

**CAROLINA WATER SERVICE, INC. OF NORTH CAROLINA
DOCKET NO. W-354, SUB 360**

**TESTIMONY OF JOHN R. HINTON
ON BEHALF OF THE PUBLIC STAFF
NORTH CAROLINA UTILITIES COMMISSION**

October 4, 2018

1 **Q. PLEASE STATE YOUR NAME, POSITION, AND BUSINESS**
2 **ADDRESS FOR THE RECORD.**

3 A. My name is John R. Hinton and my business address is 430 North
4 Salisbury Street, Raleigh, North Carolina. I am the Director of the
5 Economic Research Division of the Public Staff. My qualifications
6 and experience are provided in Appendix A.

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

9 A. The purpose of my testimony is to present to the North Carolina
10 Utilities Commission (Commission) the results of my analysis and
11 my recommendations as to the fair rate of return to be used in
12 establishing rates for water and sewer utility service provided by
13 Carolina Water Service, Inc. of North Carolina, Inc. (CWSNC or
14 Company).

1 **Q. WHAT IS THE CURRENTLY APPROVED COST OF**
2 **CAPITAL FOR CWSNC?**

3 A. In the last CWSNC general rate case, Docket No. W-354, Sub 356,
4 the Commission approved a capital structure of 48.00% long-term
5 debt, 52.00% common equity, a cost rate of long-term debt of
6 5.93%, and a cost rate of common equity of 9.60% for an overall
7 weighted cost of capital of 7.84%.

8 **Q. WHAT IS THE COST OF CAPITAL REQUESTED BY CWSNC IN**
9 **THIS PROCEEDING?**

10 A. CWSNC has requested an overall rate of return or cost of capital of
11 8.91%. This applied for rate of return is based on a capital structure
12 of 47.11% long-term debt, 52.89% common equity, a cost rate of
13 long-term debt of 6.00%, and a cost rate for common equity of
14 11.50%.

15 **Q. HOW DOES CWSNC WITNESS D'ASCENDIS DEVELOP HIS**
16 **RECOMMENDATION?**

17 A. CWSNC witness D'Ascendis utilizes three cost of equity methods: (1)
18 Discounted Cash Flow (DCF); (2) the Predictive Risk Premium method
19 (PRPM); and (3) Capital Asset Pricing Model (CAPM). He applies
20 these methodologies to a proxy group of six publically-traded water

1 companies. His first method relies on the DCF model which produces
2 a cost of equity of 9.10%. The second method is the Predictive Risk
3 Premium Model (PRPM) that relies on predicted bond yields produces
4 a 13.43% cost of equity. The witness includes a second risk premium
5 analysis that he characterizes as a “total market approach” which
6 produces a 10.80% cost of equity for his utility proxy group. The
7 witness concludes by averaging the 13.43% PRPM result with the
8 10.80 total market result to derive his overall risk premium result of
9 12.12% cost of equity. His third method incorporates the capital asset
10 pricing model (CAPM) that is based on a risk-free rate of return, beta
11 coefficient, and the expected return on the market. To derive the
12 expected return on the market, the witness relies on one historical
13 arithmetic return on the S&P 500 of 11.97% and two forecasted based
14 returns on the S&P 500 of 14.59% and 15.73%. With these and other
15 inputs, he estimated the cost of equity by averaging the traditional
16 CAPM result of 11.25% and with his empirical CAPM result of 11.37%
17 for a 11.31% cost of equity. He also applies the DCF method, Risk
18 Premium methods, and CAPM to a group of comparable risk non-price
19 regulated companies and derives cost of equity estimates of 14.15%,
20 12.46%, and 11.78%, respectively. He averages these three non-
21 utility results to arrive at 12.63% cost of equity for his non-price
22 regulated group of companies. His final conclusion for the cost of

1 equity using his three methods as applied to a utility and a non-utility
2 groups of companies is 11.50%. Given that the witness believes that
3 CWSNC's small size relative to his proxy groups has added risks, he
4 increases the baseline cost of equity by 0.40%, which raises his
5 recommended cost to 11.90%. However, the Companies Schedule D-
6 1 of the Item 10 shows a proposed cost rate of 11.50% for common
7 equity.

8 **Q. WHAT IS THE OVERALL RATE OF RETURN RECOMMENDED**
9 **BY THE PUBLIC STAFF?**

10 A. The Public Staff recommends an overall rate of return of 7.37%,
11 based on the June 30, 2018, capital structure and cost of debt
12 consisting of 54.92% long-term debt at a cost rate of 5.87% and
13 45.08% common equity. As such, the disagreement between the
14 Company and the Public Staff is the capital structure, the
15 embedded debt cost rate, pre-tax interest coverage and
16 recommended cost rate of common equity of 9.20%.

