital Structure:	Swx
calc	calc	calc	calc		calc	calc	calc		INCBEFEXT NETOPGFC CHGOPASLIAB DEPAMORT INCTAX	COMDIVS1	PFDDIV	INCAVAILCOMM	NETINC	INTEXP	AFUDC	Bloomberg	EPSAPPCOMM Bloomberg Bloomberg	STDEBT	Input Data TOTEQ Input Data	LTDEBT PFD	FYE: 12/31/2020	
748,242,000,000	717,225,000.000	0.000	5,554,586,000.000	2,879,633,000.000	66.110	5,447,586,000.000	46.771		238 985,000 000 626,080,000 000 99,071,000.000 332,027,000 000 65,753,000 000	125,504,000.00	0.000	238,985,000.000	238,985,000.000	111,477,000.000	7,926,000.000	2.280	4.140 79.950 52.270	107,000,000.00	57,192,925.00 2,674,953,000.00 0.000	2,772,633,000.00 0.000	2020	
685,133,000.000	454,532,000.000	0.000	5,180,908,000.000	2,674,994,000.000	83.030	4,969,908,000.000	45.556		216,647,000,000 500,372,000,000 -37,121,000,000 303,237,000,000 56,023,000,000	116,127,000.000	0.000	216,647,000.000	216,647,000.000	109.226,000.000	8,719,000,000	2.180	3.940 92.140 73.920	211,000,000.000	55,007,433.000 2,505,914,000.000 0.000	2,463,994,000.000 0,000	2019	
589,844,000,000	535,427,000.000	0.000	4,543,908,000.000	2,292,318,000.000	74,455	4,391,908,000.000	42.461		182.277.000.000 528.856.000.000 13.462.000.000 249.212.000.000 61.684.000.000	100,240,000.000	0.000	182,277,000.000	181,652,000.000	96,671,000.000	6,891,000.000	2.080	3,680 84,770 64,140	152,000,000.000	53,026,848.000 2,251,590,000.000 0.000	2,140,318,000,000 0,000	<u>2018</u>	CAPITALIZAT
587,584,000.000	241,308,000.000	0.000	3,800,133,000.000	1,987,730,000.000	79.550	3,585,633,000.000	37.687		193,481,000,000 369,955,000,000 -124,685,000,000 250,951,000,000 65,088,000,000	92, 130,000,000	0.000	193,481,000.000	193,942,000.000	78,064,000.000	3,962,000 000	2.100	4.040 86.270 72.830	214,500,000.000	48,090,470.000 1,812,403,000.000 0.000	1,773,230,000,000 0.000	2017	Southwest Gas CAPITALIZATION AND FINANCIAL STA 2015 - 2020, Inclusive
593,301,000.000	687,863,000.000	0.000	3,261,357,000,000	1,600,084,000.000	66.345	3,261,357,000.000	34.987		152,041,000,000 598,389,000,000 92,938,000,000 289,132,000,000 78,468,000,000	83,317,000.000	0.000	152,041,000 000	153,055,000.000	73,660,000.000	3,464,000.000	1.800	3, 180 78,830 53,860	0.000	47,482,068.000 1,661,273,000.000 0.000	1,600,084,000.000 0 000	2016	ATISTICS (1)
560,209,000,000	455,318,000.000	0.000	3,183,087,000.000	1,588,679,000.000	57.080	3,165,087,000.000	33.653		138,317,000,000 547,147,000,000 -88,821,000,000 270,111,000,000 79,902,000,000	74,248,000.000	99,000.000	138,317,000 000	138,317,000 000	71,879,000.000	3,008,000.000	1.620	2.920 63.380 50.780	18,000,000 000	47,377,575.000 1,594,408,000.000 0.000	1,570,679,000.000 0,000	2015	

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Southwest Gas_____ CAPITALIZATION AND FINANCIAL STATISTICS (1) 2015 - 2020, Inclusive

51.06 %	49.06 %	52.31 %	50 45 %	51.63 %	51.84 %	TOTAL DEBT / TOTAL CAPITAL
24.08 %	42.99 %	12.14 %	23.36 %	16.99 %	24.91 %	FUNDS FROM OPERATIONS / TOTAL DEBT (4)
3.54 x	2.70 ×	3.38 x	3.89 ×	3.90 ×	3.85 x	TOTAL DEBT / EBITDA (3)
9.56 %	9.34 %	11.14 %	8.97 %	9.11 %	9.23 %	RATE OF RETURN ON AVERAGE BOOK COMMON EQUITY
5.16 % 185.98 2.84 52.71	4,79 % 193,31 2,71 54,80	5.08 % 218.92 2.64 47.62	4.94 % 185.79 2.79 54.99	4.75 % 188.67 2.63 53.60	6.26 % 143.21 3.45 52.52	FINANCIAL RATIOS - MARKET BASED EARNINGS / PRICE RATIO MARKET / AVERAGE BOOK RATIO DIVIDEND YIELD DIVIDEND PAYOUT RATIO
						FINANCIAL STATISTICS
51.06 % 0.00 <u>48.94</u> <u>100.00</u> %	49.06 % 0.00 <u>50.94</u> 100.00 %	52.31 % 0.00 <u>47.69</u> <u>100 00</u> %	50.45 % 0.00 <u>49.55</u> <u>100.00</u> %	51.63 % 0.00 <u>48.37</u> <u>100.00</u> %	51.84 % 0.00 <u>48.16</u> 100.00 %	BASED ON TOTAL CAPITAL: TOTAL DEBT, INCLUDING SHORT-TERM PREFERRED STOCK COMMON EQUITY TOTAL
AVERAGE 49.54 % 0.00 50.46 100.00 %	49 06 % 0.00 <u>50 94</u> 1 <u>00.00</u> %	49.45 % 0.00 <u>50.55</u> 100.00 %	4 8.73 % 0.00 <u>51.27</u> 100.00 %	49 58 % 0 00 <u>50 42</u> 100 00 %	50 90 % 0.00 <u>49 10</u> 1 <u>00 00</u> %	<u>CAPITAL STRUCTURE RATIOS</u> BASED ON TOTAL PERMANENT CAPITAL: LONG-TERM DEBT PREFERRED STOCK COMMON EQUITY TOTAL
5.YEAR	4.62 %	4.35 %	4.52 %	4.40 %	4.01 %	INDICATED AVERAGE CAPITAL COST RATES. (2) TOTAL DEBT PREFERRED STOCK
	\$3,261,357 <u>\$0 000</u> \$3,261,357	\$3,585 633 <u>\$214 500</u> \$3 800 133	\$4,391.908 <u>\$152.000</u> <u>\$4.543.908</u>	\$4,969,908 <u>\$211,000</u> \$5,180,908	\$5,447.586 <u>\$107.000</u> <u>\$5.554,586</u>	AMOUNT OF CADITAL EMPLOYED TOTAL PERMANENT CAPITAL SHORT-TERM DEBT TOTAL CAPITAL EMPLOYED
	<u>2016</u>	RS) 2017	2018 (MILLIONS OF DOLLARS)	<u>2019</u> (MILL)	2020	CAPITALIZATION STATISTICS

EBITDA	NETOPGFC + CHGOPASLIAB - AFUDC	Preferred Stk + Sink Fund Req.	Total Capital	Total Debt	Average Price	Total Permanent Capital	Com Eq / Shares Out	Calculations	Income Bef Extra Items-S&U Net Operating Cash Flow Change in op'g Assets + Liabilities Depreciation & Amontzation Income Tax Expense	Common Dividends	Preferred Stock Dividends	CE Income before Extra.	Net income before Extra	Total Interest	AFUDC	DPS by payable date	EPS excluding extra Price - High Price - Low	Short Term Debt	Common Shares Outst. Common Equity Sinking Fund Requirements	Long Term Debt Preferred Stock	Capital Structure:	SR
calc	calc	calc	calc		calc	calc	calc		INCBEFEXT NETOPGFC CHGOPASLIAB DEPAMORT INCTAX	COMDIVS1	PEDDIV	INCAVAILCOMM	NETINC	INTEXP	AFUDC	Bloomberg	EPSAPPCOMM Bloomberg Bloomberg	STDEBT	Input Data TOTEQ Input Data	LTDEBT PFD	FYE: 9/30/2020	
403,800,000.000	484,300,000.000	242,000,000.000	5,654,400,000 000	3,132,100,000.000	69.560	5,006,400,000.000	44.182		88,600,000,000 469,900,000,000 14,400,000,000 197,300,000,000 12,400,000,000	128,000,000.000	14,800,000.000	73,700,000,000	88,600,000.000	105,500,000.000	0.000	2,490	1,440 87,600 51,520	648,000,000.000	51,611,789 000 2,280,300,000 000 0,000	2,484,100,000,000 242,000,000,000	2020	
505,200,000.000	472,700,000,000	242,000,000.000	5,408,800,000.000	2,865,800,000 000	79.195	4,665,600,000.000	45.141		184,600,000,000 450,900,000,000 21,800,000,000 181,700,000,000 34,500,000,000	119,000,000.000	3,400,000.000	178,900,000.000	184,600,000 000	104,400,000.000	0.000	2.370	3.520 87.240 71.150	743,200,000.000	50,973,515.000 2,301,000,000.000 0.000	2,122,600,000.000 242,000,000,000	2019	
454,500,000.000	515,100,000.000	0.000	4,726,600,000,000	2,471,200,000,000	71.775	4,173,000,000.000	44.510		214,200,000,000 456,600,000,000 58,500,000,000 168,400,000,000 -26,500,000,000	112,100,000.000	0.000	213,700,000.000	214,200,000.000	98,400,000,000	0,000	2.250	4.330 82.250 61.300	553,600,000.000	50,671,903,000 2,255,400,000,000 0,000	1,917,600,000,000 0,000	<u>2018</u>	CAPITALIZATI
482,400,000.000	183,900,000,000	0.000	4,563,600,000.000	2,572,300,000,000	68.685	4,086,300,000.000	41.259		161,600,000,000 288,300,000,000 -104,400,000,000 154,100,000,000 77,600,000,000	96,200,000.000	0.000	161,600,000.000	161,600,000.000	89,100,000.000	0 000	2.100	3.430 77.400 59.970	477,300,000.000	48,263,243.000 1,991,300,000.000 0.000	2,095,000,000,000 0,000	2017	<u>Spire Inc</u> CAPITALIZATION AND FINANCIAL STATISTICS (1) <u>2015 - 2020, Inclusive</u>
428,400,000.000	301,200,000.000	0.000	4,250,600,000.000	2,482,400,000.000	62.710	3,851,900,000.000	38.733		144,200,000,000 328,300,000,000 -27,100,000,000 137,500,000,000 69,500,000,000	85,200,000.000	0.000	144,200,000.000	144,200,000.000	77,200,000.000	0.000	1.960	3.240 70.840 54.580	398,700,000.000	45,650,642.000 1,768,200,000.000 0.000	2,083,700,000.000 0.000	2016	TISTICS (1)
404,500,000.000	333,200,000.000	0.000	3,763,100,000,000	2,189,500,000.000	51.085	3,425,100,000.000	36.312		136,900,000,000 322,400,000,000 10,800,000,000 130,800,000,000 62,200,000,000	79,000,000.000	0.000	136,900,000,000	136,900,000.000	74,600,000 000	0 000	1.840	3.160 56.020 46.150	338,000,000.000	43,335,012,000 1,573,600,000,000 0,000	1,851,500,000.000 0,000	2015	

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Spire Inc. CAPITALIZATION AND FINANCIAL STATISTICS (1) <u>2015 - 2020, Inclusive</u>

TOTAL DEBT / TOTAL CAPITAL	FUNDS FROM OPERATIONS / TOTAL DEBT (4)	TOTAL DEBT / EBITDA (3)	RATE OF RETURN ON AVERAGE BOOK COMMON EQUITY	FINANCIAL RATIOS - MARKET BASED EARNINGS / PRICE RATIO MARKET / AVERAGE BOOK RATIO DIVIDEND YIELD DIVIDEND PAYOUT RATIO	EINANOIAL STATISTICS	BASED ON TOTAL CAPITAL: TOTAL DEBT, INCLUDING SHORT-TERM PREFERRED STOCK COMMON EQUITY TOTAL	CAPITAL STRUCTURE RATIOS BASED ON TOTAL PERMANENT CAPITAL: LONG-TERM DEBT PREFERRED STOCK COMMON EQUITY TOTAL	INDICATED AVERAGE CAPITAL COST RATES (2) TOTAL DEBT PREFERRED STOCK	AMOUNT OF CAPITAL EMPLOYED TOTAL PERMANENT CAPITAL SHORT-TERM DEBT TOTAL CAPITAL EMPLOYED	CAPITALIZATION STATISTICS
55.39 %	15.46 %	7.76 x	3.22 %	2.07 % 155.75 3.58 173.68		55.39 % 4.28 <u>40.33</u> 1 <u>00.00</u> %	49.62 % 4.83 <u>45.55</u> 100.00 %	3.52 % 6.12	\$5 ,006,400 <u>\$648,000</u> <u>\$5,654,400</u>	2020
52.98 %	16 49 %	5.67 x	7.85 %	4.44 % 176.67 2.99 66.52		52.98 % 4.48 <u>42.54</u> 100.00 %	45.49 % 5.19 <u>49.32</u> 100.00 %	3.91 % 2.81	\$4,665.600 <u>\$743.200</u> \$5,408.800	<u>2019</u> (MILI
52.28 %	20 84 %	5.44 x	10.06 %	。 167.37 52.46		52.28 % 0.00 <u>47.72</u> 1 <u>00.00</u> %	45.95 % 0.00 <u>54.05</u>	3.90 %	\$4,173.000 <u>\$553.600</u> \$4,726.600	<u>2018</u> (MILLIONS OF DOLLARS)
56.37 %	7.15 %	5.33 x	8.60 %	。 171.73 3.06 59.53		56 37 % 0.00 <u>100 00</u> %	51.27 % 0.00 <u>48.73</u>	3.53 %	\$4,086,300 <u>\$477,300</u> <u>\$4,563,600</u>	<u>2017</u> ARS)
58.40 %	, 12.13 %	5.79 x	8.63 %	5.17 % 167.12 3.13 59.08		58,40 % 0.00 <u>41,60</u> 1 <u>00 00</u> %	54.10 % 0.00 % 100.00 %	3.30 %	\$3,851,900 <u>\$398 700</u> \$4,250 600	2016
55.08 %	14.41 %	6.00 x	7.67 %	4.54 % 167.73 3.18 82.25		55.08 % 1.75 <u>43.17</u> 1 <u>00.00</u> %	AVERAGE 49.29 % 2.00 48.71 100.00 %			

0.17 % (3)

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 Feb-2021	3.04 % 2.70	3.27 2.93	3.44 % 3.09	3.72 %
Jan-2021	2.45	2.93	2.91	3.37 <u>3.18</u>
Average	2.73 %	2.98 %	3.15_%	3.42 %
		Selected	Bond Spreads	
A2 Rated Public	Utility Bonds Over Aa	a Rated Corporate B	onds:	
				0.42 % (1)
Baa2 Rated Pub	lic Utility Bonds Over A	A2 Rated Public Utili	ty Bonds:	<u> </u>

A2 Rated Public Utility Bonds Over Aa2 Rated Public Utility Bonds:

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

	M	oody's	
	Long-Term	Issuer Rating	
	Mar	ch 2021	
Drown Crown of Source Maturel Coo	Long-Term	N	
Proxy Group of Seven Natural Gas	Issuer	Numerical	Credit Risk
Distribution Companies	Rating (1)	Weighting (2)	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:

Ratings are that of the average of each company's utility operating
 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	А	
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	В	
B3	16	В-	

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

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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

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1 I. INTRODUCTION

2

- A. <u>Witness Identification</u>
- 3 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.

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

- 7 **A.** I am a Director at ScottMadden, Inc.
- 8 B. Background and Qualifications

9 Q. Please summarize your professional experience and educational 10 background.

11 Α. 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 12 rate filings, including but not limited to revenue requirements and original 13 I am a graduate of the University of cost and lead/lag studies. 14 Pennsylvania, where I received a Bachelor of Arts degree in Economic 15 History. I also hold a Masters of Business Administration from Rutgers 16 University with a concentration in Finance and International Business, 17 which was conferred with high honors. I am a Certified Rate of Return 18 Analyst ("CRRA") and a Certified Valuation Analyst ("CVA"). My full 19 20 professional qualifications are provided in Appendix A.

4

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2 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.

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

8 A. Yes. I have prepared D'Ascendis Exhibit No. 1, which consists of
 9 Schedules DWD-1 through DWD-8.

10 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:

18

Table 1: Summary of Overall Rate of Return

Type of Capital	<u>Ratios</u>	Cost Rate	Weighted Cost Rate
Long-Term Debt	52.04%	5.59%	2.91%
Common Equity	<u>47.96%</u>	10.75%	<u>5.16%</u>
Total	<u>100.00%</u>		<u>8.07%</u>

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1 III. SUMMARY

2 Q. Please summarize your recommended common equity cost rate.

- Α. My recommended common equity cost rate of 10.75% is summarized on 3 4 page 2 of Schedule DWD-1. I have assessed the market-based common equity cost rates of companies of relatively similar, but not necessarily 5 identical, risk to CWSNC. Using companies of relatively comparable risk as 6 proxies is consistent with the principles of fair rate of return established in 7 the Hope¹ and Bluefield² cases. No proxy group can be identical in risk to 8 any single company, so there must be an evaluation of relative risk between 9 the company and the proxy group to see if it is appropriate to make 10 adjustments to the proxy group's indicated rate of return. 11
- My recommendation results from the application of several cost of 12 common equity models, specifically the Discounted Cash Flow ("DCF") 13 model, the Risk Premium Model ("RPM"), and the Capital Asset Pricing 14 Model ("CAPM"), to the market data of a proxy group of six water companies 15 ("Utility Proxy Group") whose selection criteria will be discussed below. In 16 addition, I also applied the DCF, RPM, and CAPM to a proxy group of 17 domestic, non-price regulated companies comparable in total risk to the six 18 water companies ("Non-Price Regulated Proxy Group"). 19
- 20

The results derived from each are as follows:

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).

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1	Table 2: Summary of Common	Equity Cost Rate
2 3		Utility Proxy <u>Group</u>
4 5 6 7 8	Discounted Cash Flow Model Risk Premium Model Capital Asset Pricing Model Cost of Equity Models Applied to Comparable Risk, Non-Price	8.70% 10.62 10.21
9 10 11	Regulated Companies Indicated Common Equity Cost Rate Before Adjustment	<u>11.78</u> 10.35%
12	Size Adjustment	<u>0.40</u>
13 14	Recommended Common Equity Cost Rate After Adjustment	<u>10.75%</u>
15	After analyzing the indicated con	

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.

22 IV. <u>GENERAL PRINCIPLES</u>

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

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safe and reliable service at all times, requires a level of earnings sufficient 1 to maintain the integrity of presently invested capital. Sufficient earnings 2 also permit the attraction of needed new capital at a reasonable cost, for 3 which the utility must compete with other firms of comparable risk, 4 consistent with the fair rate of return standards established by the 5 U.S. Supreme Court in the previously cited Hope and Bluefield decisions. 6 7 Consequently, marketplace data must be relied on in assessing a common 8 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 9 judgment used in arriving at a recommended common equity cost rate, the 10 11 use of multiple generally accepted common equity cost rate models also adds reliability and accuracy when arriving at a recommended common 12 equity cost rate. 13

14

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 <u>general</u> 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. OFFICIAL COPY

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.

5 Q. What business risks do the water and wastewater industries face in 6 general?

Α. 7 Water and wastewater utilities have an ever-increasing responsibility to be 8 stewards of the environment from which water supplies are drawn in order to preserve and protect essential natural resources of the United States. 9 This increased environmental stewardship is a direct result of compliance 10 11 with the Safe Water Drinking Act and response to continuous monitoring by the Environmental Protection Agency ("EPA") and state and local 12 governments of the water supply for potential contaminants and their 13 resultant regulations. This, plus aging infrastructure, necessitate additional 14 15 capital investment in the distribution and treatment of water, exacerbating the pressure on free cash flows arising from increased capital expenditures 16 for infrastructure repair and replacement. The significant amount of capital 17 investment and, hence, high capital intensity, is a major risk factor for the 18 water and wastewater utility industry. 19

20

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

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1pipes in America were laid early to mid-20th century,2with an average lifespan of between 75 and 100 years.3Many of these assets are currently in great need of4repair or replacement. Indeed, the ASCE estimates5that almost six billion gallons of water are lost per day6as a result of leaky pipes. In other terms, this is 14%-718% of the amount of water treated daily.

State regulatory commissions are extremely important 8 because they literally set the rate of return that a utility 9 is allowed to earn on its investment. No matter how 10 well run a company is, harsh treatment by authorities 11 is nearly impossible to overcome. Fortunately, 12 regulators have [sic] utilities have been successfully 13 working together. They realize that many [sic] of the 14 15 water infrastructure in the U.S. need to be upgraded and that the task will require a lot of money. Thus, 16 states are permitting the utilities to make a decent 17 return on their assets.³ (emphasis added) 18

and wastewater industry also experiences 19 The water low depreciation rates. Depreciation rates are one of the principal sources of 20 internal cash flows for all utilities (through a utility's depreciation expense), 21 and are vital for a company to fund ongoing replacements and repairs of 22 23 water and wastewater systems. Water / wastewater utility assets have long 24 lives, and therefore have long capital recovery periods. As such, they face 25 greater risk due to inflation, which results in a higher replacement cost per dollar of net plant. 26 Substantial capital expenditures, as noted by Value Line, will require 27

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

Value Line Investment Survey, April 12, 2019.

ability to achieve that return. Consistent with Hope and Bluefield, the return 1 must be sufficient to maintain credit quality as well as enable the attraction 2 of necessary new capital, be it debt or equity capital. If unable to raise debt 3 or equity capital, the utility must turn to either retained earnings or free cash 4 flow,⁴ both of which are directly linked to earning a sufficient rate of return. 5 The level of free cash flow represents a utility's ability to meet the needs of 6 7 its debt and equity holders. If either retained earnings or free cash flow is 8 inadequate, it will be nearly impossible for the utility to attract the needed capital for new infrastructure investment necessary to ensure quality service 9 to its customers. An insufficient rate of return can be financially devastating 10 11 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. OFFICIAL COPY

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

- 1 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.
- 10 Q. Can bond and credit ratings be a proxy for the combined business and
- 11 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.

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.

That being said, do rating agencies reflect company size in their bond		
ratings?		
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.		
CAPITAL STRUCTURE		

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

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- 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.

15 VI. <u>CWSNC AND THE UTILITY PROXY GROUP</u>

16 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. 1 Please explain how you chose your proxy group of six water companies. 2 The basis of selection for the Utility Proxy Group was to select those Α. 3 companies which meet the following criteria: 4 They are included in the Water Utility Group of Value Line's Standard (i) 5 or Small and Midcap Editions (April 12, 2019); 6 7 (ii) They have 70% or greater of 2018 total operating income and 70% 8 or greater of 2018 total assets attributable to regulated water operations; 9 At the time of preparation of this testimony, they had not publicly (iii) 10 11 announced that they were involved in any major merger or acquisition activity (*i.e.*, one publicly-traded utility merging with or 12 acquiring another); 13 14 (iv) They have not cut or omitted their common dividends during the five 15 years ending 2018 or through the time of the preparation of this testimony; 16 They have Value Line and Bloomberg adjusted betas; (v) 17 (vi) They have a positive Value Line five-year dividends per share 18 ("DPS") growth rate projection; and 19 (vii) They have Value Line, Reuters, Zacks, or Yahoo! Finance 20 consensus five-year earnings per share ("EPS") growth rate 21 22 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.

4 Q. Please describe schedule DWD-2, page 1.

1

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3

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.

8 During the five-year period ending 2018, the historically achieved 9 average earnings rate on book common equity for the group averaged 10 10.17%. The average common equity ratio based on total permanent 11 capital (excluding short-term debt) was 55.57%, and the average dividend 12 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%.

17 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

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1	premium reflects the market's assessment of market/systematic risk, since
2	beta coefficients are derived from regression analyses of market prices.
3	The Predictive Risk Premium Model ("PRPM") uses monthly market returns
4	in addition to expectations of the risk-free rate. The CAPM is market-based
5	for many of the same reasons that the RPM is market-based (<i>i.e.</i> , the use
6	of expected bond yields and beta coefficients). Selection of the comparable
7	risk non-price regulated companies is market-based because it is based on
8	statistics which result from regression analyses of market prices and reflect
9	the market's assessment of total risk.

10

A. Discounted Cash Flow Model

11 Q. What is the theoretical basis of the DCF model?

Α. The theory underlying the DCF model is that the present value of an 12 13 expected future stream of net cash flows during the investment holding period can be determined by discounting those cash flows at the cost of 14 capital, or the investors' capitalization rate. DCF theory indicates that an 15 investor buys a stock for an expected total return rate, which is derived from 16 cash flows received in the form of dividends plus appreciation in market 17 price (the expected growth rate). Mathematically, the dividend yield on 18 19 market price plus a growth rate equals the capitalization rate, *i.e.*, the total common equity return rate expected by investors. 20

21 Q. Which version of the DCF model do you use?

22 **A.** I use the single-stage constant growth DCF model.

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1Q.Please describe the dividend yield you used in your application of the2DCF 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

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.

11 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 12 companies in the Utility Proxy Group increase their guarterly dividend at 13 various times during the year, a reasonable assumption is to reflect one-14 15 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-16 month period, my adjustment is a conservative approach that does not 17 overstate the dividend yield. Therefore, the actual average dividend yields 18 in Column 1 on page 1 of Schedule DWD-3 have been adjusted upward to 19 reflect one-half the average projected growth rate shown in Column 6. 20

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

Α. Investors with more limited resources than institutional investors are likely 3 to rely on widely available financial information services, such as Value 4 Line, Reuters, Zacks, and Yahoo! Finance. Investors realize that analysts 5 have significant insight into the dynamics of the industries and individual 6 7 companies they analyze, as well as companies' abilities to effectively 8 manage the effects of changing laws and regulations, and ever-changing economic and market conditions. For these reasons, I use analysts' five-9 year forecasts of EPS growth in my DCF analysis. 10

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.

17 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

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3

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

4 Q. Please describe the theoretical basis of the RPM.

5 A. The RPM is based on the fundamental financial principle of risk and return, 6 namely, that investors require greater returns for bearing greater risk. The 7 RPM recognizes that common equity capital has greater investment risk 8 than debt capital, as common equity shareholders are behind debt holders 9 in any claim on a company's assets and earnings. As a result, investors 10 require higher returns from common stocks than from investment in bonds, 11 to compensate them for bearing the additional risk.

While it is possible to directly observe bond returns and yields, 12 13 investors' required common equity return cannot be directly determined or observed. According to RPM theory, one can estimate a common equity 14 risk premium over bonds (either historically or prospectively), and use that 15 premium to derive a cost rate of common equity. The cost of common equity 16 equals the expected cost rate for long-term debt capital plus a risk premium 17 18 over that cost rate to compensate common shareholders for the added risk 19 of being unsecured and last-in-line for any claim on the corporation's assets 20 and earnings in the event of a liquidation.

Please explain how you derived your indicated cost of common equity			
based on the RPM.			
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.			
Please explain the PRPM.			
The PRPM, published in the <i>Journal of Regulatory Economics</i> , 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. 14

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The PRPM estimates the risk / return relationship directly, as the 15 predicted equity risk premium is generated by the prediction of volatility or 16 risk. The PRPM is not based on an estimate of investor behavior, but rather 17 on the evaluation of the results of that behavior (i.e., the variance of 18 historical equity risk premiums). 19

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.

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1	The inputs to the model are the historical returns on the common
2	shares of each company in the Utility Proxy Group minus the historical
3	monthly yield on long-term U.S. Treasury securities through April 2019.
4	Using a generalized form of ARCH, known as GARCH, I calculated each
5	Utility Proxy Group company's projected equity risk premium using Eviews $^{\ensuremath{ ext{$^{\circ}$}}}$
6	statistical software. When the GARCH Model is applied to the historical
7	return data, it produces a predicted GARCH variance series ⁹ and a GARCH
8	coefficient ¹⁰ . Multiplying the predicted monthly variance by the GARCH
9	coefficient, then annualizing it ¹¹ produces the predicted annual equity risk
10	premium. I then added the forecasted 30-year U.S. Treasury Bond yield,
11	3.33% ¹² , to each company's PRPM-derived equity risk premium to arrive at
12	an indicated cost of common equity. The 30-year Treasury yield is a
13	consensus forecast derived from the <u>Blue Chip Financial Forecasts ("Blue</u>
14	<u><i>Chip</i></u> ^{")13} . The mean PRPM indicated common equity cost rate for the Utility
15	Proxy Group is 11.15%, the median is 11.25%, and the average of the two
16	is 11.20%. Consistent with my reliance on the average of the median and
17	mean results of the DCF, I will rely on the average of the mean and median
18	results of the Utility Proxy Group PRPM to calculate a cost of common
19	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 Order¹⁴ regarding the PRPM in the Company's last rate case?

I have. The Commission expressed a concern regarding the use of a Α. 3 specific statistical package to produce the results of the PRPM and were 4 skeptical that investors would place significant weight on the model given 5 that assumption. To clarify, the GARCH methodology, which has been in 6 7 the public domain since the 1980's as discussed above, is available in 8 various statistical packages such as EViews®, SAS, RATS, S-Plus and JMulti, which are not cost-prohibitive and provide instructions for using the 9 various statistical methodologies in their software. The software that I used 10 11 in this proceeding currently costs approximately \$1,500 for a single user commercial license. In fact, JMulti is a free downloadable software with 12 GARCH estimation applications. In providing this additional information, it 13 is my hope that the Commission will revisit this concern in its Order in this 14 15 rate case.

16 **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 betaadjusted 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.

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Α. The first step in the total market approach RPM analysis is to determine the 3 expected bond yield. Because both ratemaking and the cost of capital, 4 including common equity cost rate, are prospective in nature, a prospective 5 yield on similarly-rated long-term debt is essential. I rely on a consensus 6 7 forecast of about 50 economists of the expected yield on Aaa-rated 8 corporate bonds for the six calendar quarters ending with the third calendar guarter of 2020 and the long-term projections for 2020 to 2024, and 2025 9 to 2029 from Blue Chip. As shown on Line No. 1 of page 3 of Schedule 10 11 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 12 bonds, I make an upward adjustment of 0.41%, which represents a recent 13 spread between Aaa corporate bonds and A2-rated public utility bonds, in 14 15 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 16 the expected Aaa corporate bond yield of 4.25% results in an expected A2 17 public utility bond of 4.66%. 18

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.

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1	between A2 and A3 public utility bond yields, is necessary to make the A2
2	prospective bond yield applicable to an A2/A3 public utility bond. ¹⁶ Adding
3	the 0.08% to the 4.66% prospective A2 public utility bond yield results in a
4	4.74% expected bond yield for the Utility Proxy Group.

5 Q. Please explain how the beta-derived equity risk premium is 6 determined.

Α. The components of the beta-derived risk premium model are 1) an expected 7 8 market equity risk premium over corporate bonds, and 2) the beta coefficient. The derivation of the beta-derived equity risk premium that I 9 apply to the Utility Proxy Group is shown on lines 1 through 9 of page 8 of 10 11 Schedule DWD-4. The total beta-derived equity risk premium I apply is based on an average of: 1) lbbotson-based equity risk premiums; 2) Value 12 Line-based equity risk premiums; and 3) Bloomberg-based equity risk 13 premium. Each of these is described in turn. 14

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 <u>Stocks, Bonds, Bills, and Inflation ("SBBI") 2019 Yearbook ("SBBI –</u> 20 <u>2019")</u> 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

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.

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returns over a very long period of time is appropriate because it is consistent 1 with the long-term investment horizon presumed by investing in a going 2 concern, *i.e.*, a company expected to operate in perpetuity. 3

SBBI's long-term arithmetic mean monthly total return rate on large 4 company common stocks was 11.62% and the long-term arithmetic mean 5 monthly yield on Moody's Aaa/Aa-rated corporate bonds was 6.08%.¹⁸ As 6 7 shown on line 1 of page 8 of Schedule DWD-4, subtracting the mean 8 monthly bond yield from the total return on large company stocks results in a long-term historical equity risk premium of 5.54%. 9

I used the arithmetic mean monthly total return rates for the large 10 11 company stocks and yields (income returns) for the Moody's Aaa/Aa corporate bonds, because they are appropriate for the purpose of 12 estimating the cost of capital as noted in SBBI – 2019.¹⁹ The use of the 13 arithmetic mean return rates and yields is appropriate because historical 14 15 total returns and equity risk premiums provide insight into the variance and standard deviation of returns needed by investors in estimating future risk 16 when making a current investment. If investors relied on the geometric 17 mean of historical equity risk premiums, they would have no insight into the 18 potential variance of future returns because the geometric mean relates the 19 20 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. 21

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.

Α. To derive the regression analysis-derived market equity risk premium of 3 7.93%, shown on line 2 of page 8 of Schedule DWD-4, I used the same 4 monthly annualized total returns on large company common stocks relative 5 to the monthly annualized yields on Moody's Aaa/Aa corporate bonds as 6 7 mentioned above. The relationship between interest rates and the market 8 equity risk premium was modeled using the observed monthly market equity 9 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 10 11 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 12 yield: 13

14 $\operatorname{RP} = \alpha + \beta (\operatorname{R}_{\operatorname{Aaa}/\operatorname{Aa}})$

15 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.

Α. As noted previously, because both ratemaking and the cost of capital are 5 prospective, a prospective market equity risk premium is needed. The 6 7 derivation of the forecasted or prospective market equity risk premium can 8 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 9 prospective market equity risk premium is derived from an average of the 10 11 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 12 estimated dividend yield for the common stocks of the 1,700 firms covered 13 in Value Line's Standard Edition.²² 14

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.

²¹ Shown on Line No. 3 on page 8 of Schedule DWD-4.

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

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1	Q.	Please explain the derivation of an equity risk premium based on the
2		S&P 500 companies.
3	A.	Using data from Value Line, I calculate an expected total return on the S&P
4		500 using expected dividend yields and long-term growth estimates as a
5		proxy for capital appreciation. The expected total return for the S&P 500 is
6		16.03%. Subtracting the prospective yield on Aaa Corporate bonds of
7		4.25% results in an 11.78% projected equity risk premium.
8	Q.	Please explain the derivation of an equity risk premium based on
9		Bloomberg data.
10	Α.	Using data from Bloomberg Professional Services, I calculate an expected
11		total return on the S&P 500 using expected dividend yields and long-term
12		growth estimates as a proxy for capital appreciation, identical to the method
13		described above. The expected total return for the S&P 500 is 13.35%.
14		Subtracting the prospective yield on Aaa Corporate bonds of 4.25% results
15		in a 9.10% projected equity risk premium.
16	Q.	What is your conclusion of a beta-derived equity risk premium for use
17		in your RPM analysis?
18	A.	I give equal weight to the six equity risk premiums in arriving at my
19		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

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

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1	prospective relative risk to the market as a whole and is a logical means by
2	which to allocate a company's, or proxy group's, share of the market's total
3	equity risk premium relative to corporate bond yields. As shown on page 1
4	of Schedule DWD-5, the average of the mean and median beta coefficient
5	for the Utility Proxy Group is 0.67. Multiplying the beta coefficient of the
6	Utility Proxy Group of 0.67 by the market equity risk premium of 8.71%
7	results in a beta-adjusted equity risk premium of 5.84% for the Utility Proxy
8	Group.

9 Q. How did you derive the equity risk premium based on the S&P Utility 10 Index and Moody's A-rated public utility bonds?

Α. I estimated three equity risk premiums based on S&P Utility Index holding 11 returns, and two equity risk premiums based on the expected returns of the 12 S&P Utilities Index, using Value Line and Bloomberg data, respectively. 13 Turning first to the S&P Utility Index holding period returns, I derived a long-14 15 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 16 of 6.56% from 1928 to 2018 to arrive at an equity risk premium of 4.00%.²⁴ 17 I then used the same historical data to derive an equity risk premium of 18 5.72% based on a regression of the monthly equity risk premiums. The final 19 S&P Utility Index holding period equity risk premium involved applying the 20 PRPM using the historical monthly equity risk premiums from January 1928 21

²⁴

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

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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%.

- 9 Q. What is your conclusion of an equity risk premium for use in your total
 10 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
- 15 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.

²⁵ Derived on Line No. 3 of page 3 of Schedule DWD-4.

²⁶ As shown on page 7 of Schedule DWD-4.

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1	Q.	What are the results of your application of the PRPM and the total
2		market approach RPM?
3	Α.	As shown on page 1 of Schedule DWD-4, the indicated RPM-derived
4		common equity cost rate is 10.62%, which gives equal weight to the PRPM
5		(11.20%) and the adjusted market approach results (10.03%).

6

C.

The Capital Asset Pricing Model

7 Q. Please explain the theoretical basis of the CAPM.

8 A. CAPM theory defines risk as the co-variability of a security's returns with 9 the market's returns as measured by the beta coefficient (β). A beta 10 coefficient less than 1.0 indicates lower variability than the market as a 11 whole, while a beta coefficient greater than 1.0 indicates greater variability 12 than the market.

13 The CAPM assumes that all other risk (*i.e.*, all non-market or unsystematic risk) can be eliminated through diversification. The risk that 14 cannot be eliminated through diversification is called market, or systematic, 15 risk. In addition, the CAPM presumes that investors require compensation 16 only for systematic risk, which is the result of macroeconomic and other 17 18 events that affect the returns on all assets. The model is applied by adding 19 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 20 to the total market as measured by the beta coefficient. The traditional 21 CAPM model is expressed as: 22

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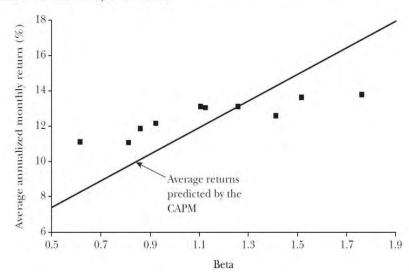
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1		Rs	=	$R_f + \beta(R_m - R_f)$
2	Where:	Rs	=	Return rate on the common stock
3		Rf	=	Risk-free rate of return
4		R_{m}	=	Return rate on the market as a whole
5 6		β	=	Adjusted beta coefficient (volatility of the security relative to the market as a whole)
7	Nume	erous t	ests of	the CAPM have measured the extent to which
8	security retu	rns and	d beta c	coefficients are related as predicted by the CAPM,
9	confirming it	s valid	ity. Th	e empirical CAPM ("ECAPM") reflects the reality
10	that while t	he res	ults of	these tests support the notion that the beta
11	coefficient is	relate	d to se	curity returns, the empirical Security Market Line
12	("SML") des	cribed	by the	CAPM formula is not as steeply sloped as the
13	predicted SI	ML. ²⁷	The E	CAPM reflects this empirical reality. Fama and
14	French clear	ly state	e regaro	ding Figure 2, below, that "[t]he returns on the low
15	beta portfoli	os are	too hig	h, and the returns on the high beta portfolios are
16	too low." 28			

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



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 2 3 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 4 SML. Morin states: 5 6 With few exceptions, the empirical studies agree that ... lowbeta securities earn returns somewhat higher than the CAPM 7 would predict, and high-beta securities earn less than 8 predicted.29 9 10 Therefore, the empirical evidence suggests that the expected 11 return on a security is related to its risk by the following 12 approximation: 13 $K = R_F + x \beta(R_M - R_F) + (1-x) \beta(R_M - R_F)$ 14 where x is a fraction to be determined empirically. The value 15 of x that best explains the observed relationship [is] Return = 16

²⁹ Morin, at 175.

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1 2	0.0829 + 0.0520 β is between 0.25 and 0.30. If x = 0.25, the equation becomes:
3	K = R _F + 0.25(R _M - R _F) + 0.75 β (R _M - R _F) ³⁰
4	Fama and French provide similar support for the ECAPM when they
5	state:
6 7 8 9 10 11 12	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
13 14	Finally, Fama and French further note:
15 16 17 18 19 20 21 22 23 24	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
25	Clearly, the justification from Morin, Fama, and French along with
26	their reviews of other academic research on the CAPM, validate the use of
27	the ECAPM. In view of theory and practical research, I have applied both
28	the traditional CAPM and the ECAPM to the companies in the Utility Proxy
29	Group and averaged the results.

³⁰

Morin, at 190. Fama & French, at 32. 31

³² *Ibid.,* at 33.

1	Q.	Have you reviewed the Commission's Order ³³ regarding the ECAPM in
2		the Company's last rate case?
3	Α.	I have. The Commission's concern regarding the ECAPM was that I did not
4		provide enough evidence why the ECAPM was superior to the CAPM in my
5		testimony. The additional language provided above attempts to address
6		the Commission's concerns.
7	Q.	What Beta coefficients did you use in your CAPM analysis?
8	Α.	With respect to the Beta coefficient, I considered two methods of
9		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.

17 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

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?

- 6 **A.** The yield on long-term U.S. Treasury Bonds is almost risk-free and its term 7 is consistent with the long-term cost of capital to public utilities measured 8 by the yields on A-rated public utility bonds; the long-term investment 9 horizon inherent in utilities' common stocks; and the long-term life of the 10 jurisdictional rate base to which the allowed fair rate of return (*i.e.*, cost of 11 capital) will be applied. In contrast, short-term U.S. Treasury yields are 12 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:
- 18 (i) Ibbotson-based market risk premiums;
- 19 (ii) Value Line data-based market risk premiums; and
- 20 (iii) Bloomberg data-based market risk premium.
- The long-term income return on U.S. Government Securities of 5.12% was deducted from the <u>SBBI - 2019</u> monthly historical total market return of 11.89%, which results in an historical market equity risk premium

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1	of 6.77%. ³⁴ I applied a linear OLS regression to the monthly annualized
2	historical returns on the S&P 500 relative to historical yields on long-term
3	U.S. Government Securities from <u>SBBI - 2019</u> . That regression analysis
4	yielded a market equity risk premium of 9.00%. The PRPM market equity
5	risk premium is 9.40%, and is derived using the PRPM relative to the yields
6	on long-term U.S. Treasury securities from January 1926 through April
7	2019.

8 The Value Line-derived forecasted total market equity risk premium is derived by deducting the forecasted risk-free rate of 3.33%, discussed 9 above, from the Value Line projected total annual market return of 13.82%, 10 11 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 12 derived by subtracting the projected risk-free rate of 3.33% from the 13 projected total return of the S&P 500 of 16.03%. The resulting market equity 14 risk premium is 12.70%. 15

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%.

SBBI - 2019, at Appendix A-1 (1) through .A-1 (3) and Appendix A-7 (19) through A-7 (21).

1	Q.	What are the results of your application of the traditional and empirical
2		CAPM to the Utility Proxy Group?
3	Α.	As shown on page 1 of Schedule DWD-5, the mean result of my
4		CAPM/ECAPM analyses is 10.25%, the median is 10.17%, and the average
5		of the two is 10.21%. Consistent with my reliance on the average of mean
6		and median DCF results discussed above, the indicated common equity
7		cost rate using the CAPM/ECAPM is 10.21%.
8 9 10		D. <u>Common Equity Cost Rates for a Proxy Group of Domestic,</u> <u>Non-Price Regulated Companies Based on the DCF, RPM, and</u> <u>CAPM</u>
11	Q.	Why do you also consider a proxy group of domestic, non-price
12		regulated companies?
12 13	A.	
		regulated companies?
13		regulated companies? In the <i>Hope</i> and <i>Bluefield</i> cases, the U.S. Supreme Court did not specify
13 14		regulated companies? In the <i>Hope</i> and <i>Bluefield</i> cases, the U.S. Supreme Court did not specify that comparable risk companies had to be utilities. Since the purpose of
13 14 15		regulated companies? In the <i>Hope</i> and <i>Bluefield</i> 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,
13 14 15 16		regulated companies? In the <i>Hope</i> and <i>Bluefield</i> 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
13 14 15 16 17		regulated companies? In the <i>Hope</i> and <i>Bluefield</i> 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
 13 14 15 16 17 18 		regulated companies? In the <i>Hope</i> and <i>Bluefield</i> 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

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1	Q.	How	did you select unregulated companies that are comparable in
2		total	risk to the regulated public Utility Proxy Group?
3	A.	In orc	ler to select a proxy group of domestic, non-price regulated companies
4		simila	ar in total risk to the Utility Proxy Group, I relied on the beta coefficients
5		and r	elated statistics derived from Value Line regression analyses of weekly
6		mark	et prices over the most recent 260 weeks (<i>i.e.</i> , five years). Using these
7		selec	tion criteria resulted in a proxy group of eleven domestic, non-price
8		regula	ated firms comparable in total risk to the Utility Proxy Group. Total risk
9		is the	e sum of non-diversifiable market risk and diversifiable company-
10		speci	fic risks. The criteria used in the selection of the domestic, non-price
11		regula	ated firms was:
12		(i)	They must be covered by Value Line Investment Survey (Standard
13			Edition);
14		(ii)	They must be domestic, non-price regulated companies, <i>i.e.</i> , non-
15			utilities;
16		(iii)	Their beta coefficients must lie within plus or minus two standard
17			deviations of the average unadjusted beta coefficient of the Utility
18			Proxy Group; and
19		(iv)	The residual standard errors of the Value Line regressions which
20			gave rise to the unadjusted beta coefficients must lie within plus or
21			minus two standard deviations of the average residual standard error
22			of the Utility Proxy Group.

1		Beta coefficients are a measure of market, or systematic, risk, which
2		is not diversifiable. The residual standard errors of the regressions were
3		used to measure each firm's company-specific, diversifiable risk.
4		Companies that have similar beta coefficients and similar residual standard
5		errors resulting from the same regression analyses have similar total
6		investment risk.
7	Q.	Have you prepared a schedule which shows the data from which you
8		selected the eleven domestic, non-price regulated companies that are
9		comparable in total risk to the Utility Proxy Group?
10	Α.	Yes, the basis of my selection and both proxy groups' regression statistics
11		are shown in Schedule DWD-6.
12	Q.	Did you review the Commission's Order ³⁵ regarding the use of a Non-
13		Price Regulated Proxy Group in the Company's last rate case?
14	A.	I have. Regarding the use of a Non-Price Regulated Proxy Group, the
15		Commission's conclusion that, since the market model results were different
16		than the results of those same models applied to the Utility Proxy Group,
17		the two groups could not be similar in risk. In order to provide more
18		information to show similarity between the Utility and Non-Price Regulated
19		Proxy Groups, I have analyzed the coefficients of variation ("CoV") ³⁶ of net

20

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.

1		Schedule DWD-6. As shown, the mean and median CoV of net profit for				
2		the Non-Price Regulated Proxy Group are within the range of CoVs of net				
3		profit set by the Utility Proxy Group companies. With this additional				
4		information, I would hope that the Commission revisit this argument in its				
5		Order in this case.				
6	Q.	Did you calculate common equity cost rates using the DCF, RPM, and				
7		CAPM for the Non-Price Regulated Proxy Group?				
8	Α.	Yes. Because the DCF, RPM, and CAPM have been applied in an identical				
9		manner as described above, I will not repeat the details of the rationale and				
10		application of each model. One exception is in the application of the RPM,				
11		where I did not use public utility-specific equity risk premiums, nor did I apply				
12		the PRPM to the individual companies.				
13		Page 2 of Schedule DWD-7 contains the derivation of the DCF cost				
14		rates. As shown, the indicated common equity cost rate using the DCF for				
15		the Non-Price Regulated Proxy Group comparable in total risk to the Utility				

16 **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

37

Blue Chip Financial Forecasts, December 1, 2018, at p. 14 and May 1, 2019, at p. 2.

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- 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 NonPrice Regulated Proxy Group.

15VIII.CONCLUSION OFCOMMONEQUITYCOSTRATEBEFORE16ADJUSTMENT

17 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.

12 IX. ADJUSTMENTS TO THE COMMON EQUITY COST RATE

13

Α.

Size Adjustment

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

- 17 the Utility Proxy Group because of its smaller size compared with the group,
- as measured by an estimated market capitalization of common equity for
- 19 CWSNC (whose common stock is not publicly-traded).

1	Table 5: Size as Measured by Mai	rket Capitalization f	or the Company
2	and the Utilit	y Proxy Group	
3			Times
4		Market	Greater than
5		Capitalization*	the Company
6		(\$ Millions)	
7			
8	CWSNC	\$217.491	
9			
10	Utility Proxy Group	\$4,385.585	20.2x
11			
12	*From page 1 of Schedule DWD-8.		

13 The Company's estimated market capitalization was at \$217.491 14 million as of April 30, 2019, compared with the market capitalization of the 15 average water company in the Utility Proxy Group of \$4.386 billion as of 16 April 30, 2019. The Utility Proxy Group's market capitalization is 20.2 times 17 the size of CWSNC's estimated market capitalization.

18 **Q.** Please explain why size has a bearing on business risk.

Α. Company size is a significant element of business risk for which investors 19 expect to be compensated through higher returns. Generally, smaller 20 companies are less able to cope with significant events that affect sales, 21 revenues, and earnings. For example, smaller companies face more risk 22 23 exposure to business cycles and economic conditions, both nationally and locally. Additionally, the loss of revenues from a few larger customers would 24 have a greater effect on a small company than on a much larger company 25 with a larger, more diverse, customer base. 26

27 Further evidence of the risk effects of size include the fact that 28 investors demand greater returns to compensate for the lack of OFFICIAL COPY

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Appendix 12 Schedule G-5 Docket No. W-354, Sub 364

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 5 equity cost rate of 10.35% to reflect CWSNC's greater risk due to its smaller 6 7 relative size. The determination is based on the size premiums for portfolios of New York Stock Exchange, American Stock Exchange, and NASDAQ 8 listed companies ranked by deciles for the 1926 to 2018 period. The 9 average size premium for the Utility Proxy Group with a market 10 capitalization of \$4.386 billion falls in the 5th decile, while CWSNC's market 11 capitalization of \$217.491 million places the Company in the 10th decile. 12 The size premium spread between the 5th decile and the 10th decile is 13 3.94%. Even though a 3.94% upward size adjustment is indicated, I apply 14 15 a size premium of 0.40% to CWSNC's indicated common equity cost rate.

16 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.

45

I have. The Commission's concerns regarding the size adjustment were Α. 3 that whether the size studies presented in the record were applicable to 4 utilities, and that the selection of a 40 basis point adjustment from an 5 indicated 461 basis point risk premium was rather arbitrary. In order to 6 7 provide more information to the Commission in this case, I conducted a 8 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 9 in Value Line Standard Edition. From each of the utilities' Value Line 10 11 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 12 company. After ranking the companies by size (largest to smallest) and risk 13 (least risky to most risky), I made a scatter plot of the data, as shown on 14 Chart 1, below: 15

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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.

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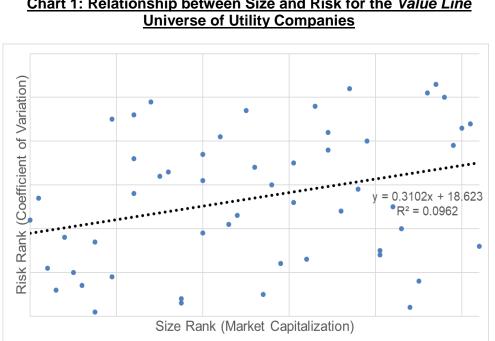


Chart 1: Relationship between Size and Risk for the Value Line

As shown in Chart 1 above, as company size decreases (increasing 4 size rank), the CoV increases, linking size and risk for utilities. The R-5 Squared of 0.0962 means that approximately 10% of the change in risk rank 6 is explained by the size rank. While a 0.0962 R-Squared does not appear 7 to have strong explanatory power, the average R-Squared of the Utility 8 Proxy Group's beta coefficient is 0.0794.⁴⁰ The selection of a 40 basis point 9 upward adjustment based on its difference in size given an indicated risk 10 premium of approximately 400 basis points is consistent with the 11 12 approximate 0.10 R-Squared of the size study applicable to utilities. With

1 2

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.

5

3 X. ECONOMIC CONDITIONS IN NORTH CAROLINA

4 Q. Did you consider the economic conditions in North Carolina in arriving

at your recommended cost of common equity?

Α. Yes, I did. As the Commission has stated, it "...is and must always be 6 7 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 8 dictates of the United States and North Carolina Constitutions."41 In that 9 10 regard, the cost of common equity should be neither excessive nor confiscatory; it should be the minimum amount needed to meet the Hope 11 and *Bluefield* Comparable Risk, Capital Attraction, and Financial Integrity 12 standards. 13

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.").

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.

11 Q. What specific measures of economic conditions have you reviewed?

- 12 **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;
- 17 (iii) Median household income in the United States and in North Carolina;

and

18

19 (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.

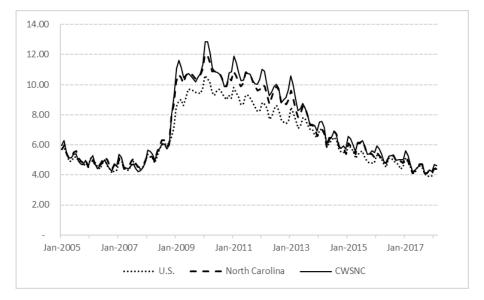
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1	Turning first to the rate of unemployment, it has fallen substantially
2	in North Carolina and the U.S. since late 2009 and early 2010, when the
3	rates peaked at 10.00% and 12.00%, respectively. Although the
4	unemployment rate in North Carolina rather exceeded the national rate
5	during and after the 2008/2009 financial crisis, by late 2013, the two were
6	largely consistent. By April 2019, the unemployment rate had fallen to less
7	than one-half of the 2008/2009 peak levels: 3.30% nationally; and 3.60% in
8	North Carolina. (<i>see</i> Chart 2, below).

9 Chart 2: Unemployment Rate: U.S. North Carolina, and CWSNC⁴⁶



10

11 Since the conclusion of the Company's last rate filing in February 12 2019, the unemployment rate in North Carolina has decreased from 4.20% 13 to 3.60%. That 0.60% decrease is slightly lower than the U.S.

46

Source of Information: Bureau of Labor Statistics.

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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 5 unadjusted) in the counties served by CWSNC. At its peak, which occurred 6 7 in late 2009 into early 2010, the unemployment rate in those counties 8 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 9 than the state-wide average). Since the conclusion of the Company's last 10 11 rate filing in February 2019, the counties' unemployment has also fallen, from 4.49% to 3.68%. From 2005 through 2018, the correlation in 12 unemployment rates between the counties served by CWSNC, and the U.S. 13 and North Carolina, were also approximately 99%. In summary, although it 14 15 remains slightly higher than national and state-wide averages, county-level unemployment has fallen considerably since its peak in early 2010. 16

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.

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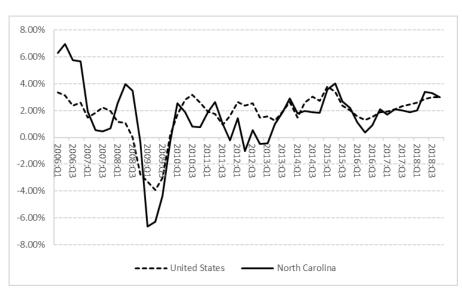


Chart 3: Real Gross Domestic Product Growth Rate⁴⁷

1

2

3 As to median household income, the correlation between North Carolina and the U.S. is relatively strong (approximately 87% from 2005 4 through 2018). Since 2009 (the years subsequent to the financial crisis), 5 median household income in North Carolina has grown at a similar annual 6 rate as the national median income (2.32% vs. 2.65%; see Chart 4, below). 7 To put household income in perspective, the Missouri Economic Research 8 and Information Center reports that in 2018, North Carolina had the 19th 9 lowest cost of living index among the 50 states and the District of 10 Columbia.48 11

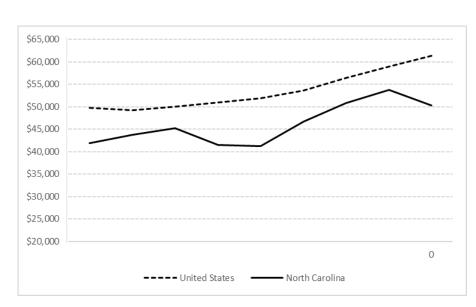
⁴⁷ Source: Bureau of Economic Analysis.

⁴⁸ Source: https://www.missourieconomy.org/indicators/cost_of_living/ Accessed 6/4/2019.

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2

1

3 Q. Please summarize your analyses and conclusions.

Α. In its Order on Remand in Docket No. E-22, Sub 479, the Commission 4 5 observed that economic conditions in North Carolina were highly correlated with national conditions, such that they were reflected in the analyses used 6 to determine the cost of common equity.⁵⁰ Those relationships still hold: 7 economic conditions in North Carolina continue to improve from the 8 recession following the 2008/2009 financial crisis, and they continue to be 9 strongly correlated to conditions in the U.S., generally. 10 In particular, unemployment, at both the state and county level, continues to fall and 11 12 remains highly correlated with national rates of unemployment; real Gross 13 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.

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1	national rate of growth, although the two remain fairly well correlated; and
2	median household income also has grown faster in North Carolina than the
3	rest of the Country, and remains strongly correlated with national levels. In
4	sum, the correlations between state-wide measures of economic conditions
5	noted by the Commission in Docket No. E-22, Sub 479 remain in place and,
6	as such, they continue to be reflected in the models and data used to
7	estimate the cost of common equity.

8 XI. CONCLUSION OF COMMON EQUITY COST RATE

9 Q. What is your recommended cost of common equity for CWSNC?

- 10 **A.** Given the indicated cost of common equity of 10.35%, and the size-adjusted
- 11 cost of common equity of 10.75%, I conclude that a cost of common equity
- 12 cost rates for the Company of 10.75% is appropriate.
- 13 Q. In your opinion, is your proposed cost of common equity cost rate of
- 14 **10.75%** fair and reasonable to CWSNC, its shareholders, and its
- 15 customers, considering the above economic conditions?
- 16 **A.** Yes, it is.
- 17 Q. Does this conclude your direct testimony?
- 18 A. Yes, it does.

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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
- Financial M
 Valuation
 - Regulatory Strategy and Rate Case Support

Rate of ReturnCost of ServiceRate Design

Topic

Cost of Service, Rate Design

Cost of Service, Rate Design

Cost of Service, Rate Design Return on Common Equity

Valuation

Recent Expert Testimony Submission/Appearances

Jurisdiction

- Illinois Commerce Commission
- New Jersey Board of Public Utilities
- Hawaii Public Utilities Commission
- South Carolina Public Service Commission
- American Arbitration Association

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", coauthored 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.

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Appendix A Professional Qualifications of Dylan W. D'Ascendis, CRRA, CVA

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Sponsor	Date	CASE/APPLICANT	DOCKET NO.	SUBJECT
Regulatory Comm	ission of Al			
Alaska Power				
Company	07/16	Alaska Power Company	Docket No. TA857-2	Rate of Return
Arizona Corporation	on Commiss	sion		
Arizona Water Company	08/18	Arizona Water Company	Docket No. W01445A- 18-0164	Rate of Return
Colorado Public U	tilities Com	mission		
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 S	ervice Com	mission		
Tidewater Utilities, Inc.	11/13	Tidewater Utilities, Inc.	Docket No. 13-466	Capital Structure
Hawaii Public Utili	ties Commi			1
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	Commissio	n		
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 Reg	ulatory Con	nmission		
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 S	Service Com		I	
Louisiana Water Service, Inc.	06/13	Louisiana Water Service, Inc.	Docket No. U-32848	Rate of Return
Maryland Public S	ervice Com		1	
FirstEnergy, Inc.	08/18	Potomac Edison Company	Case No. 9490	Rate of Return
Massachusetts De	partment of			1
Liberty Utilities	07/15	Liberty Utilities d/b/a New England Natural Gas Company	Docket No. 15-75	Rate of Return
Mississippi Public				
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



Appendix A Professional Qualifications of Dylan W. D'Ascendis, CRRA, CVA

Sponsor	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
Missouri Public Se	ervice Comn	nission		
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 U	tilities		
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 Uti	lities Comm	ission		
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 Co	mmission o	f Ohio		
Aqua Ohio, Inc.	05/16	Aqua Ohio, Inc.	Docket No. 16-0907- WW-AIR	Rate of Return
Pennsylvania Pub	lic Utility Co	mmission		
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

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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 Cor	poration Cor	nmission		
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

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Carolina Water Service, Inc. of North Carolina Table of Contents to D'Ascendis Direct Exhibit No. 1

	<u>Schedule</u>
Summary of Cost of Capital and Fair Rate of Return	DWD-1
Financial Profile of the Utility Proxy Group	DWD-2
Indicated Common Equity Cost Rate Using the Discounted Cash Flow Model	DWD-3
Indicated Common Equity Cost Rate Using the Risk Premium Model	DWD-4
Indicated Common Equity Cost Rate Using the Capital Asset Pricing Model	DWD-5
Basis of selection for the Non-Price Regulated Companies Comparable in Total Risk to the Utility Proxy Group	DWD-6
Cost of Common Equity Models Applied to the Comparable Risk Non-Price Regulated Companies	DWD-7
Estimated Market Capitalization for Carolina Water Service, Inc. of North Carolina and the Utility Proxy Group	DWD-8

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D'Ascendis Exhibit No. 1 Schedule DWD-1 Page 1 of 2

Carolina Water Service, Inc. of North Carolina Recommended Capital Structure and Cost Rates for Ratemaking Purposes <u>at March 31, 2019</u>

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.

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D'Ascendis Exhibit No. 1 Schedule DWD-1 Page 2 of 2

<u>Carolina Water Service, Inc. of North Carolina</u> <u>Brief Summary of Common Equity Cost Rate</u>

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.

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D'Ascendis Exhibit No. 1 Schedule DWD-2 Page 1 of 2

Proxy Group of Six Water Companies CAPITALIZATION AND FINANCIAL STATISTICS (1) 2014 - 2018, Inclusive

	2018	2017 (MILL	2016 IONS OF DOLLAR	2015 S)	<u>2014</u>	
CAPITALIZATION STATISTICS		(iono or bollant			
AMOUNT OF CAPITAL EMPLOYED TOTAL PERMANENT CAPITAL SHORT-TERM DEBT	\$2,806.355 \$198.340	\$2,520.354 \$212.952	\$2,397.831 \$175.872	\$2,285.766 \$117.184	\$2,178.876 \$94.428	
TOTAL CAPITAL EMPLOYED	\$3.004.695	\$212.952 \$2.733.306	\$1/5.8/2	\$2.402.950	\$94.428	
TOTAL CALIFIC EMILOTED	<u>\$5.00+.075</u>	<u>\$2.733.300</u>	<u>92.373.703</u>	<u>\$2.402.750</u>	<u>92.2/3.301</u>	
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 %	
<u>CAPITAL STRUCTURE RATIOS</u> BASED ON TOTAL PERMANENT CAPITAL:						<u>5 YEAR</u> <u>AVERAGE</u>
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	<u>100.00</u> %					
BASED ON TOTAL CAPITAL: TOTAL DEBT, INCLUDING SHORT-TERM PREFERED STOCK COMMON EQUITY TOTAL	48.62 % 0.10 51.28 <u>100.00</u> %	47.48 % 0.11 52.41 <u>100.00</u> %	46.82 % 0.12 53.06 <u>100.00</u> %	46.30 % 0.13 53.57 <u>100.00</u> %	46.28 % 0.14 53.58 <u>100.00</u> %	47.10 % 0.12 <u>52.78</u> <u>100.00</u> %
FINANCIAL STATISTICS						
FINANCIAL RATIOS - MARKET BASED						
EARNINGS / PRICE RATIO MARKET / AVERAGE BOOK RATIO DIVIDEND YIELD DIVIDEND PAYOUT RATIO	3.56 % 307.51 2.05 57.39	3.46 % 303.79 2.06 59.63	3.73 % 271.29 2.31 61.35	4.55 % 219.78 2.83 61.54	4.84 % 202.93 3.00 61.49	4.03 % 261.06 2.45 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

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Capital Structure Based upon Total Permanent Capital for the <u>Proxy Group of Six Water Companies</u> <u>2014 - 2018, Inclusive</u>

	<u>2018</u>	<u>2017</u>	<u>2016</u>	<u>2015</u>	<u>2014</u>	<u>5 YEAR</u> 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	42.17 70	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 %
Total Capital	100.00 %	100.00 70	100.00 %	100.00 70	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 %
Total Capital	100.00 /0	100.00 70	100.00 /0	100.00 /0	100.00 /0	100.00 /0
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

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				İ									
		[8]	Indicated Common Equity Cost	Rate (5)	8.12 %	11.14	6.66	10.01	6.84	9.29	8.68 %	8.71 %	8.70 %
		[2]	Adjusted Dividend Yield	(4)	1.62 %	2.04	2.66	1.58	1.74	2.09	Average	Median	Average of Mean and Median
		[9]	Average Projected Five Year Growth	in EPS (3)	6.50 %	9.10	4.00	8.43	5.10	7.20			Average of M
Flow Model for		[5]	Yahoo! Finance Projected Five Year Growth in	EPS	6.00 %	8.20	4.00	9.80	2.70	4.90			
le Discounted Cash	er Companies	[4]	Zack's Five Year Projected Growth Rate	in EPS	6.00 %	8.10	NA	7.00	NA	NA			
Indicated Common Equity Cost Rate Using the Discounted Cash Flow Model for	<u>Proxy Group of Six Water Companies</u>	[3]	Reuters Mean Consensus Projected Five Year	Growth Rate in EPS	6.00 %	10.60	NA	NA	NA	NA			
ted Common Ec	Π	[2]	Value Line Projected Five Year Growth in	EPS (2)	8.00 %	9.50	NA	8.50	7.50	9.50			
Indic		[1]	Average Dividend	Yield (1)	1.57 %	1.95	2.61	1.52	1.70	2.02			
				Proxy Group of Six Water Companies	American States Water Co.	American Water Works Company Inc	Artesian Resources Corporation	California Water Service Group	Middlesex Water Co.	York Water Co.			

Carolina Water Service, Inc. of North Carolina

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

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AM	ER.	<u>sta</u>	TES	WAT	ER	YSE-A	WR	RICE	<u>70.3</u>	1 RATI	o 37 .	6 (Traili Media	ng: 40.9) an: 21.0)	RELATIVE P/E RATI		6 DIV'D YLD	1.6	<u>%</u>		-	
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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		low" per :		4.0
.39 .44	.53	.66 .45	.67 .46	.81	.78	.81 .51	1.11 .52	1.12	1.41	1.61 .76	1.57	1.61 .87	1.62	1.88 .99	1.72 1.06	1.90 1.14	2.05 1.22		s per sh ^A cl'd per s		2. 1.
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 Sp	ending p	er sh	3.
6.98 0.42	7.51 33.50	7.86	8.32 34.10	8.77 34.46	8.97 34.60	9.70 37.06	10.13 37.26	10.84 37.70	11.80 38.53	12.72 38.72	13.24 38.29	12.77 36.50	13.52 36.57	14.45 36.68	15.19 36.76	15.85 36.90	16.60 37.00		lue per sl 1 Shs Out		19. 37.
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 fig			'I P/E Rat		2
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
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%			-	'l Div'd Y	ield	2.6
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	t \$376.6	mill. L	T Interes	st \$21.5 n		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			23.0
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			Annual rei 162.5 mill	ntals \$2.6	6 mill.	45.9% 54.1%	44.3% 55.7%	45.4% 54.6%	42.2% 57.8%	39.8% 60.2%	39.1% 60.9%	41.1% 58.9%	39.4% 60.6%	38.0% 62.0%	40.5% 59.5%	42.0% 58.0%	45.0% 55.0%		rm Debt F n Equity F		46.0 54.0
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d Sto	ock None					866.4	855.0	896.5	917.8	981.5	1003.5	1060.8	1150.9	1205.0	1296.3	1360	1435	Net Plan			16
	on Stock /12/19	36,774,2	205 shs.			5.9% 8.2%	7.6% 11.0%	7.1%	8.3% 11.9%	8.9% 12.7%	8.6% 12.0%	9.0% 13.0%	8.6% 12.1%	9.3% 13.1%	7.9% 11.4%	8.0% 12.0%	8.0% 12.5%		n Total C n Shr. Eq		9.0 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%		n Com E		14.0
			on (Mid C		0/04/40	3.2%	5.8%	5.3%	6.6%	6.8%	5.7%	6.0%	5.3%	6.2%	4.5%	5.0%	5.0%		to Com		5.
(\$MI	ENT POS	THON	2016	2017 1		61%	47%	49%	45%	47%	53%	54%	56%	52%	61%	60%		All Div'd			62
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 authorities tentatively agreed to a James A. Flood
 April 12, 2019

 (A) Primary earnings. Excludes nonrecurring gains/(losses): '04, 7¢; '05, 13¢; '06, 3¢; '05, '14¢; '10, (23¢); '11, 10¢. Next earnings report destinent plan available.
 (C) In millions, adjusted for split.
 (D) Includes intangibles. As of 12/31/18; \$1.1 millions/0.3 a share.
 Company's Financial Strength & A stock's Price Stability & 85 millions/0.3 a share.

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Accts Receivable Other280.0 440.0272.0 361.0301.0 372.00investor-owned water and wastewater utility in the U.S., providing services to more than 44 million people in 46 states and Ontario, outstanding stares; BlackRock, Inc. 7.9%, officers & directors, lec outstanding stares; BlackRock, Inc. 7.9%, officers & directors, lec black Rock, Inc. 7.9%, officers & directors, lec outstanding stares; BlackRock, Inc. 7.9%, officers & directors, lec stare stare	(\$MIL	L.)	ITION																			59%
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of change (per sh)10 Yrs.5 Yrs.to '22-24Revenues3.0%6.0%7.0%'Cash Flow'18.5%6.0%7.0%CallQUARTERLY REVENUES (s mill.)FullCallQUARTERLY REVENUES (s mill.)FullCallCall.Sto.0Atting StoreSto.0QU1674.30950CallEARNINGS PER SHARE ACallEARNINGS PER SHARE ACallEARNINGS PER SHARE ACallCall LCallCall LCall LCall LCall LCall LCall L1.05Call LCall LCall LCall LCall LCall LCall LCall LCall L1.05 <td></td>																						
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	2018	.415					well	with	in ou	ir pro	jected	d Tar	get F	rice	ing t	he siz	e of th	ie cap	ital bu	ıdget.		
And April 12, 201	2019	.455								•	-		-									2019

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(A) Ditude earnings. Excludes nonrecut ings report due mid-May. Quarterly earnings do (C) In millions. (D) Includes intangibles. On company's Financial Strength not sum in '16 due to rounding.
 (b) Dividends paid in March, June, September, (E) Proforma numbers for '06 & '07.
 (3)(50.01), 6AAP used as of 2014. Next earned the investment available.
 (c) In millions. (D) Includes intangibles. On Company's Financial Strength 12/31/18: \$1.659 billion, \$9.18/share.
 (c) To '06 & '07.
 (c

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D'Ascendis Exhibit No. 1 Schedule DWD-3 Page 4 of 7

PERFOR Technical SAFETY BETA .6	MANCE	NKS		19	9.59	19.99								
Technical SAFETY BETA .6 Tinancial		= 2 ^A			6.43	15.16	24.43 18.20	24.27 21.52	23.82 19.85	29.16 20.00	35.00 25.17	43.22 29.37	41.92 32.00	40.97 Hig 33.14 Lov
SAFETY BETA .6	ıl		bove verage		LEGE									45
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ALES PI				8.4		7.56	8.10	7.82	8.13	8.50	8.67	8.92	8.69	
CASH FL		PER SH		1.9		1.64	2.04	1.87	2.04	2.22	2.43	2.55	2.66	
ARNING				1.0		.83	1.13	.94	1.07	1.26	1.41	1.51	1.54	NA/NA
IV'DS DI		PER SH G PER SI	-	2.	75 57	.76 1.83	.79 2.36	.82	.85 2.66	.87	.90 3.10	.93 4.46	.96 5.30	
OOK VA				12.4		13.12	13.57	13.80	14.09	14.61	15.23	4.46	16.57	
OMMON	N SHS C	OUTST'G	(MILL)	7.0	65	8.61	8.71	8.83	8.91	9.06	9.13	9.22	9.25	
VG ANN				18.		22.5	18.3	23.9	20.5	18.0	20.9	24.2	23.9	NA/NA
ELATIVE VG ANN		atio D yield		1.	16 1%	1.41 4.1%	1.17 3.8%	1.34 3.7%	1.08 3.9%	.93 3.8%	1.14 3.1%	1.21 2.5%	1.35 2.6%	
ALES (\$				64.9		65.1	70.6	69.1	72.5	77.0	79.1	82.2	80.4	Bold figures
PERATI				46.		45.5%	48.7%	47.0%	48.8%	43.0%	44.4%	44.6%	46.1%	are consensus
				7.0		7.4 6.7	7.9 9.8	8.3 8.3	8.7 9.5	8.8 11.3	9.2 13.0	9.6 14.0	10.3 14.3	earnings
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ET PRO				11.		10.4%	14.0%	12.0%	13.1%	14.7%	16.4%	17.0%	17.8%	recent prices,
		L (\$MILL)		d27.9		d11.4	d11.4	d12.3	d13.5	d8.8	d4.7	d9.5	d21.6	P/E ratios.
ONG-TE HR. EQL		BT (\$MIL MILL)	L)	105. 95.		106.5 113.0	106.3 118.2	105.5 121.8	105.0 125.6	103.6 132.3	102.3 139.0	105.6 146.6	115.9 153.3	
		TAL CAP	Ľ		6%	4.6%	5.9%	5.1%	5.5%	6.3%	6.7%	6.8%	6.5%	
		r. Equit	Y		0%	6.0%	8.3%	6.8%	7.6%	8.5%	9.3%	9.5%	9.3%	
		OM EQ NET PRO	-	2.0 75%	0%	.5% 92%	2.5% 70%	.9% 87%	1.6% 79%	2.6% 69%	3.4% 63%	3.7% 61%	3.6% 62%	
			r es availab			9270	7076	07 70	1970	0970	0376	0176	02 /0	
		NNUAL I									INDU	STRV W	ater Utility	
of chang			5 Yrs.	1	Yr.	ASSETS (\$m Cash Assets	ill.) 20	16 2017 .2 1.0	12/31/18 .3		INDO	U	ator othing	
Sales	-		2.5%	-2	.5%	Receivables		7.8 8.9	8.2	BUSINES	S: Artesia	n Resour	ces Corp. o	perates as the
'Cash Fle Earnings			6.5% 9.0%		.0% .0%	Inventory Other		1.6 1.5 5.0 7.6	1.5 6.1					sidiaries offer-
Dividends Book Val			3.0% 3.5%		.0% .0%	Current Asse		19.0	16.1					in Delaware,
						Devente Die	- 4							r, its principal sidential, com-
iscal Year	QUA 1Q	RTERLY S 2Q	SALES (\$ 3Q	mill.) 4Q	Full Year	Property, Plan & Equip, a		9.7 582.0	629.4					al, and utility
/31/16	18.5	19.4	21.8	19.4	79.1	Accum Depre Net Property).3 117.6	126.9 502.5					Artesian Water
/31/17	19.2	20.5	22.3	20.2	82.2	Other		<u>.0 11.2</u>	11.2					cluding opera-
/31/18	18.9	20.2	21.9	19.4	80.4	Total Assets	451	.0 494.6	529.8					ract operation
/31/19	-	DUINOO				LIABILITIES	(\$mill.)							er providers. It e protection to
iscal Year	1Q	RNINGS 2Q	PER SHA 3Q	RE 4Q	Full Year	Accts Payable Debt Due	e t	5.6 9.2 3.4 11.0	8.3 17.7					Vater produced
/31/15	.28	.36	.41	.21	1.26	Other		5.4 11.0 5.3 <u>8.3</u>	11.7	approxima	ately 90% o	of 2018 c	onsolidated	operating rev-
/31/16	.30	.33	.48	.30	1.41	Current Liab		9.3 28.5	37.7					water per year
/31/17 /31/18	.34 .38	.35 .42	.42 .42	.40 .32	1.51 1.54									00 people. Has
/31/18	.00	.+2	.44	.52	1.34	LONG-TERM	DEBT AND E	QUITY						ident: Dian C. ark, DE 19702.
Cal-	QUAR	TERLY D	IVIDENDS	PAID	Full	as of 12/3	1/18							resources.com.
ndar	1Q	2Q	3Q	4Q	Year	Total Debt \$		Due in 5 Yrs.	\$24.4 mill.	<- · -,				
2016	.222	.225	.225	.228	.90	LT Debt \$115 Including Ca	5.9 mill. p. Leases Nor	e						_
2017	.228 .235	.232 .239	.232 .239	.235 .242	.93 .96			(43	% of Cap'l)					<i>E.B.</i>
2018	.235	.200	.200	.242	.30	Leases, Unc	apitalized Ann	uai rentals \$.1	mill.			April 12,	2019	
		UTIONAL	DECISIO	NS		Pension Liab	oility None in '1	3 vs. None in '17	7 -	TOTAL		-		
		2Q'18	3Q'18		2'18	Pfd Stock Nor	ne	Pfd Div'd	Paid None	IUIAL SI	HAREHOLD			tion as of 3/31/2019
to Buy		32	40		38	Common Stor	:k 9,250,000 sha	ires		3 Mos.	6 Mos.	1 Yr.	3 Yrs.	
to Sell Hld's(000	0)	33 3514	26 3582	38	27 46		,,		% of Cap'l)	7.60%	2.68%	4.84%		

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CAL	IFC)RNI	A WA	ATEF	R NYS	E-CWT		ecent Rice	52.4	1 P/E RATIO	o 32 .	8 (Traili Media	ng: 41.6) an: 20.0)	RELATIVE P/E RATI		9 DIV'D YLD	1.5		ALUI	E	
TIMELIN		~		High: Low:	23.3 13.8	24.1 16.7	19.8 16.9	19.4 16.7	19.3 16.8	23.4 18.4	26.4 20.3	26.0 19.5	36.8 22.5	46.2 32.4	49.1 35.3	55.0 44.6				Price 2023	
AFETY ECHNI		3 Lowered 2 Raised 4		LEGE!	NDS 33 x Divide vided by In	ends p sh iterest Rate e Strength	_														64
		= Market)	12/19	2-10f-1 Sp	0111 6/11	e Strength		2-for-1							السرورا	1 ¹ •					48
		ROJECTI	nn'l Total	Options: Shaded		ates recess	ion	101					իսս հուր	11111111111111111111111111111111111111							
igh	Price 55 35	Gain (+5%)	Return 3% -7%	hhu <mark>ili</mark> h			աղեթ	ىللىمىت	أمصين	րուրդուր	ուրուր	ուղիր									20
nsider	r Decis			* <u>•••</u> •••••		··	*********									•					-12
Buy	0 0 0	SON 000 000	0 0 0					*****	**********	·····	····· • • • • • • •	······	*****	****	*******						-8
Sell	0 0 0		0 0 0		1								1					% TO	T. RETUR		-6
Buy	202018 87			Percen											H			1 yr.	THIS V STOCK 48.3	/L ARITH.* INDEX 2.7	F
o Sell Ild's(000)	91 35009	77 35103	76 35160	shares traded	12 - 6 -						llhlinti			nhuuut				3 yr. 5 yr.	115.4 154.6	35.5 37.5	F
2003	2004			2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020		JE LINE P	UB. LLC	
8.18 1.26	8.59 1.42		8.10 1.36	8.88 1.56	9.90 1.86	10.82 1.93	11.05 1.93	12.00 2.07	13.34 2.32	12.23 2.21	12.50 2.47	12.29 2.22	12.70 2.34	13.89 3.00	14.38 2.99	14.65 3.30	14.90 3.40	Revenue "Cash F	es per sn low" per s	sh	15.5 3.6
.61 .56	.73 .57	.74	.67 .58	.75 .58	.95 .59	.98 .59	.91 .60	.86 .62	1.02	1.02 .64	1.19 .65	.94 .67	1.01 .69	1.40 .72	1.26 .75	1.65 .79	1.75 .82		s per sh 4 cl'd per s		2.0 1.0
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 Sp	ending p	er sh	3.6
7.22 33.86	7.83		9.07 41.31	9.25 41.33	9.72 41.45	10.13 41.53	10.45 41.67	10.76 41.82	11.28 41.98	12.54 47.74	13.11 47.81	13.41 47.88	13.75 47.97	14.44 48.01	15.19 48.07	15.45 48.50	15.80 49.00		lue per sh n Shs Out		17.0
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 fig		Avg Ann	'I P/E Rat	io	23. 1.2
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 1.55 1.57 Value/Line settimates Relative PIE Ratio Avg Anr1 Div'd Yield CAPITAL STRUCTURE as of 1231/18 3.1% 3.1% 3.2% 3.4% 3.5% 3.1% 2.8% 2.9% 2.3% 1.9% 1.9% Avg Anr1 Div'd Yield CAPITAL STRUCTURE as of 1231/18 40.6 50.1 56.7 45.0 40.5 61.2 71.7 70 Revenues (\$mill) ⊭ Total Debt \$710.0 mill. Up in \$7 rs \$430.0 mill. 40.6 37.7 30.3% 30.0% 35.5% 45.0 45.7 60.5 60.5 60.5 60.5 60.7 60.5 60.7 60.5 60.7 60.5 61.5% <td>2.5</td>															2.5						
4.2.6 3.5% 0.1% 2.5% 5.1% 2.5% 5.5% 2.5% 1.5% 1.5% 1.6% Arg all 10 /r treid 2.5% CAPITAL STRUCTURE as of 12/3/1/8 5.1% 5.1% 5.5% 5.5% 5.5% 5.88.4 609.4 669.9 691.2 710 730 Revenues (\$mill) ₽ 7 Total Debt \$880.0 mill. Let nerest \$40.0 mill. 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\$ 7 (49% of Cap ¹¹) 76% 4.2% 7.6% 8.0% 4.3% 2.7% 4.3% 6.1% 3.5% 30.1% 21.0% 21.0% 21.0% Arg all 10 /r treid 2.5% LT Debt \$710.0 mill. LT Interest \$40.0 mill. 40.6 37.7 36.1 42.6 43.3% 5.5% 30.1% 35.5% 30.1% 25.0% Net Profit \$\$mill\$ 7 40.6 37.7 36.1 42.6 43.3% 2.7% 4.3% 6.1% 3.5% 5.0% 5.0% 5.0															77						
CAPITAL STRUCTURE as of 12/31/18 Total Debt \$880.0 mill. 449.4 460.4 501.8 560.0 584.1 597.5 588.4 606.9 691.2 710 730 Revenues (smill) E 7 Total Debt \$800.0 mill. LT Debt \$710.0 mill. Due in \$Yrs \$430.1 mill. (49% of Cap1) 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) 1 U1 opt \$710.0 mill. (49% of Cap1) 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) 1 (49% of Cap1) 7.6% 4.3% 2.7% 4.3% 51.4% 61.0% 35.5% 50.0% 5.0% ASUM 50.0% 50.0% ASUM 50.0% 50.4% 40.6% 42.8% 7.6% 8.3% 2.7% 4.3% 61.6% 3.5% 5.0% ASUM ASUM ASUM 50.0% ASUM 50.0% ASUM 50.0% 5.0%															21.09						
Total Debt \$880.0 mill. Due in \$ Yrs \$430.1 mill. 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) 1 LT Debt \$710.0 mill. LT Interest \$40.0 mill. 40.3% 35.5% 40.5% 37.5% 30.3% 30.0% 35.5% 30.1% 21.0% 21.0% 21.0% 21.0% 10:0me Tax Rate 21.0 Pension Assets-12/18 \$469.7 mill. 47.6 52.4% 14.0% 41.0% 41.0% 44.4% 44.6% 42.7% 49.3% 65.5% Comme Tax Rate 21.0 Ubits \$639.9 mill. 52.4% 7.6% 8.0% 4.3% 2.7% 4.3% 6.1% 3.5% 5.0% 5.0% AFUDC % to Net Profit 5.0 Visits 1000000000000000000000000000000000000															5.0						
LT Debt \$710.0 mill. (49% of Cap1) LT Interest \$40.0 mill. (49% of Cap1) 40.5% 2.0% 31.5% 2.0% 40.5% 2.0% 31.5% 2.0% 30.0% 2.0% 30.0% 2.0% </td <td>62.0</td>															62.0						
(49% of CapT) 40.3% 30.3%															137 250						
Pension Assets-12/18 \$469.7 mill. Oblig. \$639.9 mill. 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 62.0 38.0 Pfd Stock None 794.9 914.7 931.5 908.2 1024.9 1045.9 1154.8 1191.2 1209.3 1440.2 1400.0 1375 Total Capital (\$mill) 52.7% 65.5% 55.5% 7.1% 55.5% 6.55% 7.5% Return on Total Cap'l 8.5 65.5% 55.5% 55.5% 55.5% 6.3% 6.5% 5.5% 7.1% 5.5% 6.5% 7.5% Return on Total Cap'l 8.5															8.5 12.0						
						9.6% 9.6%	8.6% 8.6%	8.0% 8.0%	9.0% 9.0%	7.9% 7.9%	9.1% 9.1%	7.0% 7.0%	7.4%	9.7% 9.7%	8.3% 8.3%	10.5% 10.5%	11.0% 11.0%	Return o	n Com Eo	quity	12.0
	NT POS		on (Mid C 2016		2/31/18	3.8% 60%	3.0% 66%	2.3% 71%	3.4% 62%	3.4% 56%	4.1% 55%	2.0% 71%	2.4% 68%	4.7% 51%	3.3% 60%	5.5% 48%	6.0% 47%		l to Com I s to Net P		5.55 535
(\$MIL) ash A	.L.) ssets		25.5	94.8	47.2	BUSIN	ESS: Ca	lifornia W	/ater Serv	/ice Grou	p provide	s regulat	ed and	quired	Rio Grar	nde Corp	; West	Hawaii L	Jtilities (9	9/08). R	evenu
	Assets		142.1	133.1 227.9	141.5 188.7					186,900 a. Accour								; busines Off. and			
ebt Du	ayable Je			94.0 291.0	95.6 170.0					hington, N co Bay a								nployees. 20 North			
Other Current	Liab.	-		106.0 491.0	55.6 321.2	Salinas	Valley,	San Joa	aquin Val	ley & pa	rts of L	os Angel	es. Ac-	95112-4	598. Tel	: 408-36	7-8200. 1	nternet: v	ww.calw	atergrou	ip.com
NNUA	L RATE			Est'd '1						ervico all-tin								in 20 ichlor			
Revenu		10 Yrs 4.0)% 1.	5%	22-24 2.5%					t 15% which				ment dards				t new			
Cash F arning ividen	S	5.5 4.5 2.0	5% 4.0	0%	5.0% 8.5% 6.0%	heels	s of a	a [10%	6 rise	three	e moi	nths 1	orior.	throu	ıgh it	s prev	viousl	y map	oped-o	ut in	vest
ook Va	alue	4.5	5% 5.	0%	3.0%					et su rtly o								on n			
Cal- ndar	QUAR Mar.31		VENUES (\$ Sep.30		Full Year					quarte 's un								upgra te hik			
016 017	121.7 122.1	152.4 171.1	184.3 211.7	151.0 162.0	609.4 666.9	suit	of SJ	W Gr	oup is	s now	in th	e rear	view	ensue	e. For	exan	nple, t	the co	mpan	y's su	bsid
018	132.2	172.6	219.0	167.4	691.2									iary, for a							
019 020	135 140	180 185	225 230	170 175	710 730			roven		osted	its	quart	erlv	ties upgra				en th past f			
Cal- ndar			PER SHARE Sep.30		Full Year	divi	dend	payn	nent 🗄	5 to	o abo	ut 0.	20 a	CWT	has i	ts owi	1 prop	oosal i	n the	work	s.
016	d.02	.24	.48	.31	1.01	and	sugge	sts th	ie com	pany	is fur	idame	ntal-	Shar High	lest r	ank	1 for	r Tim	elines	ss. Tł	ne is
2017 2018	.02 d.05	.39 .27	.70 .72	.29 .32	1.40 1.26									sue i mark							
2019 2020	.11 .13	.40 .42	.77 .80	.37 .40	1.65 1.75	That	said	at c	urrent	level	s, the	e yield	l sig-	mont	hs an	d, thu	ıs, wi	ll app	eal to	inve	stor
Cal-	QUAR	TERLY DI	/IDENDS P/	AID ^B =	Full	broa	der i	narke	et, lea	aving	inco	ne-see		with ever,	we d	o not	recon	imend	l this	equit	y fo
ndar 2015	Mar.31 .1675		.1675	Dec.31 .1675	Year .67	acco Cap	unts l ital	ittle t inves	o get e tmen	excited ts ar	iabou ndra	it. ite h	ikes	accou 2022-	nts 2024	with Shai	a ho res of	lding [_CW]	perio Fare	d ou curr	ıt t entl
2016 2017	.1725 .18			.1725 .18	.69 .72	are	apt t	o be	the n	orm g	going	forw	ard.	tradi	ng ab	ove t	he up	oper b	ounda	ary o	f ou
2018	.1875	.1875		.1875	.72	ture	is st	ill in	need	of rej	placer	nent,	even	Targe price	ascer	ıt.	-	uue t			•
2019	.1975		oourring	noin (les-). m		• the	compa	any s					Nich	olas P			Einene'-	•	1 12, 1	
1, 4¢. N	lext ear	nings rep	ecurring g ort due la	te May.	(C)	lable. Incl. intan	gible ass	ets. In '1	8 : \$24.7	mill.,	(⊑) EXClU	des non-	rey. rev.			Sto	ck's Pric	Financia e Stabili	ty	ш	B++ 80
	ETIUS DIS	NOTICALLY	oaid in late r'd reinves	е гер.,		1/sh.		d for spli								Ear	e Glowi	h Persis	Lettice		45 65

(A) Basic EPS. Excl. nonrecurring gain (loss):
 (A) Basic EPS. Excl. nonrecurring gain (loss):
 (A) Basic EPS. Excl. nonrecurring gain (loss):
 (A) Basic EPS. Excl. nonrecurring gain (loss):
 (B) Dividends historcally paid in late Feb,
 May, Aug, and Nov. • Div'd reinvestment plan
 (D) In millions, adjusted for splits.
 (C) Vid reinvestment plan
 (D) In millions, adjusted for splits.
 (D) Vid reinvestment plan
 (D) In millions, adjusted for splits.
 (D) Vid reinvestment plan
 (D) In millions, adjusted for splits.
 (D) In millions
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MIC)DLE	ESE)	(WA	TER	NDQ-	MSEX	R P	ecent Rice	54.3	7 P/E RATI	o 26 .	8 (Traili Media	ng: 27.7) an: 21.0)	RELATIV P/E RATI		4 DIV'D YLD	1.8	8%	/ALUI LINE	E	
TIMELI		Lowered		High: Low:	19.8 12.0	17.9 11.6	19.3 14.7	19.4 16.5	19.6 17.5	22.5 18.6	23.7 19.1	28.0 21.2	44.5 25.0	46.7 32.2	60.3 34.0	60.5 51.0			Target	Price 2023	Range
SAFET		2 New 10/2 Raised 4		LEGE	NDS 20 x Divide	ends p sh terest Rate															80
	1CAL 75 (1.00 =		12/19	Options:	elative Pric Yes	e Strength										I ¹¹ ●					60 50
		OJECTIO	ONS nn'l Total	Snaded	area indici	ates recess	sion		\sim	<u> </u>		\sim		hard and the	рин ^{ин}						40
High Low	55	Gain (Nil)	Return 3%									ուսեր									
	40 (r Decis	(-2`5%) ions	-5%	- multing	البريب		ակում	ասվի	սոուն		, II.II.I.I.										20 15
to Buy	0 0 0	SON 000	0 0 0	•.•••.•	*********		···	****	*******					•	******						10
Options to Sell		0 1 0						****	-,	*********	*******	********			*•			% TO	I T. RETUR	2N 3/19	_7.5
	2Q2018	3Q2018	4Q2018	Percen	t 12 -													1 yr.	THIS N STOCK 55.6	/L ARITH.* INDEX 2.7	L
to Buy to Sell Hid's(000)	54 48 8732	54 50 9294	76 52 9247	shares traded	8 - 4 -				lililinni		Tulluuli	nahihi		hhihoto		h1		3 yr. 5 yr.	93.6 192.9	35.5 37.5	F
2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	© VAL	UE LINE P	UB. LLC	
6.12 1.15	6.25 1.28	6.44 1.33	6.16 1.33	6.50 1.49	6.79 1.53	6.75 1.40	6.60 1.55	6.50 1.46	6.98 1.56	7.19	7.26	7.77 1.97	8.16 2.17	8.00 2.24	8.42 2.89	8.65 2.95	8.85 3.05		es per sh 'low'' per s	sh	9.70 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	Earning	s per sh A	·	2.40
.65 1.87	.66 2.54	.67 2.18	.68 2.31	.69 1.66	.70 2.12	.71 1.49	.72	.73 1.50	.74	.75 1.26	.76	.78 1.59	.81 2.91	.86 3.08	.91 4.40	.97 3.50	1.00 3.50		ecl'd per s ending pe		1.15 3.50
7.60	8.02 11.36	8.26 11.58	9.52 13.17	10.05 13.25	10.03	10.33 13.52	11.13 15.57	11.27 15.70	11.48 15.82	11.82 15.96	12.24	12.74 16.23	13.40 16.30	14.02 16.35	15.17 16.40	15.75 16.50	16.10 16.75		lue per si n Shs Out		17.65
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 fig	ures are	Avg Ann	n'I P/E Rat	io	21.0
1.71 3.5%	1.39 3.4%	1.46 3.5%	1.23 3.7%	1.15 3.7%	1.19 4.0%	1.40 4.7%	1.13 4.2%	1.36 4.0%	1.32 4.0%	1.11 3.7%	.97 3.7%	.96 3.3%	1.34 2.3%	1.43 2.2%	1.20 2.1%	Value estin			P/E Ratio n'I Div'd Y		1.15 2.4%
CAPITA	L STRU	CTURE a	as of 12/3	31/18		91.2	102.7	102.1	110.4	114.8	117.1	126.0	132.9	130.8	138.1	143		Revenue	es (\$mill)		165
LT Deb	t \$152.9	mill. L	Due in 5 N LT Interes			10.0 34.1%	14.3 32.1%	13.4 32.7%	14.4 33.9%	16.6 34.1%	18.4 35.0%	20.0 34.5%	22.7	22.8 32.7%	32.5 2.8%	34.0 21.0%	36.0 21.0%	Net Prof			41.0 21.0%
(Total ir	nterest co	overage: (7.8x) (38% of C	ap'l)			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 F		2.5%
Pensio	n Assets	s-12/18 \$	66.8 mill.			46.6% 52.1%	43.1% 55.8%	42.3% 56.6%	41.5% 57.4%	40.4% 58.7%	40.5% 58.8%	39.4% 59.8%	37.9% 61.5%	37.5% 61.8%	37.8% 61.6%	37.0% 62.5%	36.5% 63.0%		rm Debt R n Equity R		36.0% 63.5%
Pfd Sto	ck \$2.4		Oblig. \$83 Div'd: \$.1			267.9 376.5	310.5 405.9	312.5 422.2	316.5 435.2	321.4 446.5	335.8 465.4	345.4 481.9	355.4 517.8	370.7 557.2	404.1 618.5	415 625	425 635	Total Ca Net Plan	pital (\$mi t (\$mill)	II)	475 650
Commo	on Stock	16,403,0	000 shs.			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 c	on Total C		9.0%
						7.0% 7.0%	8.1% 8.2%	7.5% 7.5%	7.8% 7.8%	8.7% 8.7%	9.2% 9.3%	9.6% 9.6%	10.3%	9.8% 9.9%	12.9% 13.0%	13.0% 13.0%	13.5% 13.5%		on Shr. Eq on Com Ec		13.5% 13.5%
MARKE	T CAP:	\$900 mil	lion (Sma	all Cap)		.1%	2.1%	1.0%	1.4%	2.4%	3.1%	3.5%	4.3% 58%	3.8% 62%	7.0% 46%	7.0%	7.0%	Retained	to Com I	Éq	7.0%
	NT POS		2016	2017 1	2/31/18	98% BUSIN	75% ESS: Mi	87% ddlesex \	83% Vater Co	73% mpany e	67% ngages i	63% h the own				47% sex Svs	47% tem acco		Is to Net P r 59% of		48%
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	t Assets Payable	_	26.7 12.3	29.2 13.9	30.8 19.3	system	s under (contract of	on behalf	of munic	ipal and	private cl	ients in	director	s own 3.	5% of th	ne comm	on stock	; BlackRo	ock Insti	tutional
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endar 2016	30.6	32.7	Sep. 30 37.8	31.8	Year 132.9									desi: consi							
2017 2018	30.1 31.2	33.0 34.9	36.2 38.7	31.5 33.3	130.8 138.1									conse abov							
2019 2020	33.0 34.0	36.0 37.0	40.0 42.0	34.0 35.0	143 148	sĥar	e cam	e in \$	0.06 a	ahead	of ou	r estir	nate,	recer	it yea	rs, M	SEX s	shares	s have	been	ı sig-
Cal-			PER SHAR		Full	and	the	afore	menti	oned	top-l	ine g	ains.	nifica peal	asa	pure-	play :	incom	e opti	ion at	t the
endar 2016	Mar.31 .29	Jun. 30 .36	Sep. 30 .54	Dec. 31 .19	Year 1.38	Nota	ıbly, 1	Middle	esex c	ontin	ues to	o post	im-	mom payo	ent. 1	Nonet	heles	s, we	thin	ık ar	nual
2017	.27	.33	.46	.32	1.38	chal	lengin	g cost	envii	ronme	ent (ri	sing v	vater	yield	expa						
2018 2019	.27 .32	.52 .53	.74 . 75	.43 .45	1.96 2.05	ploy	ee h	ealthc	are	premi				deca This	issu						
2020 Cal-	.35 QUAR	.55 TERLY DIV	.77 VIDENDS P	.48 AID B=	2.15 Full	crea	sed re	gulate	ory cos	sts).					the	year	-ahea	nd br	oade	r ma	rket
endar	Mar.31	Jun.30	Sep.30	Dec.31	Year	proj	ectio	ns. O	ur mõ	del ca	alls fo	r reve	nues	most	of th	he ga	ins v	ve en	vision	over	the
2015 2016	.1925	.1925 5 .1987	.1925 5 .19875	.19875 .21125			148 n e next			earn	ings	52.	15 a	2022 bake					ar to a e. Ove		
2017 2018	.21125	5 .2112	5 .21125 5 .22375	5 .22375		Sha	re-ne	t gro	wth	three	to f	ive y	ears	dlese meno	x stoc						
2019	.22.57			, .LT	.01									Nich		. Patr	ikis		Apri	l 12, 2	2019
(A) Dilut early Ma		ngs. Next	t earnings	report d	May	Dividend , Aug., ar available	nd Noverr	cally pai nber.∎ Div	d in mio /'d reinve	d-Feb., stment	(C) In mi	llions.				Sto Prio	npany's ck's Pric ce Growt nings Pr	e Stabili h Persis	tence	th	B++ 65 45 85

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Earnings Predictability 85 To subscribe call 1-800-VALUELINE

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YO	RK V	VATI		DQ-YOR	W			ecent Rice	33.6	9 P/E RATI	o 29 .	6 (Traili Medi	ng: 32.4 an: 25.0)	RELATIV P/E RATI	1.7	O DIV'D YLD	2.0		ALUE LINE		
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SAFET	4 3	B Lowered	7/17/15	LEGE	NDS			13.0	10.0	17.0	10.0	15.7	20.0	51.7	21.5	30.5			2022	2023	2024
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to Sell Hid's(000)	33 4448	36 4539	41 4765	traded	4 -		uulilu	uulilii	ատեսի	ոստեր	ulluli	hinilin	tillindi	hhham	1	Ш			19.3 87.9	35.5 37.5	F
2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	© VALU	e line pl	JB. LLC	
2.17 .65	2.18 .65	2.58	2.56	2.79	2.89 .88	2.95 .95	3.07	3.18 1.09	3.21 1.12	3.27 1.19	3.58 1.36	3.68 1.45	3.70	3.77 1.53	3.74 1.58	3.85 1.75	3.95 1.85	Revenues "Cash Flo		h	5.10 2.50
.03	.03	.19	.58	.57	.57	.64	.71	.71	.72	.75	.89	.97	.92	1.01	1.04	1.15	1.05	Earnings			1.70
.37	.39	.42	.45	.48	.49	.51	.52	.53	.54	.55	.57	.60	.63	.65	.67	.70	.73	Div'd Dec			.95
1.07 4.06	2.50 4.65	1.69 4.85	1.85 5.84	1.69 5.97	2.17 6.14	1.18 6.92	.83 7.19	.74 7.45	.94 7.73	.76 7.98	1.10 8.15	1.11 8.51	1.03 8.88	1.95 9.28	1.95 9.75	2.00 10.75	2.00 11.25	Cap'l Spe Book Valu			1.85 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 Out	sťg ^c	12.80
24.5 1.40	25.7 1.36	26.3 1.40	31.2 1.68	30.3 1.61	24.6 1.48	21.9 1.46	20.7	23.9 1.50	24.4 1.55	26.3 1.48	23.1 1.22	23.5 1.18	32.8 1.72	34.6 1.74	30.3 1.63	Bold fig Value		Avg Ann'l Relative F		0	22.5 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%	1.74	2.1%	estin		Avg Ann'l		eld	2.5%
CAPITA	L STRU	CTURE a	as of 12/3	31/18		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			65.0
	ebt \$94.3 t \$93.3 m		Due in 5 \ LT Interes			7.5	8.9	9.1 35.3%	9.3 37.6%	9.7 37.6%	11.5 29.8%	12.5 27.5%	11.8	13.0	13.4	15.0		Net Profit			21.5
						37.9%	38.5%	31.3%	25.9% 6.7%	15.7% 1.7%	21.0%	21.0%	Income Ta AFUDC %		rofit	21.0% 1.5%					
Pensio	ion Assets12/18 \$40.6 mill. (42.% 01 C4P) 1 45.7% 48.3% 47.1% 46.0% 45.1% 44.8% 44.4% 42.6% Oblig. \$41.5 mill. 54.3% 51.7% 52.9% 54.0% 54.9% 55.2% 55.6% 57.4%															36.5%	35.0%	Long-Terr	n Debt R	atio	34.0%
	Ion Assets12/18 \$40.6 mill. 45.7% 48.3% 47.1% 46.0% 45.1% 44.8% 44.4% 42.6% Oblig. \$41.5 mill. 54.3% 51.7% 52.9% 54.0% 55.2% 55.6% 57.4% 160.1 176.4 180.2 184.8 188.4 189.4 196.3 198.3															63.5% 220	65.0% 220	Common Total Can			66.0% 235
Pfd Sto	Stock None 54.3% 51.7% 52.9% 54.0% 54.9% 55.2% 55.6% 57.4% Stock None 2220 228.4 233.0 240.3 244.2 253.2 261.4 70%															305	315	Total Cap Net Plant		"	325
Commo	tock None 160.1 176.4 180.2 184.8 188.4 189.4 196.3 198.3 222.0 228.4 233.0 240.3 244.2 253.2 261.4 270.9 6.2% 6.5% 6.4% 6.4% 6.5% 7.4% 7.6% 7.2%															8.0%	8.5%	Return on			10.5%
MARKE	tock None 222.0 228.4 233.0 240.3 244.2 253.2 261.4 270.9 toon Stock 12,943,536 shs. 6.2% 6.5% 6.4% 6.5% 7.4% 7.6% 7.2% 8.6% 9.8% 9.5% 9.3% 11.0% 11.5% 10.4%															10.5%	11.0%	Return on Return on			14.0% 14.0%
CURRE	on Stock 12,943,536 shs. 6.2% 6.5% 6.4% 6.6% 7.4% 7.6% 7.2% ETCAP: \$425 million (Small Cap) 8.6% 9.8% 9.5% 9.3% 11.0% 11.5% 10.4% ETTOAP: \$425 million (Small Cap) 8.6% 9.8% 9.5% 9.3% 11.0% 11.5% 10.4% ENT POSITION 2016 2017 12/31/18 1.9% 2.7% 2.3% 2.3% 3.9% 4.4% 3.4%															4.0%	4.5%	Retained			6.0%
(\$MI Çash A	ssets		4.2			78%	72%	73%	74%	74%	64%	62%	67%	63%	64%	61%	58%	All Div'ds			56%
Invento	ts Rece ry (Avg.	ivable Cost)	4.3 .7	4.5 .9	4.8 .9				ater Com the Unite									28%); othe d: PA. Yor			
Other Current	Assets	-	3.4 -	3.2	3.3	uously	since 18	16. As o	f Decembe	er 31, 2	018, the	company	's aver-	ployees	at 12	/31/18.	Presiden	t/CEO: Je	effrey F	R. Hine:	s. Of-
Accts F Debt D			3.7	3.1	3.0 1.0				s 35.4 mil pulation o									common s York, Penr			
Other		_	4.5 -	6.0 9.1	<u>6.8</u> 10.8				ustomers									ww.yorkw			
Current		S Past	-	st Est'd					Compa									remain			
	e (per sh)		. 5 Yr	rs. to	22-24 5.5%				line uarter									aid out ncludin			
"Cash	Flow"	6.0	6.	0%	9.0%	shar	e cam	e in \$	0.04 a	bove	our ey	cpecta	tion.	tion	of a	n åd	dition	al un	treate	ed w	ater
Earning	ds	5.5 3.5	5% 4.	.0%	9.5% 6.5%				axes fr t imp					ture		grade		Mean			ruc- York
Book V		4.5	EVENUES (4.5%	prim	ary	cont	ributo	r_t	o t	he	out-		ipates	that	2019	and 2	2020	will	
Cal- endar			Sep. 30		Full Year				everth lity j									sive, as in at			
2016	11.3	11.8	12.6	11.9	47.6	vers	us õui	r prev	ious ca	all for	a mo	odesť y	/ear-	and	\$21.2	millio	on, rea	spectiv	ely. S	pecifi	ical-
2017 2018	11.3 11.6	12.3 12.0	12.7 12.7	12.3 12.1	48.6 48.4	\$48.			action, egister									ın incl storage			
2019 2020	12.0 12.2	12.5 12.7	13.0 13.3	12.5 12.8	50.0 51.0	latte	r was	adve	rsely i	impac	ted b	y a rı	ıling	ment	s, was	stewa	ter tre	eatmen	it pla	nt exp	pan-
Cal-			PER SHAR		Full				ylvania passes						and me a		e line	e and p	pipe	upgra	des,
endar	Mar.31	Jun. 30	Sep. 30	Dec. 31	Year	bene	fits a	long t	o the c					Shar	es of	York	. Wat	er are	up	one s	pot
2016 2017	.19 .20	.23 .23	.27 .31	.23 .27	.92 1.01	of lo	wer ra	ates.						on o	ur_Ti	melii	ness l	Ranki	ng So	cale	but
2018	.20	.26	.29	.29	1.04				wth o ision									Aver y con			
2019 2020	.24 .26	.28 .31	.33 .35	.30 .33	1.15	Furt	her ta	ax bei	nefits	for Y	ork sł	nould	con-	for	near	term	orie	ented	sub	scrib	ers.
Cal-	QUAR	RTERLY DI	VIDENDS F	PAID ^B	Full				flected eping									old aco evels, c			
endar	Mar.31		Sep.30		Year	grow	/th. D	espite	this, v	we th	ink sł	nare n	et is	ation	pote	ntial	is lim	ited ov	ver th	ie pu	ll to
2015 2016	.1495 .1555	.1495 .1555	.1495 .1555	.1555 .1602	.604		ed to a	rise 1	0% in	2019	, follo	wed b	y an	2022	2024.	Fin	ally,	the di und 2.0	ivider	id yi	ield,
2017	.1602	.1602	.1602	.1666	.647	A n	letho	ra of	impr	oven	nents	and	up-					he Valu			
2018 2019	.1666 .1733	.1666	.1666	.1733	.673	grâo	les ai	re on	thể h ed, Yor	oriz	on. T	his m	eans	ment	Sur (e mé Patr	dian.			_	
	d earni-	nae Novi	earnings	report 4			s, adjuste	-		AS C	apital	spen	ung	INICH	JIAS P			Financial	-	1 12,	2019 B+
ate May		iya. IveXl	earnings	, report d			s, αujust€	a ior spli								Sto	ck's Pric	Financial e Stability	Juengti /		60 55

Take May. (B) Dividends historically paid in Take February, June, September, and December. ^o 2019 Value Line, Inc. All rights reserved. Factual material is obtained from sources believed to be reliable and is provided without warranties of any kind. THE PUBLISHER K NOT RESPONSIBLE FOR ANY ERRORS OR OMISSIONS HEREIN. This publication is strictly for subscriber's own, non-commercial, internal use. No part of it may be reproduced, resold, stored or transmitted in any printed, electronic or other form, or used for generating or marketing any printed or electronic publication, service or product.

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<u>Carolina Water Service, Inc. of North Carolina</u> Summary of Risk Premium Models for the <u>Proxy Group of Six Water Companies</u>

		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.

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	[2]	Indicated ROE (5)	10.38% NMF 11.96% 9.78% 11.25% 12.36% 11.15% 11.15%
Carolina Water Service. Inc. of North Carolina Indicated ROE Derived by the Predictive Risk Premium Model (1) [1] [2] [3] [4] [5] [6]	[9]	Risk-Free Rate (4)	3.33% 3.33% 3.33% 3.33% 3.33% 3.33% Average Median
	[5]	Predicted Risk Premium (3)	7.05% NMF 8.63% 6.45% 7.92% 9.03%
	[4]	GARCH Coefficient	1.92108 6.25441 2.10682 2.00786 2.01388 2.01388
	[3]	Recommended Variance (2)	0.30% NMF 0.33% 0.26% 0.36%
	[2]	Spot Predicted Variance	0.30% NMF 0.34% 0.26% 0.38% 0.36%
	[1]	LT Average Predicted Variance	0.38% NMF 0.33% 0.32% 0.30% 0.45%
		Proxy Group of Six Water Companies	American States Water Co. American Water Works Company Inc Artesian Resources Corporation California Water Service Group Middlesex Water Co. York Water Co.

NMF = Not Meaningful Figure

11.20%

Average of Mean and Median

Notes:

- 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. Ξ
- Due to current market conditions, I have selected the lower value between the two predicted variances at this time. 2
- $(1+(Column [3] * Column [4])^{12}) 1.$ (£ (£
- From note 2 on page 2 of Schedule DWD-5. Column [5] + Column [6].

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Proxy Group of Six

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Jun 28 2019

Carolina Water Service, Inc. of North Carolina Indicated Common Equity Cost Rate Through Use of a Risk Premium Model <u>Using an Adjusted Total Market Approach</u>

Line No.		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	<u> 10.03 </u> %

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.

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<u>Carolina Water Service, Inc. of North Carolina</u> Interest Rates and Bond Spreads for <u>Moody's Corporate and Public Utility Bonds</u>

Selected Bond Yields

[1]	[2]	[3]
-----	-----	-----

	Aaa Rated	A Rated Public	Baa Rated Public				
	Corporate Bond	Utility Bond	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

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<u>Carolina Water Service, Inc. of North Carolina</u> Comparison of Long-Term Issuer Ratings for <u>Proxy Group of Six Water Companies</u>

Moody's	Standard & Poor's
Long-Term Issuer Rating	Long-Term Issuer Rating
April 2019	April 2019

Proxy Group of Six 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	А	6.0
Artesian Resources Corporation	NR		NR	
California Water Service Group (4)	NR		A+	5.0
Middlesex Water Co.	NR		А	6.0
York Water Co.	NR		A-	7.0
Average	A2 / A3	6.5	А	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

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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	А
A3	7	A-
Baa1	8	BBB+
Baa2	9	BBB
Baa3	10	BBB-
Ba1	11	BB+
Ba2	12	BB
Ba3	13	BB-
D1	14	D.
B1	14	B+
B2	15	В
B3	16	В-

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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.

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<u>Carolina Water Service, Inc. of North Carolina</u> Derivation of Equity Risk Premium Based on the Total Market Approach Using the Beta for the <u>Proxy Group of Six Water Companies</u>

<u>Line No.</u>	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.

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<u>Carolina Water Service, Inc. of North Carolina</u> Derivation of Equity Risk Premium Based on the Total Market Approach Using the Beta for the <u>Proxy Group of Six Water Companies</u>

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

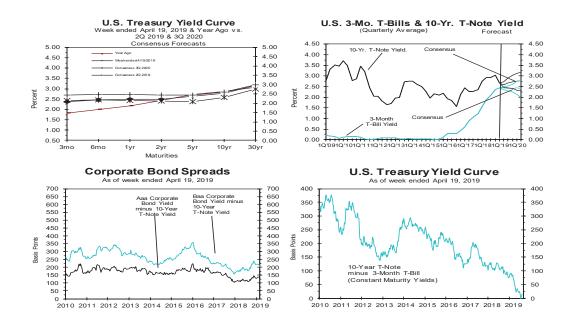
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Consensus Forecasts of U.S. Interest Rates and Key Assumptions

	History					Cons	ensus l	Foreca	sts-Qu	arterly	Avg.			
	Ave	erage For	Week End	ling	Ave	erage For	Month	Latest Qtr	2Q	3Q	4Q	1Q	2Q	3Q
Interest Rates	Apr 19	Apr 12	Apr 5	Mar 29	Mar	Feb	Jan	<u>Q1 2019</u>	<u>2019</u>	<u>2019</u>	<u>2019</u>	<u>2020</u>	<u>2020</u>	<u>2020</u>
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
				Histor	y				Co	onsensu	is Fore	casts-Q	Juartei	ly
	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 Fredie Mao, 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 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).