17 **Q. HOW IS THE REMAINDER OF YOUR TESTIMONY**
18 **STRUCTURED?**

19 A. The remainder of my testimony is presented in the following five
20 sections:

- 1 I. Legal and Economic Guidelines for Fair Rate of Return
- 2 II. Present Financial Market Conditions
- 3 III. Appropriate Capital Structure and Cost of Long-Term Debt
- 4 IV. The Cost of Common Equity Capital
- 5 V. Concerns with Company Witness D'Ascendis' Testimony
- 6 VI. Summary and Recommendations

7 **I. LEGAL AND ECONOMIC GUIDELINES FOR FAIR RATE OF**
8 **RETURN**

9 **Q. PLEASE BRIEFLY DESCRIBE THE ECONOMIC AND LEGAL**
10 **FRAMEWORK OF YOUR ANALYSIS.**

11 A. Public utilities possess certain characteristics of natural
12 monopolies. For instance, it is more efficient for a single firm to
13 provide a service such as water production and distribution or
14 wastewater collection and treatment than for two or more firms
15 offering the same service in the same area to do so. Therefore,
16 regulatory bodies have assigned franchised territories to public
17 utilities to provide services more efficiently and at a lower cost to
18 consumers.

19 **Q. WHAT IS THE ECONOMIC RELATIONSHIP BETWEEN RISK**
20 **AND THE COST OF CAPITAL?**

1 A. The cost of equity capital to a firm is equal to the rate of return
2 investors expect to earn on the firm's securities given the securities'
3 level of risk. An investment with a greater risk will require a higher
4 expected return by investors. In Federal Power Comm'n v. Hope
5 Natural Gas Co., 320 U.S. 591, 603 (1944) (Hope), the United
6 States Supreme Court stated:

7 [T]he return to the equity owner should be
8 commensurate with returns on investments in other
9 enterprises having corresponding risks. That return,
10 moreover, should be sufficient to assure confidence in
11 the financial integrity of the enterprise, so as to
12 maintain its credit and to attract capital.

13 In Bluefield Waterworks & Impr. Co. v. Public Service Comm'n, 262
14 U.S. 679, 692-93 (1923) (Bluefield) the United States Supreme
15 Court stated: A public utility is entitled to such rates as will permit it
16 to earn a return on the value of the property which it employs for
17 the convenience of the public equal to that generally being made at
18 the same time and in the same general part of the country on
19 investments in other business undertakings which are attended by
20 corresponding risks and uncertainties, but it has no constitutional
21 right to profits such as are realized or anticipated in highly profitable
22 enterprises or speculative ventures. The return should be
23 reasonably sufficient to assure confidence in the financial

1 soundness of the utility, and should be adequate, under efficient
2 and economical management, to maintain and support its credit
3 and enable it to raise the money necessary for the proper discharge
4 of its public duties. A rate of return may be reasonable at one time
5 and become too high or too low by changes affecting opportunities
6 for investment, the money market, and business conditions
7 generally.

8 These two decisions recognize that utilities are competing for the
9 capital of investors and provide legal guidelines as to how the
10 allowed rate of return should be set. The decisions specifically
11 speak to the standards or criteria of capital attraction, financial
12 integrity, and comparable earnings. The Hope decision, in
13 particular, recognizes that the cost of common equity is
14 commensurate with risk relative to investments in other enterprises.
15 In competitive capital markets, the required return on common
16 equity will be the expected return foregone by not investing in
17 alternative stocks of comparable risk. Thus, in order for the utility to
18 attract capital, possess financial integrity, and exhibit comparable
19 earnings, the return allowed on a utility's common equity should be
20 that return required by investors for stocks with comparable risk. As
21 such the return requirements of debt and equity investors, which is

1 shaped by expected risk and return, is paramount in attracting
2 capital.

3 It is widely recognized that a public utility should be allowed a rate
4 of return on capital which will allow the utility, under prudent
5 management, to attract capital under the criteria or standards
6 referenced by the Hope and Bluefield decisions. If the allowed rate
7 of return is set too high, consumers are burdened with excessive
8 costs, current investors receive a windfall, and the utility has an
9 incentive to overinvest. Likewise, customers will be charged prices
10 that are greater than the true economic costs of providing these
11 services. Consumers will consume too few of these services from
12 a point of view of efficient resource allocation. If the return is set
13 too low, then the utility stockholders would suffer because a
14 declining value of the underlying property will be reflected in a
15 declining value of the utility's equity shares. This could happen
16 because the utility would not be earning enough to maintain and
17 expand its facilities to meet customer demand for service, cover its
18 operating costs, and attract capital on reasonable terms. Lenders
19 will shy away from the company because of increased risk that the
20 utility will default on its debt obligations. Because a public utility is
21 capital intensive, the cost of capital is a very large part of its overall

1 revenue requirement and is a crucial issue for a company and its
2 ratepayers.