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14 ■ BLUE CHIP FINANCIAL FORECASTS ■ DECEMBER 1, 2018

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.

			Aver	age For The	Vear		Five-Vea	r Averages
Interest Rates		2020	2021	2022	2023	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
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
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
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
				ver-Year, %				r Averages
/	~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~	2020	2021	2022	2023	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
C CDD CL : 1D : 1 :	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

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

<u>Line No.</u>		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 a	nd Moody's Public Utility

- 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.

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Equity Cost % % % Indicated Common Rate (3) 10.009.74 10.25 10.1710.3411.02 10.689.74 8 ECAPM Cost % % % Rate 10.6510.5810.4310.7211.3111.0210.21 10.21 [] of the Traditional Capital Asset Pricing Model (CAPM) and Empirical Capital Asset Pricing Model (ECAPM) CAPM Cost % % % Traditional Rate 9.85 9.56 9.27 9.75 9.95 10.349.27 10.72 [9] % **Risk-Free** Rate (2) 3.33 3.33 3.33 3.33 3.33 3.33 5 Market Risk % Premium 9.73 9.73 9.73 9.73 9.73 9.73 £ [4]0.68 0.76 0.64 0.61 0.610.72 0.66 Average 0.67 Beta [3] Adjusted Beta 0.66 0.76 0.68 0.57 0.62 0.57 Bloomberg [2] 0.600.65 0.70 0.75 0.75 0.70 Adjusted Value Beta Line Ξ Mean Median American Water Works Company Inc Proxy Group of Six Water Companies Artesian Resources Corporation California Water Service Group American States Water Co. Middlesex Water Co. York Water Co.

Carolina Water Service, Inc. of North Carolina Indicated Common Equity Cost Rate Through Use

Notes on page 2 of this Schedule.

Average of Mean and Median

%

10.21

10.62

9.80

0.67

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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)	0.40 0/
(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 %
) For reasons explained in the direct testimony, the appropriate risk-free rate for cost of capital purposes is the aver	rage forecast

(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

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<u>Carolina Water Service, Inc. of North Carolina</u> Basis of Selection of the Group of Non-Price Regulated Companies <u>Comparable in Total Risk to the Utility Proxy Group</u>

The criteria for selection of the Non-Price Regulated Proxy Group was that the nonprice regulated companies be domestic and reported in <u>Value Line Investment Survey</u> (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:

Standard Deviation of the Std. Err. of the Regr. = <u>Standard Error of the Regression</u> $\sqrt{2N}$

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

Thus, $0.1070 = \frac{2.9846}{\sqrt{518}} = \frac{2.9846}{22.7596}$

Source of Information: Value Line, Inc., March 2019 <u>Value Line Investment Survey</u> (Standard Edition)

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<u>Carolina Water Service, Inc. of North Carolina</u> Basis of Selection of Comparable Risk <u>Domestic Non-Price Regulated Companies</u>								
	[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) 2 std. Devs. of Beta	0.29 0.21	0.71						
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							

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Source of Information: Valueline Proprietary Database, March 2019

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[4]

Carolina Water Service, Inc. of North Carolina Proxy Group of Non-Price Regulated Companies Comparable in Total Risk to the <u>Proxy Group of Six Water Companies</u>

[2]

[3]

[1]

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

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> Source of Information: Value Line Investment Survey

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 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)
 Standard

 0
 \$ 54:1
 \$ 62.7
 \$ 61:1
 \$ 60.5
 \$ 59.7
 \$ 63.9
 \$ 12.0

					Net Pro	Net Profit (millions)							
Proxy Group of Six Water Companies	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	beviation	Mean	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 Comnany Inc	2.09.9	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 Cornoration	7.3	2.6	6.7	9.6	83	5.6	11.3	13.0	14.0	14.3	2.7	10.2	0.2635
									0.1.7				
california water service Group	40.0	31.1	30.1	47.0	41.3	700	45.0	48./	7.10	c.00	9.1	48.4	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	02423
												Median	0.2405
					Net Pro	Net Profit (millions)							
Proxy Group of Eleven Non-Price						,					Standard		Coefficient
Regulated Companies	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Deviation	Mean	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	NA = Not Availabile Bold figures indicate estimates	imates										

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<u>Carolina Water Service, Inc. of North Carolina</u> Summary of Cost of Equity Models Applied to Proxy Group of Eleven Non-Price Regulated Companies Comparable in Total Risk to the <u>Proxy Group of Six Water Companies</u>

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)	l de la construcción de la constru	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.

	[8]	Indicated Common Equity Cost Rate (1)	NA %	12.11	13.46	6.97	9.40	13.22	11.09	14.84	NA	13.25	10.41	11.64 %	12.11 %	11.88 %
	[7]	Adjusted Dividend Yield	- %	2.93	0.94	1.33	3.20	1.13	2.16	2.79		0.75	2.33	Mean	Median	and Median
ik to the	[9]	Average Projected Five Year Growth Rate in EPS	12.62 %	9.18	12.52	5.64	6.20	12.09	8.93	12.05	15.81	12.50	8.08			Average of Mean and Median
omparable in Total Ris	[5]	Yahoo! Finance Projected Five Year Growth in EPS	12.48 %	8.60	16.03	0.72	2.40	11.43	7.25	12.95	13.20	14.00	7.50			
o of Non-Price-Regulated Companies Co Proxy Group of Six Water Companies	[4]	Zack's Five Year Projected Growth Rate in EPS	12.00 %	13.00	10.00	6.60	10.00	12.50	10.70	10.30	12.80	NA	9.80			
DCF Results for the Proxy Group of Non-Price-Regulated Companies Comparable in Total Risk to the <u>Proxy Group of Six Water Companies</u>	[3]	Reuters Mean Consensus Projected Five Year Growth Rate in EPS	12.48 %	8.60	16.03	0.72	2.40	11.43	7.25	12.95	13.25	NA	7.50			
DCF Results for the P	[2]	Value Line Projected Five Year Growth in EPS	13.50 %	6.50	8.00	14.50	10.00	13.00	10.50	12.00	24.00	11.00	7.50			
	[1]	Average Dividend Yield	- %	2.80	0.88	1.29	3.10	1.07	2.07	2.63		0.71	2.24			-
		Proxy Group of Eleven Non- Price Regulated Companies	AutoZone Inc.	Cheesecake Factory	Casey's Gen'l Stores	Cboe Global Markets	Cracker Barrel	Dollar General	Dunkin' Brands Group	Darden Restaurants	Integra LifeSciences	Viad Corp.	Valvoline Inc.			:

Carolina Water Service, Inc. of North Carolina

NMF= Not Meaningful Figure NA= Not Available

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 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. (1)

Value Line Investment Survey Source of Information:

www.reuters.com Downloaded on 04/30/2019 www.yahoo.com Downloaded on 04/30/2019 www.zacks.com Downloaded on 04/30/2019

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

<u>Line No.</u>		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	<u> 12.00 </u> %

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.

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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 <u>Proxy Group of Six Water Companies</u>

	Long-Ter	Moody's Long-Term Issuer Rating April 2019		d & Poor's Issuer Rating il 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

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<u>Carolina Water Service, Inc. of North Carolina</u> 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 <u>Proxy Group of Six Water Companies</u>

<u>Line No.</u>	Equity Risk Premium Measure	Proxy Group of Eleven Non-Price Regulated Companies
<u>Ib</u>	botson-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 <u>Value Line</u> Summary and Index (4)	9.57
6.	Equity Risk Premium Based on <u>Value Line</u> 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		

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

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

[8]	Indicated Common Equity Cost Rate (3)	10.51 % 10.85 11.27	11.36 10.85 11.10	11.19 11.27 11.61 11.61	11.14 % 11.19 %	11.17 %
[2]	ECAPM Cost Rate	10.87 % 11.16 11.53	11.60 11.16 11.38	11.45 11.53 11.82 11.82	<u>11.41</u> % 11.45 %	11.43 %
[9]	Traditional CAPM Cost Rate	10.14 % 10.53 11.02	11.11 10.53 10.82	10.92 11.02 11.41 11.41	10.92 %	10.90 %
[5]	Risk-Free Rate (2)	3.33 % 3.33 % 3.33	3.33 3.33 3.33	3.33 3.33 3.33 3.33 3.33 2.33	n n	
[4]	Market Risk Premium (1)	9.73 % 9.73 9.73	9.73 9.73 9.73	9.73 9.73 9.73 9.73		
[3]	Average Beta	0.70 0.74 0.79	0.80 0.74 0.77	0.78 0.79 0.83 0.83	0.78	0.78 ost rates.
[2]	Bloomberg Beta	0.60 0.73 0.82	0.85 0.72 0.73	0.86 0.77 0.85 0.86		DWD-5, note 1. DWD-5, note 2. M and ECAPM cc
[1]	Value Line Adjusted Beta	0.80 0.75 0.75	0.75 0.75 0.80	0.70 0.80 0.80 0.80	0	0. tes: (1) From Schedule DWD-5, note 1. (2) From Schedule DWD-5, note 2. (3) Average of CAPM and ECAPM cost rates.
	Proxy Group of Eleven Non-Price Regulated Companies	AutoZone Inc. Cheesecake Factory Casey's Gen'l Stores	Cboe Global Markets Cracker Barrel Dollar General	Dunkin' Brands Group Darden Restaurants Integra LifeSciences Viad Corp.	varonne nc. Mean Median	Average of Mean and Median Notes: (1) (2) (3)

Proxy Group of Six Water Companies

		[1]		[2]	[3]	[4]
Line No.	Marke	et Capitalization (1)	Market Capitalization on April 30, 2019 (1)	Applicable Decile of the NYSE/AMEX/ NASDAQ (2)	Applicable Size Premium (3)	Spread from Applicable Size Premium (4)
	(u	(millions)	(times larger)			
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	IJ	1.28%	3.94%
			[A]	[B]	[c]	[0]
			Decile	Market Capitalization of Smallest Company (millione)	Market Capitalization of Largest Company (millions)	Size Premium (Return in Excess of CAPM)*
		Tavand	÷		¢ 1 072 200 E 66	
		haigeor	7 7			0.52%
			ю	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%
			9	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%
			6	325.360	727.843	2.46%
		Smallest	10	2.455	321.578	5.22%
2	Note:		4	ז ווווז די	דוטוו בטדל בעומא הוופוף כטארטו המאוממוטו	
<u>-</u>	(1)	 From page 2 of this Schedule. Gleaned from Columns [B] corresponds to the market ca 	hedule. ns [B] and [C] on arket capitalization o	From page 2 of this Schedule. Gleaned from Columns [B] and [C] on the bottom of this page. The appropriate decile corresponds to the market capitalization of the proxy group, which is found in Column [1].	From page 2 of this Schedule. 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].	iile (Column [A

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/NASDAO

D'Ascendis Exhibit No. 1

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	[9]	to- Market o on Capitalization 019 on April 30, 2019 (3) (millions)		347.3 (5) \$ 217.491 (6)	468.6 % \$ 2,616.056 333.4 19,548.202 335.590 219.0 335.590 335.590 331.7 2,421.981 382.3 382.3 951.210 349.0	347.3 % \$ 4,385.585	e equal to the market-to-	
	[5]	Market-to- Book Ratio on April 30, 2019 (2)		34	46 33 33 33 33 34 8 8 8 8 8 8 8 8 8 8 8 8	34	assumed to b	
the	[4]	Glosing Stock Market Price on April 30, 2019	4) NA		 \$ 71.170 108.190 36.280 50.390 57.990 34.030 	\$ 59.675	on April 30, 2019 is . ropriate.	
<u>arolina</u> North Carolina and <u>ie</u> s	[3]	Total Common Equity at Fiscal Year End 2018 (millions)	62.623 (4)		558.223 5,864.000 153.251 730.157 248.787 126.195	1,280.102	tio. .c. of North Carolina April 30, 2019 as app	
nc. of North C. bervice, Inc. of 'ater Compan'			NA		5.187 \$ 2.454 \$ 6.568 \$ 5.191 \$ 5.167 \$ 9.750	86 \$	sted equity ra ter Service, In ompanies on	
Carolina Water Service, Inc. of North Carolina cation of Carolina Water Service, Inc. of North <u>Proxy Group of Six Water Companies</u>	[2]	Book Value per Share at Fiscal Year End 2018 (1)			 \$ 15.187 32.454 16.568 15.191 15.167 9.750 	\$ 17.386	olied by reque f Carolina Wa of Six Water C olumn [5].	
<u>Carolina Water Service, Inc. of North Carolina</u> Market Capitalization of Carolina Water Service, Inc. of North Carolina and the <u>Proxy Group of Six Water Companies</u>	[1]	Common Stock Shares Outstanding at Fiscal Year End 2018 (millions)	NA		36.758 180.684 9.250 48.065 16.403 12.944	50.684	 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 Froxy Group of Six Water Companies on April 30, 2019 as appropriate. (6) Column [3] multiplied by Column [5]. 	10K
		Exchange			NYSE NYSE NYSE NYSE NYSE NYSE	NA= Not Available	Notes: (1) (2) (3) (4) (5) (6)	2018 Annual Forms yahoo.finance.com
		Сотрану	Carolina Water Service, Inc. of North Carolina	Based upon Proxy Group of Six Water Companies	Proxy Group of Six Water Companies American States Water Co. American Water Works Company Inc Artesian Resources Corporation California Water Service Group Middlesex Water Co. York Water Co.	Average		Source of Information: 2018 Amual 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

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1	I.	INTRODUCTION
2		A. <u>Witness Identification</u>
3	Q.	PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.
4	Α.	My name is Dylan W. D'Ascendis. My business address is 3000 Atrium Way, Suite 241,
5		Mount Laurel, NJ 08054.
6	Q.	BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?
7	А.	I am a Director at ScottMadden, Inc.
8		B. <u>Background and Qualifications</u>
9	Q.	PLEASE SUMMARIZE YOUR PROFESSIONAL EXPERIENCE AND
10		EDUCATIONAL BACKGROUND.
11	A.	I offer expert testimony on behalf of investor-owned utilities on rate of return issues and
12		class cost of service issues. I also assist in the preparation of rate filings, including but not
13		limited to revenue requirements and original cost and lead/lag studies. I am a graduate of
14		the University of Pennsylvania, where I received a Bachelor of Arts degree in Economic
15		History. I also hold a Master of Business Administration from Rutgers University with a
16		concentration in Finance and International Business, which was conferred with high
17		honors. I am a Certified Rate of Return Analyst ("CRRA") and a Certified Valuation
18		Analyst ("CVA"). My full professional qualifications are provided in Appendix A.

1 II. PURPOSE OF TESTIMONY

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

- 3 A. The purpose of my testimony is to testify on behalf of Carolina Water Service, Inc. ("CWS"
- 4 or the "Company") about the appropriate capital structure and corresponding cost rates that
- 5 the Company should be afforded the opportunity to earn on its jurisdictional rate base.

6 Q. HAVE YOU PREPARED AN EXHIBIT IN SUPPORT OF YOUR 7 RECOMMENDATION?

8 A. Yes. I have prepared Exhibit No. ___, which consists of Schedules DWD-1 through DWD9 8.

10 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	<u>Ratios</u>	Cost Rate	Weighted Cost Rate
Long-Term Debt	48.11%	6.60%	3.18%
Common Equity	<u>51.89%</u>	10.45% - 10.95%	<u>5.42% - 5.68%</u>
Total	100.00%		8.60% - 8.86%

2 III. <u>SUMMARY</u>

1

3 Q. PLEASE SUMMARIZE YOUR RECOMMENDED RANGE OF COMMON 4 EQUITY COST RATES.

5 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 6 7 equity cost rates of companies of relatively similar, but not necessarily identical, risk to 8 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 9 group can be identical in risk to any single company, so there must be an evaluation of 10 relative risk between the company and the proxy group to see if it is appropriate to make 11 adjustments to the proxy group's indicated rate of return. 12

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).

1	of domestic, non-price regulated companies	comparable in total risk to the eight water			
2	companies ("Non-Price Regulated Proxy Gro	companies ("Non-Price Regulated Proxy Group").			
3	The results derived from each are as f	follows:			
4	Table 2: Summary of Comm	non Equity Cost Rate			
5		Utility Proxy			
6		Group			
7	Discounted Cash Flow Model	8.64%			
8	Risk Premium Model	10.69			
9	Capital Asset Pricing Model	10.51			
10	Cost of Equity Models Applied to				
11	Comparable Risk, Non-Price				
12	Regulated Companies	<u>12.06</u>			
13	Indicated Common Equity				
14	Cost Rate Before Adjustment	10.45%			
15	Size Adjustment	0.50			
16	Indicated Common Equity Cost Rate				
17	Cost Rate after Adjustment	<u>10.95</u> %			
17	Cost Rate arter regustinent	<u>10.55</u> /0			
18	Recommended Range of				
19	Common Equity Cost Rates	<u>10.45% - 10.95%</u>			
20					
		·, , · · · · · · · · · · · · · · · · ·			
21	After analyzing the indicated commo	n equity cost rates derived by these models, I			
22	conclude that a common equity cost rate of	10.45% for the Company is indicated before			
23	any Company-specific adjustment. I then ad	justed the indicated common equity cost rate			
24	upward by 0.50% to reflect CWS's smaller re	elative size as compared with the members of			
25	the Utility Proxy Group, resulting in a size-a	djusted indicated common equity cost rate of			
26	10.95%. Based on these results, I recomm	nend the Commission consider a range of			
27	common equity cost rates between 10.45%	and 10.95% for use in setting rates for the			
28	Company.				

1 IV. <u>GENERAL PRINCIPLES</u>

2 Q. WHAT GENERAL PRINCIPLES HAVE YOU CONSIDERED IN ARRIVING AT 3 YOUR RECOMMENDED RANGE OF COMMON EQUITY COST RATES?

Α. In unregulated industries, the competition of the marketplace is the principal determinant 4 5 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 6 to the public while providing safe and reliable service at all times requires a level of 7 earnings sufficient to maintain the integrity of presently invested capital. Sufficient 8 9 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 10 return standards established by the U.S. Supreme Court in the previously cited *Hope* and 11 12 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 13 the proxy group adds reliability to the informed expert judgment used in arriving at a 14 15 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 16 common equity cost rate. 17

18

Q.

A. <u>Business Risk</u>

20

19

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

1	regulatory environment in which they operate, customer mix, and concentration of
2	customers, service territory growth, and capital intensity. All of these have a direct bearing
3	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?

Water and wastewater utilities have an ever-increasing responsibility to be stewards of the 9 Α. environment from which supplies are drawn in order to preserve and protect essential 10 natural resources of the United States. Compliance with the Safe Water Drinking Act and 11 12 response to continuous monitoring by the Environmental Protection Agency ("EPA") and 13 state and local governments of the water supply for potential contaminants and their 14 resultant regulations directly result in increased environmental stewardship by water utilities. This, plus aging infrastructure, necessitate additional capital investment in the 15 16 distribution and treatment of water, exacerbating the pressure on free cash flows arising from increased capital expenditures for infrastructure repair and replacement. 17 The 18 significant amount of capital investment and, hence, high capital intensity, is a major risk 19 factor for the water and wastewater utility industry.

20

Value Line Investment Survey ("Value Line") observes the following about the

21 water utility industry:

22 One of the most positive attributes of the water industry is that 23 companies and regulatory authorities usually work together 24 reasonably well. This isn't always the case in other domestic 25 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

8 The water and wastewater industries also experience low depreciation rates. 9 Depreciation rates are one of the principal sources of internal cash flows for all utilities 10 (through a utility's depreciation expense), and are vital to a company to fund ongoing 11 replacements and repairs of the system. Water / wastewater utilities' assets have long lives, 12 and therefore have long capital recovery periods. As such, they face greater risk due to 13 inflation, which results in a higher replacement cost per dollar of net plant.

Substantial capital expenditures, as noted by Value Line, will require significant 14 financing. The three sources of financing typically used are debt, equity (common and 15 16 preferred), and cash flow. All three are intricately linked to the opportunity to earn a 17 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 18 19 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 20 which are directly linked to earning a sufficient rate of return. The level of free cash flow 21 22 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 23 24 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.

8

B. <u>Financial Risk</u>

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

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

1		specific business or financial risks may differ between companies, the same bond/credit
2		rating indicates that the combined risks are roughly similar, albeit not necessarily equal, as
3		the purpose of the bond/credit rating process is to assess credit quality or credit risk and
4		not common equity risk.
5	Q.	THAT BEING SAID, DO RATING AGENCIES REFLECT COMPANY SIZE IN
6		THEIR BOND RATINGS?
7	А.	No. Neither S&P nor Moody's have minimum company size requirements for any given
8		rating level. This means, all else equal, a relative size analysis needs to be conducted for
9		companies with similar bond ratings.
10	v.	CAPITAL STRUCTURE
11	Q.	WHAT CAPITAL STRUCTURE RATIOS DO YOU RECOMMEND BE
12		EMPLOYED IN DEVELOPING AN OVERALL FAIR RATE OF RETURN
13		APPROPRIATE FOR THE COMPANY?
14	A.	I recommend the use of a ratemaking capital structure consisting of 48.11% long-term debt
15		and 51.89% common equity as shown on page 1 of Schedule DWD-1. This capital
16		structure is based on a test year capital structure for Utilities, Inc., CWS's parent company,
17		ended December 31, 2017.
18	Q.	HOW DOES YOUR PROPOSED RATEMAKING COMMON EQUITY RATIO OF
19	-	51.89% FOR CWS COMPARE WITH THE TOTAL EQUITY RATIOS
20		MAINTAINED BY THE COMPANIES IN YOUR UTILITY PROXY GROUP?
21	Α.	My proposed ratemaking common equity ratio of 51.89% for CWS is reasonable and
22		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.

11 Q. WHAT COST RATE FOR LONG-TERM DEBT IS MOST APPROPRIATE FOR

12 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. <u>CAROLINA WATER SERVICE, INC. AND UTILITY PROXY GROUP</u> <u>SELECTION</u>

17 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.

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.

1	Q.	PLEA	ASE EXPLAIN HOW YOU CHOSE YOUR PROXY GROUP OF EIGHT
2		WAT	ER COMPANIES.
3	A.	The b	asis of selection for the Utility Proxy Group was to select those companies which
4		meet	the following criteria:
5		(i)	They are included in the Water Utility Group of Value Line's Standard Edition
6			(October 13, 2017);
7		(ii)	They have 70% or greater of 2016 total operating income and 70% or greater of
8			2016 total assets attributable to regulated water operations;
9		(iii)	At the time of the preparation of this testimony, they had not publicly announced
10			that they were involved in any major merger or acquisition activity (i.e., one
11			publicly-traded utility merging with or acquiring another);
12		(iv)	They have not cut or omitted their common dividends during the five years ending
13			2016 or through the time of the preparation of this testimony;
14		(v)	They have Value Line and Bloomberg adjusted betas;
15		(vi)	They have a positive Value Line five-year dividends per share ("DPS") growth rate
16			projection; and
17		(vii)	They have Value Line, Reuters, Zacks, or Yahoo! Finance consensus five-year
18			earnings per share ("EPS") growth rate projections.
19			The following eight companies met these criteria: American States Water Co.,
20		Ameri	can Water Works Co., Inc., Aqua America, Inc., California Water Service Group,
21		Conne	ecticut Water Service, Inc., Middlesex Water Co., SJW Corp., and York Water Co.

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- 1 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.
 - 4 During the five-year period ending 2016, the historically achieved average earnings 5 rate on book common equity for the group averaged 10.56%. The average common equity 6 ratio based on total permanent capital (excluding short-term debt) was 53.13%, and the 7 average dividend payout ratio was 56.73%.

8 Total debt to earnings before interest, taxes, depreciation, and amortization 9 ("EBITDA") for the years 2012 to 2016 ranges between 3.40 and 3.83, with an average of 10 3.63. Funds from operations to total debt range from 20.86% to 25.95%, with an average 11 of 23.18%.

12

VII. <u>COMMON EQUITY COST RATE MODELS</u>

13 Q. ARE YOUR COST OF COMMON EQUITY MODELS MARKET-BASED 14 MODELS?

Yes. The DCF model is market-based because market prices are used in developing the 15 Α. 16 dividend yield component of the model. The RPM is market-based because the bond 17 ratings and expected bond yields used in the application of the RPM reflect the market's 18 assessment of bond/credit risk. In addition, the use of beta coefficients (β) to determine 19 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 20 Risk Premium Model ("PRPM") uses monthly market returns in addition to expectations 21 22 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 23

1	comparable risk non-price regulated companies is market-based because it is based on
2	statistics which result from regression analyses of market prices and reflect the market's
3	assessment of total risk.

A. <u>Discounted Cash Flow Model</u>

5 Q. WHAT IS THE THEORETICAL BASIS OF THE DCF MODEL?

The theory underlying the DCF model is that the present value of an expected future stream 6 A. 7 of net cash flows during the investment holding period can be determined by discounting 8 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 9 from cash flows received in the form of dividends plus appreciation in market price (the 10 11 expected growth rate). Mathematically, the dividend yield on market price plus a growth 12 rate equals the capitalization rate, *i.e.*, the total common equity return rate expected by 13 investors.

14 Q. WHICH VERSION OF THE DCF MODEL DO YOU USE?

15 A. I use the single-stage constant growth DCF model.

16 Q. PLEASE DESCRIBE THE DIVIDEND YIELD YOU USED IN YOUR 17 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

See Schedule DWD-3, page 1, column 1.

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 5 dividend yield component of the model. Since the various companies in the Utility Proxy 6 Group increase their quarterly dividend at various times during the year, a reasonable 7 assumption is to reflect one-half the annual dividend growth rate in the dividend yield 8 9 component, or $D_{1/2}$. Because the dividend should be representative of the next twelvemonth period, my adjustment is a conservative approach that does not overstate the 10 dividend yield. Therefore, the actual average dividend yields in Column 1 on page 1 of 11 12 Schedule DWD-3 have been adjusted upward to reflect one-half the average projected 13 growth rate shown in Column 6.

14 Q. PLEASE EXPLAIN THE BASIS OF THE GROWTH RATES YOU APPLY TO 15 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. 1 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 2 on market prices than dividend expectations. Thus, the use of earnings growth rates in a 3 4 DCF analysis provides a better match between investors' market price appreciation expectations and the growth rate component of the DCF. 5

PLEASE SUMMARIZE THE DCF MODEL RESULTS. 6 Q.

As shown on page 1 of Schedule DWD-3, the mean result of the application of the single-7 A. stage DCF model is 8.86%, the median result is 8.42%, and the average of the two is 8.64% 8 for the Utility Proxy Group. In arriving at a conclusion for the DCF-indicated common 9 equity cost rate for the Utility Proxy Group, I have relied on an average of the mean and 10 the median results of the DCF. This approach takes into consideration all of the proxy 11 companies' results while mitigating the high and low outliers of those individual results. 12

13

B. **The Risk Premium Model**

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

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

While it is possible to directly observe bond returns and yields, investors' required 21 22 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 23

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.

6 Q. PLEASE EXPLAIN HOW YOU DERIVED YOUR INDICATED COST OF 7 COMMON EQUITY BASED ON THE RPM.

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

10 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.

www.nobelprize.org.

2

on an <u>estimate</u> of investor behavior, but rather on the evaluation of the results of that behavior (*i.e.*, the variance of historical equity risk premiums).

The inputs to the model are the historical returns on the common shares of each 3 company in the Utility Proxy Group minus the historical monthly yield on long-term U.S. 4 Treasury securities through September 2017. Using a generalized form of ARCH, known 5 as GARCH, I calculate each Utility Proxy Group company's projected equity risk premium 6 using Eviews[©] statistical software. When the GARCH Model is applied to the historical 7 return data, it produces a predicted GARCH variance series¹⁰ and a GARCH coefficient¹¹. 8 Multiplying the predicted monthly variance by the GARCH coefficient and annualizing it¹² 9 produces the predicted annual equity risk premium. I then add the forecasted 30-year U.S. 10 Treasury Bond yield, 3.58%¹³, to each company's PRPM-derived equity risk premium to 11 arrive at an indicated cost of common equity. The 30- year Treasury yield is a consensus 12 forecast derived from the Blue Chip Financial Forecasts ("Blue Chip")¹⁴. The mean 13 PRPM indicated common equity cost rate for the Utility Proxy Group is 11.48%, the 14 median is 11.41%, and the average of the two is 11.45%. Consistent with my reliance on 15 the average of the median and mean results of the DCF, I will rely on the average of the 16 mean and median results of the Utility Proxy Group PRPM to calculate a cost of common 17 equity rate of 11.45%. 18

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.

2 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 3 premium, and 2) an equity risk premium based on the S&P Utilities Index. 4

5

6

Q. PLEASE EXPLAIN THE BASIS OF THE EXPECTED BOND YIELD OF 4.92% APPLICABLE TO THE UTILITY PROXY GROUP.

7 A. The first step in the total market approach RPM analysis is to determine the expected bond 8 yield. Because both ratemaking and the cost of capital (including common equity cost rate) 9 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 10 corporate bonds for the six calendar quarters ending with the first calendar quarter of 2019 11 and the long-term projections for 2019 to 2023 and 2024 to 2028 from Blue Chip. As 12 13 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 14 rated-public utility bonds, I make an upward adjustment of 0.25%, which represents a 15 16 recent spread between Aaa corporate bonds and A2-rated public utility bonds, in order to 17 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 18 of 4.61% results in an expected A2 public utility bond of 4.86%. 19

20 Since the Utility Proxy Group's average Moody's long-term issuer rating is A2/A3. 21 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 22

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

1		a recent spread between A2 and A3 public utility bond yields, is necessary to make the A2
2		prospective bond yield applicable to an A2/A3 public utility bond. ¹⁶ Adding the 0.06% to
3		the 4.86% prospective A2 public utility bond yield results in a 4.92% expected bond yield
4		for the Utility Proxy Group.
5	Q.	PLEASE EXPLAIN THE DERIVATION OF THE BETA-DERIVED EQUITY
6		RISK PREMIUM.
7	A.	The components of the beta derived risk premium model are: 1) An expected market equity
8		risk premium over corporate bonds, and 2) the beta coefficient. The derivation of the beta-
9		derived equity risk premium that I apply to the Utility Proxy Group is shown on lines 1
10		through 11 of page 8 of Schedule DWD-4. The total beta-derived equity risk premium I
11		apply is based on an average of: 1) Historical data-based equity risk premiums; 2) Value
12		Line-based equity risk premiums; and 3) Bloomberg-based equity risk premium. Each of
13		these is described in turn.
14	Q.	HOW DID YOU DERIVE A MARKET EQUITY RISK PREMIUM BASED ON
15		LONG-TERM HISTORICAL DATA?
16	A.	To derive a historical market equity risk premium, I used the most recent holding period
17		returns for the large company common stocks from the 2017 Stocks, Bonds, Bills, and

19

20

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

returns for the large company common stocks from the <u>2017 Stocks</u>, <u>Bonds</u>, <u>Bills</u>, and <u>Inflation ("SBBI") Yearbook ("SBBI – 2017")</u>¹⁷ less the average historical yield on

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.

2

the long-term investment horizon presumed by investing in a going concern, *i.e.*, a company expected to operate in perpetuity.

3 SBBI's long-term arithmetic mean monthly total return rate on large company 4 common stocks was 11.69% and the long-term arithmetic mean monthly yield on Moody's 5 Aaa/Aa-rated corporate bonds was 6.13%.¹⁸ As shown on line 1 of page 8 of Schedule 6 DWD-4, subtracting the mean monthly bond yield from the total return on large company 7 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 8 9 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 10 use of the arithmetic mean return rates and yields is appropriate because historical total 11 12 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. 13 14 If investors relied on the geometric mean of historical equity risk premiums, they would 15 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 16 year-to-year fluctuations, or variance, which is critical to risk analysis. 17

18 Q. PLEASE EXPLAIN THE DERIVATION OF THE REGRESSION-BASED 19 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

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:

8
$$RP = \alpha + \beta (R_{Aaa/Aa})$$

9 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.

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.

1 Q.

2

PREMIUM BASED ON VALUE LINE DATA FOR YOUR RPM ANALYSIS.

PLEASE EXPLAIN THE DERIVATION OF A PROJECTED EQUITY RISK

3 Α. 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 4 essential. The derivation of the forecasted or prospective market equity risk premium can 5 be found in note 4 on page 8 of Schedule DWD-4. Consistent with my calculation of the 6 dividend yield component in my DCF analysis, this prospective market equity risk 7 premium is derived from an average of the three- to five-year median market price 8 9 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 10 firms covered in Value Line's Standard Edition.²² 11

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.

18 Q. PLEASE EXPLAIN THE DERIVATION OF AN EQUITY RISK PREMIUM 19 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

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

1	prospective yield on Aaa Corporate bonds of 4.61% results in an 9.69% projected equity
2	risk premium.

3 The average *Value Line*-based Equity risk premium is 7.26%, which is shown on
4 Line No. 7 on page 8 of Schedule DWD-4.

5 Q. PLEASE EXPLAIN THE DERIVATION OF AN EQUITY RISK PREMIUM 6 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.

12 Q. WHAT IS YOUR CONCLUSION OF A BETA-DERIVED EQUITY RISK 13 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

21

^{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.

4

Q.

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UTILITY INDEX AND MOODY'S A-RATED PUBLIC UTILITY BONDS?

HOW DID YOU DERIVE THE EQUITY RISK PREMIUM BASED ON THE S&P

I estimate three equity risk premiums based S&P Utility Index holding returns, and two 6 Α. equity risk premiums based on the expected returns of the S&P Utilities Index, using Value 7 *Line* and Bloomberg data, respectively. Turning first to the S&P Utility Index holding 8 period returns, I derive a long-term monthly arithmetic mean equity risk premium between 9 the S&P Utility Index total returns of 10.57% and monthly A-rated public utility bond 10 vields of 6.61% from 1928 to 2016 to arrive at an equity risk premium of 3.96%.²⁴ I then 11 use the same historical data to derive an equity risk premium of 5.59% based on a 12 regression of the monthly equity risk premiums. The final S&P Utility Index holding 13 period equity risk premium involves applying the PRPM using the historical monthly 14 equity risk premiums from January 1928 to September 2017 to arrive at a PRPM-derived 15 equity risk premium of 3.96% for the S&P Utility Index. The average of the three S&P 16 Utilities Index holding return equity risk premiums is 4.50%. 17

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

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.

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1		average the risk premium based on each source (i.e., Historical, Value Line, and
2		Bloomberg) to arrive at my utility-specific equity risk premium of 4.15%. ²⁶
3	Q.	WHAT IS YOUR CONCLUSION OF AN EQUITY RISK PREMIUM FOR USE IN
4		YOUR TOTAL MARKET APPROACH RPM ANALYSIS?
5	A.	The equity risk premium I apply to the Utility Proxy Group is 5.01%, which is the average
6		of the beta-derived and the S&P utility equity risk premiums of 5.87% and 4.15%,
7		respectively. ²⁷
8	Q.	WHAT IS THE INDICATED RPM COMMON EQUITY COST RATE BASED ON
9		THE TOTAL MARKET APPROACH?
10	A.	As shown on Line No. 7 of Schedule DWD-4, page 3, I calculate a common equity cost
11		rate of 9.93% for the Utility Proxy Group based on the total market approach of the RPM.
12	Q.	WHAT ARE THE RESULTS OF YOUR APPLICATION OF THE PRPM AND
13		THE TOTAL MARKET APPROACH RPM?
14	A.	As shown on page 1 of Schedule DWD-4, the indicated RPM-derived common equity cost
15		rate is 10.69%, which gives equal weight to the PRPM (11.45%) and the adjusted market
16		approach results (9.93%).
17		C. <u>The Capital Asset Pricing Model</u>
18	Q.	PLEASE EXPLAIN THE THEORETICAL BASIS OF THE CAPM.
19	A.	CAPM theory defines risk as the co-variability of a security's returns with the market's
20		returns as measured by the beta coefficient (β). A beta coefficient less than 1.0 indicates
	26	4 15% = (4 50% + 4 20% + 3 74%)/3

^{4.15% = (4.50% + 4.20% + 3.74%)/3.} As shown on page 7 of Schedule DWD-4. 27

2

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) 3 4 can be eliminated through diversification. The risk that cannot be eliminated through 5 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 6 7 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 8 9 proportionately to reflect the systematic risk of the individual security relative to the total 10 market as measured by the beta coefficient. The traditional CAPM model is expressed as:

11

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

12 Where: $R_s = Return rate on the common stock$

13 R_f = Risk-free rate of return

14 $R_m =$ Return rate on the market as a whole 15 $\beta =$ Adjusted beta coefficient (volatility of the 16 security relative to the market as a whole)

17 Numerous tests of the CAPM have measured the extent to which security returns 18 and beta coefficients are related as predicted by the CAPM, confirming its validity. The 19 empirical CAPM ("ECAPM") reflects the reality that while the results of these tests support 20 the notion that the beta coefficient is related to security returns, the empirical Security 21 Market Line ("SML") described by the CAPM formula is not as steeply sloped as the 22 predicted SML.²⁸ In view of theory and practical research, I have applied both the

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.

3 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.

11 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.

17 Q. WHY IS THE YIELD ON LONG-TERM U.S. TREASURY BONDS 18 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

1		(i.e., cost of capital) will be applied. In contrast, short-term U.S. Treasury yields are more
2		volatile and largely a function of Federal Reserve monetary policy.
3	Q.	PLEASE EXPLAIN THE ESTIMATION OF THE EXPECTED RISK PREMIUM
4		FOR THE MARKET USED IN YOUR CAPM ANALYSES.
5	A.	The basis of the market risk premium is explained in detail in Note 1 on Schedule DWD-5.
6		As discussed previously, the market risk premium is derived from an average of:
7		1) Historical data-based market risk premiums;
8		2) <i>Value Line</i> data-based market risk premiums; and
9		3) Bloomberg data-based market risk premium.
10		The long-term income return on U.S. Government Securities of 5.17% was
11		deducted from the SBBI-2017 monthly historical total market return of 11.97%, which
12		results in an historical market equity risk premium of 6.80%. ²⁹ I applied a linear OLS
13		regression to the monthly annualized historical returns on the S&P 500 relative to historical
14		yields on long-term U.S. Government Securities from SBBI-2017. That regression
15		analysis yielded a market equity risk premium of 8.60%. The PRPM market equity risk
16		premium is 6.69%, and is derived using the PRPM relative to the yields on long-term U.S.
17		Treasury securities from January 1926 through September 2017. The average of the
18		historical data-based market risk premiums is 7.36%. ³⁰
19		The Value Line-derived forecasted total market equity risk premium is derived by
20		deducting the forecasted risk-free rate of 3.58%, discussed above, from the Value Line
21		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.

1		risk premium of 5.87%. The S&P 500 projected market equity risk premium using Value
2		Line data is derived by subtracting the projected risk-free rate of 3.58% from the projected
3		total return of the S&P 500 of 14.30%. The resulting market equity risk premium is
4		10.72%. The average Value Line market risk premium is 8.29%. ³¹
5		The S&P 500 projected market equity risk premium using Bloomberg data is
6		derived by subtracting the projected risk-free rate of 3.58% from the projected total return
7		of the S&P 500 of 13.92%. The resulting market equity risk premium is 10.34%.
8		These three sources (historical, Value Line, and Bloomberg), when averaged, result
9		in an average total market equity risk premium of 8.67%. ³²
10	Q.	WHAT ARE THE RESULTS OF YOUR APPLICATION OF THE TRADITIONAL
	χ.	
11		AND EMPIRICAL CAPM TO THE UTILITY PROXY GROUP?
12	A.	As shown on page 1 of Schedule DWD-5, the mean result of my CAPM/ECAPM analyses
13		is 10.43%, the median is 10.58%, and the average of the two is 10.51%. Consistent with
14		my reliance on the average of mean and median DCF results discussed above, the indicated
15		common equity cost rate using the CAPM/ECAPM is 10.51%.
17		D. Common Equity Cost Rates for a Proxy Group of Domestic, Non-Price
16 17		D. Common Equity Cost Rates for a Proxy Group of Domestic, Non-Price Regulated Companies Based on the DCF, RPM, and CAPM
18	Q.	WHY DO YOU ALSO CONSIDER A PROXY GROUP OF DOMESTIC, NON-
19		PRICE REGULATED COMPANIES?
20	A.	In the Hope and Bluefield cases, the U.S. Supreme Court did not specify that comparable
21		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.} 8.67% = (7.36% + 8.29% + 10.34%)/3.32

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?

9 Α. In order to select a proxy group of domestic, non-price regulated companies similar in total 10 risk to the Utility Proxy Group, I relied on the beta coefficients and related statistics derived 11 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-12 eight domestic, non-price regulated firms comparable in total risk to the Utility Proxy 13 14 Group. Total risk is the sum of non-diversifiable market risk and diversifiable company-15 specific risks. The criteria used in the selection of the domestic, non-price regulated firms 16 were:

17 1) They must be covered by *Value Line Investment Survey* (Standard Edition);

18 2) They must be domestic, non-price regulated companies, *i.e.*, non-utilities;

- 193)Their beta coefficients must lie within plus or minus two standard deviations of the20average 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 1 2 diversifiable. The residual standard errors of the regressions were used to measure each 3 firm's company-specific, diversifiable risk. Companies that have similar betas and similar 4 residual standard errors resulting from the same regression analyses have similar total 5 investment risk. 6 Q. HAVE YOU PREPARED A SCHEDULE WHICH SHOWS THE DATA FROM 7 WHICH YOU SELECTED THE TWENTY-EIGHT DOMESTIC, NON-PRICE **REGULATED COMPANIES THAT ARE COMPARABLE IN TOTAL RISK TO** 8 THE UTILITY PROXY GROUP? 9 10 Α. Yes, the basis of my selection and both proxy groups' regression statistics are shown in 11 Schedule DWD-6. Q. 12 DID YOU CALCULATE COMMON EQUITY COST RATES USING THE DCF. 13 **RPM, AND CAPM FOR THE NON-PRICE REGULATED PROXY GROUP?** 14 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. 15 16 One exception is in the application of the RPM, where I did not use public utility-specific 17 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 18 19 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%. 20 21 Pages 3 through 5 contain the data and calculations that support the 11.91% RPM 22 cost rate. As shown on Line No. 1 of page 3 of Schedule DWD-7, the consensus 23 prospective yield on Moody's Baa rated corporate bonds for the six guarters ending in the

1		first quarter of 2019, and for the years 2019 to 2023 and 2024 to 2028, is 5.36%. ³³ When
2		the beta-adjusted risk premium of 6.55%, ³⁴ relative to the Non-Price Regulated Proxy
3		Group, is added to the prospective Baa2 rated corporate bond yield of 5.36%, the indicated
4		RPM cost rate is 11.91%.
5		Page 6 contains the inputs and calculations that support my indicated
6		CAPM/ECAPM cost rate of 11.15%.
7	Q.	HOW IS THE COST RATE OF COMMON EQUITY BASED ON THE NON-
8		PRICE REGULATED PROXY GROUP COMPARABLE IN TOTAL RISK TO
9		THE UTILITY PROXY GROUP?
10	A.	As shown on page 1 of Schedule DWD-7, the results of the DCF, RPM, and CAPM, applied
11		to the Non-Price Regulated Proxy Group comparable in total risk to the Utility Proxy
12		Group, are 13.57%, 11.91%, and 11.15%, respectively. The average of the mean and
13		median of these models is 12.06%, which I use as the indicated common equity cost rate
14		for the Non-Price Regulated Proxy Group.
15	VIII.	CONCLUSION OF COMMON EQUITY COST RATE BEFORE ADJUSTMENTS
16	Q.	WHAT IS THE INDICATED COMMON EQUITY COST RATE BEFORE
17		ADJUSTMENTS?
18	A.	Based on the results of the application of multiple cost of common equity models to the
19		Utility Proxy Group and the Non-Price Regulated Proxy Group, the indicated cost of equity
20		before adjustments is 10.45%. I use multiple cost of common equity models as primary
21		tools in arriving at my recommended common equity cost rate, because no single model is

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.

10 IX. ADJUSTMENT TO THE COMMON EQUITY COST RATE

11 A. Size Adjustment

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).

1	Table 5: Size as Measured by 1	Market Capitalization	n for the Company
2	and the U	tility Proxy Group	
3			Times
4		Market	Greater than
5		Capitalization*	the Company
6		(\$ Millions)	
7			
8	CWS	\$57.209	
9			
10	Utility Proxy Group	\$3,543.646	61.9x
11			
12	*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.

18 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

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equity in this proceeding that reflects CWS's relevant risk, including the impact of its small size.

3	As a result, it is necessary to upwardly adjust the indicated common equity cost rate
4	of 10.45% to reflect CWS's greater risk due to its smaller relative size. The determination
5	is based on the size premiums for portfolios of New York Stock Exchange ("NYSE"),
6	American Stock Exchange ("AMEX"), and NASDAQ listed companies ranked by deciles
7	for the 1926 to 2016 period. The average size premium for the Utility Proxy Group with a
8	market capitalization of \$3.545 billion falls in the 5 th decile, while CWS's market
9	capitalization of \$57.209 million puts the Company in the 10 th decile. The size premium
10	spread between the 5 th decile and the 10 th decile is 4.08%. Even though a 4.08% upward
11	size adjustment is indicated, I apply a size premium of 0.50% to CWS's indicated common
12	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 applicable³⁵, 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 million³⁶, 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

DID YOU EVALUATE OTHER MEASURES OF RELATIVE SIZE BETWEEN
CWS AND THE PROXY GROUP?
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 <u>Duff and Phelps</u> ' 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.
WHAT IS THE INDICATED COST OF COMMON EQUITY AFTER YOUR

7 8 9 10 11 12 be smaller than the average water proxy group company with associate 13 ranging from 1.34% to 3.94%. In view of these results, in my opinior 14 adjustment of 0.50% to the indicated cost of common equity is both 15

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- WHAT IS THE INDICATED COST OF COMMON EQUITY 17 Q. R

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ADJUSTMENT FOR SIZE?

19 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. 20

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1 X. <u>CONCLUSION OF COMMON EQUITY COST RATE</u>

2 Q. WHAT IS YOUR RECOMMENDED COST OF COMMON EQUITY FOR CWS?

- 3 A. Given the indicated cost of common equity of 10.45% and the size adjusted cost of common
- 4 equity of 10.95%, I conclude that an appropriate range of common equity cost rates for the
- 5 Company is from 10.45% to 10.95%.

Q. IS YOUR RECOMMENDED RANGE OF COMMON EQUITY COST RATES 7 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
- 10 necessary new capital.

11 Q. DOES THAT CONCLUDE YOUR DIRECT TESTIMONY?

12 A. Yes, it does

KvPSC Case No. 2021-00190 STAFF-DR-03-011 Attachment 2 Appendix A ^{Page 40 of 82} **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

Capital Market Risk Financial Modeling

- . 2 Mutual Fund Benchmarking Capital Market Risk
- Valuation Regulatory Strategy and Rate Case Support

Recent Expert Testimony Submission/Appearances

Jurisdiction

- **Regulatory Commission of Alaska**
- New Jersey Board of Public Utilities
- Pennsylvania Public Utility Commission
- South Carolina Public Service Commission
- American Arbitration Association

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 副 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

- 9 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 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.

Topic

Rate of Return

Cost of Service

Rate Design

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Return on Common Equity & Capital Structure Cost of Service, Rate Design **Return on Common Equity** Return on Common Equity Valuation

Appendix A Professional Qualifications of Dylan W. D'Ascendis, CRRA, CVA

ው	COLT MANAGEMENT CONSULTANTS
	SCC

Regulatory Commission of Alaska Alaska Power Company Colorado Public Utilities Commission Atmos Energy Corporation Atmos Energy Corporation Delaware Public Service Commission Tidewater Utilities, Inc. Hawaii Public Utilities Commission	07146	The second se		
	07/46			
	01/10	Alaska Power Company	Docket No. TA857-2	Rate of Return
	06/17	Atmos Energy Corporation	Docket No. 17AL-0429G	Return on Equity
	11/13	Tidewater Utilities, Inc.	Docket No. 13-466	Capital Structure
	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	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
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	1445			
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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Appendix A Professional Qualifications of Dylan W. D'Ascendis, CRRA, CVA

Ottmadden MANAGEMENT CONSULTANTE
scott

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

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	<u>Schedule</u>
Summary of Cost of Capital and Fair Rate of Return	DWD-1
Financial Profile of the Proxy Group of Eight Water Companies	DWD-2
Indicated Common Equity Cost Rate Using the Discounted Cash Flow Model	DWD-3
Indicated Common Equity Cost Rate Using the Risk Premium Model	DWD-4
Indicated Common Equity Cost Rate Using the Capital Asset Pricing Model	DWD-5
Basis of selection for the Non-Price Regulated Companies Comparable in Total Risk to the Proxy Group of Eight Water Companies	DWD-6
Cost of Common Equity Models Applied to the Comparable Risk Non-Price Regulated Companies	DWD-7
Relative Measures of Size for Carolina Water Service, Inc. and the Proxy Group of Eight Water Companies	DWD-8

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<u>Carolina Water Service, Inc. of South Carolina</u> Recommended Capital Structure and Cost Rates for Ratemaking Purposes <u>Estimated at December 31, 2017</u>

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.

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

	<u>2016</u>	<u>2015</u> (MIL	2014 LIONS OF DOLLAR	<u>2013</u> S)	2012	
CAPITALIZATION STATISTICS		(5)		
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	<u>\$137.724</u>	\$95,003	\$72,459	<u>\$95,589</u>	\$60,594	
TOTAL CAPITAL EMPLOYED	<u>\$2,537.578</u>	<u>\$2,364.479</u>	<u>\$2,228.866</u>	<u>\$2.154.336</u>	<u>\$2,058.952</u>	
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 %	
						5 YEAR
CAPITAL STRUCTURE RATIOS BASED ON TOTAL PERMANENT CAPITAL:						AVERAGE
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 %	<u>100.00</u> %		100.00 %	100.00 %	100.00 %
	<u></u> //		<u></u>			distantialistic 7.0
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	<u>51.30</u>	<u>52.25</u>	<u>52.87</u>	<u>52.08</u>	<u>48.96</u>	<u>51.49</u>
TOTAL	<u>100.00</u> %	<u>100.00</u> %	<u>100.00</u> %	<u>100.00</u> %	<u>100.00</u> %	<u>100.00</u> %
FINANCIAL STATISTICS						
FINANCIAL RATIOS - MARKET BASED	4.04 .04	4 80 0/	E 44 . 0/	4.04 %	E 47 A	4.00 01
EARNINGS / PRICE RATIO	4.01 %	4.72 %		4.84 % 206.33	5.47 % 187.65	4.90 % 221.18
MARKET / AVERAGE BOOK RATIO	274.64 2.17	224.46 2.66	212.84 2.76	208.33	3.17	221.18
DIVIDEND YIELD DIVIDEND PAYOUT RATIO	55.72	56.71	52.46	58.35	60.42	56.73
DIVIDEND PATOOT KATIO	55.72	30.71	52.40	30.33	00.42	30,73
RATE OF RETURN ON AVERAGE BOOK COMMON EQUITY	10.83 %	10,40 %	11.38 %	10.08 %	10.12 %	10.56 %
<u>TOTAL DEBT / EBITDA (3)</u>	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

<u>Capital Structure Based upon Total Permanent Capital for the</u> <u>Proxy Group of Eight Water Companies</u> <u>2012 - 2016. Inclusive</u>

	204.6	0045	0044	0040	0010	5 YEAR
	<u>2016</u>	<u>2015</u>	<u>2014</u>	<u>2013</u>	<u>2012</u>	<u>AVERAGE</u>
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 %
<u>Aqua America Inc</u>						
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 Total Capital	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 Total Capital	60.42	58.87	57.74	57.76	55.45	58.05
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	10 0. 00 %
SIW 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 Total Capital	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						

Source of Information

Annual Forms 10-K

	[8]	Indicated Common Bquity Cost Rate (5)	7.41 %	9.97	8.95	10.49	7.49	7.82	10.88	7.89	8.86 %	8.42 %	8.64 %		7 for	
	[2]	Adjusted Dividend Yield (4)	2.08 %	2.11	2.51	1.96	2.14	2.22	1.63	1.94	Average	Median	Average of Mean and Median		/s ending 10/13/201	umn 6) x column ment, Thus, for
L	[9]	Average Projected Five Year Growth in EPS (3)	5.33 %	7.86	6.44	8.53	5.35	5.60	9.25	5.95			Average of M		e last 60 trading da	owth rate (from col
n Flow Model for	[2]	Yahoo! Finance Projected Five Year Growth in EPS	4.90 %	7.03	5.60	9.80	5.45	2.70	14.00	4.90					osing price of th	ates. conclusion of grc il) as opposed to 08%.
of South Carolina he Discounted Casl ter Companies	[4]	Zack's Five Year Projected Growth Rate in BPS	5.00 %	7.40	6.30	5.50	6.00	NA	NA	NA					d by the average cl	g negative growth r ual to one-half the (nds (Gordon Mode 1/2 x 5,33%)) = 2.(
<u>Carolina Water Service. Inc. of South Carolina</u> Indicated Common Equity Cost Rate Using the Discounted Cash Flow Model for <u>Proxy Group of Eight Water Companie</u> s	[3]	Reuters Mean Consensus Projected Five Year Growth Rate in EPS	4.90 %	8.52	6.87	9.80	5.45	NA	NA	NA					 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%.
<u>Carr</u> cated Common I	[2]	Value Line Projected Five Year Growth in EPS (2)	6.50 %	8.50	7.00	00.6	4.50	8.50	4.50	7.00				NA= Not Available	Indicated dividenc each company.	rom pages 2 thro verage of column his reflects a gro to reflect the per merican States V
Indi	[1]	Average Dividend Yield (1)	2.03 %	2.03	2.43	1.88	2.08	2.16	1.56	1,88				NA= N	Notes: (1) Ir e:	(2) (3) (4) (4) (4) (4) (4) (4) (4) (4) (4) (4
		Proxy Group of Eight Water Companies	American States Water Co.	American Water Works Company Inc	Aqua America Inc	California Water Service Group	Connecticut Water Service Inc	Middlesex Water Co.	SJW Corp	York Water Co.						

(5) Column 6 + column 7.

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

Source of Information:

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AM	ER.	STA'	TES	WAT	ER N	IYSE-A	WR P	ecent Rice	51.1	1 P/E RATI	o 26 .	9 (Traili Medi	ng: 27,6 an: 20,0)	RELATIV P/E RATI		5 DIV'D	2.0	%	ALUI	E	
TIMELI		3 Lowered	8/11/17	High: Low:	21.9 15.1	23.1 16.8	21.0 13.5	19.4 14.9	19.8 15.6	18.2 15.3	24.1 17.0	33.1 24.0	38.7 27.0	44.1 35.8	47.2 37.3	51.8 41.1			Target	Price	Range
SAFET	_	Z Raised 7		LEGEN	NDS 25 x Divide	ends p sh iterest Rate	-												LULU		80
TECHN	ICAL ⊿ 80 (1.00∍	2 Raised 9 = Market)	/29/17	2-for-1 sp	elative Pric	e Strength															- 60
		OJECTIO	ONS nn'i Total	 Options: `` 	Yes	ales recess	ion					2-60	1-	in the second se	ا _{الل} اناررا	iint"					
	Price 55 (·	Gain +10%)	Return 4%								Ĺ	,mll m	րորովո								30
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to Buy Options to Sell	0 0 0 2 311 1 3 2	11 0 8	0 0 0 2 0 3 3 2 4		-					**************************************	**************************************		10 ⁰⁴ 0 ⁴ 00								-10 -7.5
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to Buy	4Q2016 102	1Q2017 87	2Q2017 96	Percent shares	16 -		d. : uu	<u></u> h			. 1i				-1 -			1 yr. 3 yr.	25.7 73.0	INDEX 16,4 31,5	Þ
to Sell Hid's(DOD)	87 24607	89 29082	84 28355	traded	8 -												0040	5 yr.	150.6	88.9	-
2001 6.53	2002 6.89	2003 6.99	2004 6.81	2005 7.03	2006 7,88	2007 8,75	2008 9,21	2009 9,74	2010 10.71	2011 11.12	2012 12.12	2013 12.19	2014 12.17	2015 12.56	2016 11.92	2017 12.40	2018 12.65	Revenue	JE LINE PI Is per sh	UB, LLC	20-22 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 F	low" per :		3.85
.67 .43	.67 .44	.39	.53	.66 .45	.67 .46	.81 .48	.78 .50	.81 .51	1.11 .52	1.12	1.41	1.61 .76	1.57	1,60	1.62 .91	1.85 .98	1.85		s per sh ^A cl'd per s		2.35 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 Sp	ending p	er sh	3.60
6.61 30.24	7.02	6,98 30.42	7.51 33.50	7,86	8.32 34.10	8.77 34.46	8.97 34.60	9,70 37,06	10,13 37.26	10.84 37.70	11,80 38,53	12.72	13,24 38,29	12,77 36,50	13,52 36.57	14.20 36.70	14.85		lue per st 1 Shs Out		16.80
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 fig	ires are	Avg Ann	'I P/E Rat	io	21.0
.86 3,9%	1.00 3.6%	1.82 3.5%	1.23 3.6%	1.17 3,1%	1.50 2.5%	1.27 2.5%	1.36 2.9%	1.41 2.9%	1.00 3.0%	.97 3.2%	.91 3.1%	.97 2.7%	1.06 2.6%	1.24	1.35 2.2%	Value estim			P/E Ratio 'I Div'd Yi		1.30 2.8%
		CTURE a			2.070	301,4	318.7	361.0	398.9	419.3	466.9	472.1	465.8	458.6	436.1	465	470	Revenue			590
	ebt \$365	.3 mill. E	Due in 5 1	Yrs \$41.7 st \$20.0 m		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 Prof	it (\$m0l)		87.0
LI Debi	. 4 521.0		38% of C			42,6% 8.5%	37.8% 6.9%	38.9% 3.2%	43.2% 5.8%	41.7% 2.0%	39.9% 2.5%	36.3%	38.4%	38.4% 2.5%	36.8% .5%	36.5% 1.5%	35.0%	Income 1	Fax Rate % to Net F	Profit	35.0% 2.5%
				ntals \$2.5	i mill.	46.9%	46.2%	45.9%	44.3%	45.4%	42.2%	39.8%	39.1%	41.1%	39.4%	40.0%	42.0%		m Debt R		43.5%
Pensior	1 Assets	s-12/16 \$* (150.9 mill)blig, \$ 11			53.1% 569,4	53.8% 577.0	54.1% 665.0	55.7% 677.4	54.6% 749.1	57.8% 787.0	60.2% 818.4	60.9% 832,6	58,9% 791,5	60.6% 815.3	50.0% 870	58.0% 935		Equity F pital (\$mi		56.5% 1100
Pfd Sto	ck None		a- 1			776.4	825.3	866.4	855.0	896.5	917.8	981.5	1003.5	1060.8	1150.9	1200	1250	Net Plan		"	1400
		36,644,7	'58 shs.			6.7% 9.3%	6.4% 8,6%	5.9% 8.2%	7.6% 11.0%	7.1% 10.3%	8.3% 11.9%	8.9% 12.7%	8.6% 12.0%	9.0% 13.0%	8.6% 12.1%	8.5% 12.0%	8.5%		n Total C		9.0%
as of 7/						9.3%	8.6%	8.2%	11.0%	10.3%	11.9%	12.7%	12.0%	13.0%	12.1%	12.0%	12.0%	1	n Shr. Eq n Com Ec	~ 1	14.0% 14.0%
CURRE		\$1.9 billi	on (Mid C 2015		6/30/17	3.9% 58%	3.1% 64%	3.2% 61%	5.8% 47%	5.3% 49%	6.6% 45%	6.8% 47%	5.7% 53%	6.0% 54%	5.3% 56%	5.0% 58%	5.5% 58%	1	to Com I		δ.0%
(\$MIL Cash A	L)		4.4	.4				nerican S										dino Cou	s to Net P		57%
Accts R Other	eceivab		18.9	20.0 146.5	2.1 25.3 122.1	compar	ny. Thro	ugh its p	principal	subsidia	ry, Golde	en State	Water	Water o	f Arizona	(6/11). H	las 736	employee	s. Black	Rock, In	c. owns
Current			32.7	166.9	149.5			pplies wa vice area										, 9,5%;; esident &			
Accts P Debt Di			50.6 28.3	43.7 90.3	45.2 44.3 51.0			nd Orang prvices to										ess: 630 300, Inten			
Other Current	Liab.	-1	23.5	43.9 177.9	140.5			Stat	· · · · · · · · · · · · · · · · · · ·			-	-					urn o		_	
ANNUA		40.1/	= 14	st Est'd	0.0 10.0	dive	st an	ope	ratio	n for	a pi	rofit.	The	limit	ed, ho			busin			
Revenu "Cash F	e (per sh) Ies Taur'	5.5	% 3.	0% 4	20-22 4.5% 5.0%			ility's ater						more Over		eari	nings	an	d d	divid	end
Earning	5	7.5 10.0 7.0	% 9.	5% 6	5.5% 7.5%	Wate	er Sy	ystem	this	្ទុនបា	nmer	to	the	grow	th p	rospe	cts a	re go	od. D	ue m	ostly
Book V		5.5		0% 4	4.0%			distri nately										d sale 7 shai			
Cal- endar		TERLY RE		\$ mill.) Dec. 31	Full Year			as Č										iny \$			
2014	102.0	115.6	138.3	109.9	465.8			acqui resul										efty 1 e thini			
2015 2016	100.9 93.5	114.6 112.0	133.0 123.8	110.1 106.8	458.6 436.1	preta a sha		n of \$	8.3 m	illion	, or al	oout \$	0.13	· . ·				post t		-	
2017	98.8	113.2	140	113	465			utility	y sec	tor i	is pe	rforn	ning	contr	ibutio	n ťo t	he bo	nonre ttom l	ine ris	ses.	
2018 Ca⊩	102 EA	118 RNINGS P	135 ER SHARI	115 EA	470 Full			ponsil norn										ort- a bette			
endar	Mar.31	Jun. 30	Sep. 30	Dec. 31	Year	subsi	idiary	provi	des w	ater :	servic	es to	U.S.	elsev	where	e. Sha	res o	í awf	thave the second	e beer	n on
2014 2015	.28 .32	.39 .41	.54 .56	.36 .31	1.57 1.60			nstalla ist of										storica efensiv			
2016	.28	.45	.59	.30	1.62	tems	on m	any d	lomest	tic bas	ses. E	arlier	this	becau	ise of	` their	low	volati	lity, ł	າighີ	divi-
2017 2018	.34 .39	.62 . 48	.59 .60	.30 .38	1.85 1.85			JS ⁻ sn Elgin						dend	yield	is, ar	nd go	od di nt prio	viden	d gro	owth
Cal-	QUAR	TERLY DIV	IDENDS P	AID ^B	Full			gener						yield	is or	ily on	par	with '	the V	alue	Line
endar 2013	Mar.31	Jun.30 .1775	2025	Dec.31 .2025	Year .76	nues	. On	Öctob hat it	er 2r	nd, th	e con	npany	an-	medi	an. Ir	our	opini	on, m	ost of	the	good
2014	.1775 .2025	.2025	.2025 .213	.213	.83			act wo										the st ent pr			
2015 2016	.213 .224	.213 .224	.224 .224	.224 .242	.87 .91			n Kai										ity ha			total
2017	.242	.242	.255					ntinu Since							es A. I			ugh 20 (Co-20		2017
A) Prim	ary earn	nings, Ex	cludes n	onrecurrir		Dividends					(C) in mi	lions, adj	usted for	split.				Financia		h	A 75
ains/(ios 14¢); '10	ອະຣ). ປ4 . (23¢): '	-, /¢, Ut '11 10¢	, iog; C Nextearr	06, 3¢; 'D ninos repo	vrt vest	Septem ment plan			$r_i = DiV_i$									e Stabilit h Persist			75 70

(14c): 10, (23c): 11, 10c, Next earnings report vestment plan available.
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		10, 2011
Company's Finar	ncial Strength	A
Stock's Price Sta		75
Price Growth Per	sistence	70
Earnings Predict	ability	85
To subscribe o	all 1-800-\//	

KyPSC Case No. 2021-00190 STAFF-DR-03-04-10 star hment 2 Page **Page** 50 of 82

AME	RIC	AN	WAT	ERM	YSE-4	WK	R P	ecent Rice	81.7	5 P/E RATIO	» 27.	7 (Traili Media	ng: 30.8) an: NMF)	RELATIVE P/E RATIO	1.3	9 div'd Yld	2.1	%	/ALUI	E	
TIMELIN	-	Lowered				High: Low:	23.7 16.5	23.0 16.2	25.8 19.4	32.8 25.2	39.4 31.3	45.1 37.0	56.2 41.1	61.2 48.4	85.2 58.9	83.1 70.0				Price	
FCHNIC	3 Cal 2				85 x Divide	ends p sh	_										L				12
	λαL ∠ 5 (1.00 =		JET SET E	Options: '	Yes	terest Rate e Strength															96
2020)-22 PR(DJECTIC	NS n'i Total	Shaded	area indic	ales recess	ion				~				ال ^{ال} الي.	1010					64
			Return 5%							/			1								+48
ow 6	60 (Decisi	-25%)	-4%							""الكشي											32
0	DJF	MAM	JJA				IIIII	L'Und	in Min.		************	·*****		·		*******					16
otions (307	001						** *******	,								N TO			-12
		lecision				5	1											% 10	T. RETUR THIS V STOCK	INDEX	
o Buy o Seli	316 278	269 302	281 291	Percent shares traded	t 21 – 14 – 7 –		11			JI.H. 11.	um um			ti dant t		ահետ		1 yr. 3 yr.	10,4 79.2	16.4 31.5	-
ild's(000) 1	2002		158865	2005		2007E	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	5 yr.	146.0	88.9	20-2
					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	1	es per sh	00, LLV	23.
					.65 d.97	d.47 d2.14	2.87 1.10	2.89 1.25	3.56 1.53	3.73 1.72	4.27 2.11	4.36 2.06	4.75	5.13 2.64	5.26 2.62	5.60 2.85	6.15 3.25	L	low" per : s per sh ⁴		7. 4.
							.40	.82	.86	.90	1.21	.84	1.21	1.33	1.47	1.62	1.76	Div'd De	cl'd per s	h B∎	2.
					4.31 23.86	4.74 28.39	6.31 25.64	4.50 22.91	4.38 23.59	5.27 24.11	5.25 25.11	5,50 26,52	5.33 27.39	6.51 28.25	7.36 29.24	6.75 30.90	6.70 32.40		ending po lue per st		6. 39.
			••		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	Commo	n Shs Out	st'g ^C	187.
							18.9 1.14	15.6 1.04	14.6 .93	16.8 1.05	16.7 1.06	19.9 1.12	20.0	20.5 1,03	27.7 1.46	Bold fig Value	Line		P/E Ratio		18
							1.9%	4.2%	3.8%	3,1%	3,4%	2.0%	2,5%	2.5%	2.0%	estim	ales	Avg Anr	'l Div'd Yi	ield	3.1
			s of 6/30 ue in 5 Y	/17 (rs \$1698	3.0 mil.	2214.2 d342,3	2336.9 187.2	2440.7 209.9	2710.7 267.8	2666.2 394.9	2876.9 374.3	2901.9 369.3	3011.3 429.8	3159.0 476.0	3302.0 468.0	3440 510	3600 580	Revenue Net Prof	es (\$mill) it /\$mill)		43
T Debt S	\$5650.0		T Interes	t \$300.0	mit.		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
	ilneanlt	,		ntals \$14.	0 mill	50.9%	 53.1%	56.9%		 55.7%	6.2% 53.9%	5.1% 52.4%	52.4%	5.1% 53.7%	1.4% 52.4%	2.0%	2.5%		% to Net F rm Debt R		3.5 54.0
		12/16 \$1	443.0 mil	l		49.1%	46.9%	43.1%	43.2%	44.2%	46.1%	47.6%	47.4%	46.2%	47.5%	46.5%	45.0%	Commo	n Equity R	tatio	46.0
fd Stoc	k \$9.0 m		fd Div'd	364.0 mill \$.5 mill		9245.7 9318.0	8750.2 9991.8	9289.0 10524	9561.3 11059	9580.3 11021	9635.5 11739	9940.7 12391	10364 12900	10911 13933	10967 14992	11600 15675	12850 16400	Total Ca Net Plar	pital (\$mil t (\$mill)	II)	160 180
		178,282,	329 shs.			NMF	3.7%	3.8%	4.4%	4.8%	5.4%	5.1%	5.5%	5.7%	5.6%	6.0%	6.0%	Return o	n Total C	-	6.5
s of 7/2	7/17					NMF NMF	4.6% 4.6%	5.2% 5.2%	6.5% 6.5%	7.2% 7.2%	8.4% 8.4%	7.8% 7.8%	8.7% 8,7%	9.4% 9.4%	9.0% 9.0%	9.5% 9.5%	10.0%	1	on Shr. Eq on Com Ec	-	10.5 10.5
IARKET	CAP: S	i14.6 bill	ion (Larg	ie Cap)		NMF	3.0% 34%	1.8% 65%	2.8% 56%	3.5% 52%	3.6% 57%	4.7% 40%	4.3% 50%	4.7% 50%	4.0% 56%	4.5% 57%	4.5% 55%	Retained	l to Com I	Eq	4.5
	IT POSI		2015		6/30/17	BUSIN			Vater Wo										g for 25.4		57 equiate
ash As	sets eceivabl		45.0 55.0	75.0 269.0	64.0 288.0	investo	r-owned	water an	d wastew	vater utili	ty in the	U.S., pr	oviding	revenue	s. Has 6	,800 emp	oloyees.	The Vang	juard Gro 2%; office	oup, owr	ns 9.6
)ther Surrent /	Assets			440.0 784.0	456.0 808.0	(Regula	ated pres	ence in	16 states) Nonre	gulated b	usiness	assists	less that	n 1.0%.	(3/17 Pr	roxy). Pro	esident &	CEO: S	Susan N	I. Sto
ccts Pa	ayable	1	26.0	154.0	134.0 1803.0				y bases v ations ma					hees, N	Jeorge N 1 08043,	facKenzi Tel.: 856	e. Addre: 5-346-820	ss: 1025)0. Intern	Laurel O et: www.a	ak Road amwater	d, Voo r.com.
ther urrent l		7	25.0	815.0	724.0				rante					ginia	settl	ement	t (we	have	taken	it o	ut o
NNUAL	RATES		Pas	st Esťd	'14-'16			-	ttlem ican			<u> </u>	-), we re eari		
change evenue	35	10 Yrs. 3.05	5 Yr: % 3.5	s. toʻ. 5% 4	20-'22 4.5% 5.5%	Janu	lary o	f 201	4, the subsid	whol	ly ow	med \	Nest	rise	9%	over	2016	's m	ediocro pany o	e fig	gure
Cash Fl amings	5		- 11.0	0% 8	8.5%				ed ov										demai		
ividend ook Val		1.59		0% 10 D% 5	0.0% 5.5%				al spil e prop										up († ing bi		
Cal- ndar			VENUES (1 Sep. 30		Full Year	Wate	er wor	uld h	ave to	pay	appr	oxima	tely	vatiz	e the	ir wa	ter sy	stem	s), sh	are o	earn
014	679.0	754.8	846.1	731.4	3011.3	it. N			resolv nce pi										heft ued si		
2015	698.0 743.0	782.0 827.0	896.0 930.0		3159.0 3302.0	00110			e final out \$2										tions a the c		
2017	756.0 770	844.0 895	985 1040	855 895	3440 3600	shar	е.			_				more	effici	ent wi	ill also	o play	a ma	jor pa	art.
Cal-	_		ER SHARE		Full				ie has her fa										for (-	
ndar I 014	Mar.31 .39	Jun. 30 .62	Sep. 30 .86	Dec. 31 .52	Year 2.39	ing i	n the	state	of N	ew Yo	rk, w	hich i	indi-	annu	al pay	yout c	an ris	se 109	6 over	the	nex
015	.44	.68	.96	.56	2.64				r utilií er tax								100. I his gr		the l	nigne	est o
016 017	.46 .52	.77 .73	.83 1.02	.57 . 58	2.62 2.85				h cha d qua					Thes	e_sha	ares	do n	ot_h	old an wever		
2018	.62 OLIART	.83 FRLV DM	1.09 DENDS P/	.71	3.25	same	e peri	od, o	perati	ng in	come	from	the	being	the	large	est ar	nd po	ssibly	best	t-ru
Cal- ndar		Jun.30			Full Year				utility / to re										ty in 1 I by th		
2014 2015	.28 .31	.31 .34	.31 .34	.31 .34	1.21 1.33	ing a	t U.S	. milit	ary ba	ases.	-			for th	is gro	oup_of	stock	s see	ms exc	cessiv	/e, i
2016	.34	.375	.375	.375	1.33				hole, are							ı. Her lsewh		ivesto	rs can	prob	Japi
017	.375	.415	.415			Even	with	the p	penalt	y fron	n the	West	Vir-	Jame	s A. I	Flood			Octobe		
	d earnir	nas Exc	ludes no	onrecurrir	na i 2014	. Next ea	mings re	port due	mid-Nove	ember. r	nent ava	ilable, (C) In millio	ons. (D) li	ndudes i	n-I Cor	npany's	Financia	I Strangt	h	B+
ses: '08	3, \$4.62;	'09, \$2.		\$0.07. Di '11, \$0.0	is-Quai	terly ear	nings do	not sun	n in '16 d	due to 1	angibles,	On	6/30/17:	\$1.37 numbers	3 billio	n, Sto	ck's Pric	e Stabili	ty		100

2, (so, 10), (so, 01),
KyPSC Case No. 2021-00190 Exhibit No. STAFF-DR: 03:0110 Mtashment 2 Page Page 51 of 82

<u>AQ</u>	<u>ua /</u>	AME	<u>rica</u>	NYSE	E-WTR		P	RICE	<u>33.7</u>	7 P/E RATI	o 24 .	3 (Traini Medi	ng: 25.8 an: 22.0)	RELATIVI P/E RATI		1 DIV'D YLD	2.5				
TIMELI			8/26/16	High: Low:	23.8 16.1	21.3 15.1	17.6 9.8	17.2 12.3	18.4 13.2	19.0 15.4	21.5 16.8	28.1 20.6	28.2 22.4	31.1 24.4	35.8 28.0	34.7 29.4	1			Price	
AFET				LEGEI	NDS 60 x Divide	ends p sh iterest Rate		_											2020	2021	
ECHN	ICAL] 70 (1.00 -		0/13/17	} • • • • • • • • • •	elative Pric	iterest Rate e Strength									~~					,	
	20-22 PR		ONS	4-for-3 sp 5-for-4 sp Options:	dii 9/13			-				5-fo	r-4								-50
			nn'i Total Return	Shaded	area indic	ates recess	sion				1				րուլը						
igh Ww		+35%) (+5%)	10% 4%					-				,, ¹¹ ,11,,,,		100,01							+25
	r Decis	ions		^{بيو} رية الم	••••••••••••••••••••••••••••••••••••••	որորը				ուսիս											11
Buy	D J F 0 0 0	MAM	J J A 0 0 0			******									*****						⊥1(
tions Sell		7700	170200						**************************************	~~ <u>~</u> ~~	***	•••	*******************************	********		94 ^{9⁹8⁹8⁹9}		% тот	Retur	N 9/17	⊢ 7.
SULL	tional [402016	Jecišioi 102017	ns 202017	Percen	l t 15 =	أيبالت	i Ju du	. 1											STOCK	/L ARITH." INDEX	L
Buy Şeli	182 171	179 180	172 155	shares	10 - 5 -					յիսլ. Ու		illin.	ասկոլ		Որուլը			1 yr. 3 yr.	11.6 51.9	16.4 31.5	E
^{#s(000}	88568 2002	103594 2003	104564 2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	5 yr. © \/Al I	89.6 Je line P	88.9	20-2
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	Revenue		OD. LLO	6
.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		ow" per		2.
.41 .24	.43	.46	.51 .29	.57 .32	.56	.57 .38	.58 .41	.62	.72 .47	.83 .50	.87	1.16	1.20	1.14	1,32 .74	1.36 .80	1.45	Earnings Div'd De	; persh / cl'd pers		1
.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 Sp	ending p	er sh	2
3.32 2.47	3.49 141.49	4.27 154.31	4.71	5.04	5,57 165,41	5.85 166.75	6.26 169.21	6.50 170.61	6.81 172.46	7.21	7,90	8,63 177,93	9.27 178.59	9,78 176,54	10.43	11.10 178.00	11.75 178.50	Book Val Commor	ue per si		14 180
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 fig			'I P/E Rat		2
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 estim			P/E Ratio		1
.5%	2.5%	2.5%	2.3% s of 6/30	1.8%	1.8%	2.1% 602.5	2.8% 627.0	3.1% 670,5	3.1% 726.1	2.8% 712.0	2.8% 757.8	2.4% 768,6	2.5% 779.9	2.6% 814.2	2.3% 819.9	830	<u> </u>		'l Div'd Yi	ield	2.
tal D	ebt \$209	3.6 mill.	Due in 5	Yrs \$430		95.0	97.9	104,4	124.0	144.8	153,1	205.0	213.9	201.8	234.2	245	880 260	Revenue Net Profi			1
Deb	t \$1882.6	i mill. L	T Interes. (51%)	t \$76.3 n of Cap'l)		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 1	ax Rate		10.
nein	n Aeento	.19/16 \$1	242.4 mill.		•	55.4%	54.1%	55.6%	56.6%	52.7%	52.7%	1.1% 48.9%	2.4%	3.1% 50.3%	3.8% 48.4%	3.5% 47.0%	3.0%	AFUDC 1	6 to Net F		3. 51.
		-12/10 42		olig. \$308	3.2 mill.	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			49.
	ck None on Stock	177.651.	543 share	86		2191.4	2306.6	2495.5	2706.2	2646.8	2929.7	3003.6	3216.0	3469.5	3587.7	3735	4100		oital (\$mi	II)	5
	24/17					2792.8	2997.4 5.7%	3227.3	3469.3 5.9%	3612.9 6.9%	3936,2	4167.3 8.0%	4402.0	4688.9 6.9%	5001.6 7.6%	5080 7.5%	5275 7.5%	Net Plan Return o		ap'l	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 o	n Shr. Eq	uity	12.
	T CAP:		on (Large 2015		6/30/17	9.7% 3.2%	9.3%	9.4% 2.7%	10.6%	11.6% 4.6%	11.0%	13.4% 6.7%	12.9%	11.7% 4.7%	12.7% 5.6%	12.5% 5.5%	12.5%	Return o	n Com Eo to Com I		<u>12.</u> 4.
(\$MI	LL) ssets		3.2	3.7	7.8	67%	70%	72%	65%	60%	61%	50%	52%	60%	56%	58%		All Div'd			6
ceiv	ables ry (Avg0	(ef)	99.1 12.4	97.4 13.0	98.9 16.8				ica, Inc. i									er, 25%. (
her		·	13.7	14.6	14.6				ihat serve Ohio, Noi									ad Group (3/17 Pr			
cts F	t Assets Payable		56.5	128.7 59.9	138.1 46.4	Jersey,	Florida,	Indiana,	and five	other st	ates, Has	s 1,551 e	mploy-	Executiv	e Office	r: Christe	opher Fr	anklin. In	corporate	ed: Pen	nsylv
bt D her	ue		52.3 84.4	157,2 84.4	221.0 65.1				rce, 7/13; enues '20									Avenue, ernet: ww			
	t Liab,			301.5	332,5	A la	rge p	ercer	ntage	of A	qua A	meri	ca's	gener	ation	shou	ıld er	able	its p	ayout	s 1
	L RATES (per sh)	5 Past 10 Yrs.		st Est'd s. to'	'1 4-'16 20-'22				will									throu large			
veni		4.0 7.5	% 2.(0% {	5.0% 6.0%				ilar to tilitie:									i this			
rning rider	IS	8.5 8.0	% 11.0)% 7	7.0% 9.0%				of si									appro			
	alue	7.0	% 7.	5% (6.5%				most n the									of fun ain, ar			
ıl- lar			VENUES (Sep.30		Full Year				ewitha					pipel	ines a	ind eq	lnibm	ent. V	Ve do	n't ex	rpe
14	182.7	195.3		191.4	779.9				ctures ypes d									e muc nink o			
15 16	190.3 192.6	205.8 203.9	221.0 226.6	197.1 196.8	814.2 819.9	grad	ually	incre	ease	its c	uston	ier b	ase.	decli	ie to	the	\$300	millio	n-\$3Ž	5 mi	illio
17	187.8	203.4	233.8	205	830				actua this :									nembe a is c			
18	200	220	245	215	880	sets	can bi	e oper	ated r	nore e	efficier	ntly.		that	rates	a Fir	nancia	al Stre	ength	ratin	ıg (
al- Jar			ER SHARE Sep.30		Full Year				s son tory									he bal er the			
14	.24	.31	.38	.27	1.20	has	receiv	red ra	ite rel	lief in	ı Indi	ana,	New	years	, it sh	ould	remai	n rela	tively	healt	thy
15 16	.27 .29	.32 .34	.38 .41	.17 .28	1.14				arolin: le case									h yie l ng 2.5			
17	.28 . 31	.34 .36	.43 .47	.31 .31	1.36 1.45				ois. A					basis	poin	ts mo	re tha	an its	peer:	s. Th	is
18 11-	<u> </u>		JENDS PA		T.45 Full	tions	hips v	with i	ts regi	uĺator	's, so ī	ve are	e not	unus	ual_c	onside	ering	the e	equity	's stu	ron
lar	Mar,31		Sep.30	-	Year				iajor n iould									rowth. hink s			
13	.14	.14	.152	.152	.58	heal	thy i	rate	for t	he fo	resee	eable	fu-	utilit	ies ar	e curr	ently	tradir	ig at 1	too hi	igh
4.4	.152	.152 .165	.165 .178	.165 .178	.63 .69				ter, th		yout w				ium, ` for th			bably			
14 15	.165																		101 1111		
15 16	.178	.178	.1913	.1913	.74	five-	and	l0-yea	r hist	orical	avera	age of	8%.	stock	in th	is ind			_		
15 16 17	.178 .1913	.178 .1913	.1913 .205 ec. gains:		.74	five-	and in a second	l0-yea		orical k Aqu	avera 1a's st	age of rong (8%. cash		in th s A. I	is ind Flood	ustry.		Octobe	r 13,	

ELECTRONICALLY FILED - 2018 February 26 5:32 PM - SCPSC - Docket # 2017-292-WS - Page 51 of 82

'02, 4¢; '03, 3¢; '12, '18¢, Excl. gain from disc. | (B) Dividends histoncally paid in early March, operations: '12, 7ç; '13, 9¢; '14, 11¢. May not | June, Sept. & Dec. = Div'd, reinvestment plan sum due to rounding. Next earnings report due | available (5% discount).
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Company's Finar Stock's Price Sta	ncial Strength	A
Stock's Price Sta	bility	95
Price Growth Per		65
Earnings Predict	ability	90
To subscribe c	all 1-800-VA	LUELINE

KyPSC Case No. 2021-00190 STAFF-DBcHadulinovitashment 2 Page **Bage** 52 of 82

CAI	LIFC)RNI	A W/	ATEF	R NYS	E-CWT	R P	ECENT Rice	39.6	5 P/E RATH	o 28 .	3 (Traili Medi	ng: 33.0) an: 20,0)	RELATIV P/E RATI	1.4	1 DIV'D YLD	1.8	8%	/ALUI LINE	B	
TIMELIN	ESS 2	2 Raised 9	1/17	High: Low:	22.9 16.4	22.7 17.1	23.3 13.8	24.1 16.7	19.8 16.9	19.4 16.7	19.3 16.8	23.4 18.4	26.4 20.3	26.0 19.5	36.8 22.5	39.8 32.4				Price	Ran
AFETY Echni		3 Lowered 2 Lowered		LEGEI	NDS 33 x Divid vided by Ir	ends p sh iterest Rate se Strength				<u>}</u>											-64
ETA .8	1.00	= Market}		2-for-1 sp Options;	DIR 6711	e Strength	<u> </u>			2-101-51	\sim				<u> </u>						±4
	0-22 PR Price	OJECTIO A Gain	DNS nn'i Total Return	Shaded	area indic	ates recess	<u> </u>			-				ասորը							-3
		+25%) (-25%)	8% -4%		Cunt -		יויחיים	Hipm.	ողիեռ	ասվիր	190 <u>1</u> 00	<mark>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</mark>						-			+20
nside	D J F	ions	JJA		********	**************************************	** ****	••••	**********	e ⁶ 8.04		<u> </u>			*******	*******					+1
Buy	1 1 1	1 1 1 1 22 0 0	1 1 1 1 0 0 0			1				********	****************	27%g 20 ⁰ 0 ⁰ 0 ⁰ 0 ⁰	****************	***********	1 ⁴ 25 ⁵						
	000 tional l	1 0 1 Decisio																% то	T. RETUR	N 9/17 /L ARITH.*	
Buy	402016 93	1Q2017 97	202017 88	Percen shares	t 18 - 12 -												 	1 yr.	sтоск 21.4	INDEX 16.4	F
Sell Id's(000)	82 34200	83 38686	77 38422	traded	6 -													3 yr. 5 yr.	83.2 134.5	31.5 88,9	E
001 8,13	2002 8,67	2003 8,18	2004 8.59	2005 8,72	2006 8,10	2007 8,88	2008 9,90	10.82	2010 11.05	2011 12.00	2012 13.34	2013 12.23	2014 12.50	2015 12.29	2016 12.70	2017 13.45	2018 13.90	r	UE LINE P es per sh	UB. LLC	<u>20-</u> 14
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 F	low" per		3
.47 .56	.63 .56	.61	.73 .57	.74 .57	.67 .58	.75 .58	.95 .59	.98 .59	.91 .60	.86 .62	1.02 .63	1.02 .64	1.19 .65	.94	1.01 .69	1.35 .72	1.45 .75		spersh / cl'dpers		1
2.04 6.48	2.91 6,56	2.19	1.87 7.83	2.01 7.90	2.14 9.07	1.84 9.25	2.41 9.72	2.66	2.97 10.45	2.83 10.76	3.04 11.28	2.58 12.54	2.76 13.11	3.69 13.41	4.77 13.75	3.85 14.20	3.65 14.45		ending p		3 16
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	Commo	n Shs Out	st'g D	5(
27.1 1.39	19.8 1.08	22.1 1.26	20.1	24.9 1.33	29.2 1.58	26.1 1.39	19.8 1.19	19.7 1.31	20.3 1.29	21.3 1.34	17.9 1.14	20.1 1.13	19.7 1.04	24.8	29.6 1.56	Bold fig Value			I'l P/E Rat P/E Ratio		2
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%	estim	ates		ı'l Div'd Y		2
		6,1 mill. 🕻	as of 6/30 Due in 5 Y	frs \$174.		367.1 31.2	410.3 39.8	449.4 40.6	460.4 37.7	501.8 36.1	560.0 42.6	584.1 47.3	597.5 56.7	588.3 45.0	609.4 48.7	650 65.0	675 70.0	Revenu Net Prot	es (\$mill) fit (\$mill)	E	
l Debt	\$519.9	mill. L	T Interes. 44)	at \$35.0 n 4% of Caj		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.
nsior	Assets	s-12/16 S	376.5 mill.			8.3% 42.9%	8.6% 41.6%	7.6%	4.2% 52.4%	7.6%	8.0% 47.8%	4.3%	2.7% 40.1%	4.3%	6.1% 44.6%	5.0% 45.0%	5.0% 45.0%	-	% to Net F rm Debt F		5. 43.
	ck None	(Oblig. \$56			56.6% 674.9	58.4% 690.4	52.9% 794.9	47.6% 914.7	48.3% 931.5	52.2% 908.2	58.4% 1024.9	59.9% 1045.9	55.6%	55.4% 1191.2	55.0% 1250	55.0% 1275		n Equity P		57.
		48,018,	000 shs			1010,2	1112.4	1198,1	1294.3	1381.1	1457.1	1515.8	1590.4	1701.8	1859,3	1900	1930	Net Plan	pital (\$mi it (\$mill)		2
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		1 40,010,	000 0110.			5.9% 8.1%	7.1% 9.9%	6.5% 9.6%	5.5% 8.6%	5.5% 8.0%	6.3% 9.0%	6.0% 7.9%	6.3% 9.1%	5.2%	5.5% 7.4%	6.5% 9.5%	6.5% 10.0%		on Total C on Shr. Eq		7. 11.
ARKE	TCAP	¢1 q hilli	on (Mid C	an)		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 o	on Com E	uity	11
URRE	NT POS		2015		6/30/17	1.8% 77%	3.8% 61%	3.8% 60%	3.0% 66%	2.3% 71%	3.4% 62%	3.4% 56%	4.1% 55%	2.0% 71%	2.4% 68%	4.5% 53%	5.0% 52%		d to Com I Is to Net P		5. 5
(\$MIL ash A: ther	ssets	1	8.8 18.8	25.5 116.6	29.1 141.5						p provide customer								Jtilities (9		
urrent	Assets ayable			142.1 77.8	170.6 84.2	munitie	s in the	state of	California	a. Áccoui	nts for o	/er 94%	of total	public a	uthorities	, 3%; ot	her 1%.	Off. and	ss, 20%; dir. own	1% of c	omn
ebt Du				123.3 49.1	226.2 50.6	Main s	ervice ar	eas: Sar	Francis	co Bay a	vew Mex area, Sac	ramento	Valley,	A. Krop	elnicki In	c.: DE, A	Addr.: 17	20 North	Pres, an First St.	, San Jo	ose,
urrent	Liab,	-1		250.2	361.0						rts of Lo rvice	-							www.calw		·
				Est'd '1		bene	forni: efited	fron	Vater 1 fav	orabl	e rat	e act:	roup ivity	cast i	is uncl	hange	d. at	\$675	8 top millio	n.	
evenu	65	10 Yrs. 4.0 5.0	% 2.0		20-'22 2.5% 5.0%									The muc							
Cash F arning viden	S	4.0 1.5	% 3.0	0% 9	9.0%	milli	on, a	12% :	annua	1 imp	rovem	ent, a	nd a	rema	in the	mair	n ther	nes h	ere. T	he co	mp
ok Va	alue	5.0	% 5.0	0%	3.0%	adva	nce ca	an lar	gely b	e attr	ibute	d to re	ecent	ny ha struc	ture i	upgra	des a	nd wa	ater s	ystem	1 i :
al- dar	QUAR Mar.31		VENUES (\$ Sep.30		Full Year									prove just							
	110.5	158.4 144.4	191.2 183.5	137.4 138.4	597.5 588.3	cifica	ally, r	ate ir	creas	es alc	one a	ded	more	leavi	ng ap	ргохі	matel	y \$4	50 mi	illion-	\$5
016	122.0 121.7	152.4	184.3	151.0	609.4						ed re			millio quisi					iner, i /enue		
)17)18	122.0 140	171.1 170	200 205	156.9 160	650 675						of gai		lifor-		ld ma	nager	nent	want	to si	upplei	me
al- dar			ER SHARE Sep.30		Full Year	nia \	Nater	earne	ed \$0.3	39 a s	hare	in the	e sec-	ued	inqui	ry in	ito in	icreas	ed ba	ase r	at
014	d.11	.36	.70	.24	1.19						0.35 c wer				rs we decad		u DUS	mess	pros	pects	ır
)15)16	.03 d.02	.21 .24	.52 .48	.18 .31	.94 1.01									Thes high							
)17)18	.02	.39 .38	.62 .67	.32 .33	1.35 1.45	İy sl	imme	r ma	intena	ince a	and a	dmini	stra-	the o	compa	ny fo	r ret	urnin	g to	growt	h
al-	QUAR	TERLY DIV	IDENDS P/	VID B =	Full	tive of \$1	costs. 1.35 a	our	2017 e rem	botto ains	m-lin intact	e esti: , equ	mate ating	2016, from	, as ti last v	ne sto year's	lows.	nce is This	up n issue	early is ti	75 me
	Mar.31		Sep.30 .16		Year .64	to ye	ar-ove	er-yea	r grow	/th of	34%.	-	_	(2), a	ind is	slate	ed to	outpe	rform	the	yea
013	.16	.16 .1625	.1625	.16 .1625	.65	curr	ent-y	ear	reve	nue	estii	nate,	to	ahea due	to the	e run	-up in	n pri	ce, to	tal re	etu
015 016	.1675 .1725	.1675 .1725	.1675 .1725	.1675 .1725	.67 .69						ly ow wing.			poter: below			he 3-	to 5	-year	stret	ch
017	.18	.18	.18											Nich			ikis	(Octobe	r 13, 1	201
, 2¢; '0		11, 4¢. Ne er.	ecurring g ext earnin aid in late	igs report	avai	ncl. intan				· ((D) In mil (E) Exclu			splits.		Sto Pric	npany's ck's Pric ce Growt nings Pr	e Stabili h Persis	tence	h	8+ 8 3 7

(a) Dividentias inscribed by part in react resc, [voltability part i

KyPSC Case No. 2021-00190 STAFF-DR: Care Date Date Start 2 Page Bage 53 of 82

CO	NNE	CTI	CUT	WAT	ER N	IDQ-CT	WS P	ecent Rice	60.9	3 P/E RATI	o 27 .	8 (Traili Medi	ing: 30.5 an: 20.0)	RELATIV P/E RATI	1.3	9 DIV'D YLD	2.0	% VAL		
TIMELI		3 Raised 1	0/13/17	High: Low:	27.7 20.3	25.6 22.4	29.0 19.3	26.4 17.3	27.9 20.0	29.1 23.3	32.8 26.2	36.4 27.8	37.5 31.0	39.9 33.2	58.3 37.5	62.2 50.8			pet Price	
SAFET		3 New 1/1		LEGEI	NDS 30 x Divide	ends p sh iterest Rate	-	1210										202	2021	120
TECHN BETA	ICAL . 55 (1,00	3 Lowered = Market)	10/13/17	div Re Options:	elative Pric	terest Rate e Strength														100
	· ·	OJECTIO		Shaded	area indic	atus recess	sion				\sim				ւ	ոհնի				48
	Price	Gain	nn'l Total Return					-					ատուլ	սոյլուղ	^{pan} n					- 32
High Low	60 40	(Nil) (-35%)	2% -7%	111 174 111 174 111 174	<u>d</u>				,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	կստիլը	լ ^{ուլ} ուլ	on the		այուղ						24
Inside	r Decis DJF	MAM	JJA		**************************************	**************************************	and and a state of the state of			daqU					*****	880° "440				20 16
to Buy Options	000	100	0000						***********	*****		10.000 000 000 000 000 000 000	*********************	**************************************						+12
to Sell Institu		Decisio	001 ns		[% TOT, RET	URN 9/17 VL ARITH."	-8
to Buy	4Q2016 59	48	202017 55	Percen	t 12 = 8 - 4 -										1.1.1.			STOCK 1 уг. 21,8	INDEX 16,4	E
to Seli Hld's(000)	45 5436	56 6170	44 6289	traded		huutuluu			n III II				libitada					3 yr. 96.8 5 yr. 113.5	31.5 88.9	-
2001 5.93	2002 5,77	2003 5,91	2004 6,04	2005 5.81	2006 5.68	2007 7.05	2008 7.24	2009 6.93	2010	2011	2012	2013	2014	2015	2016	2017	2018	© VALUE LIN		
5.93 1.78	1.78		1.91	1.62	1.52	1.90	1.95	1.93	7.65 2.04	7.93 2.11	9.47 2.64	8.29 2.63	8.45 2.97	8.58 3.18	8,77 3.31	9.00 3.40	9.60 3.50	Revenues per "Cash Flow" p		12.80 3.85
1.13 .80	1,12 .81	1,15	1.16	.88 .85	.81 .86	1,05 .87	1.11 .88	1,19 .90	1.13 .92	1.13 .94	1.53	1.66 .98	1.92	2.04	2.08 1.12	2.20 1.18	2.35 1.24	Earnings per a Div'd Decl'd p		2.65 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 Spendin		3.35
9.25 7.65	10.06 7.94	10.46	10.94	11.52 8.17	11.60 8.27	11,95 8,38	12,23 8.46	12,67 8,57	13.05 8.68	13.50 8.76	20.95	17.92	18.83	20.01	20.98	21.70 11.75	21.65 12.00	Book Value pe Common Shs		22.80 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 fig	ures are	Avg Ann'l P/E		12.50
1.10 3,3%	1.33 3.0%	1.34	1.21 3.1%	1.52 3,4%	1.57 3.6%	1.22 3.6%	1.34 3,6%	1.23 4,1%	1.32 3.9%	1.44 3.6%	1.23 3.2%	1.03 3.2%	.92 3.0%	.89 2.9%	1.22 2.3%	Value estin		Relative P/E R		1.20 2.8%
		ICTURE a			5.0 %	59.0	61.3	59.4	66.4	69.4	83.8	91.5	94.0	96.0	98.7	105	115	Avg Ann'l Div' Revenues (\$m		160
	ebt \$210),6 mill.		Yrs \$19.8 st \$7.7 mi		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 (\$mi	ll)	32.0
LIDED	ι φ20 3. 4		45% of C		n.	32.4%	27.2% 1.7%	19.5%	35.2%	41.3%	32.0%	28.0%	14.4% 2.4%	3.5% 2.3%	9.9% 5.1%	19.0% 3.0%	20.0% 2.5%	income Tax Ra AFUDC % to N		28.0% 2.5%
		italized: /		ntals \$.3 i	nill.	47.8%	46.9%	50.6%	49.5%	53.2%	49.0%	46.9%	45.7%	44.1%	45.4%	46.5%	47.0%	Long-Term De	ot Ratio	46.5%
Pensio	1 Asset:	s-12/16 \$0 (62.7 mill. Dblig. \$ 79	9.3 mill.		51.8% 193.2	52.7% 196.5	49.1% 221,3	50.2% 225,6	46.5% 254.2	50.8% 364.6	52.9% 373.6	54.1% 386.8	55.7% 402.4	54.4% 433.8	53.5% 475	53.0% 490	Common Equi Total Capital (53.5% 535
Pfd Sto	ck \$0.8		Yfd Divd			284.3	302.3	325.2	344,2	362.4	447.9	471.9	506,9	546.3	601.4	615	635	Net Plant (\$ml	1)	675
						5.5% 8.7%	5.9% 9.0%	5.5% 9.3%	5.4% 8.6%	4.9% 8.3%	4.8%	5.9% 9.2%	6.4%	6.5% 10.1%	6.3% 9.9%	6.0% 10.0%	6.5% 11.0%	Return on Tota Return on Shr.		7.0%
		11,575,4				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 Con		11.5%
CURRE		\$700 mil	2015		6/3 0/1 7	1.6% 82%	1.9% 79%	2.3% 76%	1.6% 81%	1.4% 83%	2.8% 62%	3.8% 59%	4.8%	4.9% 52%	4.6% 54%	4.5% 54%	5.0% 53%	Retained to Co All Div'ds to N	•	5.5% 53%
(\$MII Cash A	L)		.7	1.6	2,7				Water		1			January		L		Saco Water.		
Accoun Other		ivable	11.0 15.3	13.0 14.8	12.9 16.6	holding	compan	iy, whose	income compan	is deriv	/ed from	earnings	s of its		Village,	Februar	y, 2017.	Inc.: Conn Ha	s 266 em	ployees.
Current Accts P			27.0	29.4 13.1	32.2 9,6	2016, 9	95% of r	net incom	e was d	erived fr	om thes	e activitie	s. Pro-	ficers a	nd direct	tors own	2.5% of	the common	stock; Bla	ckRock,
Debt D Other			2.8	4.9 37.1	5.2 47,8				40,000 pi ne, Acqu					Inc., 7.2 06413,	% (4/17 Felephon	proxy), A ie: (860) (ddress: 1 669-8636	93 West Main 5. Internet: www	Street, Clir .ctwater.c	iton, CT
Current			36.9	55.1	62.6				Vater					Addi	ional	ly, the	e com	pany filed	for a	rate
ANNUA of chang				st Est'd s. to'	'14-'16 20-'22				r rest ations									ICA (reco ogrades.)	vered f	unds
Revenu "Cash l	es	4.0 6.5	% 3.0	0% 7 5% 3	7.0%	milli	on in	iprove	d ma	rgina	lly, o	пау	ear-	Long	ter:	m , a	cquis	itions a	nd hi	gher
Earning	S	8.0 2.5		0% 0%	4.5% 4.5% 2.5%				but n uly p					capit card	tal s s. Ind	pend i leed. 1	ing a the st	are like trategy is	l y in startii	the ng to
Book V		6.0				quar	ter of	' Heri	tage V	/illago	e oper	ations	s, as	bear	fruit,	, as (CTWS	lifted it	s_cust	omer
Cal- endar	Mar.31	TERLY RE Jun. 30	Sep. 30		Full Year				ental d Ma									0 via its Financia		
2014	20.3	25.4	27.6	20.7	94.0 96.0	third	quai	rter w	ill th	e con	nplete	d acq	uisi-	shoul	d fee	l the	effec	ts beginr	ing in	the
2015 2016	20.0 21.6	26.6 26.1	28.4 29.5	21.0 21.5	96.0 98.7				f the n the									vear. Mor ce full ac		
2017 2018	22.5 25.0	27.9 30.0	32.0 35.0	23.6 25.0	106 115	the t	ottom	ı line	was a	nick	el shy	of ou	r es-	WICA	A and	d WI	SC b	enefits (i	ncreas	e to
Cal-	E/	RNINGS P	ER SHARE	EA	Full				a sh ted by									ding), an ging wate		
endar 2014	Mar.31 .27	Jun. 30 .67	Sep. 30 .76	Dec. 31 .22	Year 1.92	great	ter bu	siness	deve	lopme	ent co	sts as	soci-	the c	oming	, years	5.	0 0		
2015	.28	.77	.79	.20	2.04	None	ethele	ss, C	abo onnec	ticut	Wate	r she	ould	Time	lines	sto	3, Av	lipped a erage. W	hat's n	nore,
2016 2017	.28 .36	.89 .73	.84 . 88	.07 .23	2.08 2.20				in th s we									n (28.0x timate) is		
2018	.35	.80	.90	.30	2.35	\$32 1	millio	n and	share	net o	f \$0.8	8.		when	com	pared	to h	istorical	norms,	and
Cal- endar	QUAR Mar.31	TERLY DIV Jun.30	IDENDS P/ Sep.30		Full Year				e <mark>n so</mark> arlier									is. The st 5-year T		
2013	.2425	.2425	.2475	.2475	.98	Mair	ie Wa	ter Co	mpar	y file	d for	a rate	e in-	Rang	e, an	d tota	l retu	irn poten	tial is	sub-
2014 2015	.2475 .2575	.2475 .2575	.2575 .2675	.2575 .2675	1.01 1.05				appr									mend inv nt before		
2016	.2675	.2825	.2825	.2825	1.12	defor	d and	l Saco	divisi	ion. T	his co	uld po	oten-	funds	here		-			0
2017	,2825	.2975		ropert d		0			\$2 m	ullion	to th	e top	line.	Nich	olas P	Patr.			ber 13,	
ate Nove	mber.	ngs, Next	-		(C)	nent plan n millions			40. ***							Sto	ck's Pric	Financial Stre e Stability	igth	8+ 90
B) Divid	enas ni	storically	palo In I	mid-Marc	n, (U)	ncludes	intangibli	es. in 20	116; \$30,	4 mil-								h Persistence		50

(B) Dividends historically paid in mid-March, I(D) Includes intangibles. In 2016: \$30.4 mil-June, September, and December, and December, and Divid rein-ion/\$2.70 a share.
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Company's Financial Strength	B+
Stock's Price Stability	90
Price Growth Persistence	50
Earnings Predictability	90
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KyPSC Case No. 2021-00190 STAFF-DBcHadliloAffachment 2 Page Page 54 of 82

MIC)DLE	SE)	(WA	TER	NDQ-	MSEX	R	ecent Rice	40.4	7 P/E RATI	o 26.	3 (Traili Medi	ing: 30,4 an: 20,0	RELATIV P/E RATI		2 DIV'D YLD	2.1	%	ALUI	E	
TIMELI	NESS	Lowered	7/7/17	High: Low:	20.5 16.5	20.2 16.9	19.8 12.0	17.9 11.6	19.3 14.7	19.4 16.5	19.6 17.5	22.5 18.6	23.7 19.1	28.0 21.2	44.5 25.0	42.8 32.2				Price	Range 2022
SAFET TECHN		2 New 10/3 3 Raised 7		LEGE	20 x Divid	ends p sh iterest Rate															-64
	60 (1.00 ·		/14/17	Options:	elative Pric Yes	e Strength										ព្រំព្រា ន					48
202	20-22 PR	OJECTIC	ONS nn'i Total	Shaded	area indic	ales recess	ion									111111-					-32
High		Gain +25%)	Return 8%		plandin	HILLING .	he him			ասեր	րուսո	m _m iluu		0000000000							24
Low	35 (r Decis	(-15%) ions	-1%		¹⁴ 92 ¹⁴ 9		18 ⁴ 040 ⁴ 01	1.61.	· ·												-16 12
to Buy	DJF	MAM	J J A 0 0 0			1			1°0,00,00,100,	**********	100100000000					******					8
Options to Sell	0 0 0		0 0 0			1							**************************************	******				× TO	I T. RETUR	N 0/47	-6
Institu	tional 402016	Decisio 102017	ns 202017															7610		IN 57 17 /L ARITH,* INDEX	
to Buy to Sell	40 62	45 51	60 44	Percen shares traded	t 12 = 8 - 4 -													1 уг. З уг.	14.1 117.7	16.4 31.5	-
Hid's(000) 2001	7874	9400 2003	9201 2004	2005	2006	uululuu 2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	5 yr. ©VAL	140.1 UE LINE P	88.9 UB. 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	Revenu	es per sh		9.40
1.18 .66	1,20	1.15	1.28	1.33	1.33	1.49 .87	1.53 .89	1.40	1.55 .96	1.46 .84	1.56	1.72	1.84	1.97	2.17 1.38	2.35 1.48	2.50 1.60		low" per : s per sh ^A		3.10 2.05
.62	.63	.65	.66	.67	.68	.69	.70	.71	.72	.73	.74	.75	.76	.78	.81	.84	.87	Div'd De	ecl'd per s	h Bm	1.02
1.25 7.11	1.59 7.39	1.87 7.60	2.54 8.02	2.18 8.26	2.31 9.52	1.66 10,05	2.12 10,03	1.49 10.33	1,90 11,13	1.50 11.27	1,36 11,48	1,26 11,82	1.40 12.24	1.59 12.74	2.91 13,40	1.80 13.95	1.90 14.35		ending p lue per sl		2.05 16.45
10.17	10.36	10.48	11.36 26.4	11.58 27.4	13.17 22.7	13.25 21.6	13.40 19.8	13.52 21.0	15.57 17.8	15.70 21.7	15.82 20.8	15.96 19.7	16.12	16.23 19.1	16.30 25.6	16.50	16.75		n Shs Out		17.00
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	Boid fig Value	Line		"I P/E Rat P/E Ratio		21.0 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%	estin		<u> </u>	'l Div'd Y	ield	2.4%
Total D	ebt \$159	.6 mill. 🛙	s of 6/30 Due in 5 Y	f rs \$ 32.1		86.1 11.8	91.0 12.2	91.2 10.0	102.7 14.3	102.1 13.4	110.4 14.4	114.8 16.6	117.1 18.4	126.0 20.0	132.9 22.7	137 24.5	145 27.0	Net Pro	es (\$mill) At (\$mill)		160 35.0
	t \$136.4 nterest co	mill. L overage: E	.T Interes 3,6x)	it \$6.0 mi	ill.	32.6%	33.2%	34.1%	32.1%	32.7%	33.9%	34.1%	35.0%	34.5%	34.0%	35.0%	36.0%		Tax Rate		37.0%
		(38% of C	ap'i)		49.0%	45.6%	46.6%	6.8% 43.1%	6.1% 42.3%	3.4% 41.5%	1.9%	1.7% 40.5%	1.9% 39.4%	2.7% 37.9%	2.0% 37.5%	2.0% 37.5%		<u>% to Net I</u> rm Debt F		2.5% 37.5%
Pensio	n Assets	i-12/16 \$	59.4 mill. Dblig. \$ 78	3.6 mill.		49.6% 268.8	51.8% 259.4	52.1% 267.9	55.8% 310.5	56.6% 312.5	57.4% 316.5	58.7% 321,4	58.8% 335.8	59,8% 345,4	61.5% 355.4	62.0% 370	62.0% 385		n Equity F pital (\$mi		62.0% 455
Pfd Sto	ck \$2.4		Div'd: \$.1			333.9	366,3	376.5	405.9	422.2	435.2	446.5	465.4	481.9	517.8	525	535	Net Plan		"/	400 575
Commo as of 7/		16,337,7	′84 shs.			5.6% 8.6%	5.8% 8.6%	5.0% 7.0%	5.7% 8.1%	5.2%	5.4% 7.8%	5.9%	6.3% 9.2%	6.6% 9,6%	7.1% 10.3%	7.5% 10.5%	7.5%		on Total C on Shr. Eq		8.0% 12.5%
da UI //	91/13					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 o	on Com E	uity	12.5%
			lion (Sma	ull Cap)		1.8% 79%	2.0% 78%	.1% 98%	2.1% 75%	1.0% 87%	1.4% 83%	2.4% 73%	3.1% 67%	3.5% 63%	4.3% 58%	4.5% 57%			d to Com I Is to Net F	· ·	6.0% 50%
CURRE (\$MI Cash A	INT POS	ITION	2015		6/30/17	BUSIN	ESS: Mic	Idlesex V	Vater Co	mpany e	ngages ir	the ow	nership	2016, tł		sex Syst	tem acco	unted fo	r 60% of	operatin	g reve-
Other		_	3.5 20.9	3.9 22.8	3.7 26.0						tems in N s water								employee nnis W, I		
Accts F			24.4 6.5	26.7 12.3	29.7 15.0						ipal and water se								; BlackRe Ronson I		
Debt D Other		_	8.7 <u>13.1</u>	18.2 16.6	23.2						County,								niddlesex		
Current	Liab.	S Past	28.3 Pag	47.1 st Est'd	55,4						any cond						REN		progr ive, th		and
F 1	e (per sh)	48.1/	5 Yrs	s. to	'20-'22 3.5%	Follo	wing	a s	omew	hat	colder	(lor	iger)	ny a	ims to	o allo	cate n	nearly	\$12	millio	n in
"Cash Earning	Flow"	4.5 5.0	% 6,5	5% 7	7.5% 8.5%	picke	er se ed up	only	mod	erate	wat ly thr	er u rough	sage the						rs to l ities l		
Divider Book V	ds	1.5 4.0	% 1.	5% 4	4.5% 4.5%	late	spring	g into	early	sum	ner m st reg	onths	. In-						es, and ey. Tot		
Cal-			VENUES (Full	U.S.	(MS	EX's	main	area	of	operat	tion)	spene	ding d	n its	wate	er dis	ťribut	ion ir	ıfra-
endar 2014	Mar.31 27.1	Jun. 30 29.2	Sep. 30 32.7	28.1	Year 117.1						to we								\$200 1t to 1		
2015	28.8	31.7	34.7	30.8	126.0	roug	hly fla	at, ye	ar ove	er yea	r, at 🗄	\$33.0	mil-	moni	tored,	with	ıap	ortior	n of t	hose	cor-
2016 2017	30.6 30.1	32.7 33.0	37.8 39.0	31.8 34.9	132.9 137						s reg custo				nding		vestm propr		cost: cate fi		eing Fi-
2018 Col-	33.0 FA	37.0 RNINGS P	40.0 PER SHARE	35.0 A	145 Full						ersey l tren			nally	, a slo	w bû	t sure	pick	up in sident	consu	mp-
Cal- endar	Mar.31	Jun. 30	Sep. 30	Dec. 31	Year	wate	r con	sump	tion.	Simil	ar to	the	first	provi	de an				he top		
2014 2015	.20 .22	.29 .31	.42 .41	.22 .28	1.13						step t gure.			ther Our		lines	s Rai	ıkine	Syst	em r	egs
2016 2017	.29 .27	.36 .33	.54 .55	.19 .33	1.38 1.48	of \$0).33 jn	nissed	our	mark	ັby \$∣	0.04,	with	shar	es of	Mid	dlese	x Wa	ter C	omp	any
2018	.33	.38	.57	.32	1.60	on pi	rofits.		•		costs								ggard brea		
Cal- endar	QUAR Mar.31		IDENDS P/ Sep.30		Fuli Year						id boi estly								ul retu 111, an		
2013	.1875	.1875	.1875	.19	.75	We r	low e	xpect	Middl	esex	to ear	n \$1.	48 a	dend	yield	, thou	ıgh åv	erage	e, pale	s in (com-
2014 2015	.19 .1925	.19 .1925	.19 .1925	.1925 .19875	.76 .78						r prev s (-\$1 :								rms. 1 m the		
2016 2017	.19875	.19875	.19875	.21125		Infra	astru	cture	upgr	ades	are s	till n	nan-	for n	ow.	_		Ū.	- ·		
	L		earnings		ue (B)	Dividend					nder i (C) In mil				olas P				Octobe		ZU17 B++
early Nov			200100189		May	Aug., an available	d Novem				,					Sto	ck's Pric	e Stabili	ty –		70 40
					1.									varrantios		Ear	nings Pr				85