3 The Hope and Bluefield standards are embodied in N.C. Gen. Stat.
4 § 62-133(b)(4), which requires that the allowed rate of return be
5 sufficient to enable a utility by sound management

6 to produce a fair return for its shareholders,
7 considering changing economic conditions and other
8 factors, . . . to maintain its facilities and services in
9 accordance with the reasonable requirements of its
10 customers in the territory covered by its franchise, and
11 to compete in the market for capital funds on terms
12 that are reasonable and are fair to its customers and
13 to its existing investors.

14 N.C. Gen. Stat. § 62-133(b)(4) (2017).

15 On April 12, 2013, the North Carolina Supreme Court decided State
16 ex rel. Utils. Comm'n v. Cooper, 366 N.C. 484, 739 S.E. 2d 541
17 (2013) (Cooper). In that decision, the Supreme Court reversed and
18 remanded the Commission's January 27, 2012, Order in Docket
19 No. E-7, Sub 989, approving a stipulated return on equity of
20 10.50% for Duke Energy Carolinas, LLC. In its decision, the
21 Supreme Court held (1) that the 10.50% return on equity was not
22 supported by the Commission's own independent findings and
23 analysis as required by State ex rel. Utils. Comm'n v. Carolina Util.
24 Customers Ass'n, 348 N.C. 452, 500 S.E.2d 693 (1998) (CUCA I),

1 in cases involving nonunanimous stipulations, and (2) that the
2 Commission must make findings of fact regarding the impact of
3 changing economic conditions on consumers when determining the
4 proper return on equity for a public utility. In Cooper, the Court's
5 holding introduced a new factor to be considered by the
6 Commission regardless of whether there is a stipulation.

7 In considering this new element, the Commission is guided by
8 ratemaking principles laid down by statute and interpreted by a
9 body of North Carolina case law developed over many years.
10 According to these principles, the test of a fair rate of return is a
11 return on equity that will provide a utility, by sound management,
12 the opportunity to (1) produce a fair profit for its shareholders in
13 view of current economic conditions, (2) maintain its facilities and
14 service, and (3) compete in the marketplace for capital. State ex
15 rel. Utils. Comm'n v. General Tel. Co., 281 N.C. 318, 370, 189
16 S.E.2d 705, 738 (1972). Rates should be set as low as reasonably
17 possible consistent with constitutional constraints. State ex rel.
18 Utils. Comm'n v. Pub. Staff-N. Carolina Utils. Comm'n, 323 N.C.
19 481, 490, 374 S.E.2d 361, 366 (1988). The exercise of subjective
20 judgment is a necessary part of setting an appropriate return on
21 equity. Id. Thus, in a particular case, the Commission must strike

1 a balance that (1) avoids setting a return so low that it impairs the
2 utility's ability to attract capital, (2) avoids setting a return any
3 higher than needed to raise capital on reasonable terms, and (3)
4 considers the impact of changing economic conditions on
5 consumers.

6 **Q. WHAT IS A FAIR RATE OF RETURN?**

7 A. The fair rate of return is simply a percentage, which, when
8 multiplied by a utility's rate base investment will yield the dollars of
9 net operating income a utility should reasonably have the
10 opportunity to earn. This dollar amount of net operating income is
11 available to pay the interest cost on a utility's debt capital and a
12 return to the common equity investor. The fair rate of return
13 multiplied by the utility's rate base yields the dollars a utility needs
14 to recover in order to earn the investors' required return on capital.