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KyPSC Case Not 2021-00190 STAFF-DB: Machine Contraction Contractic Contrac

<u>SJV</u>	N G	ROU	<u>P nys</u>	E-sjw			P	ecent Rice	<u>57.6</u>	O RATI	<u>o 22.</u>	7 (Traili Medi	ng: 21.6) an: 23.0)	P/E RATI		3 DIV'D YLD	1.5	<u>%</u>	ALUI		
rimeli		3 Raised 6		High: Low:	45.3 21.2	43.0 27.7	35.1 20.0	30.4 18.2	28.2 21.6	26.8 20.9	26.9 22.6	30.1 24.5	33.7 25.5	35.7 27.5	56.9 28.6	57.8 45.4				Price 2021	Rang
SAFETY ECHN		3 New 4/22 3 Lowered		LEGEI	NDS 50 x Divide vided by Ir	ends p sh iterest Rate															+12(10(
	75 (1.00		0/11/1/	3-for-1 sp	elative Pric olit 3/04	e Strength															
202	20-22 PF	ROJECTIC	ONS nn'i Total	2-for-1 sp Options: Sharlart	Yes	ates recess	ion				\sim			\sim		<u></u>					48
	Price 80 (Gain	Return 10%							\sim				H <u>h</u>	141111111						132
ligh .ow	55 r Decis	+40%) (-5%)	1%	- Littin		* · ·	111		, <mark>Illilinul</mark>			աղուն	ուրուս,	Htrutt				┞			+24 20
	DJF	MAM	JJA					1.0°	*************							un un					+16
Buy ptions Sell	000000000000000000000000000000000000000	680	000 000 001					1		*******		**************************************	98 ₀₀ 98 ⁴	*** _{**} ****	**************************************						+12
	tional	Decision	ns	·				-					09 ⁰ 9 ⁰					% TO	T. RETUR	L ARITH."	-8
o Buy	4Q2016 81	83	2Q2017 67	Percent shares	10 -													1 yr.	STOCK 31,8 124,9	INDEX 16,4 31,5	F
o Sell 11d's{000)		10726	73 10969	traded	5 -						ալլ	ողիրոր		2015				3 yr. 5 yr.	151.9	88.9	F
2001 7.45	2002 7,97	2003 8,20	2004 9,14	2005 9,86	2006 10,35	2007 11.25	12,12	2009 11.68	2010 11.62	2011 12,85	2012 14.01	2013 13,73	2014 15.76	2015 14.97	2016 16,61	2017 17.15	2018 16.80		UE LINE PL es per sh	JB. LLC	20-2: 20.
1.49	1.55		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		is per sn low" per s	sh	20. 5.1
.77 .43	.78 .46	.91 .49	.87 .51	1,12	1.19 .57	1.04	1.08 .65	.81	.84	1.11	1.18	1.12 .73	2.54 .75	1.85	2.57	2.45	2.60		s per sh A		3.
2.63	2.06	3.41	2.31	2.83	3.87	.61 6.62	3.79	3.17	5.65	.69 3.75	.71 5.67	4.68	5.02	.78 5.24	.81	.87	.93 5.50		cl'd per s ending pe		1.
8,17 18,27	8,40 18,27		10.11	10.72	12,48	12.90 18.36	13.99	13.66 18.50	13.75	14.20 18.59	14.71	15.92	17.75	18.83	20.61	21.20	21.60		lue per sh		23.
18.5	17.3	18.27 15.4	18.27	18.27 19.7	18.28 23.5	33.4	18.18	28.7	18.55 29.1	21.2	18.67	20.17	20.29	20.38	20.46	21.00 Bold fig	22.00 ures are		n Shs Out I'l P/E Rat		23. 22
.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 estin	Line		P/E Ratio		1.
3.0%	3.4%	3.5%	3.0%	2.4%	2.0%	1.7%	2.3%	2.8%	2.8% 215.6	2.9% 239.0	3.0%	2.7% 276.9	2.6%	2.5%	2.0% 339.7	360	370		'l Div'd Yi	eld	1.7
otal D	ebt \$430).9 mill. D	Due in 5 Y	/rs \$14.3		19,3	220.3	15.2	15.8	20.9	201.5	270.5	51.8	37.9	52.8	51.0	57.0	Revenue Net Prof			6
I Debi	t \$430.9	mill. L	T Interes	t \$20.0 m (50% o		39.4% 2.7%	39.5% 2.3%	40.4%	38.8%	41.1%	41.1%	38,7%	32,5%	38.1%	38.8%	39.0%	39.0%	Income '			39.0
eases	. Uncapi	italized: A	Annual rer	ntals \$6.6	mill.	47.7%	46.0%	49.4%	53.7%	56.6%	55.0%	51.1%	51.6%	2.0% 49.8%	1.0%	1.5% 49.0%	<u>1.5%</u> 48.5%		% to Net F rm Debt R		1.5
		s- 12/16 \$ 1				52.3%	54.0%	50.6%	46.3%	43.4%	45.0%	48.9%	48.4%	50.2%	49.3%	51.0%	51.5%		1 Equity R		51.0
		i c	Dblig. \$17			453,2 645,5	470,9 684,2	499,6 718,5	550.7 785.5	607.9 756.2	610.2 831.6	656.2 898.7	744,5 963,0	764.6 1036.8	855,0 1146,4	870 1200	925 1250	Net Plan	pital (\$mil t (\$mill))	10) 13.
td Sto	ck None	.				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 o	n Total C		7.5
commo	on Stock	20,506,4	94 shs.			8.2% 8,2%	8.0% 8,0%	6.0% 6.0%	6.2% 6.2%	7.9% 7.9%	8.1% 8.1%	7.3% 7.3%	14.4% 14.4%	9.9% 9.9%	12.5% 12.5%	11.5% 11.5%	12.0%		n Shr. Eq n Com Ec		12.5 12.5
		\$1.2 billio				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	i to Com I	q	8.0
(\$MII ash A	NT POS		2015 5.2	2016 25,3	6/30/17 9.2	57%	59%	80%	80% pengagi	61%	59%	62%	29%	42%	31%	36%	36%		s to Net P and own		37
ccts R	Receival		16.4 51.8	16.4 57.9	20.6 43.1	storage	, purifica	tion, dist	ibution, a	nd retail	sale of w	ater. It p	rovides	commer	cial real	estate in	vestment	s. Has al	bout 406	employe	es. C
Current	Assets		73.4	99,6	72.9				imately 2 e million										loss) owr C.E.O.:		
)ebt Di	ayable ue		16.2 38.1	18.7 14.3	27.1				reaches . nio and /										r Street, t:www.siv		
)ther Current	t Liab.		25.3 79.6	30,6 63.6	43.3				maki		_				<u>.</u>				r eari		
	LRATE			st Est'd		heln	n. Cur	rent l	Presid	ent a	nd Ch	ief Ex	ecu-	timat	e, to	\$2.45	a sh	are n	nainly	owir	ng t
chang levenu Cash I	e (per sh) Jes Flour?	10 Yrs. 5.0 7.0	5 Yr % 5.9 % 12.0	5% 4	20-'22 4.5% 3.0%				hard ctive										For \$2.60		
aming	IS	8.0' 4.0'	% 20.	5% 4	4.5% 5.0%	boar	d of d	directo	ors ha	s app	ointe	d Erio	: W.	Reve	nues i	for th	is yea	r and	next	are t	bein
ook V		5.5		5%	4.0%				repla a nev										n and \$370		
Cal- ndar	QUAF Mar,31	TERLY RE	VENUES (Sep. 30		Full Year				tep do						ctivel		100 0	woht	to h		ko
014	54.6	70.4	125.4	69.3	319.7	hold	er's m	eeting						grow	/th di	river	furth	er ou	to b it. Yea	r to c	late
015	62.1	72.4 86.9	83.0 112.3	87.6 79.4	305.1 339.7				iarter pecte										illion, o its N		
017	69.0	102.1	102	87.0	360	pres	sive fi	inanci	al res	ults d	luring	the _	June						ce, onl		
:018 Cal-	70.0 E/	105 ARNINGS P	105 ER SHARE	90.0 A	370 Full				nned b her re					dent	has i ling	been	made	in it astlv	s \$30 the	0 mi	llio
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her	ry (Avg.		.8	.7 <u>3.4</u>	.8 3.4				the Unite Decemb									d: PA. Yo t/CEO:			
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(A) Diluted earnings. Next earnings report due (C) in millions, acjusted for split. late November.
(B) Dividends historically paid in late February, June, September, and December.
2017 Value Line, Inc. All rights reserved. Factual material is obtained from sources believed to be reliable and is provided without warranties of any kind. THE PUBLISHER IS NOT RESPONSIBLE FOR ANY ERRORS OR OMISSIONS HEREIN. This publication is strictly for subscriber's own, non-commercial, internal use. No part of it may be reproduced, resold, stored or transmitted in any printed, electronic or other form, or used for generaling or marketing any printed or electronic publication, service or product.

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.

	Derive	India India predict	Indicated ROE Derived by the Predictive Risk Premium Model (1)	m Model (1)			
	[1]	[2]	[3]	[4]	[2]	[9]	[2]
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%

Carolina Water Service, Inc. of South Carolina

NMF = Not Meaningful Figure

11.45%

Average of Mean and Median

Notes:

coefficient. The historical data used are the equity risk premiums for the first available trading month as The Predictive Risk Premium Model uses historical data to generate a predicted variance and a GARCH reported by Bloomberg Professional Service. Ξ

- $(1+(Column [3] * Column [4])^{12}) 1.$
- From note 2 on page 2 of Schedule DWD-5. € @ £
 - Column [5] + Column [6].

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Carolina Water Service, Inc. of South Carolina Indicated Common Equity Cost Rate Through Use of a Risk Premium Model <u>Using an Adjusted Total Market Approach</u>

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	<u>9.93</u> %

- 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.

<u>Carolina Water Service, Inc. of South Carolina</u> Interest Rates and Bond Spreads for <u>Moody's Corporate and Public Utility Bonds</u>

Selected Bond Yields

[1] [2]

	Aaa Rated	A Rated Public	Baa Rated Public
	Corporate Bond	Utility Bond	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)

[3]

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

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

	Long-Term	oody's Issuer Rating per 2017	Long-Terr	rd & Poor's n Issuer Rating ber 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) American Water Works Company Inc (3) Aqua America Inc (4) California Water Service Group (5) Connecticut Water Service Inc (6) Middlesex Water Co. SJW Corp (7) York Water Co.	A2 A3 NR NR NR NR NR NR	6.0 7.0 	A+ A A+ A A A A A-	5.0 6.0 5.0 5.0 6.0 6.0 6.0 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

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

_		
Moody's Bond Rating	Numerical Bond Weighting	Standard & Poor's Bond Rating
Аза	1	AAA
Aa1	2	AA+
Aa2	3	AA
Aa3	4	AA-
A1	5	A+
A2	6	А
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	В
B3	16	B-

KyPSC Case No. 2021-00190 STAFF-DR: A contract hor contra

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	<u> </u>
Notoo	(1) From page 9 of this Schodula	

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

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<u>Carolina Water Service, Inc. of South Carolina</u> Derivation of Equity Risk Premium Based on the Total Market Approach Using the Beta for the <u>Proxy Group of Eight Water Companies</u>

<u>Line No.</u>	Equity Risk Premium Measure	Proxy Group of Eight Water Companies
<u> </u>		dompanieb
	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.

<u>Carolina Water Service, Inc. of South Carolina</u> Derivation of Equity Risk Premium Based on the Total Market Approach Using the Beta for the <u>Proxy Group of Eight Water Companies</u>

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

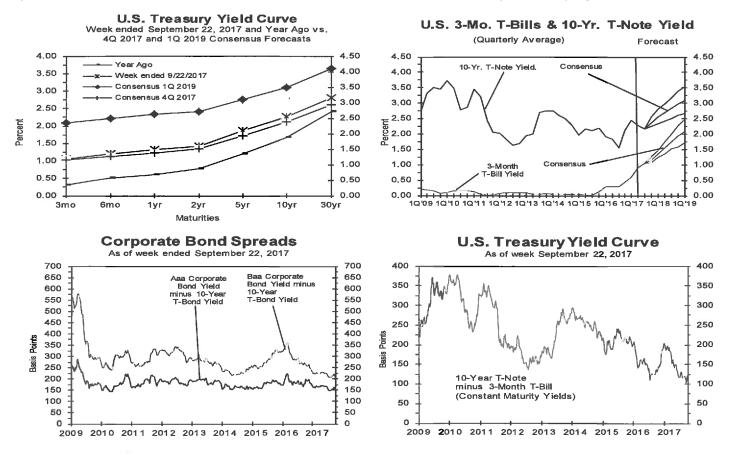
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2 ■ BLUE CHIP FINANCIAL FORECASTS ■ OCTOBER 1, 2017

Consensus Forecasts Of U.S. Interest Rates And Key Assumptions¹

				Histor	v				Cons	ensus l	Foreca	sts-Ou	arterly	Avg.
	Av	erage For	Week End					Latest Qtr		1Q	2Q	3Q	4Q	1Q
Interest Rates	<u>Sep. 22</u>	<u>Sep. 15</u>	<u>Sep. 8</u>	<u>Sep. 1</u>	<u>Aug</u>	Jul	<u>Jun</u>	<u>3Q 2017</u> *	2017	2018	2018	2018	2018	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
				Histor	y				Co	onsensi	is Fore	casts-Q)uarte	rly
	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q
Key Assumptions	2015	2016	2016	2016	2016	2017	2017	2017*	2017	2018	2018	2018	2018	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's Bureau of Statistics (BLS). ^{*}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.



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Long-Range Survey:

The table below contains the results of our twice-annual long-range CONSENSUS survey. There are also Top 10 and Bottom 10 averages for each variable. Shown are consensus estimates for the years 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.

			——Aver	age For Th	e 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
5 Tressure Dill Mold 2 Mo	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 3.4	2.9	2.8	2.9
	Top 10 Average Bottom 10 Average	3.1 1.9	3.4 2.2	3.4 2.3	2.2	3.5 2.3	3.3 2.2	3.5 2.3
6. Treasury Bill Yield, 6-Mo.	CONSENSUS	2.6	2.2	3.0	3.0	3.0	2.2	3.0
6. Heastry Bill Heid, 6-100.	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
7. Heusary Din Heia, t-tt.	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
 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 5.6	6.9	6.9	7.0
14. State & Local Bonds Yield	Bottom 10 Average CONSENSUS	<u>5.5</u> 4.6	<u>5.6</u> 4.7	<u> </u>	4.7	<u>5.8</u> 4.7	<u> </u>	<u>5.7</u> 4.8
14. State & Local Bonds field	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
15, Holik Moltgage Mate	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
	-		Vear_O	ver-Year, S	% Change		Five-Vea	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
	-							

<u>Carolina Water Service. Inc. of South Carolina</u> Derivation of Mean Equity Risk Premium Based Studies Using Holding Period Returns and <u>Projected Market Appreciation of the S&P Utility Index</u>

<u>Line No.</u>		Implied Equity Risk Premium
	Equity Risk Premium based on S&P Utility Index Holding Period Returns (1) :	ð
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:	 Based on S&P Public Utility Index monthly total returns and Bond average monthly yields from 1928-2016. Holding peri calculated based upon income received (dividends and inter- change in the market value of a security over a one-year hold This equity risk premium is based on a regression of the monthly 	od returns are est) plus the relative ling period.
	premiums of the S&P Utility Index relative to Moody's A rate yields from 1928 - 2016 referenced in note 1 above.	d public utility bond
	(3) The Predictive Risk Premium Model (PRPM) is applied to the monthly total returns of the S&P Utility Index and the month rated public utility bonds from January 1928 - September 20	ly yields on Moody's A
	(4) Using data from Value Line for the S&P Utilities Index, an exp was derived based on expected dividend yields and long-tern proxy for market appreciation. Subtracting the expected A ra yield of 4.86%, calculated on line 3 of page 3 of this Schedule risk premium of 4.20%. (9.06% - 4.86% = 4.20%)	n growth estimates as a ted public utility bond

- (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.

	[8]	Indicated Common Equity Cost Rate (3)	$\begin{array}{c} 10.50 \\ 9.29 \\ 9.67 \\ 9.67 \\ 10.65 \\ 9.74 \\ 11.41 \\ 10.73 \\ 10.73 \\ 10.43 \\ 10.51 \\ \% \\ 10.51 \\ \% \end{array}$
	[7]	ECAPM Cost Rate	$\begin{array}{c} 10.75 \\ 9.71 \\ 9.71 \\ 10.04 \\ 10.08 \\ 10.10 \\ 11.53 \\ 11.53 \\ 11.53 \\ 11.53 \\ 10.69 \\ 10.82 \\ \end{array}$
Model (ECAPM)	[9]	Traditional CAPM Cost Rate	10.25 % 8.87 9.30 10.43 9.39 11.29 10.51 11.29 10.51 10.17 % 10.34 %
Carolina Water Service. Inc. of South Carolina Indicated Common Equity Cost Rate Through Use Asset Pricing Model (CAPM) and Empirical Capital Asset Pricing Model (ECAPM)	[2]	Risk-Free Rate (2)	3.58 3.58 3.58 3.58 3.58 3.58 3.58
<u>Carolina Water Service. Inc. of South Carolina</u> Indicated Common Equity Cost Rate Through Use set Pricing Model (CAPM) and Empirical Capital A	[4]	Market Risk Premium (1)	8.67 % 8.67 8.67 8.67 8.67 8.67 8.67
ater Service. I mmon Equity (odel (CAPM) a	[3]	Average Beta	0.77 0.61 0.66 0.79 0.79 0.79 0.89 0.89 0.89 0.89 0.76 0.78 0.78
<u>Carolina W</u> Indicated Coi al Asset Pricing M	[2]	Bloomberg Adjusted Beta	0.74 0.57 0.51 0.78 0.97 0.98 0.98
of the Traditional Capital	[1]	Value Line Adjusted Beta	0.80 0.65 0.70 0.80 0.80 0.75 0.80
of the Tr		Proxy Group of Eight Water Companies	American States Water Co. American Water Works Company Inc Aqua America Inc California Water Service Group Connecticut Water Service Inc Middlesex Water Co. SJW Corp York Water Co. Mean Mean Average of Mean and Median

Notes on page 2 of this Schedule.

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

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Notes:

 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: Arithmetic Mean Income Returns on Long-Term Government Bonds: MRP based on Ibbotson Historical Data:		11.97 % 5.17 6.80 %
Measure 2: Application of a Regression Analysis to lbbotson Historical Da (1926-2016)	ita	8.60 %
Measure 3: Application of the PRPM to Ibbotson Historical Data: (January 1926 - September 2017)		6.69 %
	Average Historical Data MRP	<u>7.36</u> %
Value Line MRP Estimates:		
Measure 4: Value Line Projected MRP (Thirteen weeks ending October 13	3, 2017)	
Total projected return on the market 3-5 years hence*: Projected Risk-Free Rate (see note 2): MRP based on Value Line Summary & Index: *Forcasted 3-5 year capital appreciation plus expected divider	nd yield	9.45 % 3.58 5.87 %
Measure 5: Value Line Projected Return on the Market based on the S&P	500	
Total return on the Market based on th e S&P 500: Projected Risk-Free Rate (see note 2): MRP based on Value Line data		14.30 % 3.58 10.72 %
	Average Value Line MRP:	8.29 %
Measure 6: Bloomberg Projected MRP		
Total return on the Market based on th e S&P 500: Projected Risk-Free Rate (see note 2):	MRP based on Bloomberg data	13.92 % 3.58 10.34 %
Average of Value Lin	e, Ibbotson, and Bloomberg MRP:	<u> </u>
2) For reasons explained in the direct testimony, the appropriate risk-free r	ate for cost of capital purposes is the a	average forecast of

(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

<u>Carolina Water Service, Inc. of South Carolina</u> Basis of Selection of the Group of Non-Price Regulated Companies <u>Comparable in Total Risk to the Utility Proxy Group</u>

The criteria for selection of the proxy group of twenty-eight non-price regulated companies was that the non-price regulated companies be domestic and reported in <u>Value Line Investment Survey</u> (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:

Standard Deviation of the Std. Err. of the Regr. = 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

Thus, 0.1168 =	<u>2.6576</u> =	<u>2.6576</u>
	$\sqrt{518}$	22.7596

Source of Information: Value Line, Inc., September 2017 Value Line Investment Survey (Standard Edition)

			KyPSC C STAFF-D R _07	ase No. 2021-00190 xhibi No. aute Division Page Page 72 of 82
<u>Carolina Water Se</u> Basis of Select <u>Domestic Non-F</u>	tion of Compara	ble Risk		
	[1]	[2]	[3]	[4]
			Residual	

Proxy Group of Eight Water Companies	Value Line Adjusted Beta	Unadjusted Beta	Standard Error of the Regression	Standard Deviation of Beta
<u>×</u> U				
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

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<u>Carolina Water Service, Inc. of South Carolina</u> Proxy Group of Non-Price Regulated Companies Comparable in Total Risk to the <u>Proxy Group of Eight Water Companies</u>

	[1]	[2]	[3]	[4]
Proxy Group of Twenty-Eight Non- Price Regulated Companies	VL Adjusted Beta	Unadjusted Beta	Residual Standard Error of the Regression	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

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<u>Carolina Water Service, Inc. of South Carolina</u> Summary of Cost of Equity Models Applied to Proxy Group of Twenty-Eight Non-Price Regulated Companies Comparable in Total Risk to the <u>Proxy Group of Eight Water Companies</u>

Principal Methods		Twenty-Eigh Non-Price Regulated Companies	
Discounted Cash Flow Model (DCF) (1)	l	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.

		DCF Results for the P	<u>Carolina Water Service. Inc. of South Carolina</u> DCF Results for the Proxy Group of Non-Price-Regulated Companies Comparable in Total Risk to the Proxy Group of Eight Water Companies	Carolina Water Service. Inc. of South Carolina croup of Non-Price-Regulated Companies Com Proxy Group of Eight Water Companies	lina Comparable in Total Ris E	sk to the		
	[1]	[2]	[3]	[4]	[2]	[9]	[2]	[8]
Proxy Group of Twenty- Eight Non-Price Regulated Companies	Average Dividend Yield	Value Line Projected Five Year Growth in EPS	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 Rate in EPS	Adjusted Dividend Yield	Indicated Common Equity Cost Rate (1)
AmerisourceBergen ARAMARK Holdings AutoZone Inc. Bright Horizons Fami	1.77 % 1.02	11.00 % NA 11.50 19.50	8.24 % 13.96 10.11 17.17	9,30 % 12,00 11.60 20.00	8.24 % 13.96 10.11 17.17	9.20 % 13.31 10.83 18.46	1.85 % 1.09	11.05 % 14.40 NA NA
Cheesecake Factory CBOE Holdings Chemed Corp. C.H. Robinson	1.98 1.06 0.57 2.55	8.50 13.00 13.50 6.00	10.55 NA NA 6.30	14.60 17.40 10.00 8.80	10.55 18.28 10.00 6.31	11.05 16.23 11.17 6.85	2.09 1.15 2.64	13.14 17.38 11.77 9.49
CME Group DineEquity Inc. Dunkin' Brands Group	2.05 9.49 2.43	8.50 5.00 10.00	8.65 3.90 10.51	10.60 NA 13.40	8.65 3.90 10.51	9.10 4.27 11.11	2.14 2.56 2.33	11.24 13.96 13.67
Varten Ressaurants Forrester Ressarch Formel Foods Lilly (Eli) Mercury General Vail Resorts	3.00 2.09 2.52 4.35	10,00 10,00 11,00 14,00 20,50	11.00 12.00 1.62 11.40 2.6.50	12.00 9.30 10.30 26.50 NA	11.00 1.62 1.41 26.50 17.50	11.15 5.76 11.03 23.38 18.50	3.23 2.15 2.66 2.09	13.47 13.47 13.69 28.24 20.59
NVR, Inc. Pinnacle Foods Quintiles IMS Hidgs. Regal Entertainment Sir Flags Entertainm Spectrum Brands Target Corp. VertSion Inc	2.20 5.30 4.53 4.33	15.00 NA 12.00 12.00 11.50 4.50	18.70 10.91 3.34 8.00 9.25 (3.33)	14.90 9.30 10.00 8.00 9.60 4.70 NA	18.70 10.91 4.27 8.00 8.00 (3.33) 8.00	16.83 10.37 7.40 9.00 9.90 9.26	- 231 - 231 - 473 4.43 - 4.43	12.68 NA 12.68 13.73 11.53 11.53 0.03 NA
WR Corp. WD-40 Co. West Pharmac, Svcs.	- 1.80 0.62	NA NA 15.00	8.99 NA 18.13	NA 10.09 17.10	8.99 13.00 18.13	8.99 10.33 17.09	- 1.89 0.67 Mean	NA 12.22 17.76 13.83 %
22	NA= Not Avallable NMF= Not Meaningful Figure	igure				Average of Me	Median Average of Mean and Median	13.31 %
3	 The application of a dividend yield is de 	the DCF model to the do erived by using the 60 da	(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 12 the average risk comparable risk companies is indicated by the risk comparable risk compared by the risk compared	d comparable risk con oot indicated dividend	c companies is identical to the app dend as of October 13, 2017. The much in EDE surveided hyrvalier fin	he application of the D . The dividend yield is 	CF to the utility prox s then adjusted by 1/7	y group. The 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 (e::cluding any negative growth rates) and then adding that growth rate to the adjusted dividend yield.

Source of Information: Value Line In

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

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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 <u>Proxy Group of Eight Water Companies</u>

	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 Compani es	Long- Term Issuer Rating	Numerical Weighting (1)	Long- Term Issuer Rating	Numerical Weighting (1)
AmerisourceBergen ARAMARK Holdings AutoZone Inc. Bright Horizons Fami Cheesecake Factory	Baa2 NR Baa1 NR NR	9.0 8.0 	A- BB+ BBB NR NR	7.0 11.0 9.0
CBOE Holdings Chemed Corp. C.H. Robinson CME Group	Baa1 NR NR Aa3	8.0 4.0	BBB+ NR NR AA-	8.0 4.0
DineEquity Inc. Dunkin' Brands Group Darden Restaurants Forrester Research	NR NR Baa3 NR	10.0	NR NR BBB NR	9.0
Hormel Foods Lilly (Eli) Mercury General Vail Resorts NVR, Inc.	A1 A2 Baa2 NR Baa2	5.0 6.0 9.0 9.0	A AA- NR NR BBB+	6.0 4.0 8.0
Pinnacle Foods Quintiles IMS Hldgs. Regal Entertainment Six Flags Entertainm	NR NR B3 B2	 16.0 15.0	BB- BBB- BB- BB	13.0 10.0 13.0 12.0
Spectrum Brands Target Corp. VeriSign Inc. VWR Corp. WD-40 Co.	NR A2 Ba1 NR NR	6.0 11.0 	NR A BB+ BB- NR	6.0 11.0 13.0
West Pharmac. Svcs. Average	NR Baa2	8.9	NR BBB	9,0

Notes:

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

Source of Information:

Bloomberg Professional Services

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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 <u>Proxy Group of Eight Water Companies</u>

Line No.			Proxy Group o wenty-Eight No Price Regulated Companies	on-
<u>Line No.</u>		Equity Risk Premium Measure	companies	
	<u>lbbc</u>	otson-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	-
	<u>Valu</u>	e Line-Based Equity Risk Premiums:		
5.		Equity Risk Premium Based on <u>Value Line</u> Summary and Index (4)	4.84	
6.		Equity Risk Premium Based on <u>Value Line</u> S&P 500 Companies (5)	9.69	-
7.		Average <u>Value Line</u> Equity Risk Premium	7.26	-
	<u>Bloc</u>	omberg-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.		
		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.		
		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.		
	Soui	rces of Information:		
		Stocks, Bonds, Bills, and Inflation - 2017 SBBI Yearbook, John Wiley & S	ons, Inc.	
		Value Line Summary and Index		
		Blue Chin Einspeiel Feregests October 1, 2017 and June 1, 2017		

Blue Chip Financial Forecasts, October 1, 2017 and June 1, 2017

Bloomberg Professional Services

Trad	iltional CAPM and E	CAPM Results for t	the Proxy Group of <u>Proxy Group of F</u>	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	d Companies Compa s	rable in Total Risk	to the	
	[1]	[2]	[3]	[4]	[5]	[9]	[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					
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	0.00	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 Hidgs.	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 %
No	Notes:							
	(1) From Schedule DWD-5, note 1.	DWD-5, note 1.						
	(2) Prom Schedule DWD-5. note 2	DWD-5. note 2.						

Carolina Water Service, Inc. of South Carolina

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

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	[4]	Spread from Applicable Size Premium (4)		4.08%	[E]	Size Premium (Return in Excess of	CAPM)	-0.35%	0.61%	0.89%	0.98%	1.66%	1.72%	2.08%	2.68%	5.59%	arbook	corresponds to the	ge. s derived as follows
q	[3]	Applicable Size Premium (3)	5.59%	1.51%	[0]	Recent Average Market	Capitalization (millions)	\$80,054.84	\$15,053.36	\$7,968.20	\$4,573.99 \$7 987 91	\$2.088.95	\$1,357.35	\$823.17	\$436.57	\$117.57	, and Inflation (SBBI) Yea	iate decile (Column (A)).	i on the bottom of this pa in Column 4, Line No. 2 i
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	[2]	Applicable Decile of the NYSE/AMEX/ NASDAQ (2)	10	IJ	[c]	Recent Total Market	Capitalization (millions)	\$15,290,475.30	\$3,010,671.02	\$1,609,575.62	\$1,010,851.81 \$677 120.07	\$541,038.00	\$384,129.20	\$297,164.94	\$212,609.64	\$92,882.17	*From 2017 Stocks, Bonds, Bills, and Inflation (SBBI) Yearbook	From page 2 of this Schedule. 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.	Corresponding risk premium to the decile is provided on Column (E) on the bottom of this page. 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 Derivation of Investment Risk Adjustment Based upon ates' Size Premia for the Decile Portfolios of the NYSE/	ſ	tton on October 17 (1) (times larger)		61.9 x	[B]	Number of	Companies	191	200	202	722 777	259	283	361	487	260	*Fro	s Schedule. tmn (D) on the bottom ion of the proxy group,	k premium to the decile 3 – Line No. 2 Column .51%.
<u>Carolina Wate</u> Derivation of Inve oclates' Size Premia f	[1]	Market Capitalization on October 13, 2017 (1) (millions) (times larger)	\$ 57.209	\$ 3,543.646	[A]		Decile	1	2	т М	4 п	с чо	2	8	6	10		 From page 2 of this Schedule. Gleaned from Column (D) on market capitalization of the pi 	 (3) Corresponding risk pren (4) Line No. 1 Column 3 - Li 4.08% = 5.59% - 1.51%.
Ibbotson Ass			Carolina Water Service, Inc. of South Carolina	Proxy Group of Eight Water Companies				Largest								Smallest	:	Notes:	
		Line No.	1.	5															

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	[9]	Market Capitalization on October 13, 2017 (3) (millions)		\$ 57.209 (6)	<pre>\$ 1,931.334 15,141.780 6,175.098 1,983.349 699.317 710.669 1,245.580 462.040</pre>	\$ 3,543.646	d by the requested I to the market-to-book to the average market- Inc. of South Carolina's
	[2]	Market-to- Book Ratio on October 13, 2017 (2)		329.7 [5]	390.7 % 290.2 333.8 300.7 296.3 325.4 295.3 405.1	329.7 %	ommission multiplie assumed to be equa to-book ratio equal (olina Water Serrice,
	[4]	Closing Stock Market Price on October 13, 2017	NA NA		 \$ 52.810 85.020 34.810 41.350 62.170 63.610 60.890 35.950 	\$ 52.076	mual report to the C 1 October 13, 2017 is id trade at a market- ies, 329.7%, and Car t million.
arolina of South Carolina and nies	[3]	Total Common Equity at Fiscal Year End 2016 (millions)	17.352 (4)		494.297 5,218.000 1,850.068 659.471 236.028 218.437 421.646 114.061	1,151.501	book equity from its a c. of South Carolina or ober 13, 2017. m stock, if traded, wou f Eight Water Compan efore have been \$57.2:
<u>Carolina Water Service, Inc. of South Carolina</u> lization of Carolina Water Service, Inc. of Sout Proxy Group of Eight Water Companies]	I	NA \$		13.516 \$ 29.299 10.429 13.749 20.983 13.404 13.404 20.612 8.875 8.875	16.358 \$	n Carolina's 2016 l Mater Service, In Companies on Octo Carolina's commo the Proxy Group o 2017 would there
<u>Water Servi</u> if Carolina V Group of Ei	[2]	Book Value per Share at Fiscal Year End 2016 (1)			60	\$	inc. of South of Carolina ght Water (13, 2017 of October 13,
<u>Carolina Water Service, Inc. of South Carolin</u> a Market Capitalization of Carolina Water Service, Inc. of South Carolina and Proxy Group of Eight Water Companies	[1]	Common Stock Shares Outstanding at Fiscal Year End 2016 (millions)	NA		36.571 178.097 177.394 47.965 11.248 16.296 20.456 20.456	62.610	 rallable Notes: (1) Column 3 / Column 1. (2) Column 4 / Column 2. (3) Column 1 * Column 4. (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, 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 and 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 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 Carolina Water Service, Inc. of South Carolina's Common Second Services, Inc. of South Carolina's Common Second Second Services, Inc. of South Carolina's Common Second Second Services, Inc. of South Carolina's Common Second Second Services, Inc. South Carolina's Common Second Second Second Second Second Services, Inc. South Carolina's Common Second Sec
		Exchange			NYSE NYSE NYSE NYSE NYSE NASDAQ NYSE NYSE		NA= Not Available Notes: (1) Column (2) Column (3) Column (4) Carolin (5) The ma ratio of (5) The ma ratio of to-book market Bloomberg Financial Services
		Company	Carolina Water Service, Inc. of South Carolina	Based upon Proxy Group of Eight Water Companies	Proxy Group of Bight Water Companies American States Water Co. American Water Works Company Inc Aqua America Inc California Water Service Group Connecticut Water Service Inc Middlesex Water Co. SJW Corp York Water Co.	Average	NA= Not Available Notes: (1) Cc (2) Cc (3) Cc (4) Ca (4) Ca (4) Ca (5) Th ra (6) Ca (6) Ca nii Mi Source of Information: 2016 Annual Forms 10K Bloomberg Financial Ser

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																																Page	¥ag	é 8
	Smoothed Premium over CAPM	0.43%	1,40%	2.09%	2.35%	2.57%	2.71%	2.86%	3.02%	3.14%	3.24%	3.47%	3.61%	3.74%	3.85%	3.98%	4.11%	4.26%	4.42%	4.60%	4.82%	5.10%	5.42%	6.30%	Portfolio	Ranking	22-23		25	20	R			
B-8	Average Number of Employees	341,434 107 A66	004'/0T	46 747	34.256	26,595	22,447	18,590	15,489	13,344	11,841	9,004	7,588	6,511	5,710	4,908	4,194	3,507	2,908	2,328	1,797	1,281	871	305		B-8 Value	1,417		48	7072 1	-			
<u>B-7</u>	Smoothed Premium over CAPM	0.88%	%1212	2 3506	2.54%	2.73%	2.88%	3.02%	3.14%	3.25%	3.36%	3.60%	3.71%	3.78%	3.85%	3.96%	4.08%	4.21%	4.34%	4.49%	4.63%	4.86%	5.13%	2.99%	Portfolio	Ranking	21-22		25	1 4204				
άI	Sales (in \$millions)	\$ 123,791 20202	200,000	17114	13.286	10,376	8,400	6,977	5,938	5,106	4,455 2 740	3,184	2,771	2,509	2,276	1,980	1,670	1,412	1,181	6969	L6L	589	407	129		B-7 Value	\$ 723		\$ 21.47	1 4				
10	Smoothed Premium over CAPM	52.00%	1.59%	1 95%	2.20%	2.38%	2.59%	2.74%	2.85%	2.96%	3.09%	3,31%	3.43%	3.55%	3.66%	3.78%	3.93%	4.06%	4.19%	4.38%	4.60%	4,82%	5.08%	5,83%	Portfolio	Ranking	13-14		25	707	0/ 0			
8-2 B-2	Total Assets (in \$millions)	\$ 161,117 51 025	35 110	75 351	18.141	14,376	11,035	9,004	7,861	6,771	5,710	4.290	3,661	3,160	2,735	2,345	1,927	1,621	1,363	1,069	801	600	429	161		B-5 Value	\$ 3,961		\$ 79.51	7077 C	F			
B-4	Smoothed Premium over CAPM	-1.02%	2002 U	1 16%	1.45%	1.73%	1.91%	2,05%	2.28%	2.50%	2.65%	2.96%	3,11%	3.27%	3.40%	3.55%	3.72%	3.93%	4.15%	4.40%	4.67%	4.99%	5.36%	6.52%	Portfolio	Ranking	14		25	7017 6	04.11			
μ	MVIC (in \$millions)	\$ 277,921 77255	CD5,11 779 34	22 471	24.248	18,506	15,426	13,457	10,762	8,658	7,453 6 466	5.466	4,718	4,043	3,541	3,075	2,587	Z,109	1,696	1,323	1,014	738	513	163		B-4 Value	\$ 4,769		\$ 57.21		r. 6	-1 through B-8		
2.	Smoothed Premium over CAPM	0.98%	1.05%	90666	2.40%	2.54%	2.65%	2.78%	2.89%	3.01%	3.09%	3.25%	3.34%	3.43%	3.50%	3.58%	3.69%	3,81%	3,94%	4.05%	4.19%	4.34%	4.57%	5.19%	Portfolio	Ranking	16		25	700	06.6	odbook Exhibit B		
B-2	Average Book Val. (in \$millions)	\$ 67,532	61/17	0.700	6.875	5,488	4,590	3,716	3,112	2,586	2,266	1.751	1,500	1,303	1,174	1,030	861	711	577	479	385	303	207	76		B-2 Value	\$ 1,152		\$ 17.35	1 2002	0'T	mation: Duff & Phelps 2017 Valuation Handbook Exhibit B-1 through B-8	0-K	
	Smoothed Premium over CAPM	-1.78%	%0T'0-	0.050%	1.32%	1.59%	1.80%	2.04%	2.27%	2.49%	2.66%	3.09%	3.28%	3.45%	3.62%	3.81%	3.99%	4.17%	4.39%	4.69%	5.08%	5.46%	5.89%	7.22%	Portfolio	Ranking	14		25	2	0	nation: Juff & Phelps 201	SNL Financial Company Form 10-K	
붭	Average Mkt Value (in \$millions)	\$ 238,299	25 620	73 756	17.471	13,871	11,594	9,463	7,822	6,482	5,637	3.915	3,329	2,897	2,508	2,130	1,842	1,584	1,313	1,023	731	532	370	121		B-1 Value	\$ 3,383		\$ 57.21		0,44%	Sources of Information: Duff & P	20	
	Portfolio Rank by Size	- ,	7 6	n 4	+ v	0 00	7	8	6	10	11	13	14	15	16	17	18	19	20	21	22	23	24	25			Proxy Group of Eight Water Companies	Carolina Water Service, Inc.	of South Carolina	Ta di sete d'Airle Dana la ma	Indicated KISK Fremum			

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FILED 6/30/2020 DOCUMENT NO. 03429-2020 FPSC - COMMISSION CLERK

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

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24

1 I. INTRODUCTION

- 2 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.

5

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.
- 11 On behalf of the American Gas Association ("AGA"), I calculate the AGA Gas Index, 12 which serves as the benchmark against which the performance of the American Gas Index 13 Fund ("AGIF") is measured on a monthly basis. The AGA Gas Index and AGIF are a market 14 capitalization weighted index and mutual fund, respectively, comprised of the common stocks 15 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.

- 1 The details of my educational background and expert witness appearances are shown
- 2 in Exhibit DWD-1.
- 3 Q. On whose behalf are you presenting this testimony?
- 4 A. I am presenting this testimony and appearing on behalf of Utilities, Inc. of Florida. ("UIF" or
 5 the "Company"), the applicant for rate increase in the present docket.
- 6 Q. What is the purpose of your direct testimony?
- 7 A. The purpose is to provide testimony related to the return on investor-supplied capital, including
- 8 the appropriate return on common equity ("ROE") which the Company should be afforded in
- 9 order to have the opportunity to earn a fair return on its property used and useful in the public
- 10 service. I am presenting testimony regarding the appropriate return on investor-supplied
- 11 capital associated with UIF's operations because the Company does not believe that in this
- 12 case the use of the Florida Leverage Formula (the "FL ROE Formula") accurately reflects the
- 13 return on equity necessary to afford it an opportunity to earn a fair return.

14 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
- 21
- 22

¹ Excluding customer deposits and deferred tax liabilities.

ROE = $6.05\% + (1.80 / \text{Equity Ratio}) \rightarrow 9.69\% = 6.05\% + (1.80 / 49.39\%).$

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.

5 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 capital³ 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:
- 13

Table 1: Summary of the Return on Investor-Supplied Capital

Type of Capital	<u>Ratio</u>	Cost Rate	Weighted Cost Rate
Long-Term Debt Short-Term Debt Common Equity Total	45.58% 5.03% <u>49.39%</u> <u>100.00%</u>	5.78% 4.04% 11.75%	2.63% 0.20% <u>5.80%</u> <u>8.63%</u>

14 Q. Have you prepared an exhibit that supports your recommended return on investor 15 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 DWD2, 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.

1 II. <u>SUMMARY</u>

2 Q. Please summarize your recommended common equity cost rate.

3 A. My recommended common equity cost rate of 11.75% is summarized on page 2 of Schedule 4 1. Because UIF's common stock is not publicly traded, a market-based common equity cost 5 rate cannot be directly observed for the Company. Consequently, I have assessed the marketbased common equity cost rates of companies with relatively similar, but not necessarily 6 7 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 8 principle of fair and reasonable rates of return required by the $Hope^4$ and $Bluefield^5$ decisions, 9 10 adding reliability to the informed expert judgment necessary to arrive at a recommended 11 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 wellrecognized 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:

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).

	Utility Proxy Group
Discounted Cash Flow Model Risk Premium Model	9.07%
Capital Asset Pricing Model	10.91% 10.90%
Cost of Equity Models Applied to Non- Price Regulated Proxy Group	<u>11.48%</u>
Indicated Common Equity Cost Rate before Adjustment	10.75%
Business Risk Adjustment	<u>1.00%</u>
Recommended Common Equity Cost Rate	<u>11.75%</u>

Table 2: Summary of Common Equity Cost Rate

2 After reviewing the cost rates based on these models, I conclude that the indicated 3 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 4 5 below. Thus, the indicated common equity cost rate of 10.75% based solely on the Utility 6 Proxy Group must be adjusted upward by 1.00% to reflect UIF's increased unique business 7 risk, as noted above. The details of this adjustment will be discussed below. After adjustment, 8 my recommended Company-specific risk-adjusted common equity cost rate applicable to UIF 9 is 11.75%.

10 III. <u>GENERAL PRINCIPLES</u>

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."

17 The cost of capital is based on the economic principle of "opportunity cost," meaning 18 that investing in any asset or security implies a forgone opportunity to invest in alternative

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assets or securities. The opportunity cost of an investment should equal the return available on investments of comparable risk.

3 Although both debt and equity have costs, those costs differ fundamentally. The cost 4 of debt is often contractually defined and can be directly observed in the market as the interest 5 rate or yield on debt securities. In contrast, the cost of equity is not normally contractually 6 defined nor can it be directly observed in the market. Rather, because common equity investors 7 have a claim on a firm's cash flows only after debt holders are paid, it is the uncertainty (or 8 risk) associated with the equity investors' lower priority or junior position to receive those 9 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 10 11 debt holders. In that sense, common equity and debt investors are distinct: they invest in 12 different securities, face different risks, and require different returns. That is not to say that the 13 risks facing debt and equity investors are completely separate and distinct; the two may share 14 common risks, but only to a point. Therefore, commentary from both debt and equity analysts 15 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.

5 In rate base/rate of return regulation, the authorized return on common equity is defined 6 as the investor-required return. In turn, the investor-required return is defined as the return 7 required by the investor on the funds invested in the publicly traded common stocks of firms. 8 As stated previously, the cost of common equity is not directly observable in the capital markets 9 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. 10 11 Therefore, the cost of common equity must be estimated from market (economic and financial) 12 data, using financial models developed for that purpose, such as the CAPM, DCF, and RPM. 13 Therefore, my recommended common equity cost rate is based on the marketplace data of a 14 proxy group of utilities that are as similar in risk as possible to UIF based on selection criteria 15 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.
- 3 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

1 cash flow brought about by economic or regulatory factors, long-term business risks reflect the 2 prospect of an impaired ability of investors to earn a return on and of their invested capital. 3 Moreover, because water utilities accept the obligation to provide safe, adequate, and reliable 4 water service at all times (in exchange for the opportunity to earn a fair and reasonable return 5 on their investment), they generally do not have the option to delay, defer, or reject required 6 long-term capital investments in order to comply with Safe Drinking Water Act ("SDWA") 7 standards. Those investments are generally capital-intensive, and water utilities therefore 8 cannot choose to avoid raising external funds during periods of capital market distress.

9 Because water utilities invest in long-lived assets, long-term business risks are of 10 considerable concern to equity investors. That is, the risk of not recovering the return on and 11 of their investment extends far into the future. But, the timing and nature of events that may 12 lead to losses are also uncertain. Consequently, those risks and their implications for the 13 required return on equity tend to be difficult to quantify. That does not mean, however, that 14 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 15 16 their capital) regulatory commissions, like the FL PSC, must review a variety of quantitative 17 and qualitative data, applying their reasoned judgment to determine how long-term risks weigh 18 in their assessment of the market-required return on equity.

19 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 1 in consumers.

2	Increasingly stringent environmental standards necessitate additional capital
3	investment in the treatment and distribution of water, thereby increasing the pressure on water
4	utilities' free cash flow through increased capital expenditure for infrastructure, repair, and
5	replacement. In addition, the United States Environmental Protection Agency and individual
6	state and local environmental agencies continually monitor potential contaminants in the water
7	supply and promulgate or expand regulations when necessary. In the course of procuring water
8	supplies and treating water so that it complies with SDWA standards, water utilities have an
9	ever-increasing responsibility to be stewards of the environment from which supplies are
10	drawn in order to preserve and protect essential natural resources.
11	Water utilities are typically vertically engaged in the entire process of acquiring supply,
12	producing, treating, and distributing water, serving both a production function and a delivery
13	function. Accordingly, water utilities require significant capital investment, not only in
14	transmission and distribution systems, but also in sources of supply (surface and groundwater),
15	production (wells), treatment, and storage. Significant capital investment is necessary to serve
16	additional customers and to replace aging systems, creating a major risk factor for the water
17	utility industry.
18	Value Line Investment Survey ("Value Line") observes the following about the water
19	utility industry:
20 21 22 23 24 25 26 27 28	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.

29

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1Probably the prime reason for water utility stocks performing so well over the2past five years has been due to constructive regulation. Unlike, electric utilities,3for example, both sides are basically in agreement that upgrades are required and4ratepayers['] bills will have to [be] raised. Investors should be aware of what5can happen when authorities and utilities do not work as partners (i.e. the Electric6Utility Industry). As of now, we see no signs of rifts between the water group7and regulators.⁶

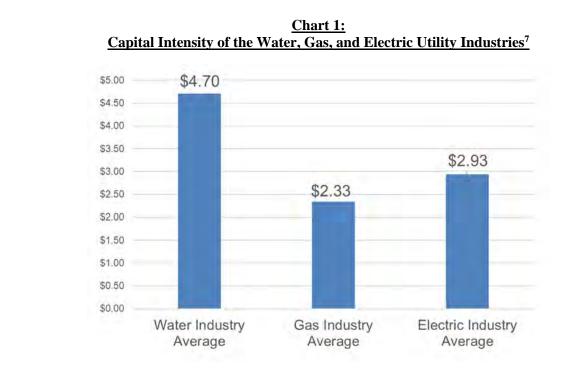
8 Q. Please discuss the capital intensity of the water utility industry relative to other utility

9 industries.

As a capital-intensive industry, water utilities require significantly greater capital investment 10 A. 11 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 12 net utility plant on average to produce \$1.00 in operating revenues in 2019 for the water utility 13 14 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 15 16 needs have increased and will continue to increase, the competition for capital from traditional 17 sources has increased and continues to increase, making the need to maintain financial integrity and the ability to attract needed new capital increasingly important. 18

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Value Line Investment Survey, April 10, 2020. [clarification added]



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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.

9 Substantial water utility investment and expenditures require significant financing. The 10 three sources typically used for financing are debt, equity (common and preferred), and cash 11 flow from operations. All three are intricately linked to the opportunity to earn a sufficient rate 12 of return on investment and the ability to actually achieve that return. The return must be 13 sufficient to maintain credit quality and enable the water utility to attract necessary new capital, 14 be it debt or equity capital. If unable to raise debt or equity capital, the water utility must turn 15 to either retained earnings or free cash flow⁸, both of which are directly linked to earning a

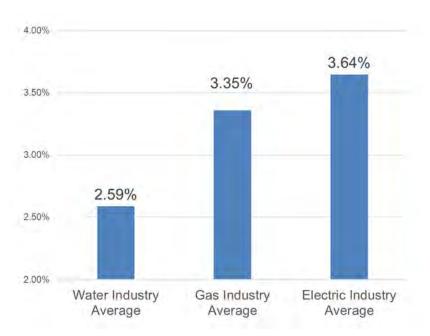
⁷ SNL Financial, Company SEC Form 10-Ks.

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.

8 Q. Please continue your discussion of business risks.

9 In addition to its capital-intensive nature, the water utility industry also experiences low A. 10 depreciation rates. Given that depreciation is one of the principal sources of internally-11 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 12 13 and, hence, long capital recovery periods, utilities face increased risk due to inflation, which 14 results in a significantly higher cost to replace a decades-old utility plant where original cost 15 was a small fraction of the cost of the plant to replace it. As shown on Chart 2, below, water 16 utilities experienced a depreciation rate of 2.59% for 2019. In contrast, in 2019, the natural 17 gas and electric utilities experienced average depreciation rates of 3.35% and 3.64%, 18 respectively. Low depreciation rates signify that the pressure on cash flow remains 19 significantly greater for water utilities than for other gas and electricity utilities, on average.



<u>Chart 2:</u> <u>Depreciation Rates of the Water, Gas, and Electric Utility Industries</u>⁹

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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.

10

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 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

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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).
- 12 However, one must keep in mind that a long-term credit or bond issue rating is an 13 opinion regarding the particular company's overall financial capacity to pay its financial 14 obligations as they become due and payable. It is not an assessment of the risk faced by equity 15 investors. The claims of equity holders are subordinate to the claims of debt holders, including 16 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 17 18 thus have higher credit/bond ratings), common equity holders bear the residual risk of 19 insufficient or volatile cash flows in perpetuity. For that fundamental reason, the risks of 20 owning common equity do not directly correspond to the risks of owning bonds.
- 21

IV. UTILITIES, INC. OF FLORIDA AND THE UTILITY PROXY GROUP

22 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.

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1	Q.	Please explain how you chose the Utility Proxy Group.
2	A.	I chose the Utility Proxy Group by selecting those water companies that met the following
3		criteria:
4		1) They are included in the Water Utility Group of <i>Value Line's</i> Standard Edition (April
5		10, 2020);
6		2) They have 70% or greater of 2019 total operating income derived from, and 70% or
7		greater of 2019 total assets devoted to, regulated water operations;
8		3) They had not publicly announced involvement in any major merger or acquisition
9		activity (<i>i.e.</i> , one publicly-traded utility merging with or acquiring another) at the
10		time of the preparation of this testimony;
11		4) They have not cut or omitted their common dividends during the past five years or
12		through the time of the preparation of this testimony;
13		5) They have <i>Value Line</i> and Bloomberg adjusted Beta coefficients;
14		6) They have a positive <i>Value Line</i> five-year dividends per share ("DPS") growth rate
15		projection and,
16		7) They have Value Line, Bloomberg, Zacks or Yahoo! Finance, consensus five-year
17		earnings per share ("EPS") growth rate projections.
18		The following seven companies meet these criteria:
19		• American States Water Co. ("AWR");
20		• American Water Works Co. Inc. ("AWK");
21		• California Water Service Corp. ("CWT");
22		• Essential Utilities, Inc. ("WTRG");
23		• Middlesex Water Co. ("MSEX");
24		• SJW Corporation ("SJW"); and
25		• York Water Co. ("YORW").
26	Q.	Have you reviewed financial data for the utility proxy group?
27	A.	Yes. Page 1 of Schedule 2 contains comparative capitalization and financial statistics for the
28		Utility Proxy Group for the years 2015-2019. As shown on page 1, during the five-year period
29		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%.

6 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?
- 9 A. In this instance, I recommend the use of UIF's Parent's 13-month average capital structure
 10 ending December 31, 2019, which consists of 45.58% long-term debt, 5.03% short-term debt,
 11 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% shortterm 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

- 1 appropriate for use in a cost of capital determination for UIF, as they are the actual average
- 2 debt cost rates incurred by UIF's Parent for the 13-months ended December 31, 2019.
- 3 VI. <u>COMMON EQUITY COST RATE MODELS</u>

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

5 A. Yes. Public utilities, like UIF, must compete for equity in capital markets along with 6 all other companies with commensurate risk, which includes non-utilities. The cost of common 7 equity is thus determined based on equity market expectations for the returns of those 8 companies. If an individual investor is choosing to invest their capital among companies with 9 comparable risk, they will choose the company providing a higher return over a company 10 providing a lower return.

11 Q. Are the cost of common equity models you use market-based models?

- 12 A. Yes. The DCF model is market-based in that market prices are used in developing the 13 dividend yield component of the model. The RPM and CAPM are also market-based in that 14 the bond/issuer ratings and expected bond yields/risk-free rate used in the application of the 15 RPM and CAPM reflect the market's assessment of bond/credit risk. In addition, the use of 16 the Beta coefficient to determine the equity risk premium also reflects the market's assessment 17 of market/systematic risk, as Beta coefficients are derived from regression analyses of market 18 prices. Moreover, market prices are used in the development of the monthly returns and equity 19 risk premiums used in the Predictive Risk Premium Model ("PRPM"). Selection criteria for 20 the Non-Price Regulated Proxy Group are based on regression analyses of market prices and 21 reflect the market's assessment of total risk.
- 22

А.

Discounted Cash Flow Model

23 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

1		cash flows at the cost of capital, or the investors' capitalization rate. DCF theory assumes that
2		an investor buys a stock for an expected total return rate which is derived from cash flows
3		received in the form of dividends plus appreciation in market price (the expected growth rate).
4		Mathematically, the dividend yield on market price plus a growth rate equals the capitalization
5		rate (<i>i.e.</i> , the total common equity return rate expected by investors).
6	Q.	Which version of the DCF model do you use?
7	A.	I use the single-stage constant growth DCF model. The single-stage DCF model is expressed
8		as:
9		$K = (D_1 / P_0) + g$
10		Where:
11 12 13 14		K=Cost of Equity Capital D_1 =Expected Dividend Per Share in one year P_0 =Current Market PriceG=Expected Dividend Per Share Growth
15	Q.	Please describe the dividend yield used in your application of the DCF model.
16	A.	The unadjusted dividend yields are based on a recent (April 30, 2020) indicated dividend,
17		divided by the average of closing market prices for the 60 days ending April 30, 2020, as shown
18		in Column [1] on page 1 of Schedule 3.
19	Q.	Please explain the adjusted dividend yield shown in column [7] on page 1 of Schedule 3.
20	A.	Because dividends are paid quarterly, or periodically, as opposed to continuously (daily), an
21		adjustment must be made to the dividend yield. This is often referred to as the discrete, or the
22		Gordon Periodic, version of the DCF model.
23		DCF theory calls for the use of the full expectational growth rate, referred to as D_1 , in
		•
24		calculating the dividend yield component of the model. However, since the various companies
24 25		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

1	yield component, referred to as $D_{1/2}$. This is a conservative approach because it does not
2	overstate the dividend yield, which should be representative of the next 12-month period.
3	Therefore, the actual average dividend yields in Column [1] on page 1 of Schedule 3, have
4	been adjusted upward to reflect one-half the average projected growth rate shown in Column
5	[6].

7

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.
- 14Over the long run, there can be no growth in DPS without growth in EPS. Thus, the15use of earnings growth rate forecasts in a DCF analysis provides a better matching between16investors' market price appreciation expectations and the growth rate component of the DCF.17Therefore, I have relied on security analysts' five-year forecasts of EPS growth in my18application of the DCF model.
- 19 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. <u>The Risk Premium Model</u>

2 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.

9 While it is possible to directly observe bond returns and yields, the investor-required 10 common equity return cannot be directly determined or observed. According to RPM theory, 11 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, 12 13 according to the RPM, the cost of common equity equals the expected cost rate for long-term 14 debt capital plus a risk premium over that cost rate to compensate common shareholders for 15 the added risk of being unsecured and last-in-line for any claim on a corporation's assets and 16 earnings.

17 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.
- 21

Q. Please explain the PRPM.

22 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. <u>The Journal of Regulatory Economics</u> (December 2011), 40:261-278.

Journal ("TEJ"),¹¹ was developed from the work of Robert F. Engle, who shared the Nobel 1 2 Prize in Economics in 2003, "for methods of analyzing economic time series with time-varying ("ARCH")"¹² 3 volatilitv (with "ARCH" standing for autoregressive conditional 4 heteroskedasticity). Engle found that the volatility in market prices, returns, and equity risk 5 premiums cluster over time, making them highly predictable and available to predict future 6 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 <u>estimate</u> of investor behavior, but rather on the evaluation of the <u>actual</u> results of that behavior, *i.e.*, the variance of historical equity risk premiums.

11 The inputs to the model are the historical returns on the common shares of each publicly 12 traded utility in the Utility Proxy Group, minus the historical monthly yield on long-term U.S. 13 Treasury securities, through April 2020. Using a generalized form of ARCH, known as 14 GARCH, each water utility's projected equity risk premium was determined using Eviews[©] 15 statistical software. When the GARCH model is applied to the historical return data, it produces a predicted GARCH variance series¹³ and a GARCH coefficient.¹⁴ The forecasted 16 30-year U.S. Treasury Bond yield of 2.03% is based on consensus forecasts for the six quarters 17 18 ending with the third quarter 2021, derived from the May 1, 2020 Blue Chip Financial 19 Forecasts ("Blue Chip"), averaged with the long-range forecasts for 2021 – 2025 and 2026 – 20 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 21

¹¹ "Comparative Evaluation of the Predictive Risk Premium ModelTM, 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, <u>The Electricity Journal</u> (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.

1 Column [7] on page 2 of Schedule 4. Consistent with my use of the average of the mean and 2 median DCF results, I rely on the average of the mean and median PRPM results of 11.31% as 3 my conclusion of the PRPM equity cost rate, also shown in Column [7] on page 2 of Schedule 4 4.

5

O. Please explain the adjusted total market approach RPM.

6 A. The adjusted total market approach RPM adds a prospective public utility bond yield to the 7 average of: (1) an equity risk premium derived from a beta-adjusted total market equity risk 8 premium and (2) an equity risk premium based on the S&P Utilities Index.

9 Q. Please explain the basis of the adjusted prospective bond yield of 3.82% applicable to the 10 Utility Proxy Group, shown on line 5 on page 3 of Schedule 4.

11 A. The first step in the adjusted total market approach RPM analysis is to determine the expected 12 bond yield. Because both ratemaking and the cost of capital, including the common equity 13 cost rate, are prospective in nature, a prospective yield on long-term debt, similarly rated to the 14 Utility Proxy Group, is essential. Since *Blue Chip* does not publish consensus yield forecasts 15 for the Moody's A-rated public utility bonds, I began with the May 1, 2020 Blue Chip 16 consensus forecast of about 50 economists of the expected yield on Aaa-rated corporate bonds 17 for the six calendar quarters ending with the third calendar quarter of 2021, averaged with the 18 long-range forecasts for 2021 – 2025, and 2026 – 2030, from the December 1, 2019 Blue 19 *Chip.*¹⁵ As shown on line 1 on page 3, the average expected yield on Moody's Aaa-rated 20 corporate bonds is 3.21%. In order to derive a prospective Moody's A-rated public utility bond 21 yield, an adjustment of 0.53%, or the average spread between Moody's Aaa-rated corporate 22 bond yields and Moody's A-rated public utility bond yields for the three months ending April 2020¹⁶ must be made to the average Aaa corporate bond yield, which results in a bond yield of 23

¹⁵ See pages 10 and 11 of Schedule 4.

¹⁶ See page 4 of Schedule 4.

1		3.74% applicable to a Moody's A-rated public utility bond.
2		Because the Utility Proxy Group average Moody's issuer rating is A2/A3, as shown on
3		page 5 of Schedule 4, an 0.08% upward adjustment to the prospective Moody's A-rated public
4		utility bond yield of 3.74% is necessary. The 0.08% represents one-sixth (1/6) of the average
5		spread of 0.46% between Moody's A-rated and Baa-rated public utility bonds for the three
6		months ending April 2020. This is necessary so that the prospective bond yield is consistent
7		with the Utility Proxy Group's average A2/A3 long-term issuer rating. Adding the 0.08% to
8		the 3.74% prospective Moody's A-rated public utility bond yield results in a 3.82% expected
9		bond yield for the Utility Proxy Group, as shown on line 5 on page 3 of Schedule 4.
10	Q.	Please explain the derivation of the beta-derived equity risk premium.
11	A.	The components of the beta-derived risk premium model are: (1) An expected market equity
12		risk premium over corporate bonds, and (2) the Beta coefficient. The derivation of the beta-
13		derived equity risk premium applied to the Utility Proxy Group is shown on lines 1 through 9
14		on page 8 of Schedule 4. The total beta-derived equity risk premium applied is based on an
15		average of three historical data-based equity risk premiums, two Value Line-based equity risk
16		premiums, and one Bloomberg-based equity risk premium. Each of these is described in turn.
17	Q.	How did you derive a market risk premium based on long-term historical data?
18	A.	To derive a historical market equity risk premium, I used the most recent holding period returns
19		for the large company common stocks from the 2020 SBBI® Yearbook: Stocks, Bonds, Bills,
20		and Inflation ("SBBI - 2020") ¹⁷ less the average historical yield on Moody's Aaa/Aa-rated
21		corporate bonds for the period 1928 to 2019. The use of holding period returns over a very
22		long period of time is appropriate because it is consistent with the long-term investment horizon
23		presumed by investing in a going concern, <i>i.e.</i> , a company expected to operate in perpetuity.

¹⁷ <u>SBBI – 2020</u> Appendix A Tables.

1	SBBI's long-term arithmetic mean monthly total return rate on large company common
2	stocks was 11.83% and the long-term arithmetic mean monthly yield on Moody's Aaa/Aa-
3	rated corporate bonds was 6.05%. ¹⁸ As shown on line 1 on page 8 of Schedule 4, subtracting
4	the mean monthly bond yield from the total return on large company stocks results in a long-
5	term historical equity risk premium of 5.78%.

6 I used the arithmetic mean monthly total return rates for the large company stocks and 7 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 8 9 arithmetic mean return rates and yields is appropriate because historical total returns and equity 10 risk premiums provide insight into the variance and standard deviation of returns needed by 11 investors in estimating future risk when making a current investment. If investors relied on the 12 geometric mean of historical equity risk premiums, they would have no insight into the 13 potential variance of future returns because the geometric mean relates the change over many 14 time periods to a constant rate of change, thereby obviating the year-to-year fluctuations, or 15 variance, which is critical to risk analysis.

16 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 <u>SBBI – 2020</u>, at 10-22.

1		market equity risk premium is expressed as a function of the Moody's Aaa/Aa corporate bonds
2		yield:
3		$\mathbf{RP} = \alpha + \beta \; (\mathbf{R}_{\text{Aaa/Aa}})$
4	Q.	Please explain the derivation of the PRPM equity risk premium.
5	A.	I used the same PRPM approach described previously to develop another equity risk premium
6		estimate. The inputs to the model are the historical monthly returns on large company common
7		stocks minus the monthly yields on Aaa/Aa corporate bonds during the period from January
8		1928 through April 2020. ²⁰ Using the previously discussed generalized form of ARCH, known
9		as GARCH, the projected equity risk premium is determined using Eviews [©] statistical
10		software. The resulting PRPM predicted market equity risk premium is 11.95%. ²¹
11	Q.	Please explain the derivation of a projected equity risk premium based on Value Line
12		data for your RPM analysis.
12 13	A.	data for your RPM analysis. As noted previously, because both ratemaking and the cost of capital, including the cost rate
	A.	
13	A.	As noted previously, because both ratemaking and the cost of capital, including the cost rate
13 14	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
13 14 15	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
13 14 15 16	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
13 14 15 16 17	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
13 14 15 16 17 18	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 <i>Value Line</i> for the 13
13 14 15 16 17 18 19	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 <i>Value Line</i> for the 13 weeks ending May 1, 2020, plus an average of the median estimated dividend yield for the

²⁰ Data from January 1926-December 2019 is from <u>SBBI – 2020</u>. 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 vield of 3.21% is deducted from the total market return of 18.71%.

- 2 forecasted Aaa bond yield of 3.21% is deducted from the total market return of 18.71%,
- 3 resulting in an equity risk premium of 15.50%, shown on page 8, line 4 of Schedule 4.
- 4 Q. Please explain the derivation of an equity risk premium based on the S&P 500 composite
 5 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?
- 19 A. I give equal weight to all these market equity risk premiums in arriving at my conclusion of 20 market equity risk premium of 10.71%. After calculating the average market equity risk 21 premium of 10.71%, I adjust it by the Beta coefficient of the Utility Proxy Group to account 22 for the risk of the Group. As discussed below, the Beta coefficient is a meaningful measure of 23 prospective relative risk to the market as a whole and is a logical means by which to allocate a 24 company's or proxy group's share of the market's total equity risk premium, relative to 25 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.

4 Q. How did you derive the equity risk premium based on the S&P utility index and Moody's 5 A-rated public utility bonds?

6 A. I estimate three equity risk premiums based on the S&P Utility Index holding returns, and two 7 equity risk premiums based on the expected returns of the S&P Utilities Index, using Value 8 Line and Bloomberg data, respectively. Turning first to the S&P Utility Index holding period 9 returns, I derive a long-term monthly arithmetic mean equity risk premium between the S&P 10 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 11 data to derive an equity risk premium of 6.68% based on a regression of the monthly equity 12 13 risk premiums. The final S&P Utility Index holding period equity risk premium involves 14 applying the PRPM using the historical monthly equity risk premiums from January 1928 to 15 April 2020 to arrive at a PRPM-derived equity risk premium of 5.95% for the S&P Utility 16 Index.

17I then derive expected total returns on the S&P Utilities Index of 10.50% and 8.97%18using data from *Value Line* and Bloomberg Professional Services, respectively, and subtract19the prospective A2-rated public utility bond yield $(3.74\%)^{24}$, which results in risk premiums of206.76% and 5.23%, respectively. As with the market equity risk premiums, I average all the21risk premiums to arrive at my utility-specific equity risk premium of 5.76%.

As shown on line 1 on page 12 of Schedule 4.

²⁴ Derived on line 3 on page 3 of Schedule 4.

1	Q.	What is your conclusion regarding the appropriate equity risk premium for use in your
2		adjusted total market approach RPM analysis?
3	A.	The equity risk premium applicable to the Utility Proxy Group is 6.68%, derived by averaging
4		the beta-derived premium of 7.60% (line 9 on page 8 of Schedule 4) with the equity risk
5		premium of 5.76% based on the holding period returns of public utilities with Moody's A-rated
б		bonds (line 6 on page 12 of Schedule 4).
7	Q.	What is the RPM-based common equity cost rate based on the adjusted total market
8		approach?
9	A.	It is 10.50% for the Utility Proxy Group as shown on line 7 on page 3 of Schedule 4.
10	Q.	What are the results of your application of the PRPM and the adjusted total market
11		approach RPM?
12	A.	As shown on page 1 of Schedule 4, the indicated RPM-derived common equity cost rate is
13		10.91%, derived by averaging the PRPM results (11.31%) with those based on the adjusted
14		total market approach (10.50%).
15		C. <u>The Capital Asset Pricing Model</u>
16	Q.	Please explain the theoretical basis of the CAPM.
17	A.	CAPM theory defines risk as the co-variability of a security's returns with the market's returns
18		as measured by the Beta coefficient (β). A Beta coefficient of less than 1.0 indicates lower
19		variability while a Beta coefficient greater than 1.0 indicates greater variability than the market.
20		The CAPM assumes that all other risk, <i>i.e.</i> , all non-market or unsystematic risk, can be
21		eliminated through diversification. The risk that cannot be eliminated through diversification
22		is called market or systematic risk. In addition, the CAPM presumes that investors require
23		compensation only for those systematic risks that are the result of macroeconomic and other
24		events that affect the returns on all assets. The model is applied by adding a risk-free rate of
25		return to a market risk premium, which is adjusted proportionately to reflect the systematic risk

1	of the individual security relative to the total market, as measured by Beta coefficient. The
2	traditional CAPM model is expressed as:
3 4 5 6 7 8	$\begin{array}{llllllllllllllllllllllllllllllllllll$
9	Numerous tests of the CAPM have measured the extent to which security returns and
10	Beta coefficients are related, as predicted by the CAPM, confirming the CAPM's validity. The
11	empirical CAPM ("ECAPM") reflects the reality that, while the results of these tests support
12	the notion that the Beta coefficient is related to security returns, the empirical Security Market
13	Line ("SML") described by the CAPM formula is not as steeply sloped as the predicted SML.
14	Morin ²⁵ states:
15 16 17 18	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.
19 20	* * *
21 22 23	Therefore, the empirical evidence suggests that the expected return on a security is related to its risk by the following approximation:
24 25	$K = R_F + x β(R_M - R_F) + (1-x) β(R_M - R_F)$
26 27 28 29	where x is a fraction to be determined empirically. The value of x that best explains the observed relationship Return = $0.0829 + 0.0520 \beta$ is between 0.25 and 0.30. If x = 0.25, the equation becomes:
30 31	$K = R_F + 0.25(R_M - R_F) + 0.75 \ \beta(R_M - R_F)$
32	In view of theory and practical research, I have applied both the traditional CAPM and
33	the ECAPM to the companies in the Utility Proxy Group and averaged the results.

Roger A. Morin, <u>New Regulatory Finance</u>, Public Utility Reports, 2006, at 175, 190. 32

1 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.

7 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.

22 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.

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.

4 The long-term income return on U.S. Government Securities of 5.09% was deducted 5 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 6 7 monthly annualized historical returns on the S&P 500 relative to historical yields on long-term 8 U.S. Government Securities from <u>SBBI - 2020</u>. That regression analysis yielded a market 9 equity risk premium of 10.26%. The PRPM market equity risk premium is 13.44% and is 10 derived using the PRPM relative to the yields on long-term U.S. Treasury securities from 11 January 1926 through April 2020.

12 The *Value Line*-derived forecasted total market equity risk premium is derived by 13 deducting the forecasted risk-free rate of 2.03%, discussed above, from the *Value Line* 14 projected total annual market return of 18.71%, resulting in a forecasted total market equity 15 risk premium of 16.68%. The S&P 500 projected market equity risk premium using *Value* 16 *Line* data is derived by subtracting the projected risk-free rate of 2.03% from the projected total 17 return of the S&P 500 of 14.79%. The resulting market equity risk premium is 12.76%.

18 The S&P 500 projected market equity risk premium using Bloomberg data is derived 19 by subtracting the projected risk-free rate of 2.03% from the projected total return of the S&P 20 500 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

<u>SBBI – 2020</u>, at Appendix A-1 (1) through A-1 (3) and Appendix A-7 (19) through A-7 (21).

1	Q.	What are the results of applying the traditional and empirical CAPM to the Utility Proxy
2		Group?
3	A.	As shown in Column [8] on page 1 of Schedule 5, the average and median CAPM/ECAPM
4		equity cost rate is 10.90%.
5		D. <u>Common Equity Cost Rates for a Proxy Group of Domestic, Non-Price Regulated</u>
6		Companies Based on the DCF, RPM, and CAPM
7	Q.	Why do you also consider a proxy group of domestic, non-price regulated companies?
8	A.	In the Hope and Bluefield cases, the U.S. Supreme Court did not specify that comparable risk
9		companies had to be utilities. Since the purpose of rate regulation is to be a substitute for
10		marketplace competition, non-price regulated firms operating in the competitive marketplace
11		make an excellent proxy if they are comparable in total risk to the Utility Proxy Group being
12		used to estimate the cost of common equity. The selection of such domestic, non-price
13		regulated competitive firms theoretically and empirically results in a proxy group which is
14		comparable in total risk to the Utility Proxy Group, since all of these companies compete for
15		capital in the exact same markets.
16	Q.	How did you select non-price regulated companies that are comparable in total risk to
17		the Utility Proxy Group?
18	A.	In order to select a proxy group of domestic, non-price regulated companies similar in total
19		risk to the Utility Proxy Group, I relied on the Beta coefficients and related statistics derived
20		from Value Line regression analyses of weekly market prices over the most recent 260 weeks
21		(<i>i.e.</i> , five years). These selection criteria resulted in a proxy group of 12 domestic, non-price
22		regulated firms comparable in total risk to the Utility Proxy Group. Total risk is the sum of
23		non-diversifiable market risk and diversifiable company-specific risks. The criteria used in
24		selecting the domestic, non-price regulated firms was:
25		1) They must be covered by Value Line Investment Survey (Standard Edition);

1		2) They must be domestic, non-price regulated companies, <i>i.e.</i> , not utilities;
2		3) Their Beta coefficients must lie within plus or minus two standard deviations of the
3		average unadjusted Beta coefficients of the Utility Proxy Group; and
4		4) The residual standard errors of the Value Line regressions which gave rise to the
5		unadjusted Beta coefficients must lie within plus or minus two standard deviations of
6		the average residual standard error of the Utility Proxy Group.
7		Beta coefficients measure market, or systematic, risk, which is not diversifiable. The
8		residual standard errors of the regressions measure each firm's company-specific, diversifiable
9		risk. This is demonstrated clearly by Jack C. Francis on page 273 of Investments: Analysis
10		and Management, where he states "Total risk can be measured by the variance of returns,
11		denoted $Var(r)$. This measure of total risk is partitioned into its systematic and unsystematic
12		components."28 Essentially, companies that have similar betas and standard errors of
13		regression have similar total investment risk.
14	Q.	Have you prepared a schedule which shows the data from which you selected the 12
14 15	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
	Q.	
15	Q. A.	domestic, non-price regulated companies that are comparable in total risk to the Utility
15 16		domestic, non-price regulated companies that are comparable in total risk to the Utility Proxy Group?
15 16 17		domestic, non-price regulated companies that are comparable in total risk to the UtilityProxy Group?Yes, the basis of my selection and both proxy groups' regression statistics are shown in
15 16 17 18	A.	domestic, non-price regulated companies that are comparable in total risk to the UtilityProxy Group?Yes, the basis of my selection and both proxy groups' regression statistics are shown inSchedule 6.
15 16 17 18 19	A.	 domestic, non-price regulated companies that are comparable in total risk to the Utility Proxy Group? Yes, the basis of my selection and both proxy groups' regression statistics are shown in Schedule 6. Did you calculate common equity cost rates using the DCF model, RPM, and CAPM for
15 16 17 18 19 20	А. Q.	 domestic, non-price regulated companies that are comparable in total risk to the Utility Proxy Group? Yes, the basis of my selection and both proxy groups' regression statistics are shown in Schedule 6. Did you calculate common equity cost rates using the DCF model, RPM, and CAPM for the Non-Price Regulated Proxy Group?
15 16 17 18 19 20 21	А. Q.	 domestic, non-price regulated companies that are comparable in total risk to the Utility Proxy Group? Yes, the basis of my selection and both proxy groups' regression statistics are shown in Schedule 6. Did you calculate common equity cost rates using the DCF model, RPM, and CAPM for the Non-Price Regulated Proxy Group? Yes. Because the DCF model, RPM, and CAPM have been applied in an identical manner as
15 16 17 18 19 20 21 22	А. Q.	 domestic, non-price regulated companies that are comparable in total risk to the Utility Proxy Group? Yes, the basis of my selection and both proxy groups' regression statistics are shown in Schedule 6. Did you calculate common equity cost rates using the DCF model, RPM, and CAPM for the Non-Price Regulated Proxy Group? 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.

²⁸ Jack C. Francis, <u>Investments: Analysis and Management</u> 5th (McGraw-Hill, 1991) at 273 (italics in original).

1 companies.

2		Page 2 of Schedule 7 derives the constant growth DCF model common equity cost rate.
3		As shown, the indicated common equity cost rate, using the constant growth DCF for the Non-
4		Price Regulated Proxy Group comparable in total risk to the Utility Proxy Group, is 8.41%.
5		Pages 3 through 5 of Schedule 7 contain the data and calculations that support the
б		13.12% RPM common equity cost rate. As shown on line 1, page 3 of Schedule 7, the
7		consensus prospective yield on Moody's Baa-rated corporate bonds for the six quarters ending
8		in the third quarter of 2021, and for the years $2021 - 2025$ and $2026 - 2030$, is 4.55% . ²⁹ When
9		the beta-adjusted risk premium of 8.57% ³⁰ relative to the Non-Price Regulated Proxy Group is
10		added to the prospective Baa2-rated corporate bond yield of 4.55%, the indicated RPM
11		common equity cost rate is 13.12%.
12		Page 6 of Schedule 7 contains the inputs and calculations that support my indicated
13		CAPM/ECAPM common equity cost rate of 11.83%.
14	Q.	What is the cost rate of common equity based on the Non-Price Regulated Proxy Group?
15	A.	As shown on page 1 of Schedule 7, the results of the common equity models applied to the
16		Non-Price Regulated Proxy Group which group is comparable in total risk to the Utility
17		Proxy Group are as follows: 8.41% (DCF), 13.12% (RPM), and 11.83% (CAPM). The
18		average of the mean and median of these models is 11.48%, which I used as the indicated
19		common equity cost rate for the Non-Price Regulated Proxy Group.

Blue Chip Financial Forecasts, December 1, 2019, at page 14 and May 1, 2020, at page 2. Derived on page 4 of Schedule 7. 29

³⁰

1 VII. INDICATED COMMON EQUITY COST RATE BEFORE ADJUSTMENT FOR 2 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:

10 1) No single model is so inherently precise that it can be relied on solely to the 11 exclusion of other theoretically sound models;

- 12 2) All of the models are market-based;
- 133) The use of multiple models adds reliability to the estimation of the common equity14cost rate; and
- 15
 4) The prudence of using multiple cost of common equity models is supported in both
 the financial literature and regulatory precedent.
- 17 Based on these common equity cost rate results, I conclude that a common equity cost
- 18 rate of 10.75% is indicated for the Utility Proxy Group before determining if there need to be
- 19 any Company-specific adjustments.
- 20 A. Company-Specific Risk Adjustments
- 21

1. <u>Business Risk Adjustment</u>

22 Q. Does UIF's smaller size compared with the Utility Proxy Group increase its business risk?

- 23 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.
- 25 Size affects business risk because smaller companies generally are less able to cope 26 with significant events that affect sales, revenues and earnings. For example, smaller

1	companies face more risk exposure to business cycles and economic conditions, both nationally
2	and locally. Additionally, the loss of revenues from a few larger customers would have a
3	greater effect on a small company than on a bigger company with a larger, more diverse,
4	customer base.
5	As further evidence illustrates that smaller firms are riskier, investors generally demand
6	greater returns from smaller firms to compensate for less marketability and liquidity of their
7	securities. Duff & Phelps 2019 Valuation Handbook Guide to Cost of Capital - Market Results
8	through 2018 ("D&P - 2019") discusses the nature of the small-size phenomenon, providing
9	an indication of the magnitude of the size premium based on several measures of size. In
10	discussing "Size as a Predictor of Equity Premiums," <u>D&P - 2019</u> states:
11 12 13 14 15 16 17 18	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 <i>predictor</i> of equity returns. In other words, there is a significant (negative) relationship between size and historical equity returns - as size <i>decreases</i> , returns tend to <i>increase</i> , and vice versa. (footnote omitted) (emphasis in original) ³¹
19	Furthermore, in "The Capital Asset Pricing Model: Theory and Evidence," Fama and
20	French note size is indeed a risk factor which must be reflected when estimating the cost of
21	common equity. On page 14, they note:
22 23 24 25	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
26	Based on this evidence, Fama and French proposed their three-factor model which
27	includes a size variable in recognition of the effect size has on the cost of common equity.

³¹ Duff & Phelps <u>2019 Valuation Handbook Guide to Cost of Capital - Market Results through 2018</u>, 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.

1		Also, it is a basic financial principle that the use of funds invested, and not the source
2		of funds, is what gives rise to the risk of any investment. ³³ Eugene Brigham, a well-known
3		authority, states:
4 5 7 8 9 10 11		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
12		Consistent with the financial principle of risk and return discussed above, increased
13		relative risk due to small size must be considered in the allowed rate of return on common
14		equity. Therefore, the Commission's authorization of a cost rate of common equity in this
15		proceeding must appropriately reflect the unique risks of UIF's, including its small size, which
16		is justified and supported above by evidence in the financial literature.
17	Q.	Is there a way to quantify an adjustment to compensate UIF for greater business risk due
18		to its smaller size relative to the Utility Proxy Group?
19	A.	Yes. UIF has greater relative risk than the average utility in the Utility Proxy Group because
20		of its smaller size compared with the Utility Proxy Group, as measured by an estimated market
21		capitalization of common equity for UIF.

³³ Brealey, Richard A. and Myers, Stewart C., <u>Principles of Corporate Finance</u> (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

1

2

		Times Greater
	Market	Than
	Capitalization*	The Company
	(\$ Millions)	
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 <u>billion</u> 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 7 8 10.75% to reflect UIF's greater risk due to their smaller relative size. The determination is 9 based on the size premiums for portfolios of the New York Stock Exchange, American Stock 10 Exchange, and NASDAQ listed companies ranked by deciles for the 1926 to 2019 period as 11 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 12 Company's estimated market capitalization of \$196.004 million places it in the 10th decile. 13 The size premium spread between the 4^{th} decile and the 10^{th} decile is 4.20% as shown on the 14 15 top half of page 1 of Schedule 8. Even though a 4.20% upward size adjustment is indicated, I 16 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.

1	Q.	Did you evaluate UIF's parent, CRU-US's estimated market capitalization compared to
2		the proxy group?
3	A.	Yes. Even though I do not think it is applicable, ³⁶ I looked at CRU's common equity balance
4		at December 31, 2019. I then adjusted it by the proxy group market-to-book ratio and
5		compared it with the proxy group. CRU-US's estimated market capitalization, \$944.372
б		million, ³⁷ would fall in the 8 th decile, which would indicate a 0.80% size premium over the
7		average proxy group company.
8	Q.	Does the FL ROE Formula allow for adjustments for increased risks of small utilities?
9	A.	Yes, it does. Order No. PSC-2019-0267-PAA-WS states the following:
10 11 12		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.
13 14 15 16		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]
17		In view of the all of the above, and especially given CRU-US's debt was privately
18		placed, my 1.00% upward adjustment to reflect the increased risk of UIF relative to the Utility
19		Proxy Group is both reasonable and conservative.
20	VIII.	CONCLUSION
21	Q.	What is your recommended return on investor-supplied capital for UIF?
22	A.	Given the Company's 13-month average balances of investor-supplied capital ending
23		December 31, 2019 which consists of 45.58% long-term debt at an embedded debt cost rate of
24		5.78%, 5.03% short-term debt at an embedded debt cost rate of 4.04%, and 49.39% common
25		equity at my recommended ROE of 11.75%, I conclude that an appropriate return on investor-
36	It is M	r. D'Ascendis' opinion that the parent company's size is irrelevant in setting rates for one of its jurisdictional

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

1	supplied capital for the Company is 8.63%. A common equity cost rate of 11.75% is consistent
2	with the Hope and Bluefield standard of a just and reasonable return which ensures the integrity
3	of presently invested capital and enables the attraction of needed new capital on reasonable
4	terms. It also ensures that UIF will be able to continue providing safe, adequate and reliable
5	water service to the benefit of customers. Thus, it balances the interests of both customers and
б	the Company.

- 7 Q. Does that conclude your direct testimony?
- 8 A. Yes
- 9

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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

Docket No. 20200139-WS Summary of Experience Exhibit DWD-1 Page 1 of 4

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

Recent Expert Testimony Submission/Appearances

Jurisdiction

- Massachusetts Department of Public Utilities
- New Jersey Board of Public Utilities
- Hawaii Public Utilities Commission
- South Carolina Public Service Commission
- American Arbitration Association

Financial Modeling Valuation

- Regulatory Strategy
- Rate Case Support

Topic Rate of Return Rate of Return Cost of Service, Rate Design Return on Common Equity

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.



- Rate of Return
- Cost of Service
- Rate Design



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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		
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 C	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 C	Commission					
Tidewater Utilities, Inc.	11/13	Tidewater Utilities, Inc.	Docket No. 13-466	Capital Structure		
Hawaii Public Utilities Cor	nmission					
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 Commi	ssion					
Utility Services of Illinois,				Cost of Service / Rate		
Inc.	11/17	Utility Services of Illinois, Inc.	Docket No. 17-1106	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		Γ	1		
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 Com				-1		
Atmos Energy	07/19	Atmos Energy	19-ATMG-525-RTS	Rate of Return		
Louisiana Public Service (Commission			1		
Louisiana Water Service, Inc.	06/13	Louisiana Water Service, Inc.	Docket No. U-32848	Rate of Return		
Maryland Public Service C	1			1		
FirstEnergy, Inc.	08/18	Potomac Edison Company	Case No. 9490	Rate of Return		
Massachusetts Departmer	nt of Public U	tilities				
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	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 Co	ommission		-	-		
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 Publ	ic 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 Co	mmission					
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	on of Ohio		-	-		
Aqua Ohio, Inc.	05/16	Aqua Ohio, Inc.	Docket No. 16-0907-WW- AIR	Rate of Return		
Pennsylvania Public Utility	y Commissio	1				
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		



KyPSC Case No. 2021-00190 STAFF-DR-03-011 Attachment 3 Page 48 of 88 Docket No. 20200139-WS Summary of Experience Exhibit DWD-1 Page 4 of 4

Sponsor	Date	Case/Applicant	DOCKET NO.	SUBJECT
Veolia Energy			Docket No. R-2017-	
Philadelphia, Inc.	06/17	Veolia Energy Philadelphia, Inc.	2593142	Rate of Return
Emporium Water			Docket No. R-2014-	
Company	07/14	Emporium Water Company	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 Serv	vice Commis	sion	·	
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,	09/13	United Utility Companies, Inc.	Docket No. 2013-199-WS	Rate of Return
Inc.	09/13	, , , , , , , , , , , , , , , , , , ,	DUCKELINU. 2013-199-WS	
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,	0//10			
Inc.	11/12	Tega Cay Water Services, Inc.	Docket No. 2012-177-WS	Capital Structure
Virginia State Corporation	Commission			1 1
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		-		Rate of Return / Rate
Service Corp.	08/14	Massanutten Public Service Corp.	PUE-2014-00035	Design

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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

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Utilities, Inc. of Florida Table of Contents to Exhibit DWD-2

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<u>Utilities, Inc of Florida</u> Recommended Capital Structure and Cost Rates for Ratemaking Purposes <u>at December 31, 2019</u>

Type Of Capital	Ratios (1)	Cost Rate		Weighted Cost Rate
Long-Term Debt Short-Term Debt Common Equity	45.58% 5.03% 49.39%	5.78% 4.04% 11.75%	(1) (1) (2)	2.63% 0.20% 5.80%
Total	100.00%		-	8.63%

Notes:

(1) Company-provided.

(2) From page 2 of this Schedule.

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<u>Utilities, Inc of Florida</u> 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%
Nataa (1) Errore Cale adula 2	

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.

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Proxy Group of Seven Water Companies CAPITALIZATION AND FINANCIAL STATISTICS (1) 2014 - 2018, Inclusive

	<u>2019</u>		2018 (MII	<u>2017</u> LIONS OF DOI	LARS	2016	2015	
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 TOTAL CAPITAL EMPLOYED	\$189.862 \$4,078.085		\$184.221 \$3,392.857	\$185.250		\$152.691 \$2,832.709	\$106.277 \$2,642.072	
TOTAL CALITAL EMILIOTED	\$ 1 ,070.005		\$5,572.057	\$3,022.707		\$2,032.707	\$2,042.072	
INDICATED AVERAGE CAPITAL COST RATES (2)								
TOTAL DEBT	4.30		4.75 %			4.943 %		
PREFERRED STOCK	5.84	%	5.92 %	5.9	1 %	5.91 %	6 5.91 %	
CAPITAL STRUCTURE RATIOS								<u>5 YEAR</u> AVERAGE
BASED ON TOTAL PERMANENT CAPITAL:								TIVEIUIGE
LONG-TERM DEBT	47.17	%	45.15 %	45.5	3 %	46.14 %	6 46.49 %	46.11 %
PREFERRED STOCK	0.06		0.09	0.1)	0.11	0.11	0.09
COMMON EQUITY	52.77		54.76	54.3		53.75	53.40	53.80
TOTAL	100.00	_%_	100.00 %	100.0	0%	100.00 %	% <u>100.00</u> %	100.00 %
BASED ON TOTAL CAPITAL:	50.61	07	40.27.0	40.0	2.07	40.42.0	4777.0	40.02.0/
TOTAL DEBT, INCLUDING SHORT-TERM PREFERRED STOCK	50.61 0.06	%	48.37 % 0.08	5 48.9 0.0		48.42 % 0.10	6 47.77 % 0.11	0 48.82 % 0.09
COMMON EQUITY	49.34		51.54	50.9		51.47	52.12	51.09
TOTAL	100.00	- 06 -	100.00 %			100.00 9		
101111	100.00	= '''=	100.00 //	10010	= /0 =	100100	100100 //	100100 /0
FINANCIAL STATISTICS								
FINANCIAL RATIOS - MARKET BASED								
EARNINGS / PRICE RATIO	2.67	%	6.31 %	5 7.91	%	3.97 9	6 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
DATE OF DETUDN ON AVEDACE DOOV COMMON FOURTY	9.49	07	10.12 %	5 11.31	07	10.93 9	6 10.39 %	10.45 %
RATE OF RETURN ON AVERAGE BOOK COMMON EQUITY	9.49	90	10.12 %) 11.51	90	10.93 %	0 10.39 %	10.45 %
TOTAL DEBT / EBITDA (3)	5.54	х	4.22 x	3.42	х	3.41 x	3.42 x	4.00 x
FUNDS FROM OPERATIONS / TOTAL DEBT (4)	14.49	%	21.37 %	22.87	%	23.65 %	6 25.81 %	21.64 %
	FO	-	10.05		-	10.15		10.00
<u>TOTAL DEBT / TOTAL CAPITAL</u>	50.61	%	48.37 %	48.93	%	48.42 %	6 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 (a) computer by leading actual rola user interest or preferred stock invitations booked to average or begins 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

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Capital Structure Based upon Total Permanent Capital for the Proxy Group of Seven Water Companies <u>2014 - 2018, Inclusive</u>

						<u>5 YEAR</u>
	<u>2019</u>	<u>2018</u>	2017	<u>2016</u>	2015	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 %
<u>California Water Service Group</u>						
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

Indicated Common Equity Cost Rate Using the Discounted Cash Flow Model for Proxy Group of Seven Water Companies Utilities, Inc of Florida

[8]		7.66 % 10.05 10.16 9.44 6.05 9.87 7.66 8.70 % 9.44 %
[7]	Adjusted Dividend Yield (4)	1.49 % 1.80 1.73 2.19 1.70 2.12 1.71 Average Median
[9]	Average Projected Five Year Growth in EPS (3)	6.17 % 8.25 8.43 7.25 4.35 7.75 5.95
[5]	Bloomberg Projected Five Year Growth in EPS	6.00 % 8.19 9.00 6.69 NA 7.00 NA
[4]	Yahoo! Finance Projected Five Year Growth in EPS	6.00 % 8.20 9.80 6.40 2.70 4.90
[3]	Zack's Five Year Projected Growth Rate in EPS	NA %810 8.10 5.90 NA 4.00 NA NA
[2]	Value Line Projected Five Year Growth in EPS (2)	6.50 % 8.50 6.50 6.00 6.00 7.00
[1]	Average Dividend Yield (1)	1.45 % 1.73 1.66 2.11 1.66 2.04 1.66
	Proxy Group of Seven Water Companies	American States Water Co. American Water Works Company Inc California Water Service Group Essential Utilities, Inc. Middlesex Water Co. SJW Group York Water Co.

NA= Not Available

%

9.07

Average of Mean and Median

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.

reflect the periodic payment of dividends (Gordon Model) as opposed to the continuous payment. Thus, for American (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 States Water Co., 1.45% x (1+(1/2 x 6.17%)) = 1.49%.

(5) Column 5 + column 6.

Source of Information:

www.yahoo.com Downloaded on 04/30/2020 www.zacks.com Downloaded on 04/30/2020 **Bloomberg Professional Services** Value Line Investment Survey

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6.81	7.03	-	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		es per sh	00. 220	16.4
1.11	1.32		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 F	low" per s		4.5
.53 .44	.66 .45		.81	.78 .50	.81 .51	1.11 .52	1.12 .55	1.41 .64	1.61 .76	1.57 .83	1.61 .87	1.62 .91	1.88 .99	1.72 1.06	2.28 1.16	2.25 1.25	2.40 1.35		s per sh A cl'd per s		2.9 1.8
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 Sp	ending pe	er sh	3.7
7.51 33.50	7.86		8.77 34.46	8.97 34.60	9.70 37.06	10.13 37.26	10.84 37.70	11.80 38.53	12.72 38.72	13.24 38.29	12.77 36.50	13.52 36.57	14.45 36.68	15.19 36.76	16.33 36.85	17.15 37.00	18.10 37.25		lue per sh n Shs Out		21.3 37.5
23.2	21.9		24.0	22.6	21.2	15.7	15.4	14.3	17.2	20.1	24.6	25.6	25.7	36.76	30.00	Bold fig	ires are		i'l P/E Rat		23
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 estim	Line	Relative	P/E Ratio		1.
3.6%	3.1%		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%			-	i'l Div'd Yi	eld	2.6
otal De	ebt \$286	CTURE a	Due in 5 N	/rs \$6.9 r		398.9 41.4	419.3 42.0	466.9 54.1	472.1 62.7	465.8 61.1	458.6 60.5	436.1 59.7	440.6 69.4	436.8 63.9	473.9 84.3	480 83.0	495 90.0	Revenue Net Prof			6 1
T Debt	\$281.0		T Interes 32% of C	st \$24.5 m an'l)	nill.	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% 44.3%	2.0% 45.4%	2.5% 42.2%	39.8%	 39.1%	41.1%	 39.4%	38.0%	2.5% 40.5%		1.0% 46.0%	1.0% 47.0%		% to Net F rm Debt F		1.0 49.5
		italized: / s-12/19 \$			mili.	44.3 % 55.7%	40.4 % 54.6%	42.2 % 57.8%	60.2%	60.9%	41.1% 58.9%	60.6%	62.0%	40.5 % 59.5%	44.4 % 55.6%	40.0 % 54.0%	53.0%		n Equity F		49.5
fd Stor	ck None		Oblig. \$2	31.9 mill.		677.4	749.1	787.0	818.4	832.6	791.5	815.3	854.9	938.4	1082.5	1180	1275		pital (\$mi	II)	156
						855.0 7.6%	896.5 7.1%	917.8 8.3%	981.5 8.9%	1003.5 8.6%	1060.8 9.0%	1150.9 8.6%	1205.0 9.3%	1296.3 7.9%	1415.7 8.9%	1485 8.0%	1590 8.0%	Net Plan	it (\$mill) on Total Ca	an'l	170 8.5
ommo s of 2/2		(36,859,5	605 shs.			11.0%	10.3%	11.9%	12.7%	12.0%	13.0%	12.1%	13.1%	11.4%	14.0%	13.0%	13.5%		n Shr. Eq		14.0
		\$3.1 billi	on (Mid (Can)		11.0%	10.3%	11.9%	12.7%	12.0%	13.0%	12.1%	13.1%	11.4%	14.0%	13.0%	13.5%		on Com Ed		14.0
	NT POS		2017	2018 1	2/31/19	5.8% 47%	5.3% 49%	6.6% 45%	6.8% 47%	5.7% 53%	6.0% 54%	5.3% 56%	6.2% 52%	4.5% 61%	6.9% 51%	6.0% 56%	6.0% 56%		to Com I s to Net P		5.0 64
ther urrent	ssets eceivat Assets ayable	_1		7.1 23.4 101.0 131.5 59.5 40.3	1.3 20.9 100.3 122.5 55.6 5.3	compar it supp Service Orange	ny. Throu lies wate areas in Countie	igh its pr er to 260 nclude th s. The c	States Wa incipal sub 0,708 custo ne metropo ompany al	sidiary, omers i olitan ar so prov	Golden S n 10 Cal eas of L ides elec	State Wat ifornia co os Angel tricity to	er Co., ounties. es and 24,420	ASUS s 841. Bla off. & di Robert	ubsidiary ickRock, r. 1.2%. (Sprowls.	. Sold C Inc. own (4/19 Pro Inc: CA	haparral s 15.1% xy). Cha . Addres	City Wtr of out. sl airman: Ll ss: 630	litary bas . of AZ. (hares; Va oyd Ross East Foo	6/11). E nguard, s. Pres. thill Blv	imploy 11.5% & CE0 d., Sa
other Current		-	46.4	46.8	55.1 116.0			-	Lake and										net: www		
NNUA f change levenu Cash F arning lividen look Va	L RATE e (per sh) es Flow" s ds alue	10 Yrs. 3.0 6.0 9.5 8.0 5.5	% 3. % 5. % 7. % 4.	rs. to 0% 0% 5% 0%	' 17-'19 23-'25 5.0% 5.5% 9.5% 5.5%	has ties fina servi econ lems	perfo durin ncial ce th omy i , peo	ng the marl at is s boon ple's	Amer l bette e lates cets. T essent ming o usage	er th t dis he u ial. S r exp of	an m rupti tility j so, wh perient water	ost e on in provid tether cing p will	qui- the es a the orob- not	rema its As vides As n stalla to c	tin a SUS s wate nore tions ontinu	key ubsid r ser water are p are to	grow iary, A vices serv rivati inc	Ameri to U. ices a zed, w rease,	iness river. can St S. Arn at mi ve exp or	Thro tates ny ba litary ect A at	pro- ases in SUS leas
Cal- 1dar	Mar.31	TERLY RE	Sep. 30	Dec. 31	Full Year	State	es'in	come	strea	m is	s mu	ch be	etter	contr	act íis	for	50 y	ears,	re. Th and u	ınlike	è it
017 018	94.7	113.2 106.9	124.2	111.0	440.6 436.8	has	ieu th been	an th reflec	le typic ted in	AWI	rpora R's ye	ar-to-o	late	by st	ate a	uthor	ities.	In 2	s not 019, p	profits	s in
2019 2020	101.7 105	124.7 120	134.5 140	113.0 115	473.9 480	price	e per	forma	nce, a an 7%.	as tl	he eq	luity	has	creas	ed he	ere b	y 12	%, aı	nd re share	prese	ntee
021	107	123	145	120	495	mate	ely 1	9%	decrea	se p				Divi	dend	grow	th pr	ospe	cts ar	e bri	ght
	Mar.31	ARNINGS F Jun. 30	Sep. 30	Dec. 31	Full Year	Earı	nings	in 2	averag	ill m				nual	increa	ıse in	the p	ayout	ices a in mi	d-Au	gust
017	.34 .29	.62 .44	.57 .62	.35 .37	1.88 1.72		able sive		match owing.		st ye he d								nat 20 ew div		
019	.35	.72	.76	.45	2.28	stror	nger-tl	nan-ez	xpected	l fou	rth q	uarte	r of	share	e sho	uld	be s	somew	here	betv	veer
020	.40 .43	.68 .72	.72 .75	.50 .55	2.25 2.40				ake y					\$0.32	5 and	d \$0.3	33. T	'his w	70uld	$_{\rm still}$	rep
Cal-		TERLY DI			Full				lt. Sti contro										e that eover,		
ndar	Mar.31	Jun.30	Sep.30	Dec.31	Year	a gr	eater	contr	ibutior	1 fro	m AS	US (r	nore	shoul	d cont	tinue	to mi	d-deca	ıde.		
2016 2017 2018 2019	.224 .242 .255 .275	.224 .242 .255 .275	.224 .255 .275 .305	.242 .255 .275 .305	.91 .99 1.06 1.16	\$2.2 grow	5. Th th in	ese s the r	enable same ate bas earning	facto: se, ou	rs, al ight to	ong o resu	with lt in	want this tial t	to no group, o 2023	ote th , the 3-2025	nat lil stock'	ke mo s tota	Inves ost me l retu ow av	embei rn po	rs o oten
2020	.305						rise,			-					s A. F					il 1Ŏ,	

 gains/(losses): '04, 7c; '05, 13c; '06, 3c; '08, June, September, and December. ■ Div'd rein-(14c); '10, (23c); '11, 10c. Next earnings report vestment plan available.
 (D) Includes intangibles. As of 12/31/19; \$28.6 million/\$0.78. a share.
 Stock's Price Stability Price Growth Persistence 95 Earnings Predictability
 85

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AM	ERI	CAN	WAT	ER	YSE-	AWK_		RICE	26.72	2 P/E RATI	o 36 .	0 (Traili Media	ng: 36.9) an: 22.0)	RELATIV P/E RATI		3 DIV'D	1.7	%		=	
TIMELIN		3 Lowered		High: Low:	23.0 16.2	25.8 19.4	32.8 25.2	39.4 31.3	45.1 37.0	56.2 41.1	61.2 48.4	85.2 58.9	92.4 70.0	98.2 76.0	129.9 88.0	141.7 92.0				t Price 2024	
AFETY		3 New 7/2		LEGE															2023	2024	
ECHNI		3 Raised 4	10/20	div	vided by Ir	iterest Rate e Strength															-200 -160
		= Market)	_	Options: '	Yes	ates recess	ion								այսիս	ll e					
		get Price	-											1,	111. N.						-10 -80
ow-Hig		dpoint (%	to Mid)					\wedge				10 ¹¹¹¹¹¹¹ 10	, Internet	\bigtriangledown	Ì	``					$^{-00}_{-60}$
119-\$1		46 (15%) ROJECTI	ONG				-/	$ \longrightarrow $			11 ₁₁₁ 111										50 40
		A	nn'l Total					^{ىيىل} ىيىتى													30
igh 1	Price 40 (Gain (+10%)	Return 5%	alute	*	n ^{ntun} n,	h					· · · ·									_20
-	90	`(-30%) Decisio	-6%					*******	····*·····		• • • • • • • • • • • •			*****				% TO	T. RETUR		20
istitu	202019		4Q2019	Percen	t 21	******	*****			-									STOCK	VL ARITH.*	L
o Buy Sell	360 331		393 361	shares traded	14 - 7 -													1 yr. 3 yr.	23.3 67.3	-6.8 6.6	E
Id's(000)	155051		155435	2008	2009	2010	2011	2012							2010	2020	2021	5 yr.	152.2 JE LINE P	20.3	23-2
	2005	10.00	13.84	14.61	13.98	15.49	2011 15.18	16.25	16.28	2014 16.78	2015 17.72	2016 18.54	2017 18.81	2018 19.04	2019 19.97	2020	2021		es per sh	UD. LLC	23-2
			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		low" per si	sh	8.1
		0.07	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		s per sh		4.
			4.74	.40	.82 4.50	.86 4.38	.90 5.27	1.21 5.25	.84 5.50	1.21	1.33	1.47 7.36	1.62	1.78 8.78	1.96 9.15	2.10 8.70	2.25 9.20		cl'd per s ending p		2. 9.
			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		lue per si		9. 42.
		_	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	Commo	n Shs Out	tsťg ^C	189.
				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 fig Value			'I P/E Rat		23
				1.14	1.04 4.2%	.93 3.8%	1.05 3.1%	1.06 3.4%	1.12 2.0%	1.05 2.5%	1.03 2.5%	1.45	1.70 2.0%	1.47	1.79 1.7%	estin		1	P/E Ratio 'I Div'd Y		1. 2.5
	L STRI	JCTURE :	as of 12/3		11270	2710.7	2666.2	2876.9	2901.9	3011.3	3159.0	3302.0	3357.0	3440.0	3610.0	3785	3975	Revenue			46
otal De	ebt \$94	53.0 mil. I	Due in 5 ۱	Yrs \$1773		267.8	304.9	374.3	369.3	429.8	476.0	468.0	426.0	567.0	621.0	670	730	Net Prof			9
I Debt	\$8639		LT Interes (59% of C		mil.	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			21.0
				• /	0 :!!	56.8%	55.7%	6.2% 53.9%	5.1% 52.4%	 52.4%	53.7%	52.4%	54.7%	5.1% 56.3%	4.0% 58.5%	5.0% 58.5%	5.0% 59.0%		% to Net F rm Debt F		5.0 59.0
		bitalized: // s12/19 \$1			.0 mili.	43.2%	44.2%	46.1%	47.6%	52.4 % 47.4%	46.2%	47.5%	45.3%	43.6%	41.4%	41.5%	41.0%		n Equity F		41.0
			Oblig. \$2	161.0 mill		9561.3	9580.3	9635.5	9940.7	10364	10911	10967	11875	13433	14760	15400	16325	Total Ca	pital (\$mi		200
10 510	ck \$5.0	11111.	Pfd Div'd	ә. 4 ШШ		11059	11021	11739	12391	12900	13933	14992	16246	17409	18232	19100	19900	Net Plan		11	222
ommo s of 2/1		k 180,974	,719 shar	res		4.4%	4.8%	5.4% 8.4%	5.1% 7.8%	5.5% 8.7%	5.7% 9.4%	5.6% 9.0%	4.9%	5.4% 9.7%	5.4% 10.1%	5.5% 10.5%	6.0% 11.0%		n Total C n Shr. Eq		6.0 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%		n Com E		11.5
		: \$22.9 bil SITION	lion (Larg		0/01/10	2.8%	3.5%	3.6%	4.7%	4.3%	4.7%	4.0%	2.5%	4.2%	4.4%	4.5%	4.5%		to Com		4.5
(\$MIL	_L.)	SITION		2018 1		56%	52%	57%	40%	50%	50%	56%	68%	56%	57%	57%	56%		s to Net F		. 59
ash A .ccts R	ssets leceiva	ble	82 272	158 301	91 294				Vater Wor Id wastew						6% of reg Has 6,80						
other Current	Assets	. –	<u>366</u> 720	322 781	900	service	s to app	roximatel	y 15 millio	on peop	le in 46 s	states. No	onregu-	outstan	ding shar	es; Black	Rock, In	c., 7.9%;	officers &	& directo	rs, les
ccts P	ayable		195	175	203				nunicipalit p as well.						0%. (3/19 ieorge M						
Debt Du Dther	le		1227 903	1035 884	814 1028				New Jerse						Tel.: 856-						. , .
urrent	Liab.		2325	2094	2045				rican						acqu						
	L RATE e (per sh			st Est'd	'17-'19 '23-'25				ven fo urmoi						e the se ma						
evenu Cash I	ies	3.0 13.0)% 3.	.0%	4.5% 6.5%				Year to						easily						
arning	IS	45.5	5% 6.	5%	8.5%				increa						The						
ividen ook V		16.0 2.5			8.5% 5.0%				ie S& 19% ov						ase, a d ass						
Cal-		RTERLY RI			Full				th long						eason						
ndar		Jun. 30			Year				ne wel						tive 1				regu	lator	s ii
2017 2018	756. 761.								ed bul most						s whe nces				age.	The d	com
019	813.	0 882.0) 1013.0	902.0	3610.0		nturns		11050	Stock	15 UU	umg	the		ion c						
2020 2021	835 885	920 970	1080 1120	950 1000	3785 3975				ason						ram, t						
Cal-		ARNINGS			Full				ss? Th d the o						new ee r hav						
ndar	Mar.31	Jun. 30	Sep. 30		Year				nance.					capit	al rat	io of	all th	ne wa	ter ut	tilities	s w
017	.52	.73	1.12	.01	2.38				base or						v, by						
2018 2019	.59 .62	.91 .94	1.03 1.33	.62 .54	3.15				ie of t tion j						de, sha . Thus						
2020	.66	.97	1.35	.72	3.70	pipel	ines a	are in	despe	rate	need	of rep	air.)	time	to hav	ve an	equity	y offer	ing.		0
2021	.73	1.05 DTEDLV DI	1.45	.77	4.00	The	secon	d is	the an	ong	oing a	cquis	ition	Desp	oite a	ll of	the	comp	any's		
Cal-		RTERLY DI Jun.30			Full Year				is a fo divid						butes at th						
	.34	.375			1.47				ht th						AWK						
					1.62				r is p						ahea						
2016 2017	.375																				
endar 2016 2017 2018 2019	.415	.45	5.455	5 .455	1.78	bene	ficiar	y of	the d	onso	lidatio	n ta	king	utilit	ies, A	WK h	as ur	nattra			erm
2016 2017		.45	5.455	5 .455		bene place	ficiary e in th	y of ne don		onso water	lidatio mark	n ta ket. As	king s the	utilit total		WK h n pote	as ur	nattra	ctive		

(A) Diluted earnings. Excludes nonrecur. ings report due mid-May. Quarterly earnings do losses: '08, \$4.62; '09, \$2.63; '11, \$0.07. Disc. I not sum in '16 due to rounding. oper.' '06, (\$0.04); '11, \$0.03; '12, (\$0.10); (IG) Dividends paid in March, June, September, (E) Pro forma numbers for '06 & '07. '13, (\$0.01). GAAP used as of 2014. Next earn- | and December. ■ Div. reinvestment available.
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Company's Financial Strength	B+
Stock's Price Stability	100
Price Growth Persistence	85
Earnings Predictability	80
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ESS	SEN1	TIAL	UTI	L. NYS	SE-WTF	G		ecent Rice	43.05	P/E RATI	o 32.	4 (Traili Media	ng: 43.1) an: 23.0)	RELATIV P/E RATI	2.4	5 DIV'D YLD	2.3	8% \	ALUI LINE	E	
TIMELIN	iess 1	Raised 1	2/20/19	High: Low:	17.2 12.3	18.4 13.2	19.0 15.4	21.5 16.8	28.1 20.6	28.2 22.4	31.1 24.4	35.8 28.0	39.6 29.4	39.4 32.1	47.3 32.7	54.5 30.4				Price 2024	
SAFETY	-	Raised 4		LEGE															2023	2024	
TECHNI		B Raised 3	/6/20	div Re	vided by In elative Pric	terest Rate e Strength						-			<u></u>						80 60
	i0 (1.00 =		D	5-for-4 sp Options:	olit 9/13 Yes	-	. –	\sim		_			\sim	\checkmark	 ^{ررز} ارر	1					-50
18-Mor Low-Hig	th Targ	et Price point (%	-	Shaded	area indici	ates recess	ion /					սուլյիս	السين.	հարդ	p ^{pp}	· •					40 30
\$35-\$68		(20%)	to Mia)						وسلابين	nun lu	horner to	100- U.H									25
	3-25 PR		ONS			ուսեսո	ապրո	¹¹													20 15
			nn'l Total Return		1111111	րուրը						·									
High		⊦30%) (-5%)	9% 1%		•••	*****	*****	****	••••••	·····	**********		**********	··	••••	(10 7.5
-	tional D	· /																% TO	T. RETUR	N 2/20	
to Buy	202019 280	302019 248	402019 274	Percen		l In II - I												1 yr.	sтоск 21.6	INDEX -6.8	-
to Sell Hld's(000)	167	210 143792	242 149836	shares traded	10 - 5 -					mahaha	nhaltillit		hllinni	HotoH				3 ýr. 5 yr.	44.6 82.3	6.6 20.3	F
2004	2005	2006	2007	2008	2009	2010	2011	2012		2014	2015	2016	2017	2018	2019	2020	2021		JE LINE P		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	Revenue			8.70
.87 .51	.97 .57	1.01	1.10	1.14	1.29	1.42 .72	1.45 .83	1.51 .87	1.82 1.16	1.89 1.20	1.87 1.14	2.07	2.12	1.90 1.08	1.73 1.04	2.40 1.45	2.65 1.55	"Cash F Earnings	ow" per s		3.50 2.05
.29	.37	.30	.37	.30	.02	.72	.63	.67	.58	.63	.69	.74	.79	.85	.91	.97	1.05	Div'd De			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 Sp	ending p	er sh	4.75
4.71	5.04 161.21	5.57	5.85 166.75	6.26 169.21	6.50	6.81	7.21	7.90 175.43	8.63	9.27 178.59	9.78 176.54	10.43 177.39	11.02	11.28	17.58 220.76	17.35 225.00	17.60 227.00	Book Va			19.55 230.00
158.97 25.1	31.8	165.41 34.7	32.0	24.9	170.61	172.46 21.1	173.60 21.3	21.9	177.93 21.2	20.8	23.5	23.9	177.71 24.7	178.09 32.6	39.1	Bold fig		Common Avg Ann	I P/E Rat		230.00
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%			-	'l Div'd Yi	ield	2.6%
			as of 12/3 Due in 5	31/19 Yrs \$252	2.0 mill.	726.1 124.0	712.0 144.8	757.8 153.1	768.6 205.0	779.9 213.9	814.2 201.8	819.9 234.2	809.5 239.7	838.1 192.0	889.7 224.5	1460 325	1750 350	Revenue Net Prof			2000 470
			T Interes	st \$123.5	mill.	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 1			9.0%
			(43%	6 of Cap'l)					1.1%	2.4%	3.1%	3.8%	6.3%	6.8%	7.2%	7.0%	7.0%	AFUDC			8.0%
Pensior	Assets	-12/19 \$	266.4 mill	l. blig. \$310) 5 mill	56.6% 43.4%	52.7% 47.3%	52.7% 47.3%	48.9% 51.1%	48.5% 51.5%	50.3% 49.7%	48.4% 51.6%	50.6% 49.4%	54.4% 45.6%	43.1% 56.9%	49.0% 51.0%	51.0% 49.0%	Long-Ter Commor			55.0% 45.0%
	ck None			-	J.J IIIII.	2706.2	2646.8	2929.7		3216.0	3469.5	3587.7	3965.4	407.8	6824.2	7600	49.0%	Total Ca			45.0% 9800
Commo as of 2/		222,781	,536 shar	res		3469.3	3612.9	3936.2	4167.3	4402.0	4688.9	5001.6	5399.9	5930.3	6345.8	8200	8350	Net Plan	t (\$mill)		10900
						5.9%	6.9% 11.6%	6.6% 11.0%	8.0% 13.4%	7.8% 12.9%	6.9% 11.7%	7.6%	7.1% 12.2%	5.5% 9.6%	4.2% 5.8%	6.5% 8.5%	5.5% 9.0%	Return o Return o			7.0% 10.5%
MARKE	T CAP: S	\$9.6 billi	on (Larg	e Cap)		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 o			10.5%
CURRE	NT POSI		2017		2/31/19	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 I	Eq	4.0%
(\$MIL Cash A	ssets		4.2	3.6	1868.9	65%	60%	61%	50%	52%	60%	56%	59%	79%	84%	67%	68%	All Div'd			63%
Receiva Invento	ables ry (AvgC	Cst)	98.6 14.4	101.2 15.8	67.1 18.4				Utilities, In , 2020, to									idential, %. Off. &			
Other Current	Assets	_	14.0 131.2	26.6 147.2	58.3 2012.7	a natu	ral gas u	tility, wh	ich occurre	ed in 3/3	20. In 20	19, Aqua	a Amer.	the com	mon sto	ck; Black	Rock, In	c. 10.5%;	Vangua	rd Grp.,	10.4%;
Accts P	ayable		59.2	77.3	74.9				astewater IL, NC, N									14A). Pi 762 Wes			
Debt Du Other		1		160.0 161.7	130.8 113.1				/13; North									00. Interr			
Current				399.0	318.8				ities is									now i			
of change	L RATES (per sh)	S Past 10 Yrs.		st Est'd rs. to '	23-25				ı. The e chan									l done issum			
Revenu "Cash I		1.5 5.0			2.0% 0.5%				e comp									of wh			
Earning Dividen	IS	7.0 7.5	% 1.	.5% 1	0.0% 7.5%				a Pitts									tate's			
Book V		8.0	% 9.	.0%	6.5%				cost of in casl									ıce 3,0 t 15-y			
Cal-			VENUES ((\$ mill.) Dec.31	Full	sum	ption	of \$1.	1 billio	n of	debt.	In cor	nnec-	Öur	init	ial e	stima	ites	for [t	he	new
endar 2017	187.8	203.4		203.3	Year 809.5				eal, Es ounced									•. Not ng an			
2018	194.3	211.9	226.2	205.7	838.1				e Cana									publi			
2019 2020	201.1 215	218.9 385	243.6 410	226.1 450	889.7 1460				21.7 m									billio			
2021	390	410	450	500	1750				The e er: WT		' is al	so tra	ding					of the may f			
Cal-			ER SHAR		Full	The	coro	navir	us wi	ll mo				been	discu	issed.	As t	for th	e bot	tom	line,
endar 2017	Mar.31 .28	Jun.30 .34	Sep.30 .43	.30	Year 1.35				impac									on according and a contract here and a contrac			
2018	.29	.37	.44	d.02	1.08				g to be t the									rent k verlap,			
2019	.09 .25	.25 .35	.38 .45	.28 .40	1.04 1.45	Shou	ıld ur	nempl	oyment	rise	or a	reces	sion	ing v	with 1	regula	tors.	More	over,	since	the
		.40	.45	.40	1.55				rs will their e									st app: ut qua			
2019 2020 2021	.28		IDENDS P	AID B =	Full						ces is					the					
2020 2021 Cal-	QUART	FERLY DIV																POIN	u, m		
2020 2021 Cal- endar	QUART Mar.31	Jun.30	Sep.30	Dec.31	Year	Hene	ce, de	emano	d for	Esse		serv	vices				balan	ce she			pro-
2020 2021 Cal-	QUART					Hene will	ce, de not ta	emano ake a	d for s large	Esse a hi	it as t	s serv	vices pical	vide	some	insigh	balan t.	ce she	et sh	louĪd	-
2020 2021 Cal- endar 2016 2017 2018	QUART Mar.31 .178 .1913 .2047	Jun.30 .178 .1913 .2047	Sep.30 .1913 .2047 .219	Dec.31 .1913 .2047 .219	Year .74 .79 .85	Hend will corpo The	ce, de not ta oration regu	emano ake as n shor lator	d for s large uld this y clin	Esse a hi s pan ate	it as t demic in Pe	s serv the ty wors ennsy	vices pical en. Iva-	vide This mem	some stocl	insigh k is t i of this	balan t. i mely indu	ce she . How istry,	eet sh ever, long-t	iouĪd like r	nost
2020 2021 Cal- endar 2016 2017	QUART Mar.31 .178 .1913	Jun.30 .178 .1913	Sep.30 .1913 .2047	Dec.31 .1913 .2047	Year .74 .79	Hene will corpo The nia	ce, de not ta oration regu will l	emano ake as n shor l ator nave	d for s large uld this	Esse a hi s pan ate or in	it as t demic in Pe npact	the ty wors ennsy on e	vices pical en. lva- arn-	vide This mem retur	some stocl	insigh k is t i of this ential	balan t. i mely indu	ce she . How	eet sh ever, long-t ling.	iouĪd like r	nost total

Company's Financial Strength	A
Stock's Price Stability	95
Price Growth Persistence	75
Earnings Predictability	55
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 A) Diluted egs. Excl. nonrec. gains: '12, 18c.
 outstanding in the Dec. period. Next earnings report due mid-May. (B) Dividends historical: (D) Includes intangibles: 12/31/19, \$63.8 gc; '14, 11c. Quarterly EPS do not add in '19 gei in early March, June, Sept. & Dec.

 Divid.
 (D) Includes intangibles: 12/31/19, \$63.8 mill/\$0.29 a share.
 (D) Includes intangibles: 12/31/19, \$63.8 mill/\$0.29 a share.
 (D) Includes intangibles: 12/31/19, \$63.8 mill/\$0.29 a share.
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CAL	.IFO	RNI	A W	ATEF		E-CWT		ecent Rice	52.3	2 P/E RATIO	o 35 .	8 (Traili Media	ng: 39.9) an: 23.0)	RELATIV P/E RATI		1 DIV'D YLD	1.6	i% `	/ALUI LINE	E	
TIMELIN		B Lowered		High: Low:	24.1 16.7	19.8 16.9	19.4 16.7	19.3 16.8	23.4 18.4	26.4 20.3	26.0 19.5	36.8 22.5	46.2 32.4	49.1 35.3	57.5 44.6	57.4 39.7				t Price 2024	
SAFETY		Lowered		LEGEN									-						2023	2024	-120
ECHNI		3 Raised 4	10/20	div ••••• Re	vided by In elative Pric	terest Rate															
	0 (1.00 =	= Market) jet Price	Range	2-for-1 sp Options: `	lit 6/11 Yes <i>area indic</i> i	atos rocos	sion								1 ¹ 100 ¹⁰ 41	۲۵۰۰۰					-64
ow-Hig	-	point (%	-	Chadea				\sim		~	-	<u> </u>									-48
47-\$75		(15%)	,									<u> </u>	<u>1196</u>								
202	3-25 PR	OJECTIC		ן וויייוו	li _t ,	فورائية	بالليمين	ասող		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	ուսեր										<u> </u>
		Gain	n'l Total Return		••••										······						16 12
ŏw –		(+5%) (-35%)	3% -7%			********	•••••	····				•••••	********	•••••				% то	T. RETUR	N 2/20	_8
stitut	ional [202019	Decisior 302019	1 S 4Q2019							****	********									VL ARITH.*	
Buy Sell	120 102	118 94	115 101	Percent shares	12 -	երրու					սեսերի	البالل	1		 Ultimi	1		1 yr. 3 yr.	-6.7 36.9	-6.8 6.6	F
d's(000)	36947	36133	36624	traded	6 -											0000	0001	5 yr.	108.3	20.3	
004 8.59	2005 8.72	2006 8.10	2007 8.88	2008 9.90	2009 10.82	2010 11.05	2011 12.00	2012 13.34	2013 12.23	2014 12.50	2015 12.29	2016 12.70	2017 13.89	2018 14.53	2019 14.72	2020 14.80	2021 15.20	Revenue	JE LINE P	UB. LLC	<u>23-2</u> 15.
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 F	iow" per :		3.
.73 .57	.74 .57	.67	.75 .58	.95 .59	.98 .59	.91 .60	.86	1.02	1.02 .64	1.19 .65	.94 .67	1.01 .69	1.40 .72	1.36 .75	1.31 .79	1.55 .82	1.65 .86		s per sh 4 cl'd per s		2. 1.
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		ending p		3.
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		lue per sl		16.
36.73	36.78 24.9	41.31 29.2	41.33 26.1	41.45 19.8	41.53 19.7	41.67 20.3	41.82 21.3	41.98 17.9	47.74 20.1	47.81 19.7	47.88 24.8	47.97 29.6	48.01 26.9	48.07 30.3	48.53 39.3	50.00 Bold fig	51.00		n Shs Out 'I P/E Rat		53. 23
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	Value	Line	Relative	P/E Ratio)	1.
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%			- °	'l Div'd Y		2.3
		CTURE a .8 mill. D			0 mill.	460.4 37.7	501.8 36.1	560.0 42.6	584.1 47.3	597.5 56.7	588.4 45.0	609.4 48.7	666.9 67.2	698.2 65.6	714.6 63.1	740 78.0		Revenue Net Prof		E	7 1
	\$786.8	mill. L		at \$40.0 m (50% of		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	10 1		21.0
		-			Oap I)	4.2%	7.6%	8.0%	4.3%	2.7%	4.3%	6.1%	3.5%	3.1%	5.8%	5.0%		AFUDC S			5.0
ension	Assets	s-12/18 \$5 C	573.6 mill)blig. \$8			52.4% 47.6%	51.7% 48.3%	47.8% 52.2%	41.6% 58.4%	40.1% 59.9%	44.4% 55.6%	44.6% 55.4%	42.7% 57.3%	49.3% 50.7%	50.2% 49.8%	49.0% 51.0%	47.0% 53.0%	Commor	rm Debt F n Equity F		43.5 56.5
fd Stoo	k None		0			914.7	931.5	908.2	1024.9	1045.9	1154.4	1191.2	1209.3	1440.2	1566.7	1535	1525	Total Ca	pital (\$mi		15
ommo	n Stock	48,532,0	000 shs.			1294.3 5.5%	1381.1 5.5%	1457.1 6.3%	1515.8 6.0%	1590.4 6.3%	1701.8 5.2%	1859.3 5.5%	2048.0	2232.7 5.9%	2406.4 5.5%	2425 6.0%	2450 6.5%	Net Plan	t (\$mill) n Total C	an'l	25 8.0
						8.6%	8.0%	9.0%	7.9%	9.1%	7.0%	7.4%	9.7%	9.0%	8.1%	10.0%		Return o			12.5
		\$2.5 billio	on (Mid (Can)		8.6%	8.0%	9.0%	7.9%	9.1%	7.0%	7.4%	9.7%	9.0%	8.1%	10.0%		Return o			12.5
	NT POS		2017	2018 1	2/31/19	3.0% 66%	2.3% 71%	3.4% 62%	3.4% 56%	4.1% 55%	2.0% 71%	2.4% 68%	4.7% 51%	4.0% 55%	3.2% 60%	4.5% 53%		Retained All Div'd			6.0 53
(\$MIL) ash As			94.8	47.2	42.7	BUSIN	ESS: Ca	lifornia V	Vater Servi	ce Grou	p provide	s regulat	ed and	quired	Rio Gran	nde Corp					eveni
ther urrent	Assets		<u>33.1</u> 27.9	141.5 188.7	142.0				vice to 4 California						wn, '19: authorities						
ccts P ebt Du	ayable		94.0 91.0	95.6 170.0	108.5 197.0				s in Wash					stock (4	4/19 prox	y). Has	1,184 em	nployees.	Pres. ar	nd CEO:	Mar
ther)		_1	06.0	55.6	53.2				n Francisc aquin Valle						elnicki. Ir 1598. Tel.						
urrent	Liab.	4	91.0	321.2	358.7				ter Se			-			aviru						
	RATE			Est'd '1	7-'19	to i	nvest	mo	re tha	11 \$8	800 n	niÎlio	n in	busir	ness a	nd co	nsume	er act	ivity.	That	sai
evenu	(per sh) es	10 Yrs. 4.0		5%	23-'25 .5%				e-relat 21. At						man e, incr						
Cash F arning	s	5.5° 4.5	% 4.	5% (2.0% 6.5%	ly ru	inning	g gene	eral rat	te cas	se wit	h the	Cali-	al u	tility	use	ough	t to	trans	slate	int
ividen ook Va		2.5 4.5			5.5% 1.0%				Utiliti ement												
Cal-		TERLY REV			Full	2020). The	agre	ement	cover	's var	ious t	opics	\$740	millio	on. Or	n the o	other	hand,	a nu	mb
	Mar.31 122.1	Jun.30 171.1	Sep.30 211.7	Dec.31 162.0	Year 666.9				t impo cture i												
018	134.6	174.9	221.3	167.4	698.2				increa												
019 020	126.1 140	179.0 185	232.6 237	176.9 178	714.6 740				ated a												
021	147	195	248	185	775				st year les, in												
Cal-		ARNINGS P			Full	repla	aceme	nts, n	new tre	eatme	nt fac	ilities	, the	tima	tes of	\$775					
ndar 017	.02	Jun.30 .39	.70	.29	Year 1.40				back eplacei								tmen	t per	spect	ive.	Cal
018	d.02	.31	.75	.32	1.36	and	2021,	it is	likely	that	capita	ıl exp	endi-	form	ia Wa	ter s	stock	leave	es mu	ich t	o b
019	d.16 <i>.03</i>	.35 .39	.88 .80	.24 .33	1.31 1.55				ge betv nd cov												
021	.05	.42	.82	.36	1.65	impi	ovem	ent pi	rojects.	Fina	ılly, w	e are	opti-	3 (Av	verage	e). Mo	reove	r, tota	il reti	irn p	ote
Cal- ndar		TERLY DIV			Full Year	mist	ic tha		ulators					tial o	over tl	he 3-	to 5-y	ear st	tretch	is co	nsi
	.1725	Jun.30 .1725	.1725	.1725	.69		rably. forni	a Wa	ater s	shoul	ld be	e a	con-		y belo tock r						
2010	.18	.18	.18	.18	.72	siste	ent p	erfor	mer e	ven	amid	st a o	diffi-	durir	ng ree	cent	broad	er m	arket	vola	tilit
2017		.1875	.1875	.1875	.75	cult	ecor	omic	e back	drop	. Not	abiv.	Calı-	we t	nink	more	-attra	ctive	ODUIOT	is ca	n k
2016 2017 2018 2019	.1875 .1975		.1975	.1975	.79										l elsev	where					
017 018			.1975	.1975	.79			been	one o		majo	r dom	estic	found	d elsev olas P.		, at th		cture.		202

 (1)
 4.c. Next earnings report due early May.
 (C) Incl. intangible assets. In '19 : \$24.9 mill.,
 (C) Excluded not reg. root.
 Stock & Price Stability
 80

 (B)
 Dividends historically paid in late Feb.,
 (C) Incl. intangible assets. In '19 : \$24.9 mill.,
 Stock & Price Stability
 80

 May, Aug., and Nov. = Divid reinvestment plan.
 (D) In millions, adjusted for split.
 80
 Stock & Price Stability
 80

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MIDE)LE	SE)	(WA	TER			P	ECENT RICE	61.4	7 P/E Rati	1	4 (Traili Media	ng: 30.6) an: 21.0)	RELATIV P/E RATI			1.7	%		Ξ	
IMELINES		Lowered		High: Low:	17.9 11.6	19.3 14.7	19.4 16.5	19.6 17.5		23.7 19.1	28.0 21.2	44.5 25.0	46.7 32.2	60.3 34.0	67.7 51.0	69.9 48.8				Price 2024	
AFETY		2 New 10/2		LEGEI	20 x Divide	ends p sh	_														-12
CHNICA		Covered = Market)	2/7/20	Options;	elative Pric	terest Rate e Strength															-80
	,	et Price	Range			ates recess	ion	~				\sim									-64 -48
w-High	-	, point (%	-					\sim	\searrow			սերե									
7-\$94		(25%)									uu	h, ,									24
			DNS nn'l Total	n - India	i •	աղուղ	սադր	սոուլ		կեսերե											20 16
Prio ah 60	0	Gain (Nil)	Return 2%	•••••••		1. 1.							•••••••		···,··· [•] ··	**					12
w 45	5 ((-25%) Decisio	-5%			********	*****	******	*************					•••				% то	T. RETUF		_8
:	2Q2019	3Q2019	4Q2019	Percen	t 12 -					*******	*****							1 yr.	THIS STOCK 2.3	/L ARITH.* INDEX -6.8	L
Buy Sell	79 58	56 67	68 68	shares traded	8 - 4 -	hallin		lihitaa	uulutut l	athal.	ասներ		nhthata			l		3 yr. 5 yr.	66.8 185.1	6.6 20.3	F
	9432 2005	9915 2006	10433 2007	2008	2009	2010	2011	2012	2013	2014		2016	2017	2018		2020	2021	· · ·	JE LINE P		23-2
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		es per sh		9
1.28	1.33 .71	1.33	1.49	1.53	1.40 .72	1.55 .96	1.46	1.56	1.72 1.03	1.84 1.13	1.97 1.22	2.17	2.24	2.89 1.96	2.90 2.01	2.95 2.10	3.10 2.20		low" per s per sh 4		3. 2
.66	.67	.68	.69	.70	.71	.72	.73	.74	.75	.76	.78	.81	.86	.91	.98	1.04	1.10	Div'd De	cl'd per s	h ^B ∎	1
2.54 8.02	2.18 8.26	2.31 9.52	1.66 10.05	2.12 10.03	1.49 10.33	1.90 11.13	1.50 11.27	1.36 11.48	1.26 11.82	1.40 12.24	1.59 12.74	2.91 13.40	3.08 14.02	4.40 15.17	5.11 18.57	3.50 16.15	3.50 16.50		ending p		3 17
	0.20	9.52	13.25	13.40	13.52	15.57	15.70	11.46		12.24	12.74	16.30	16.35	16.40	17.43	17.65	17.75		lue per sl 1 Shs Ou		18
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 fig Value	ures are Line	Avg Ann	'l P/E Rat	io	2
1.39	1.46 3.5%	1.23	1.15 3.7%	1.19 4.0%	1.40 4.7%	1.13 4.2%	1.36 4.0%	1.32 4.0%	1.11 3.7%	.97. 3.7%	.96 3.3%	1.34 2.3%	1.43 2.2%	1.20 2.1%	1.61 1.6%	estin			P/E Ratio 'I Div'd Y		2
		CTURE a		31/19		102.7	102.1	110.4	114.8	117.1	126.0	132.9	130.8	138.1	134.6	145	150	Revenue			
al Debt				Yrs \$33.3 st \$7.2 mi		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 Prof			
		overage: 1	7.3x)			32.1% 6.8%	32.7% 6.1%	33.9% 3.4%	34.1% 1.9%	35.0% 1.7%	34.5% 1.9%	34.0% 2.7%	32.7% 3.1%	2.8% 1.4%	2.8% 3.4%	21.0% 2.0%	21.0% 2.0%	Income	Tax Rate % to Net I	Profit	21. 2
			42% of C	ap I)		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-Te	rm Debt F	Ratio	39.
nsion A	Assets	s-12/18 \$	80.4 mill. Dblia. \$1	00.9 mill.		55.8% 310.5	56.6% 312.5	57.4% 316.5	58.7% 321.4	58.8% 335.8	59.8% 345.4	61.5% 355.4	61.8% 370.7	61.6% 404.1	58.2% 556.7	57.0% 500	58.0% 505		n Equity F pital (\$mi		60
Stock	\$2.4 ו	mill. Pfd I				405.9	422.2	435.2		465.4	481.9	517.8	557.2	618.5	705.7	720	735	Net Plan		")	
mmon s	Stock	17,434,0	000 shs.			5.7%	5.2%	5.4%	5.9%	6.3%	6.6%	7.1%	6.9%	8.9%	6.7%	8.0%	8.5%		n Total C		9.
						8.1% 8.2%	7.5% 7.5%	7.8% 7.8%	8.7% 8.7%	9.2% 9.3%	9.6% 9.6%	10.3%	9.8% 9.9%	12.9% 13.0%	10.4% 10.4%	13.0% 13.0%	13.0% 13.5%		n Shr. Eq n Com E		14. 14.
DIET	CAD.	\$1.1 billi	on (Mid-(Can)		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.
			2017	2018 1	2/31/19	75%	87%	83%	73%	67%	63%	58%	62%	46%	48%	49%	50%	1	s to Net F		5
(\$MILL.) sh Ass	.) iets		4.9	3.7	2.2				Water Con ed water u						ne Middle t 12/31/1						
her Irrent As	ssets	_	24.3 -	27.1	26.9				ia. It also on behalf						sident, 0 s own 3.						
cts Pay	/able		13.9 34.9	19.3 55.8	23.3 27.2	NJ and	DE. Its	Middlese	x System	provides	water se	rvices to	61,000	6.8% (4	/19 proxy	/). Add.: •	485 C Ro	oute 1 Sc	uth, Suit	e 400, Is	
her		_	15.7	19.3	14.5				rily in Mid						Tel.: 732						
Irrent Li		S Past	64.5 Pa	94.4 st Est'd	65.0				ater) han						milli y. Thi						
change (p evenues	per sh)		. 5 Yı	rs. to '	23-'25 2.0%	amb	iguo	us eq	conom	ic c	limat	e. In	deeď,	grow	th ove	er our	curre	nt-yea	ir proj	ectio	ns.
ash Flo rnings	s ow''	6.0 8.0	% 9.	5% 4	4.5% 6.0%				ie swee known						astruo n un						
ridends ok Valu		2.5 4.5	% 4.	.0%	5.5% 1.5%	a m	ajor	toll o	n cons	sume	r spe	nding	and	mid-	deca	de. T	o sta	rt, ai	1 \$11	.2 m	illi
		TERLY RE			Full	term	estic	busir vever	ness a , takir	ctivit ig in	y in to coi	the	near	wav	ing v in Ne	vater w Jer	proje sev. 1	he co	airea mpan	uay u v pla	nc ns
dar M				Dec. 31	Year	that	wate	r is o	ne of o	our n	nost b	asic n	eces-	repla	ce m	ore t	han 2	20,000	line	ar fe	et
	30.1 31.2	33.0 34.9	36.2 38.7	31.5 33.3	130.8 138.1				ly unli the sli												
)19 🗧 🕄	30.7	33.4	37.8	32.7	134.6	sume	er di	isrupt	ion. /	Āddit	ionall	y, he	alth-	Wate	r for	Tom	orrow	pro	gram	spor	$^{\mathrm{ts}}$
	32.0 33.0	36.0 37.0	42.0 44.0	35.0 36.0	145 150				ns, su as we												
al-		ARNINGS F			Full	ber (of res	idents	s prese	ently	stayiı	ng in	their	infra	struct	ure. l	Beyon	d tha	ť, we	think	x a
dar M)17	lar.31 .27	Jun. 30 .33	Sep. 30 .46	Dec. 31 .32	Year 1.38				vell dr hile, tł								ient :	spend	ing is	pro	bak
18	.27	.52	.74	.43	1.96	raise	ed son	ne cap	oital vi	a an	equit	y issu	ance,	We	are r	not p					
)19)20	.39 .40	.49 .53	.66 .70	.46 .47	2.01 2.10				rovide : s held						llesez						
)21	.42	.55	.73	.50	2.20	our	last	repoi	rt. Mid	ldlese	ex sha	res et	tched	mark	et com	nditio	ns, bu	t the	issue	is ju	st
		TERLY DI			Full	fresh	ı higł	ıs in	mid-Fe	ebrua	ry be	fore c	rum-	Avera	age se	electio	n for	the j	year a	ahead	. (
		Jun.30 5 .19875			Year .81				indice some g												
017 .	.21125	5 .21125	5 .21125	.22375	.86	stock	c is do	own o	nly abo	out 1				five	years	henc	e is v	well k	elow	the 1	Val
	.22375 .24	5 .22375 .24	5 .22375 .24	5 .24 .2562	.91 .98				nonths ducin		r pr	elimi	narv		medi a pas			we su	ıggest	inve	sto
	.2562								botto										Apri	l 10, 2	202
Diluted April.	earnir	ngs. Next	earnings	s report d		Dividend	s histori	cally pa	id in mid v'd reinves	-Feb.,	(C) In mi	llions.						Financia e Stabili		h	B+ 6
·						available				anont						Prie	ce Growt	h Persis	tence		-

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Earnings Predictability 75

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SJV	V GF	ROU	P _{NYS}	E-sjw				ecent Rice	59.7	8 P/E Rati	o 28 .	6 (Traili Media	ng: 44.3) an: 21.0)	RELATIV P/E RATI		7 DIV'D YLD	2.1	WALU		
TIMELIN		E		High: Low:	30.4 18.2	28.2 21.6	26.8 20.9	26.9 22.6	30.1 24.5	33.7 25.5	35.7 27.5	56.9 28.6	69.3 45.4	68.4 51.3	74.5 53.9	75.0 45.6			t Price 2024	
SAFET		New 4/2	2/11	LEGEI														2023	2024	-12
				div Re	vided by In elative Pric	terest Rate e Strength									· · · ·					10 80
	0 (1.00 =	et Price	Range	Options: Shaded	area indic	ates recess	ion	\sim						htt:	1	 •				-64 -48
.ow-Hig	-	point (%	-						\sim			un IIII.								
52-\$85	\$69	(15%)							րույյյին Մուսյին	արդեր	հրուր	1 II.								-32 24
202	3-25 PR	OJECTIO	ONS nn'l Total	•••••• •••		1.1 miles	annille													20 16
		Gain ⊦60%)	Return 14%			************		····	****				····	••••••	****	•				12
ow	65 (-	+10%)	4%				-		**********	···	****							% TOT. RETUR	RN 2/20	_8
istitu	2Q2019	Oecisio 3Q2019	ns 4Q2019	Percen	t 15 -													STOCK	VL ARITH.* INDEX	L
o Buy o Sell	91 62	94 69	93 76	shares traded	10 - 5 -				h	1 1	սե.ա.							1 yr. 1.4 3 yr. 32.5	-6.8 6.6	E
lld's(000) 2004	19526 2005	19354 2006	19650 2007	2008	2009	2010	2011	2012	2013	<u>111111111</u> 2014	2015	2016	2017	2018	2019	2020	2021	5 yr. 102.4 © VALUE LINE P	20.3 UB. LLC	23-2
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
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		5.
.87 .51	1.12 .53	1.19	1.04	1.08 .65	.81 .66	.84 .68	1.11 .69	1.18 .71	1.12 .73	2.54 .75	1.85 .78	2.57	2.86 1.04	1.82 1.12	1.35 1.20	2.35 1.28	2.70 1.36	Earnings per sh Div'd Decl'd per s		3 1
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 p	er sh	5
10.11 18.27	10.72	12.48 18.28	12.90 18.36	13.99 18.18	13.66 18.50	13.75 18.55	14.20 18.59	14.71 18.67	15.92 20.17	17.75 20.29	18.83 20.38	20.61	22.57 20.52	31.31 28.40	31.27 28.46	33.30 29.00	35.60 29.50	Book Value per s Common Shs Ou		39 30
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 fig	ures are	Avg Ann'l P/E Ra	tio	2
1.04 3.0%	1.05 2.4%	1.27 2.0%	1.77 1.7%	1.58 2.3%	1.91 2.8%	1.85 2.8%	1.33 2.9%	1.30 3.0%	1.37 2.7%	.59 2.6%	.84 2.5%	.82 2.0%	.95 1.9%	1.77 1.9%	2.60 1.9%	Value estin		Relative P/E Ration Avg Ann'l Div'd Y		1 2.
			as of 12/3		2.0%	2.6%	2.9%	261.5	2.7%	2.0%	305.1	339.7	389.2	397.7	420.5	545	585	Revenues (\$mill)	ieia	2.
otal De	ebt \$130	5.9 mill. I	Due in 5 Y	′rs \$.0 m		15.8	20.9	22.3	23.5	51.8	37.9	52.8	59.2	38.8	38.5	68.0		Net Profit (\$mill)		
		erage: 3.	T Interes 8x)	st \$35.0 n	nill.	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	D	21.
		÷		(59% o	f Cap'l)	 53.7%	56.6%	55.0%	51.1%	51.6%	49.8%	50.7%	48.2%	2.0%	1.5% 59.0%	1.5% 51.0%	1.5% 41.5%	AFUDC % to Net Long-Term Debt		1. 35.
						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.
ensio	n Assets	-12/19 \$	243.5 mill			550.7 785.5	607.9 756.2	610.2 831.6	656.2 898.7	744.5 963.0	764.6 1036.8	855.0 1146.4	894.3 1239.3	1320.7 1328.8	2173.0 2206.5	1465 2300	1800 2450	Total Capital (\$m Net Plant (\$mill)	ill)	1 2
fd Sto	ck None		Oblig. \$33	38.2 mill.		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 C	ap'l	6.
		28,456,5	508 shs.			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. Ec		9.
IARKE	T CAP:	\$1.7 billi	on (Mid C	Cap)		6.2%	7.9%	8.1% 3.3%	7.3%	14.4% 10.2%	9.9% 5.7%	12.5% 8.6%	12.8% 8.2%	4.4%	4.3%	7.5%	7.5%	Return on Com E Retained to Com		9. 5.
URRE (\$MII	NT POS	ITION	2017	2018 1	2/31/19	80%	61%	59%	62%	29%	42%	31%	36%	60%	89%	52%	50%	All Div'ds to Net		4
ash A		le	7.8 17.3	420.7 19.2	17.9 36.3				ip engage									which provides se		
)ther			41.8	62.8 502.7	67.8 122.0				ribution, a kimately 2									opulation of 450,0 rectors own 8.3%		
octs P	Assets ayable		23.0	24.9	34.9				reach abo									CEO: Richard Rot ylor Street, San J		
)ebt Di)ther	le		62.1	139.1	22.3 177.4				and Austir									iet: www.sjwater.c		551
urrent				164.0	234.6				ering									ustomer ba		
	L RATES e (per sh)	10 Yrs	. 5 Yr	s. to	'16-'18 '23-'25				mate 35. Th									ıld help dri hink aggres		
levenu Cash I		5.0 7.0			4.0% 2.5%	man	ageme	ent's i	recent	guida	ance,	as we	ell as	struc	ture	inves	tment	spending	is l	ike
arning ividen		8.0 4.5	% 18. % 5.	5% 0%	6.0% 7.0%													years. Alou uch as wa		
ook V		5.5			6.5%	tobe	r, 201	9). In	ndeed,	we	look i	for a	sub-	repai	irs an	d imp	oroven	nents to its	s filtr	ati
Cal- ndar			EVENUES (Sep. 30		Full Year													nt plants, metering		
2017	69.0	102.1	124.6	93.5	389.2	2019	in th	ne for	m of a	noni	recurr	ing ch	narge	(in a	ın eff	ort to	o achi	ieve upcom	ing v	vat
2018 2019	75.0 77.7	99.1 103.0	124.9 114.0	98.7 126.0	397.7 420.5													provide ne on informat		rea
2020	105	135	170	135	545	coun	t. Alt	thoug	h the	near	-term	econ	omic	The	stocl	s prie	ce ha	as decline	d not	
2021 Cal-	115 EA	145 RNINGS I	180 Per Shari	<u>145</u> E A	585 Full													s review. SJW stock		
ndar	Mar.31	Jun. 30	Sep. 30	Dec. 31	Year	we t	hink 🕯	SJW i	is well	posit	ioned	to op	erate	abou	t 20%	in va	alue, l	largely a co	nsequ	ıen
2017 2018	.18 .06	.90 .62	.94 .76	.84 .38	2.86 1.82													turbulence 10mic conce		
2019	.21	.47	.33	.34	1.35	creas	sed h	and	washii	ng ar	nd m	ore p	eople	the]	past f	ive y	ears,	shares of	SJW	ha
2020 2021	.20 .30	.65 .70	.90 1.00	.60 .70	2.35 2.70	stayi	ing at	home	e of lat					appr	eciate	d hải	ndsom	nely and,	even	wi
Cal-			IDENDS PA		Full				pany. e like	SJW	Gro	up's l	busi-					otal return t is still su		
ndar			Sep.30		Year	ness	pro	spect	s. Fir	st, th	e rec	ently	com-	comp	ared	to the	Value	e Line medi	an.	
2016 2017	.2025 .2175	.2025 .2175	.2025 .2175	.2025 .3875	.81 1.04				now son b									given the nt appe		ity su
2018	.28	.28	.28	.28	1.12	scale	and	scope	e of its	oper	ations	s, once	e the	scrik	bers	would	d be	wise to l		
2019 2020	.30 .32	.30	.30	.30	1.20	integ	ratio	n is	in tl rt furt	he re	earvie	w m	irror, addi-	whe Nich	re at	this j	uncti	ure.	l 10, 1	209
	-	inas Ev	cludes n	onrecurri	ng Oue	-			e to round	-	-			stock sp				Financial Streng		202 B-
ses: '(4, \$3.78	3; '05, \$1	.09; '06, \$	\$16.36; '0)8, (B)	Dividends	historic	ally paid	in early M	March,	(D) Paid	special di	ividend o	f \$0.17 pe	er share (on Sto	ck's Pric	ce Stability		7
			accoun			e, Septen ment plan			per. Div'	u rein-	11/17.	andad du						th Persistence		5

\$1.22; '10, \$0.46. GAAP accounting as of June, September, and December. • Div'd rein-2013. Next earnings report due early May. © 2020 Value Line, Inc. All rights reserved. Factual material is obtained from sources believed to be reliable and is provided without warranties of any kind. THE PUBLISHER IS NOT RESPONSIBLE FOR ANY ERRORS OR OMISSIONS HEREIN. This publication is strictly for subscriber's own, non-commercial, internal use. No partice and is provided without warranties of any kind, the PUBLISHER IS NOT RESPONSIBLE FOR ANY ERRORS OR OMISSIONS HEREIN. This publication is strictly for subscriber's own, non-commercial, internal use. No partice and is provided without warranties of any kind, the PUBLISHER IS NOT RESPONSIBLE FOR ANY ERRORS OR OMISSIONS HEREIN. This publication is strictly for subscriber's own, non-commercial, internal use. No partice or product. To subscribe call 1-800-VALUELINE

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YO	RK V	VATE		DQ-YOR	W			ecent Rice	46.77	P/E Rati	₀ 42.	1 (Traili Media	ng: 42.1) an: 25.0)	RELATIV P/E RATI	5 3.1	9 DIV'D YLD	1.5	5%	/ALU LINE	_	
TIMELI	iess 2	Lowered	3/20/20	High: Low:	18.0 9.7	18.0 12.8	18.1 15.8	18.5 16.8		24.3 18.8	26.7 19.7	39.8 23.8	39.9 31.7	36.1 27.5	47.3 30.3	49.8 34.6				t Price	
SAFET		Lowered		LEGE	NDS		15.0	10.0	17.0	10.0	13.7	20.0	51.7	27.5	00.0	54.0			2023	2024	
TECHN	cal 3	B Lowered	3/20/20	di	10 x Divide vided by Ir elative Pric	iterest Rate															64 48
	65 (1.00 =			Options:	Yes	ates recess	ion						lulile di								40
		et Price	•	Childed				\sim		~	-	11111			L HIN						-32
_ow-Hig		point (%	to Mid)						,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	աստել	իկոսի			Ĕ							24 20
\$31-\$53		(-10%)		In the		1	որողոր														16
		OJECTIC	nn'l Total	••••••	in		*****					•••••••	· · · · · · · · · · · · · · · · · · ·			••					- 12
High		Gain (-5%)	Return 1%				*****	**** ****	************	······	• • • • • • • • • •			•••••••••							-8
Low		(-5%) -35%)	1% -8%	- <u>-</u> -														% то	T. RETUR	RN 2/20	-6
Institu	2Q2019	302019	1S 4Q2019	Deres	1 10														THIS STOCK	VL ARITH.* INDEX	
to Buy to Sell	48 31	55 30	52 39	Percen shares	8 -		11.	1				uul .						1 yr. 3 yr.	18.0 24.4	-6.8 6.6	F
Hld's(000)	4866	5111	5387	traded														5 yr.	97.7	20.3	<u> </u>
2004	2005	2006	2007	2008	2009	2010	2011	2012		2014		2016	2017	2018	2019	2020	2021		UE LINE P		
2.18 .65	2.58 .79	2.56	2.79 .86	2.89	2.95	3.07 1.07	3.18 1.09	3.21 1.12	3.27 1.19	3.58 1.36	3.68 1.45	3.70 1.42	3.77 1.53	3.74 1.58	3.96 1.71	4.05 1.75	4.20 1.80		es per sh low" per		5.10 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		s per sh		1.60
.39	.42	.45	.48	.49	.51	.52	.53	.54	.55	.57	.60	.63	.65	.67	.70	.73	.78		ecl'd per s		.95
2.50 4.65	1.69 4.85	1.85 5.84	1.69 5.97	2.17 6.14	1.18 6.92	.83 7.19	.74 7.45	.94 7.73	.76 7.98	1.10 8.15	1.11 8.51	1.03 8.88	1.95 9.28	1.95 9.75	2.00 10.32	2.00 11.20	1.95 11.65		ending p		1.85 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		n Shs Ou		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 fig Value			n'I P/E Rat		22.5
1.36 3.1%	1.40 2.9%	1.68 2.5%	1.61 2.8%	1.48	1.46	1.32 3.5%	1.50 3.1%	1.55 3.1%	1.48 2.8%	1.22 2.8%	1.18 2.6%	1.72 2.1%	1.74 1.9%	1.64	1.83 1.9%	estim			P/E Ratio		1.25 2.5%
		CTURE a			0.070	39.0	40.6	41.4	42.4	45.9	47.1	47.6	48.6	48.4	51.5	52.5	54.0	Revenue		loiu	65.0
Total D	ebt \$101	.0 mill. 🛙	ue in 5	Yrs \$42.5		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 Prof			20.5
LT Deb	: \$94.5 m	ill. L	T Interes	st \$5.5 mi	ill.	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			21.0%
				(41% o	of Cap'l)	1.2%	1.1% 47.1%	1.1% 46.0%	.8% 45.1%	1.8% 44.8%	1.6%	1.9% 42.6%	6.7% 43.0%	1.7% 42.5%	2.0% 41.3%	1.5% 38.5%	1.5% 37.5%		% to Net I		1.5% 36.0%
Pensio	1 Assets	12/19 \$4 Oblic	9.3 mill. 1. \$47.3 r	mill.		40.3% 51.7%	47.1% 52.9%	40.0% 54.0%	45.1% 54.9%	44.0% 55.2%	44.4% 55.6%	42.0% 57.4%	43.0% 57.0%	42.5%	41.3% 58.7%	56.5% 61.5%	62.5%		rm Debt F n Equity F		50.0% 64.0%
	ale Mana					176.4	180.2	184.8	188.4	189.4	196.3	198.7	209.5	219.5	228.7	235	240		pital (\$mi		250
Pid Sto	ck None					228.4	233.0	240.3	244.2	253.2	261.4	270.9	288.8	299.2	313.2	315	320	Net Plan			335
Commo	on Stock	13,014,8	98 shs.			6.5% 9.8%	6.4% 9.5%	6.4% 9.3%	6.5% 9.3%	7.4%	7.6%	7.2%	7.5%	7.3%	7.4%	7.5%	7.5%		on Total C on Shr. Eq		9.0% 13.0%
MARKE	T CAP:	\$600 mill	ion (Sm	all Cap)		9.8%	9.5%	9.3%	9.3%	11.0%	11.5%	10.4%	10.9%	10.6%	10.8%	10.5%	10.5%		on Com E		13.0%
CURRE (\$MI	NT POS	ITION	2017	2018 1	2/31/19	2.7%	2.5%	2.4%	2.4%	3.9%	4.4%	3.4%	4.0%	3.8%	4.0%	4.0%	3.5%		d to Com		5.0%
Cash A	ssets				4.4	72%	73%	74%	74%	64%	62%	67%	63%	64%	63%	63%	65%		Is to Net F		59%
Invento	ts Recei ry (Avg.	Cost)	4.5 .9	4.8 .9	1.0				later Comp the United						ommercia billing sen						
Other Current	Assets	_	3.2 -	3.3 9.0	4.0	uously	since 18	16. Ás o	f Decembe	er 31, 20	019, the	company	's aver-	ployees	at 12/	/31/19. I	Presiden	t/CEO:	Jeffrey I	R. Hine	s. Of-
Accts F Debt D	ayable		3.1	3.0 1.0	3.4 6.5				s 35.4 mill opulation of						irectors o 130 East						
Other		_	6.0	6.8	5.3				ustomers a						(717) 845						
Current			9.1	10.8	15.2				ompa						pects.				_		
	L RATES e (per sh)	S Past 10 Yrs.	Pa 5 Yi		1 '16-'18 '23-'25				n d bot . Altho						stme deca						
Reveni "Cash	ies	3.0 6.0		.0% 0%	4.5% 7.0%				s far fi						ned.						
Earning Divider	IS	5.5 3.5	% 6.	.5%	7.0% 5.5%				cely to						ests c						
Book V		4.5	% 4.	.0%	4.5%				al basi hand v						on are likely						
Cal-		TERLY RE			Full	the	recent	t hea	lth cri	sis,	couple	ed wit	th a	\$27	millio	n wo	rth o	f spe	nding	in 2	2021.
endar 2017	11.3	12.3	40.7	12.3	Year 48.6		Ξ.		r of res		~				ls wil						
2017	11.6	12.0	12.7 12.7	12.3	48.4				ernme erience						ment						
2019	11.8 12.2	13.0	13.7 14.0	13.0	51.5 52.5	in w			nption.					ice li	ne, ar	nd fac	ility i	mprov	vemen	its. In	our
2020 2021	12.2	13.0 13.3	14.0	13.3 13.7	52.5	eu, v			to env						facto						
Cal-	EA	RNINGS P		ΕA	Full		nue a 2021.	ina s	hare-ne	et gi	rowtn	IOP 2	2020		ructur r base						
endar				Dec. 31		The	stoc		a favo					foot	off the	gas b	beyond				
2017 2018	.20 .20	.23 .26	.31 .29	.27 .29	1.01				ix- to						nent s			tic-	long	tom	
2019	.22	.28	.35	.26	1.11				Timelii 2 (Abo						he re ment						
2020 2021	.22 .23	.28 .30	.35 .36	.30 .31	1.15	tive	year-a	ahead	price	perfo	rmano	e. Wł	nat's	have	been	onas	steady	asce	nt for	the b	etter
Cal-		TERLY DI			Full				parison						of the						
endar		Jun.30			Year				: indice tility h						erate ntial t						
2016	.1555	.1555	.1555	.1602	.627	bette	er ove	r the	past s	ix w	eeks o	of trac	ding.	belov	v aver	age. A	All tol	d, des	spite t	he st	ock's
2017 2018	.1602 .1666	.1602 .1666	.1602 .1666	.1666 .1733	.647				vative					defer	nsive o	qualiti	es, w	e thin	k buy	/-and-	hold
2019	.1733	.1733	.1733	.1802	.70				alance easing						ints c vhere				activ	e opt	JOILS
2020	.1802								stable						olas P				Apr	il 10,	2020
				s report d	1 1 1 1 1 1			d for spl	:.							0	npany's				B+

ng:

(A) Diluted earnings. Next earnings report due (C) In millions, adjusted for split.
 (B) Dividends historically paid in late February, June, September, and December.
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<u>Utilities, Inc of Florida</u> Summary of Risk Premium Models for the <u>Proxy Group of Seven Water Companies</u>

		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.

Derived by the Predictive Risk Premium Model (1) Utilities, Inc of Florida Indicated ROE

[7]	Indicated ROE (4)	11.86% NMF 9.58% 9.55% 10.06% 12.84%	11.66%	10.96%
[9]	Risk-Free Rate (3)	2.03% 2.03% 2.03% 2.03% 2.03% 2.03%	Average	Median
[5]	Predicted Risk Premium (2)	9.83% NMF 7.55% 14.02% 7.52% 8.03% 10.81%		
[4]	GARCH Coefficient	1.89033 5.52177 1.90111 2.25364 2.12256 1.51190 2.09473		
[3]	Recommended Variance	0.41% NMF 0.32% 0.49% 0.29% 0.43% 0.41%		
[2]	Spot Predicted Variance	0.45% NMF 0.32% 0.53% 0.27% 0.37%		
[1]	LT Average Predicted Variance	0.38% NMF 0.32% 0.44% 0.30% 0.42% 0.45%		
	Proxy Group of Seven Water Companies	American States Water Co. American Water Works Company Inc California Water Service Group Essential Utilities, Inc. Middlesex Water Co. SJW Group York Water Co.		

NMF = Not Meaningful Figure

11.31%

Average of Mean and Median

Notes: Ξ

coefficient. The historical data used are the equity risk premiums for the first available trading month as The Predictive Risk Premium Model uses historical data to generate a predicted variance and a GARCH reported by Bloomberg Professional Service.

- $(1+(Column [3] * Column [4])^{^{12}}) 1.$ From note 2 on page 2 of Schedule 5. (2)
 - Column [5] + Column [6].

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<u>Utilities, Inc of Florida</u> Indicated Common Equity Cost Rate Through Use of a Risk Premium Model <u>Using an Adjusted Total Market Approach</u>

<u>Line No.</u>		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.

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<u>Utilities, Inc of Florida</u> Interest Rates and Bond Spreads for <u>Moody's Corporate and Public Utility Bonds</u>

Select	ted Bond Yields	
[1]	[2]	[3]
Aaa Rated	A Rated Public	Baa Rated Public

	Corporate Bond	Utility Bond	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

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Utilities, Inc of Florida Comparison of Long-Term Issuer Ratings for <u>Proxy Group of Seven Water Companies</u>

	Long-Term	oody's Issuer Rating il 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	А	6.0	
California Water Service Group (4)	NR		A+	5.0	
Essential Utilities, Inc. (5)	NR		А	6.0	
Middlesex Water Co.	NR		А	6.0	
SJW Corp. (6)	NR		A/A-	6.5	
York Water Co.	NR		A-	7.0	
Average	A2/A3	6.5	А	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

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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	А
A3	7	A-
Baa1	8	BBB+
Baa2	9	BBB
Baa3	10	BBB-
Ba1 Ba2	11 12	BB+ BB
Ba3	13	BB-
B1	14	B+
B2	15	В
B3	16	B-

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

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<u>Utilities, Inc of Florida</u> Judgment of Equity Risk Premium for <u>Proxy Group of Seven Water Companies</u>

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 %
Nata		

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

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Utilities, Inc of Florida Derivation of Equity Risk Premium Based on the Total Market Approach Using the Beta for the <u>Proxy Group of Seven Water Companies</u>

<u>Line No.</u>	Equity Risk Premium Measure	Proxy Group of Seven Water Companies
<u>1</u>	bbotson-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.

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<u>Utilities, Inc of Florida</u> Derivation of Equity Risk Premium Based on the Total Market Approach Using the Beta for the <u>Proxy Group of Seven Water Companies</u>

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

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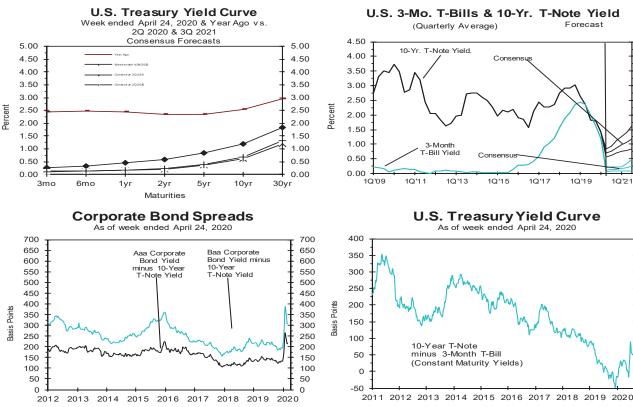
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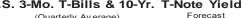
2 ■ BLUE CHIP FINANCIAL FORECASTS ■ MAY 1, 2020

Consensus Forecasts	of U.S.	Interest	Rates and	Key	Assumptions
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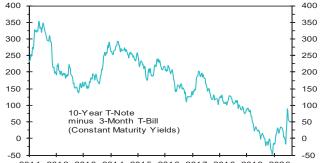
	History						Cons	ensus l	Foreca	sts-Qua	arterly	Avg.		
			Week End					Latest Qtr	2Q	3Q	4Q	1Q	2Q	3Q
Interest Rates	<u>Apr 24</u>	<u>Apr 17</u>	<u>Apr 10</u>	<u>Apr 3</u>	Mar	Feb	Jan	<u>1Q 2020</u>	<u>2020</u>	<u>2020</u>	<u>2020</u>	<u>2021</u>	<u>2021</u>	<u>2021</u>
Federal Funds Rate	0.05	0.05	0.05	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
				Histor	y				Co	onsensu	is Fore	casts-Q)uarte	rly
	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).





4.50 4.00 3.50 3.00 2.50 2.00 1.50 1.00 0.50 0.00 1Q'19 1Q'21



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14 ■ BLUE CHIP FINANCIAL FORECASTS ■ DECEMBER 1, 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 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.

			Aver	age For The	Year		Five-Year	Averages
		2021	2022	2023	2024	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
11 Transmin Nets Vield 10 Ve	Bottom 10 Average	1.5	1.7	1.9	2.1	2.3	1.9	2.3
11. Treasury Note Yield, 10-Yr.		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
12 Transmin David Viald 20 Ve	Bottom 10 Average	1.8	1.9	2.1	2.3	2.4	2.1	2.5
12. Treasury Bond Yield, 30-Yr.		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
12 Comparate Ass Band Viald	Bottom 10 Average	2.2	2.4	2.5	2.7	2.9	2.6	2.9 4.7
13. Corporate Aaa Bond Yield	CONSENSUS	3.7 4.3	4.0 4.6	4.3 4.9	4.5 5.2	4.6 5.3	4.2 4.9	5.4
	Top 10 Average Bottom 10 Average	4.3 3.2	3.4	3.6	3.2	3.9	3.6	5.4 4.0
13. Corporate Baa Bond Yield	CONSENSUS	3.2 4.7	3.4 4.9	5.0 5.2	5.7 5.4	5.9 5.6	5.0 5.2	4.0 5.6
13. Corporate Baa Boliu Tielu	Top 10 Average	5.3	4.9 5.6	5.2 5.9	6.2	6.3	5.9	5.0 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	4.2 3.6	4.3 3.7	3.9	4.0 4.1	4.8 4.2	4.5 3.9	4.2
14. State & Ebear Bonds Tield	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
15. Home Mongage Faile	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	0	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
	8_				Change			Averages
		2021	2022	2023	2024	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
	č							

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<u>Utilities, Inc of Florida</u> Derivation of Mean Equity Risk Premium Based Studies Using Holding Period Returns and <u>Projected Market Appreciation of the S&P Utility Index</u>

<u>Line No.</u>		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)	<u> </u>

- 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.

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	[8]	Indicated Common	Equity Cost	Rate (3)	9.37 %	11.36	9.27	11.67	11.05	10.94	11.57
	[2]		ECAPM Cost	Rate	10.03 %	11.73	9.94	12.00	11.46	11.37	11.91
Model (ECAPM)	[9]	Traditional	CAPM Cost	Rate	8.72 %	10.99	8.60	11.34	10.63	10.51	11.22
ı Use tal Asset Pricing I	[2]		Risk-Free	Rate (2)	%				2.03		
<u>Utilities. Inc of Florida</u> Indicated Common Equity Cost Rate Through Use set Pricing Model (CAPM) and Empirical Capital <u>A</u>	[4]		Market Risk	Premium (1)	11.94 %	11.94	11.94	11.94	11.94	11.94	11.94
<u>Utilities. Inc of Florida</u> nmon Equity Cost Rate odel (CAPM) and Empir	[3]		Average	Beta	0.56	0.75	0.55	0.78	0.72	0.71	0.77
<u>Utilities. Inc of Florida</u> Indicated Common Equity Cost Rate Through Use of the Traditional Capital Asset Pricing Model (CAPM) and Empirical Capital Asset Pricing Model (ECAPM	[2]		Bloomberg	Adjusted Beta	0.52	1.00	0.51	0.96	0.73	0.83	0.89
raditional Capit	[1]	Value Line	Adjusted	Beta	0.60	0.50	0.60	0.60	0.70	0.60	0.65
of the T			Proxy Group of Seven Water	Companies	American States Water Co.	American Water Works Company Inc	California Water Service Group	Essential Utilities, Inc.	Middlesex Water Co.	SJW Group	York Water Co.

Notes on page 2 of this Schedule.

Average of Mean and Median

%

10.75

%

11.21

%

10.29

0.69

Mean

Median

0.72

0.71

%

11.05

% 11.46

%

10.63

10.90 %

11.34

10.46

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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: Arithmetic Mean Income Returns on Long-Term Government Bonds: MRP based on Ibbotson Historical Data:	12.10 % 5.09 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)	<u>13.44</u> %
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*: Projected Risk-Free Rate (see note 2): MRP based on Value Line Summary & Index: *Forcasted 3-5 year capital appreciation plus expected dividend yield	18.71 % 2.03 16.68 %
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: Projected Risk-Free Rate (see note 2): MRP based on Value Line data	14.79 % 2.03 12.76 %
Measure 6: Bloomberg Projected MRP	
Total return on the Market based on the S&P 500: Projected Risk-Free Rate (see note 2): MRP based on Bloomberg data	$ \begin{array}{r} 13.53 & \% \\ \underline{2.03} \\ 11.50 & \% \end{array} $
Average of Value Line, Ibbotson, and Bloomberg MRP:	<u>11.94</u> %
	<u> </u>

(2) For reasons explained in the direct testimony, the appropriate risk-free rate for cost of capital purposes is the average forecast of 30 year Treasury Bonds per the consensus of nearly 50 economists reported in Blue Chip Financial Forecasts. (See pages 10-11 of Schedule 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 %
Assesses of Column Courd Column 7		

(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

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<u>Utilities, Inc. of Florida</u> Basis of Selection of the Group of Non-Price Regulated Companies <u>Comparable in Total Risk to the Utility Proxy Group</u>

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

The Non-Price Regulated Proxy Group 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:

Standard Deviation of the Std. Err. of the Regr. = 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

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)

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Basis Domest	Dock	et No. 20200139-WS Financial Schedules Exhibit DWD-2 Page 29 of 38 Schedule 6 Page 2 of 3		
	[1]	[2]	[3]	[4]
Proxy Group of Seven Water Companies	Value Line Adjusted Beta	Unadjusted Beta	Residual Standard Error of the Regression	Standard Deviation of Beta
American States Water Co. American Water Works Company Inc California Water Service Group Essential Utilities, Inc. Middlesex Water Co. SJW Group York Water Co. Average	0.60 0.50 0.60 0.60 0.70 0.60 0.65 0.61	0.36 0.23 0.38 0.39 0.54 0.38 0.46	2.6563 2.2596 2.3220 2.9281 3.4080 3.2407 3.4676 2.8975	0.0986 0.0839 0.0862 0.1087 0.1265 0.1203 0.1287 0.1076
Beta Range (+/- 2 std. Devs. of Beta) 2 std. Devs. of Beta	0.17 0.22	0.61		
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

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[4]

<u>Utilities, Inc of Florida</u> Proxy Group of Non-Price Regulated Companies Comparable in Total Risk to the <u>Proxy Group of Seven Water Companies</u>

[2]

[3]

[1]

	r_1	[_]	[-]	[- J
Proxy Group of Twelve Non-Price Regulated Companies	VL Adjusted Beta	Unadjusted Beta	Residual Standard Error of the Regression	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

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<u>Utilities, Inc of Florida</u> Summary of Cost of Equity Models Applied to Proxy Group of Twelve Non-Price Regulated Companies Comparable in Total Risk to the <u>Proxy Group of Seven Water Companies</u>

Principal Methods		Proxy Group of Twelve Non-Price Regulated Companies
Discounted Cash Flow Model (DCF) (1)	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.

<u>Utilities, Inc of Florida</u> DCF Results for the Proxy Group of Non-Price-Regulated Companies Comparable in Total Risk to the <u>Proxy Group of Seven Water Companies</u>

	[1]	[2]	[3]	[4]	[5]	[9]	[2]	[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	Yahool 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 %

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NA= Not Available NMF= Not Meaningful Figure The application of the DCF model to the domestic, non-price regulated comparable risk companies is identical to the application of the DCF to the utility proxy group. The dividend yield is derived by using the 60 day average price and the spot indicated dividend as of April 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. Ξ

%

8.41

Average of Mean and Median

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

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Utilities. Inc of Florida Indicated Common Equity Cost Rate Through Use of a Risk Premium Model Using an Adjusted Total Market Approach

<u>Line No.</u>		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	<u> 13.12 </u> %

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.

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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 <u>Proxy Group of Seven Water Companies</u>

	Long-Ter	loody's m Issuer Rating pril 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	А	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

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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 <u>Proxy Group of Seven Water Companies</u>

Line No.	Equity Ris	k Premium Measure	Proxy Group of Twelve Non-Price Regulated Companies
	bbotson-Based	l Equity Risk Premiums:	
1.	Ibbotson l	Equity Risk Premium (1)	5.78 %
2.	Regressio	n on Ibbotson Risk Premium Data (2)	9.12
3.	Ibbotson I	Equity Risk Premium based on PRPM (3)	11.95
4.		k Premium Based on <u>Value Line</u> and Index (4)	15.50
5		k Premium Based on <u>Value Line</u> Companies (5)	11.58
6.		k Premium Based on Bloomberg Companies (6)	10.32
7.	Conclusio	n of Equity Risk Premium	10.71 %
8.	Adjusted I	Beta (7)	0.80
9.	Forecaste	d Equity Risk Premium	<u> </u>
Notes:			
	1) From note	e 1 of page 9 of Schedule 4.	
	2) From note	e 2 of page 9 of Schedule 4.	
	3) From note	e 3 of page 9 of Schedule 4.	
	(4) From note	e 4 of page 9 of Schedule 4.	
	5) From note	e 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. <u>Value Line</u> Summary and Index Blue Chip Financial Forecasts, May 1, 2020 and December 1, 2019 Bloomberg Professional Services

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 Utilities. Inc of Florida

% % % % Equity Cost Indicated Common 11.83 11.3612.1411.52Rate (3) 11.25 14.089.79 14.2816.37 8.85 11.5711.4613.87 12.61 10.21 8 % % % % ECAPM Cost 12.14 12.40 9.58 11.73 14.0610.3914.2416.03 10.75 11.9112.81 11.8213.88 11.87 11.64Rate [] % % Traditional % % CAPM Cost Rate 11.53 11.8811.1710.9910.87 14.099.19 14.33 16.72 8.12 9.67 11.22 12.42 11.1113.85 [9] % **Risk-Free** Rate (2) 2.03 2.03 2.03 2.03 2.03 2.03 2.03 2.03 2.03 2.03 2.03 2.03 5 % **Market Risk** Premium (1) 11.9411.9411.9411.9411.9411.9411.9411.9411.9411.9411.9411.94[4] 0.640.87 0.76 0.99 0.80 0.51 0.77 0.601.031.23 Average 0.75 0.74 1.01 0.83 0.77 Beta From Schedule 5, note 1.
 From Schedule 5, note 2.
 Average of CAPM and ECAPM cost rates. [3] 0.410.57 0.79 1.09Bloomberg 0.83 1.310.55 1.361.720.82 1.220.81 Beta [2] 0.65 0.70 0.65 0.70 0.75 0.600.70 0.75 0.65 0.70 Value Line 0.70 0.75 Adjusted Beta Ξ Notes: Median Mean Average of Mean and Median Proxy Group of Twelve Non-Price Lamb Weston Holdings Dunkin' Brands Group **Regulated Companies Cboe Global Markets** Darden Restaurants Casey's Gen'l Stores Lancaster Colony Campbell Soup **Cracker Barrel** Hormel Foods Valvoline Inc. Altria Group Lilly (Eli)

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Ibbotson Associates' Size Premia for the Decile Portfolios of the NYSE/AMEX/NASDAQ Derivation of Investment Risk Adjustment Based upon Utilities, Inc of Florida

[4]	Spread from Applicable Size Premium (4)		4.20%	[D]	Size Premium (Return in Excess of CAPM)*	-0.28% 0.50% 0.73% 1.10% 1.34% 1.47% 1.59% 2.22% 4.99%	
[3]	Applicable Size Premium (3)	4.99%	0.79%	[C]	Market Capitalization of Largest Company (millions)	 \$ 1,061,355.011 30,542.936 13,100.225 6,614.962 4,311.252 2,685.865 1,668.282 993.847 515.602 299.748 sst of Capital Navigator 	1
[2]	Applicable Decile of the NYSE/AMEX/ NASDAQ (2)	10	4	[B]	Market Capitalization of Smallest Company (millions)	 \$ 31,090.379 \$ 1,061,355.011 13,142.606 6,618.604 13,100.225 4,312.546 6,614.962 2,688.889 4,311.252 1,669.856 993.855 993.855 993.855 993.855 993.847 230.024 515.602 1.973 299.748 *From 2020 Duff & Phelps Cost of Capital Navigator 	
			28.9 x	[A]	Decile	10 2 2 4 2 9 7 8 9 1 10 4 2 9 7 9 7 8 9 1 10 4 10 10 10 10 10 10 10 10 10 10 10 10 10	
[1]	Market Capitalization on April 30, 2020 (1) (millions) (times larger	\$ 196.004	\$ 5,657.608			Largest	
	I						Notes:
		Utilities, Inc of Florida	Proxy Group of Seven Water Companies				
	Line No.	1.	2.				

STAFF-DR-03-011 Attachment 3

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

£

From page 2 of this Schedule.
 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].

KyPSC Case No. 2021-00190

				(9)									Paç
	[9]	Market Capitalization on April 30, 2020 (3) (millions)		\$ 196.004 [\$ 22,003.118 \$ 2,180.066		\$ 1,694.016 \$ 524.761	\$ 5,657.608		ok ratio of	
	[5]	Market-to- Book Ratio on April 30, 2020 (2)		324.1 (5)		486.2 %	359.5 279.5	237.7 324.7	190.3 391.1	324.1 %		ommon equity ratio. to the market-to-bc	
	[4]	Closing Stock Market Price on April 30, 2020	NA			\$ 79.370	121.690 44.920	41.790 60.300	59.530 40.320	\$ 63.989		yy the requested c	
a and the <u>s</u>	[3]	Total Common Equity at Fiscal Year End 2019 (millions)	60.48 (4)			601.530	6,121.000 779.906	3,880.860 323.792	889.984 134.185	1,818.751		FL PSC multiplied ł April 30, 2020 is as 220 as appropriate.	
<u>la</u> of Florida <u>companie</u>		Tot: Equity E	÷			÷				÷		ort to the orida on <i>i</i> pril 30, 20	
<u>Utilities. Inc of Florida</u> Market Capitalization of Utilities, Inc of Florida and the Proxy Group of Seven Water Companies_	[2]	Book Value per Share at Fiscal Year End 2019 (1)	NA			16.325	33.853 16.070	17.580 18.572	31.275 10.310	20.569		119 Annual Repo Utilities, Inc of Fl Ompanies on A unn [5].	
<u>Utilit</u> alization Group o		Boo Sha Yea				\$				÷		2. - UIF's 20 - atio of U • Water (d by Colu	
Market Capit <u>Proxy</u>	[1]	Common Stock Shares Outstanding at Fiscal Year End 2019 (millions)	NA			36.847	180.813 48.532	220.759 17.434	28.457 13.015	77.979		 Column 3 / Column 1. Column 4 / Column 2. Column 1 * Column 4. Column 1 * Column 4. Column 1 * Column 4. 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. Column [3] multiplied by Column [5]. 	10K
		Exchange				NYSE	NYSE NYSE	NYSE NASDAQ	NYSE NASDAQ		NA= Not Available	Notes: (1) (2) (3) (4) (5) (5)	2019 Annual Forms yahoo.finance.com
		Company	Utilities, Inc of Florida	Based upon Proxy Group of Seven Water Companies	Proxy Group of Seven Water	Companies American States Water Co.	American Water Works Company Inc California Water Service Group	Essential Utilities, Inc. Middlesex Water Co.	SJW Group York Water Co.	Average	4		Source of Information: 2019 Annual Forms 10K yahoo.finance.com

KyPSC Case No. 2021-00190 STAFF-DR-03-011 Attachment 3

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KyPSC Case No. 2021-00190 STAFF-DR-03-011 Attachment 3 Page 88 of 88

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 <u>wtrierwe@psc.state.fl.us</u>

Stephanie Morse, Esquire Office of Public Counsel <u>morse.stephanie@leg.state.fl.us</u>

/s/ Martin S. Friedman

MARTIN S. FRIEDMAN

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

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

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

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	Contrac	ctor	Employ	yee
	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

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

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), <u>in addition to</u> <u>all other penalties</u> 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:

 A <u>cost-of-collection fee of twenty-five percent (25%)</u> 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

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

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

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

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

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

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.
 - 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.
 - 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 PERIOC TYPE OF FILING: _X_ ORIGINAL ___UPDATED ___ REVISED WORK PAPER REFERENCE NO(S).: 12 MONTHS FORECASTED INCLUDES ALL RIDERS

SCHEDULE M PAGE 1 OF 1 WITNESS: J.L. Kern

		REVENUE AT	REVENUE AT	REVENUE	% OF
LINE	RATE	PRESENT	PROPOSED	CHANGE	REVENUE
NO.	CLASSIFICATION	RATES	RATES	(AMOUNT)	CHANGE
	(A)	(B)	(C)	(D=C-B)	(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. 2021-00199 TEST PERIOD REVENUES AT CURRENT AVERAGE RATES FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2022 (GAS SERVICE)

DATA: TYPE OI WORK F		DATA:BASE PERIODX_FORECASTED PERIOD TYPE OF FILING: _X_ ORIGINALUPDATED REVISED WORK PAPER REFERENCE NOISN:	ED						SCHEDULE M-2.1 PAGE 1 OF 1	
12 M	ONTHS FL	12 MONTHS FORECASTED	INCLUDES ALL RIDERS		TEST PERIOD			> 7	WINESS: J.L. Kern	
					TEST PERIOD REVENUE LESS	CURRENT	% OF REV TO TOTAL		TEST PERIOD	
	RATE	CLASS /		22120	GAS COST	AVERAGE	EXCLUSIVE OF	GAS COST	REVENUE	% OF REV
	(A)		C)	(D)	KEVENUE (E)	KAIE (F=E/D)	GAS CUST (G)	KEVENUE (H)	101AL (I)	T0 T0TAL (J)
				(MCF)	(\$)	(\$/MCF)	(%)	(\$)	(2)	(%)
-	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	SS	GENERAL SERVICE COMMERCIAL	78,612	2,857,007	12,285,346	4.3001	16.54	11,605,162	23,890,508	20.82
n	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
ŝ	FT-L	FIRM TRANSPORTATION-LARGE	1,092	2,736,182	5,452,147	1.9926	7.34	(7,935)	5,444,212	4.74
9	F	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	•
80		BAD CHECK CHARGES	0	•	27,420	•	0.04	0	27,420	0.02
თ		RECONNECTION CHARGES	0	0	23,364	•	0.03	0	23,364	0.02
9		FIELD COLLECTION CHARGES	0	0	684	•	•	0	684	•
: 3		INTERDEPARTMENTAL	0	4,158	10,875	2.6154	0.01	16,890	27,765	0.02
12		MINIMUM USE CONTRACT	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	
15		OTHER MISCELLANEOUS	0	0	528	•	•	0	528	•
16	TOTAL		1,215,429	14,371,552	74,291,911	5.1694	66 .66	40,462,461	114,754,372	99.98

NOTE: DETAIL CONTAINED ON SCHEDULES M-2.2 AND M-2.3.

		TOTAL REVENUE % INCREASE (M / K1) (0)	(%)	10.5	10.5	18.1 18.3	18.3 18.1	12.5	26.7 24.8	26.2	13.4		(31.0)	(0.16)	13.3
	SCHEDULE M-2.2 PAGE 1 OF 7 WITNESS: J.L. Kern	CURRENT TOTAL REVENUE (K + H) (K1)	(\$)	78,691,507	78,691,507	23,890,508 2,459,804	2,14/,642 28,497,954	107,189,461	5,444,212 1,782,710	7,226,922	114,416,383	27,420 27,420 23,564 23,564 23,7765 258,228 258,228	528 337 989	600'100	114,754,372
	0 L S 7	GAS COST REVENUE(3) (H)	(\$)	26,327,032	26,327,032	11,605,162 1,346,492	1,1/4,820	40,453,506	(7,935) 0	(7,935)	40,445,571	1 6,89 0 0 0 0 0 0 0 0 0	16 890	060'01	40,462,461
		% INCR IN REV LESS GAS COST REV (M / K) (N)	(%)	15.8	15.8	35.1 40.5	40.5 35.9	20.1	26.7 24.8	26.2	20.7		- 12 00	- (1:3c)	20.5
ENT RATES 2022		REVENUE INCR LESS GAS COST REV (F - K) (M)	(\$)	8,275,874	8,275,874	4,316,149 450,846	5,160,593	13,436,467	1,454,008 442,297	1,896,305	15,332,772	0 4,673 5,060 (114,674)	(104 941)	(104,341)	15,227,831
TUCKY 3190 VS. MOST CURR D DECEMBER 31,	.) LIZED	% OF REV TO TOTAL LESS GAS COST REVENUE (L)	(%)	100.00	70.49	85.48 7.75	19.34	89.83	75.36 24.64	9.74	99.57	0.00 8.54 3.39 8.42 0.00	0.16	24	100.00
DUKE ENERGY KENTUCKY CASE NO. 2021-00190 ANNUALIZED REVENUES AT PROPOSED VS. MOST CURRENT RATES FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2022	(945 SERVICE) CURRENT ANNUALIZED	CURRENT REVENUE LESS GAS COST REVENUE(4) <i>(K)</i>	(\$)	52,364,475	52,364,475	12,285,346 1,113,312	9/2/822 14,371,480	66,735,955	5,452,147 1,782,710	7,234,857	73,970,812	27,420 27,420 23,364 684 10,875 258,228	528 121 Aga	860'I 70	74,291,911
DI ED REVENUI THE TWELV	-	MOST CURRENT RATES (J)	(\$/MCF)	8.0793	8.0793	4.3001 3.3586	3.3636 - 4.1325 -	6.7011	1.9926 1.0661	1.6412	5.1485		•	•	5.1694
ANNUALIZE FOR)ERS	SALES(2) (D)	(MCF)	6,481,298	6,481,298	2,857,007 331,485	289,222 3,477,714	9,959,012	2,736,182 1,672,200	4,408,382	14,367,394	4, 158 0 0 0 0 0 0 0 0	4 158	0CI '#	14,371,552
	tioc revisec nvcludes all riders	CUSTOMER BILLS(1) (C)		1,130,041	1,130,041	78,612 2,879	2,541 84,032	1,214,073	1,092 264	1,356	1,215,429		0		1,215,429
	DATA: BASE PERIOD X FORECASTED PERIOC TYPE OF FILING: X, ORIGINAL UPDATED REVISEC WORK PAPER REFERENCE NO(S):: 12 MONTHS FORECASTED	CLASS / DESCRIPTION (B)		<u>SALES SERVICE:</u> RS RESIDENTIAL	TOTAL RS	COMMERCIAL	TOTAL GS	TOTAL SALES SERVICE	<u>TRANSPORTATION SERVICE:</u> FT-L FIRM TRANSP - LARGE IT INTERRUPTIBLE TRANSP	TOTAL TRANSP SERVICE	TOTAL THROUGHPUT	<u>MISCELLANEOUS REVENUES:</u> LATE PAYMENT CHARGES BAD CHECK CHARGES RECONNECTION CHARGES FIELD COLLECTION CHARGES FIELD COLLECTION CHARGES INTERDEPARTMENTAL NITERDEPARTMENTAL REVENUE TRANSP OF GAS-INTERCO PROVISION FOR RATE REFUNDS	lisc		TOTAL COMPANY
	DATA: BASE PERIOD TYPE OF FILING: _X_ORIG WORK PAPER REFERENCI 12 MONTHS FORECASTED	LINE RATE NO. CODE (A)		1 24LE2 21	5		6 68	8 TOTAL S	9 <u>TRANSPC</u> 10 FT-L 11 IT	12 TOTAL 1	13	14 MISCELL 15 LATE PAN 16 BAD CHE 17 RECONNI 18 FIELD CO 19 INTERDEI 21 REVENUE 22 PROVISIO		-	25 TOTAL

(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)

INCLUDES ALL RIDERS DATA: BASE PERIOD X_FORECASTED PERIOD TYPE OF FILING: X_ORIGINAL UPDATED REVISED WORK PAPER REFERENCE NO(S).: INCLUDES / 12 MONTHS FORECASTED

SCHEDULE M-2.3 PAGE 1 OF 7 WITNESS: J.L. Kern

			INCLUDES ALL RIDERS		PROPOSED ANNUALIZED			7	J.L. Kern
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 (<i>f</i> + <i>H</i>) (<i>f</i>)
	SALES SEDUICE	EDIACE.		(MCF)	(\$/MCF)	(\$)	(%)	(\$)	(\$)
- 71	RS		1,130,041	6,481,298	9.3562	60,640,349	100.00	26,327,032	86,967,381
n		TOTAL RS	1,130,041	6,481,298	9.3562	60,640,349	67.74	26,327,032	86,967,381
4		COMMERCIAL	78,612	2,857,007	5.8108	16,601,495	85.00	11,605,162	28,206,657
un u	5 GS 6 GS	INDUSTRIAL	2,879	331,485	4.7186	1,564,158	8.01	1,346,492	2,910,650
		TOTAL GS	84,032	3,477,714	5.6164	1,300,420	21.82	14,126,474	2,541,240 33,658,547
80		TOTAL SALES SERVICE	1,214,073	9,959,012	8.0502	80,172,422	89.56	40,453,506	120,625,928
e 6 f	9 <u>TRANSPO</u> 10 FT-L 11 IT	9 <u>TRANSPORTATION SERVICE:</u> 0 FT-L FIRM TRANSP - LARGE 1 IT INTERRUPTIBLE TRANSP	1,092 264	2,736,182 1.672.200	2.5240 1.3306	6,906,155 2.225.007	75.63 24.37	(7,935) 0	6,898,220 2 2 2 6 01 7
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
15 15		<u>MISCELLANEOUS REVENUES:</u> LATE PAYMENT CHARGES	0	0		0	0.00	0	0
16		BAD CHECK CHARGES	0	0		27,420	12.69	0	27,420
14		RECONNECTION CHARGES	Ó	0		28,037	12.97	0	28,037
5 5		FIELU CULLECTIUN CHARGES		0 1 5 0		684	0.32	0	684
20		MINIMUM USE CONTRACT		, 130 1		142 EEA	16.1	169'01	32,825
21		REVENUE TRANSP OF GAS-INTERCO		00			0.00	0	0
3 5		PROVISION FOR RATE REFUNDS	00	0 (0	0.00	0	0
ç		20	-	0	ſ	528	0.24	•	528
24	TOTAL MISC	NSC	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.

		AN	ANNUALIZED REVE FOR THE TWI	DUKE ENERGY KENTUCKY CASE NO. 2021-00190 ALIZED REVENUES AT PROPOSED VS. MOST CURRENT RATES FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2022	(ENTUCKY 1-00190 ED VS. MOST CI DED DECEMBER	0 URRENT RATES 8 31, 2022			
DATA TYPE WORI	DATA: BASE PERIOD TYPE OF FILING: X_ORIG NORK PAPER REFERENCI 12 MONTHS FORECASTED	DATA:BASE PERIODX_FORECASTED PERIOD TYPE OF FILING: _X_ORIGINALUPDATED REVISED WORK PAPER REFERENCE NO(S).: 12 MONTHS FORECASTED		(GAS SERVICE)					SCHEDULE M-2.3 PAGE 2 OF 7 WITNESS: J.L. Kern
				PROPOSED ANNUALIZED	INALIZED				
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 (/)
-	RS RESIDENTIAL	АГ		(MCF)	(\$/MCF)	(\$)	(%)	(\$)	(\$)
0 17 19 19 1	D E	<i>STOMER CHARGE:</i> SIDENTIAL TOTAL MONTHLY BILLS × : CUSTOMER CHARGE PER MONTH	1,130,041		\$19.00	21,470,779	35.4		21,470,779
9 1	COMMODITY CHARGE: ALL CONSUMPTION	SE: ON		6,481,298	5.5330	35,861,022	59.1	26,327,032	62,188,054
œ	RATE RS EXCLUDING RIDERS	IDING RIDERS	1,130,041	6,481,298	I	57,331,801	94.5	26,327,032	83,658,833
9 11 12	RID	ERS: HOME ENERGY ASSISTANCE PROGRAM (HEA) DEMAND SIDE MANAGEMENT RATE (DSMR) WEATHER NORMALIZATION ADJUSTMENT (WNA)			\$0.30 0.458170 0.000000	339,012 2,969,536 0	0.6 0.0		339,012 2,969,536 0
13	TOTAL RIDERS				1	3,308,548	5.5		3,308,548
14		TOTAL RATE RS RESIDENTIAL INCLUDING RIDERS	1,130,041	6,481,298	n	60,640,349	100.0	26,327,032	86,967,381
	(1) BILLS THAT TERMINATE IN RESPEC (2) REFLECTS NORMALIZED VOLUMES.	(1) BILLS THAT TERMINATE IN RESPECTIVE RATE STEPS (2) REFLECTS NORMALIZED VOLUMES.	Ś						

(3) REFLECTS AVERAGE EXPECTED GAS COST OF \$4.062/MCF.

		AN	I UALIZED REVENI FOR THE TWEL	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)	ENTUCKY -00190 ED VS. MOST CL ED DECEMBER CF)	IRRENT RATES 31, 2022			
DATA: TYPE (WORK 12 MOI	C FIL OF FIL K PAPE NVTHS I	DATA:BASE PERIODX_FORECASTED PERIOD TYPE OF FILING: _X_ ORIGINALUPDATED REVISED WORK PAPER REFERENCE NO(S).: 12 MONTHS FORECASTED		PROPOSED ANNUALIZED	JALIZED				SCHEDULE M-2.3 PAGE 3 OF 7 WITNESS: J.L. Kern
LINE NO.	RATE CODE (A)	E 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 (/)
	I GS	COMMERCIAL		(MCF)	(\$MCF)	(\$)	(%)	(\$)	(\$)
01 M 4 10	D N L	CUSTOMER CHARGE: NON-RESIDENTIAL TOTAL MONTHLY BILLS x : CUSTOMER CHARGE PER MONTH	78,612		\$58.00	4,559,496	27.5		4,559,496
46		COMMODITY CHARGE: ALL CONSUMPTION		2,857,007	4.2149	12,041,999	72.5	11,605,162	23,647,161
œ	-	RATE GS COMMERCIAL EXCLUDING RIDERS	78,612	2,857,007	·	16,601,495	100.0	11,605,162	28,206,657
9 11	RID	ERS: DEMAND SIDE MANAGEMENT RATE (DSMR) WEATHER NORMALIZATION ADJUSTMENT (WNA)			0.000000	00	0.0		00
12	·	TOTAL RIDERS				0	0.0		0
13	TOTA	13 TOTAL RATE GS COMMERCIAL INCLUDING RIDERS	78,612	2,857,007		16,601,495	100.0	11,605,162	28,206,657
	(1) BI (2) RE (3) RE	(1) BILLS THAT TERMINATE IN RESPECTIVE RATE STEPS. (2) REFLECTS NORMALIZED VOLUMES. (3) REFLECTS AVERAGE EXPECTED GAS COST OF \$4 062/MCF.	S. 22/MCF						

(3) REFLECTS AVERAGE EXPECTED GAS COST OF \$4.062/MCF.

ANI DATA: BASE PERIOD X_FORECASTED PERIOC TYPE OF FILING: X_ORIGINALUPDATEDREVISEI WORK PAPER REFERENCE NO(S).: 12 MONTHS FORECASTED NO. CODE	ANNU ECASTED PERIOC UPDATED REVISED	DUKE ENERGY KENTUCKY CASE NO. 2021-00190 ZED REVENUES AT PROPOSED VS. MC R THE TWELVE MONTHS ENDED DECE (GAS SERVICE) PROPOSED ANNUALIZED PROPOSED ANNUALIZED PROPOSED ANNUALIZED
FOR TH FOR TH CUSTON BILLS(D REVENUES AT PROPO CASE NO. 20 D REVENUES AT PROPO (GAS SER (GAS SER PROPOSED AN	
LALIZED FOR TH CUSTON BILLS(CASE NO. 2021-00190 D REVENUES AT PROPOSED VS. MOST C HE TWELVE MONTHS ENDED DECEMBER (GAS SERVICE) PROPOSED ANNUALIZED MER PROPOSED ANNUALIZED	21-00190 SED VS. MOST C IDED DECEMBER VICE) NUALIZED PROPOSED RATES
CASE NO. 2021 UALIZED REVENUES AT PROPOSE FOR THE TWELVE MONTHS END (GAS SERVI (GAS SERVI (GAS SERVI (C) (D) (C) (D)	CASE NO. 2021-00190 REVENUES AT PROPOSED VS. MOST CU E TWELVE MONTHS ENDED DECEMBER (GAS SERVICE) PROPOSED ANNUALIZED MER PROPOSED ANNUALIZED	21-00190 SED VS. MOST CURRENT RATES IDED DECEMBER 31, 2022 VICE) NUALIZED PROPOSED REVENUE LESS PROPOSED REVENUE RATES REVENUE
UALIZED REVENUES AT PROPOSED VS. MOST CU FOR THE TWELVE MONTHS ENDED DECEMBER (GAS SERVICE) (GAS SERVICE) PROPOSED ANNUALIZED PROPOSED ANNUALIZED CUSTOMER BILLS(1) SALES(2) RATES (C) (D) (E)	REVENUES AT PROPOSED VS. MOST CURRENT RATES E TWELVE MONTHS ENDED DECEMBER 31, 2022 (GAS SERVICE) PROPOSED ANNUALIZED PROPOSED ANNUALIZED PROPOSED ANNUALIZED REVENUE LESS REVENUE LESS	
UALIZED REVENUES AT PROPOSED VS. MOST CURRENT RATES FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2022 (GAS SERVICE) (GAS SERVICE) PROPOSED ANNUALIZED PROPOSED ANNUALIZED PROPOSED REVENUE LESS CUSTOMER PROPOSED REVENUE LESS (C) (D) (E) (F) (F)	REVENUES AT PROPOSED VS. MOST CURRENT RATES E TWELVE MONTHS ENDED DECEMBER 31, 2022 (GAS SERVICE) PROPOSED ANNUALIZED PROPOSED ANNUALIZED REVENUE LESS TOTAL LESS MER PROPOSED GAS COST GAS COST	% OF REV TO S TOTAL LESS GAS COST REVENUE

DUKE ENERGY KENTUCKY DUKE ENERGY KENTUCKY ANNUALIZED REVENUES AT PROPOSED VS. 0021-00190 ANNUALIZED REVENUES AT PROPOSED VS. 0021-00190 TOFE OFFILING:ODST CURRENT RATES FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2022 DATA:BASE PERIOD X_FORECASTED PERIOD (GAS SERVICE) TOFE OFFILING:UDDATEDUDDATEDROBOSED MINUALIZED SCHEDULE M-2.3 WORK PAPER REFERICE NO[5)::UDDATEDROBOSED ANNUALIZED SCHEDULE M-2.3 TOR MARK PAPER REFERICE NO[5)::UDDATEDROPOSED ANNUALIZED SCHEDULE M-2.3 NONTHS FORECASTED REVENUE SCHEDULE M-2.3 UNE RATE CLASS / CUSTOMER SCHEDULE M-2.3 NON. CODE DOR REVENUE SCHEDULE M-2.3 NON. CODE DESCRIPTION BILLS(1) SALES / OTALLESS NO. CODE DESCRIPTION BILLS(1) SALES REVICE REVENUE REVENUE NO. (B) (C) (D) (F) (F) (F) (F) 1 G OTHER PUBLIC AUTHORITIES ISMORES ISMORES ISMORES ISMORES ISMORES 2 CUSTOMER CHARGE: INDARESIDENTAL ISMORES ISMORES <th>3 NON-RELINEAL 358.00 147,378 10.8 147,378 5 CUSTOMER CHARGE PER MONTH VELLS × : 2.541 5.88.00 147,378 10.8 147,378 6 CUMMODITY CHARGE: 2.541 2.89,222 4.2149 1,219,042 89.2 1,174,820 2,393,862 7 ALL CONSUMPTION ALL CONSUMPTION 2.89,222 4.2149 1,366,420 100.0 1,174,820 2,541,240 9 RIDERS: B RATE GS OPA EXCLUDING RIDERS 2.541 289,222 4.2149 1,366,420 100.0 0</th>	3 NON-RELINEAL 358.00 147,378 10.8 147,378 5 CUSTOMER CHARGE PER MONTH VELLS × : 2.541 5.88.00 147,378 10.8 147,378 6 CUMMODITY CHARGE: 2.541 2.89,222 4.2149 1,219,042 89.2 1,174,820 2,393,862 7 ALL CONSUMPTION ALL CONSUMPTION 2.89,222 4.2149 1,366,420 100.0 1,174,820 2,541,240 9 RIDERS: B RATE GS OPA EXCLUDING RIDERS 2.541 289,222 4.2149 1,366,420 100.0 0
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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		CURRENT ANNUALIZED	CURRENT % OF REV TO REVENUE % INCR IN CURRENT TOTAL MOST REVENUE LESS 107AL 107AL REVENUE MMER MOST REVENUE LESS 107AL 107AL REVENUE MMER CURRENT GAS COST GAS COST REV GAS COST REV GAS COST 8, INCREASE LS SALES(1) RATES REVENUE (F - K) (M / K) REVENUE (M / K1) (D) (J) (K) (L) (M) (N) (H) (N) (O)	(MCF) (\$MCF) (\$) (?4) (\$) (5) (74) (5) (5) (74)	1,092 \$430.00 469,560 8.6 0 0.0 469,560 0.0	2,736,182 1.8210 4,982,587 91.4 1,454,008 29.2 4,982,587 29.2	<u>1,092</u> 2,736,182 5,452,147 100.0 1,454,008 26.7 5,452,147 26.7	(0.0580) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	<u> </u>	<u>1,092 2,736,182 5,452,147 100.0 1,454,008 26.7 (7,935) 5,444,212</u> 26.7 26.7	
KENT RATES				(\$)							
VS. MOST CURF MBER 31, 2022			% OF REV TO TOTAL LESS GAS COST REVENUE (L)	(%)	8.(91.	100.(0.0	0.0	100.1	
NERGY KENTUCKY E NO. 2021-00190 ES AT PROPOSED VTHS ENDED DECE		ENT ANNUALIZED	CURRENT REVENUE LESS GAS COST REVENUE (K)	(5)	469,560	4,982,587	5,452,147		0	5,452,147	
DUKE EN CASE EAR REVENUE TWELVE MON	<u>þ</u>	CURRE	MOST CURRENT RATES (J)	(\$MCF)	\$430.00	1.8210		(0.0580)			
NUALIZED TEST Y FOR THE			SALES(1) (D)	(MCF)		2,736,182	2,736,182			2,736,182	
AN			CUSTOMER BILLS (C)		1,092		1,092			1,092	
	DATA: BASE PERIOD _X_FORECASTED PERIOC TYPE OF FILING: _X_ ORIGINALUPDATED REVISEC WORK PAPER REFERENCE NO(S).: 12 MONTHS FORECASTEC		CLASS / DESCRIPTION (B)	- L FIRM TRANSPORTATION - LARGE	TIVE CHARGE	4 TRANSPORTATION CHARGE: 5 ALL CONSUMPTION	RATË FT-LARGE EXCLUDING RIDERS	ers: Gas cost adjustment transition (gcat)(2;	TOTAL RIDERS	10 TOTAL RATE FT - LARGE INCLUDING RIDERS	
	DATA: BASE PERIOD TYPE OF FILING: X_ORIG WORK PAPER REFERENCI 12 MONTHS FORECASTED		LINE RATE NO. CODE (A)	1 FT-L 2 FIRM TR	3 ADMINISTRATIVE CHARGE	4 TRANSPORT 5 ALL CON	6 RATEFT-	7 RIDERS: 8 GAS COS	9 TOTA	10 TOTAL RATE	

REFLECTS NORMALIZED VOLUMES.
 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%

	SCHEDULE M-2.3 PAGE 7 OF 7 WITNESS:		PROPOSED TOTAL REVENUE (<i>F</i> + H) (<i>I</i>)	(\$)	113,520	2,111,487	2,225,007	0	0	2,225,007
			GAS COST REVENUE (H)	(\$)						
			% OF REV TO TOTAL LESS GAS COST REVENUE (G)	(%)	5.1	94.9	100.0	0.0	0.0	100.0
DUKE ENERGY KENTUCKY CASE NO. 2021-00190 ANNUALIZED REVENUES AT PROPOSED VS. MOST CURRENT RATES FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2022			PROPOSED REVENUE LESS GAS COST REVENUE (F)	(\$)	113,520	2,111,487	2,225,007	0	0	2,225,007
DUKE ENERGY KENTUCKY CASE NO. 2021-00190 UES AT PROPOSED VS. MO -VE MONTHS ENDED DECEN	(GAS SERVICE)	PROPOSED ANNUALIZED	PROPOSED RATES (E)	(\$/MCF)	\$430.00	1.2627		0.0000		
DUKE ENERGY KENTUCKY CASE NO. 2021-00190 CASE NO. 2021-00190 ALIZED REVENUES AT PROPOSED VS. MOST CURRENT F FOR THE TWELVE MONTHS ENDED DECEMBER 31, 2022	(CAD)	PROPOSED	SALES (D)	(MCF)		1,672,200	1,672,200			1,672,200
ANNUALIZED REV FOR THE T	tiod revised		CUSTOMER BILLS (C)		264		264			264
	DATA: BASE PERIOD X FORECASTED PERIOD TYPE OF FILING: X ORIGINAL UPDATED R MORK PAPER REFERENCE NO(S):		CLASS / DESCRIPTION (B)	INTERRUPTIBLE TRANSPORTATION	TIVE CHARGE	CHARGE: UMPTION	RATE IT EXCLUDING RIDERS		TOTAL RIDERS	10 TOTAL RATE IT TRANSPORTATION
	DATA: BASE PERIOD TYPE OF FILING: X_ORIG WORK PAPER REFERENCI		LINE RATE NO. CODE (A)	1 IT 2 INTERRU	3 ADMINISTRATIVE CHARGE	4 COMMODITY CHARGE: 5 ALL CONSUMPTION	6 RATEIT	7 RIDERS: 8 NIA	9 707.4	10 TOTAL RATE

DUKE ENERGY KENTUCKY CASE NO. 2021-00190 EFFECTS OF PROPOSED FIRM TRANSPORTATION-LARGE RATES AND INTERRUPTIBLE TRANSPORTATION BATES ON TYPICAL CUSTOMER BILLS (GAS SERVICE)

DATA: BASE PERIOD X_FORECASTED PERIOD TYPE OFFILING: X_ONGINAL UPDATED REVISED WORK PAPER REFERENCE NO(S):: 12 MONTHS FORECASTED

SCHEDULE N PAGE 2 OF 2 WITNESS: J.L. Kern

			BILL DATA 1	BILL DATA INCLUDING RIDERS LESS COST of GAS	ERS LESS COS	T of GAS		TOTAL	TOTAL	
	LEVEL	LEVEL			DOLLAR	PERCENT		CURRENT	PROPOSED	PERCENT
	ol	ō	CURRENT	PROPOSED	INCREASE	INCREASE	GAS	BILL	BILL	INCREASE
LINE RATE	DEMAND	USE	BILL	BILL	()-0	(E / C)	COST (1)	(C + C)	(9+0)	H/ (H-I)
	(A)	(B)	(c)	(q)	(E)	6	9	(H)		Ę,
		(MCF)	(2)	(\$)	(\$)	(%)	(2)	(\$)	(3)	(%)
		(MCF)	(2)	(\$)	(5)	(%)	(\$)	(2)	(8)	(%)
1 (FT-L)	Not									
2 FIRM		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
ŝ		3,000	5,893.00	7,487.20	1,594.20	27.1	(174.00)	5,719.00	7.313.20	27.9
9		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
80		20,000	36,850.00	47,478.00	10,628.00	28.8	(1,160.00)	35,690.00	46,318.00	29.8
ŋ		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
1		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
4		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		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		200 000	000 000							

(1) INCLUDES CURRENT RIDER GCAT OF (\$0.058)/MCF

	Comparison of Schedule M Galculated Proposed Revenue: Less COS Revenue Requirement CASE NO. 2021-00190	Rante •value is high & -value is low RS S	GS S	FT-Large 17	Total S		
			5,193,484	1,347,627			15,268,921
		Change Incre 11.0%	18.2%	24 B% 24 B%			-31.0%
		CO3 - no riders - includes fuel and FAC % Change Increase 83,658,696 11 0%	33,691,438	6,791,839 2 225,050	114,674		233,048 126,714,745
			4,095,886	132,688 85.409			32,925,639
	DUKE ENERGY KENTUCXY CASE NO. 2021-00190 COST OF SERVERGE 51 UDY Proposted Revenue Requirement: CASE NO. 2021-00190	Rate RS	65	FT-Large IT	Additional FT for Min use		OTHER TOTAL
udy		Lurrent Nate Kevenues - Na Riders - Including Fuel 75,382,959	28,497,954	5,444,212 1.782 710			337,989 111,445,824
ROM COST OF SERVICE ST	KY T RATE REVENUES	Lu N Customer Bills Fi 1,230,041	260,448	1,092 264			1,215,429
REVENUE REQUIREMENTS FROM COST OF SERVICE STUDY	DUKE ENERGY KENTUCKY CASE NO. 2021-00190 SCHEDULE M - CURRENT RATE REVENUES No Riders - With Fuel	52 S	65	FT-Large IT			OTHER TOTAL

117 (128,28) (128,3258 (143) (143) (13,155)

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 Less Proposed Customer Charge Revenues	\$	83,658,696
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

and a state of the	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 Less Proposed Customer Charge Revenues	\$	33,691,438
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

Communication Constraint	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 Less Proposed Customer Charge Revenues Less	\$	6,791,839
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)

18.3% 18.3% 27.5% 24.8%	24.5%
1,010.67 999.92 6,179.08 8,428.07	1,207.52
854.13 845.05 4.847.55 6.752.70	669.73
467.54 462.26 0.00 0.00	00.0
40.5 27.5 24.8	24.5
156.54 154.87 1,331.53 1,675.37	237.79
543.13 537.66 6,179.08 8,428.07	1,207.52
386.59 382.79 4,847.55 6,752.70	669.73
115.1 113.8 2,505.7 6,334.1	8,839.8
1,151 1,138 25,057 63,341	88,398

GS-Ind GS-OPA FT-L IT IMBS

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

	Labor Dollars		Original Cost	Accumulated Depreciation	Original Cost	Accumulated Depreciation	Functional A & G Expenses Less Reg
Function	(a)	Labor Ratio	General Plant (b)	General Plant (b)	General Plant (b) Common Plant (b) Common Plant (b)	Common Plant (b)	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%	•	ı		•	1
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

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EXCESS RETURN	COMPOSITE TAX RATE	COMPOSITE TAY BATE	IVIAL GAS CUST OF SERVICE	PROPOSED REVENUES	DPOPOSED DEVENIES = CIIBBENT DEVENIES	PER UNIT PRES REV	REVENUE INCREASE REQUESTED	PER UNIT PRES REV	REVENUE INCREASE JUSTIFIED	PRESENT REVENUES		ALLOWED RETURN ON COMMON EQUITY	RETURN EARNED ON COMMON EQUITY	TOTAL RATE OF RETURN ALLOWABLE	RATE OF RETURN EARNED	TOTAL RETURN EARNED (TO WPE-3.2k)	EXCESS REVENUES	PROPOSED REVENUES - ELIM 100.00% OF SUBSIDY	TOTAL GAS CUST OF SERVICE	TOTAL OTHER OPERATING REVENUES	RETURN ON RATE BASE		TOTAL OPERATING EXPENSE	REVENUE TAX	NET FED INCOME TAX EXP ALLOWABLE	TOTAL OP EXP EXCLINC & REV TAX	TOTAL OTHER TAX & MISC EXPENSE		TOTAL O&M EXPENSE	OPERATING EXPENSES		TOTAL RATE BASE	TOTAL RATE BASE ADJUSTMENTS	TOTAL DEPRECIATION RESERVE	GROSS GAS PLANT IN SERVICE	NET INCOME COMPUTATION	Schedule 1	SUMMARY OF RESULTS	GAS COST OF SERVICE STUDY GAS COST OF SERVICE STUDY COMPUTATION OF PRESENT RETURN EARNED (PRESENT NO!) TWELVE MONTHS ENDING DECEMBER 31, 2022 CASE NO: 2021-00190 DATA: 12 MONTH FORECASTED PERIOC
																Line 16 + Line 41		PA									}										2		NOI
(3,795,620) (11,432,545)	0.24925	(15,228,165)	(126,371,700)	111,143,535		0.13758	15,291,055	0.13701	15,228,165	111,143,535		0.10301	0.05486	0.070600	0.04619	21 630 932	62,890	126,434,590	126,371,700	(310,224)	33,063,477		93,618,447	1,504,852	5,596,540	86,517,055	4,716,796	19,004,235	62,796,024			468,321,206	(96,583,675)	(206,903,281)	771,808,162		070	TOTAL	
(1,484,650) (4,471,823)	0.24925	(5,956,473)	(81,339,432)	75,382,959		0.13210	9,958,418	0.07902	5,956,473	75,382,959		0.10301	0 07344	0.070600	0.05561	16 594 938	4,001,945	85,341,377	81,339,432	(222,777)	21,066,761		60,495,448	957,895	3,566,167	55,971,386	3,030,944	12,162,320	40,778,122			298,396,049	(61,512,130)	(133,530,689)	493,438,868			RS	
(1,838,382) (5,537,272)	0.24925	(7,375,654)	(35,901,373)	28,525,719		0.14760	4,210,438	0.25856	7,375,654	28,525,719		0.10301	0 00984	0.070600	0.02337	2 740 230	(3,165,216)	32,736,157	35,901,373	(66,017)	8,277,502		27,689,888	383,837	1,527,772	25,778,279	1,170,831	4,715,415	19,892,033			117,245,073	(23,679,452)	(48,731,655)	189,656,180			GEN SEBV	
(1.060.708)	0.24925	(1,412,865)	(6,865,012)	5,452,147		0.15703	856,152	0.25914	1,412,865	5,452,147		0.10301	0.05050	0.070600	0.04398	1 751 992	(556,713)	6,308,299	6,865,012	(16,333)	2,812,700		4,068,645	122,181	370,986	3,575,478	389,788	1,632,389	1,553,301			39,839,937	(8,614,678)	(18,747,351)	67,201,966		CANALL MALL	FT-L	
(120,431)	0.24925	(483, 173)	(2,265,883)	1,782,710		0.14924	266,047	0.27103	483,173	1,782,710	0,10001	0.10301	0.010000	0.070600	0.04235	543 773	(217,126)	2,048,757	2,265,883	(5.097)	906,514		1,364,466	40,939	131,615	1,191,912	125,233	494,111	572,568			12,840,147	(2.777.415)	(5,893,586)	21,511,148		CALVUL	IT INTERUPT	
(3,795,620) (11,432,545)	0.24925	(15,228,165)	(126,371,700)	111,143,535		0.13758	15,291,055	0.13701	15,228,165	111,143,535		0.00100	0 05486		0.04619	21 630 032	62,890	126,434,590	126,371,700	(310,224)	33,063,477		93,618,447	1,504,852	5,596,540	86,517,055	4,716,796	19,004,235	62,796,024		•	468,321,206	(96,583,675)	(206,903,281)	771,808,162		AT 1990E	TOTAL	WP FR-16(7)(V) WITNESS RESPONSIBLE: JAMES E. ZIOLKOWSKI PAGE 1 OF 1 8/18/2021
0 0	0.24925	0	0			0	0	οį	(0)	0	0.10001	0 10301	10 16722	0.020500	5 17257	þ	0	0	(0)	0	0		(0)	0	0	(0)	0	(0)	0			0			0		CIDEX		NSIBLE: YWSKI

DUKE ENERGY KENTUCKY, INC. GAS COST OF SERVICE STUDY CASE NO: 2021-00190 CALCULATION PROPOSED REVENUE DISTRIBUTION REFLECTING A PROPOSED REVENUE SUBSIDVIEXCESS ELIMINATION COMPONENT

WORK PAPER REFERENCE WP FR-16(7)(V)-8 WITNESS RESPONSIBLE: JAMES E. ZIOLKOWSKI PAGE 1

14	11 11 12 12 12 13 12 13 12 13 12 14 15 16 16 16 16 16 16 16 16 16 16 16 16 16	,	5	4	ω	2	-		No	Line	
Total Company	Interoopartmental (Incl.in CS) Bad Check Charges Reconnection Charges Special Contracts (Rate FT-L) Other Misc Revenue Transp of Gas - Interco Total Misc	MISCELLANEOUS REVENUES	Total	Rate IT	Rate FT-L	Rate GS	Rate RS		Rate Class		
	ale FT-L) as - Interco	REVENUES	\$ 468,321,206	12,840,147	39,839,937	117,245,073	\$ 298,396,049	FR-16(7)(v)-8	(A)	Rate Base	
111,453,759	27,420 23,364 258,228 1,212 0 310,224		\$ 111,143,535 \$	1,782,710	5,452,147	28,525,719	\$ 75,382,959	FR-16(7)(v)-8	(8)	Present	
			21,630,932	543,772	1,751,992	2,740,230	\$ 16,594,938	WP - Pres NOI	(C)	Net Operating	
			4.6188% \$	4.2349%	4.3976%	2.3372%	5.5614% \$	(C) / (A) (E	0	Present	
		:	111,143,535 \$	1,845,105	5,563,722	31,911,939	71,822,769 \$	(B) + (((D) Line 5 • (C))/(1-FIT))		At Average	Present Revenues
				(62.395)	(111,575)	(3.386,220)	3,560,190	(B) - (E)	(F)	Overcollected (Lindercollected)	Inter Class Subsidization
				(62,395)	(111,575)	(3,386,220)	\$ 3,560,190	(F) • 100 00%		100.00% J	Inter Class Subsidization
	5,228,161	Reduced by increase in reconnection charges Increase Including Incr to Recon Chg	\$ 15,223,488	417,382	1,295,062	3,811,231	\$ 9,699,813	(H) Line 5 * ((A) / (A) Line 5)	(H)	(allocated to class	Rate increase
126,681,920	27,420 28,037 258,228 1,212 0 314,897	es o	\$ 126,367,023	2,262,487	6,858,784		\$ 81,522,582	(B) - (G) + (H)		0.00% Interclass Subsidization	Proposed Revenues
13,663%	\$67,567 decr in Spe		13.697%	26.913%	25.800%	25.231%	8.145%	((H) - (G)) / (B)	(L)	Percent	Proposed
	27.40 27.40 28.037 258.228 \$67.567 decr in Spec Contract included in FT-L above 1.212 \$67.567 decr in Spec Contract included in FT-L above 1.213 314.897		7 186838% \$	7.186803%	7.186847%	7.186840%	7.186838%	((((H) - (G))*(1- FIT)+ (C)) / (A)		At Proposed	ROR
	in FT-L above		\$ 15,223,488	479,777	1,406,637	7,197,451	\$ 6,139,623	(H) - (G)	(L)	Less	Proposed Increase

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

> 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

	Labor Dollars	Functional	Original Cost	Accumulated Depreciation	Original Cost	Accumulated Depreciation	Functional A & G Expenses Less Reg
Function	(a)	Labor Ratio	General Plant (b)	General Plant (b)	General Plant (b) Common Plant (b) Common Plant (b)	Common Plant (b)	Commission Exp. (c)
Prod Plant	483,769	8.941%	2,861,675	1,408,783	920,366	644,301	658,57
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%	ı	•		•	
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

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EXCESS RETURN						PER UNIT PRES REV	REVI		REV							TOTAL RETURN EARNED (TO WPE-3.2k)	EXCESS REVENUES	PRO			TOTAL OTHER OPERATING REVENUES	RETURN ON RATE BASE		TOTAL OPERATING EXPENSE	i m			1-		TOTAL O&M EXPENSE	OPERATING EXPENSES		TOTAL RATE BASE	TOTAL RATE BASE ADJUSTMENTS	TOTAL DEPRECIATION RESERVE	GROSS GAS PLANT IN SERVICE	NET INCOME COMPUTATION	Schedule 1	SUMMARY OF RESULTS		DATA: 12 MONTH FORECASTED PERIOC	TWELVE MONTHS ENDING DECEMBER 31, 2022	GAS COST OF SERVICE STUDY	DUKE ENERGY KENTUCKY, INC.
																Line 16 + Line 41		~			I				1			•						1								(D	
(3,795,620) (11,432,544)	0.24925	(15,228,165)	(126,371,700)	111,143,535		0.13758	15,291,055	0.13701	15,228,165	111,143,535		0.10301	0.05486	0.070600	0.04619	21,630,933	62,890	126,434,590		126,371,700	(310,224)	33,063,477		93,618,447	1,504,852	5,596,540	86,517,055	4,716,796	19,004,235	62,796,024			468,321,206	(96,583,675)	(206,903,281)	771,808,162			TOTAL					
(2,325,973) (7,005,915)	0.24925	(9,331,888)	(84,714,847)	75,382,959		0.13210	9,958,418	0.12379	9,331,888	75,382,959		0.10301	0.05957	0.070600	0.04858	15 460 377	626,530	85,341,377		84,714,847	(231,974)	22,466,292		62,480,529	1,019,899	3,760,041	57,700,589	3,227,621	12,940,826	41,532,142			318,219,439	(65,792,971)	(143,723,016)	527,735,426			RS RESIDENTIAL					
(1,360,646) (4,098,314)	0.24925	(5,458,960)	(33,984,679)	28,525,719		0.14760	4,210,438	0,19137	5,458,960	28,525,719		0.10301	0.02673	0.070600	0.03193	3 384 464	(1,248,522)	32,736,157		33,984,679	(60,796)	7,482,778		26,562,697	348,628	1,417,680	24,796,389	1,059,154	4,273,356	19,463,879			105,988,351	(21,248,649)	(42,943,982)	170,180,982			GS GEN SERV					
(76,755) (231,189)	0.24925	(307,944)	(5,760,091)	5,452,147		0.15703	856,152	0.05648	307,944	5,452,147		0,10301	0.08934	0.070600	0.06367	2 123 376	548,208	6,308,299		5,760,091	(13,323)	2,354,565		3,418,849	101,883	307,521	3,009,445	325,402	1,377,546	1,306,497			33,350,785	(7,213,268)	(15,410,889)	55,974,942			FT-L FIRM TRANS					
(32,246) (97,127)	0.24925	(129,373)	(1,912,083)	1,782,710		0.14924	266,047	0.07257	129,373	1,782,710		0.10301	0.08522	0.070600	0.06158	660 715	136,674	2,048,757		1.912.083	(4,131)	759,842		1,156,372	34,441	111,299	1,010,632	104,619	412,507	493,506			10,762,631	(2,328,787)	(4,825,394)	17,916,812			INTERUPT TRANS	7				
(3,795,620) (11,432,545)	0.24925	(15,228,165)	(126,371,701)	111,143,535		0.13758	15,291,055	0.13701	15,228,165	111,143,535			0.05486		0.04619	21 630 032	62,890	126,434,590		126.371.700	(310,224)	33,063,477		93,618,447	1,504,851	5,596,541	86,517,055	4,716,796	19,004,235	62,796,024			468,321,206	(96,583,675)	(206,903,281)	771 808,162			TOTAL AT ISSUE		8/18/2021	PAGE 1 OF 1	WITNESS RESPONSIBLE:	WP FR-16(7)(v)
- 0	0.24925	-	-	0		o	0	0	0	0		0.10301	30.73874	0.070600	15.60114	_	0	0		(0)	0	0		(0)	1	(1)	(0)	0	(0)	0			0	0	0	0			ALL			INCAM	NSIBLE:	

DUKE ENERGY KENTUCKY, INC. GAS COST OF SERVICE STUDY CASE NO: 2021-00xxx CASE NO: 2021-00xx CASE NO: 2021-00xx CASE NO: 2021-00xx REFLECTING A PROPOSED REVENUE SUBSIDYIEXCESS ELIMINATION COMPONENT REFLECTING A PROPOSED REVENUE SUBSIDYIEXCESS ELIMINATION COMPONENT

WORK PAPER REFERENCE: WP FR-16(7)(V)-8 WTNESS RESPONSIBLE: JAMES E. ZIOLKOWSKI PAGE 1

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Revenue Transp of Gas - Interco Total Misc	Other Misc	Special Contracts (Rate FT-L)	Rents	Reconnection Charges	Bad Check Charges	Interdepartmental (Incl in GS)	MISCELLANEOUS REVENUES				Total	Rate IT	Rate FT-L	Rate GS	Rate RS		Rate Class				
Sas - Interco		ate FT-L)		8S		ici in GS)	REVENUES			:	\$ 468,321,206	10,762,631	33,350,785	105,988,351	\$ 318,219,439	FR-16(7)(v)-8	(A)	Rate Base			
310.224	1,212	258.228	0	23,364	27,420	0					\$ 111,143,535	1,782,710	5,452,147	28.525,719	\$ 75,382,959	FR-16(7)(v)-8	(B)	Revenues	Present		
											\$ 21,630,932	662,715	2,123,376	3,384,464	\$ 15,460,377	WP - Pres NOI	(C)	Income	Net Operating		
											4.6188% \$	6.1576%	6.3668%	3.1932%	4.8584%	(C) / (A)	(0)	ROR	Present		
											\$ 111,143,535	1,573,080	4,714,220	30,438,316	\$ 74,417,919	(B) + (((D) Line 5 • (C))/(1-FIT))	(E)	ROR	At Average	Revenues	Present
											•	209,630	737,927	(1,912,597)	\$ 965,040	(B) - (E)	(F)	(Undercollected)	Overcollected	Subsidization	Inter Class
											•	209,630	737.927	(1,912,597)	\$ 965,040	(F) • 100.00%	(G)	100.00%	times	Subsidization	Inter Class
						\$ 15,228,161	Incr to Recon Chg	Increase Including	in reconnection charges	Reduced by increase	\$ 15,223,488	349.851	1,084,110	3,445,319	5 10,344,208	(H) Line 5 * ((A) / (A) Line 5)	(H)	based on Rate Base)	(allocated to class	Rate Increase	
314 897	1,212	258,228	0	28,037	27,420				tes		3 \$ 126,367,023	1,922,931		33,883,635	3 \$ 84,762,127		(I)	Subsidization	0.00% Interclass	Proposed Revenue:	
		\$67,567 decr in Sp.									13 697%	7.866%	6.350%	18.783%	12.442%	(B) - (G) + (H) ((H) - (G)) / (B)	(L)	Increase	Percent	Proposed	
		258,228 \$67,567 decr in Spec Contract included in FT-L above									7.186838% \$	7.186808%	7,186820%	7.186844%	7,186839%	((((H) - (G))*(1- FIT)+ (C)) / (A)	(K)	Rates	At Proposed	ROR	
		d in FT-L above									\$ 15,223,488	140,221	346,183	5,357,916	\$ 9,379,168	(H) - (G)	(L)	(Subsidy) Excess	Less	Proposed Increase	

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Total Company

111,453,759

126,681,920

13.663%

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

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
<u>2021</u>	<u>\$60</u>
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

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:

- 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