15 **Q. HOW DID YOU DETERMINE THE FAIR RATE OF RETURN THAT**
16 **YOU RECOMMEND IN THIS PROCEEDING?**

17 A. To determine the fair rate of return, I performed a cost of capital
18 study consisting of three steps. First, I determined the appropriate
19 capital structure for ratemaking purposes, i.e., the proper
20 proportions of each form of capital. Utilities normally finance assets

1 with debt and common equity. Because each of these forms of
2 capital have different costs, especially after income tax
3 considerations, the relative amounts of each form employed to
4 finance the assets can have a significant influence on the overall
5 cost of capital, revenue requirements, and rates. Thus, the
6 determination of the appropriate capital structure for ratemaking
7 purposes is important to the utility and to ratepayers. Second, I
8 determined the cost rate of each form of capital. The individual
9 debt issues have contractual agreements explicitly stating the cost
10 of each issue. The embedded annual cost of debt may be
11 calculated by simply considering these agreements and the utility's
12 books and records. The cost of common equity is more difficult to
13 determine, because it is based on the investor's opportunity cost of
14 capital. Various economic and financial models or methods are
15 available to measure the cost of common equity. Third, by
16 combining the appropriate capital structure ratios for ratemaking
17 purposes with the associated cost rates, I calculated an overall
18 weighted cost of capital or fair rate of return.

1 **II. PRESENT FINANCIAL MARKET CONDITIONS**

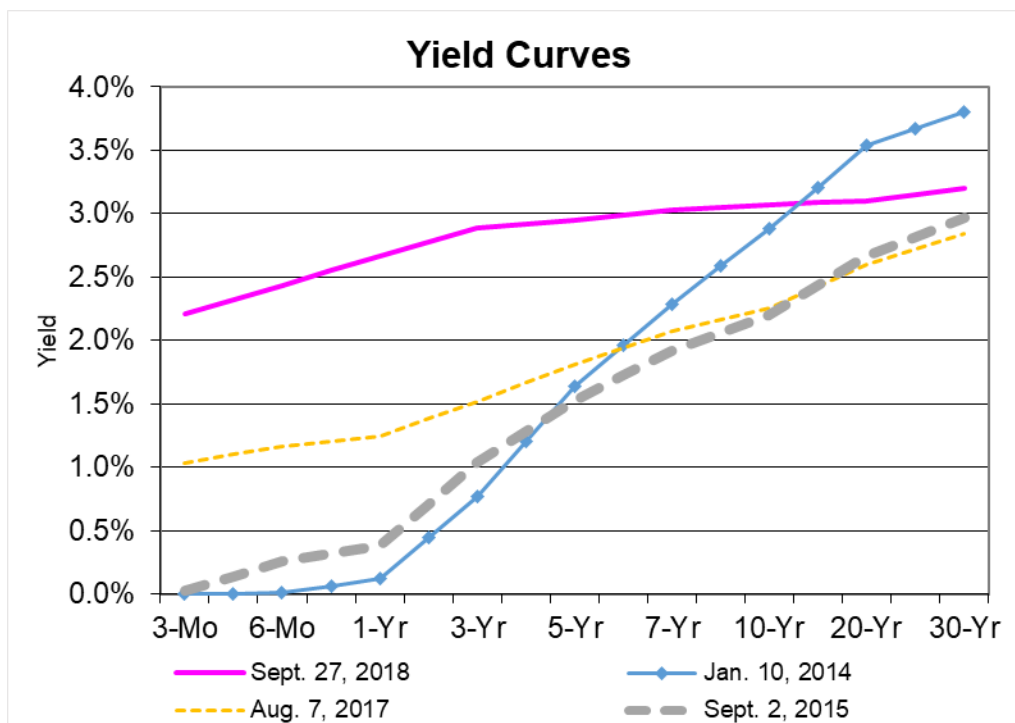
2 **Q. CAN YOU BRIEFLY DESCRIBE CURRENT FINANCIAL MARKET**
3 **CONDITIONS?**

4 A. Yes. The cost of financing is much lower today than in the more
5 inflationary period of the 1990s. More recently, the continued low
6 rates of inflation and expectations of future low inflation rates have
7 contributed to even lower interest rates. According to Moody's Bond
8 Survey, yields on long-term "A" rated public utility bonds as of
9 August, 2018 is 4.26% and 4.27% for July, 2018. By the close of this
10 proceeding, the Company will, most likely, have received four rate
11 increases over the last five years (Docket Nos. W-354, Sub 356, Sub
12 344, and Sub 336). At the time of the filed cost of capital settlement
13 on January 10, 2014 in Docket No. W-354, Sub 336, Moody's A-
14 rated utility bonds yielded 4.63%, which is 37 basis points higher
15 than the current yields on its long-term bonds, as illustrated in Exhibit
16 JRH-1.

17 **Q. HOW HAVE SHORT-TERM INTEREST RATES CHANGED SINCE**
18 **THE COMPANY'S LAST RATE CASE?**

19 A. They have increased as shown in the graph below as there is a
20 flattening of the yield curves, which can be seen as movement to in

1 the direction of historical normals. However, there has been little
 2 changes in the cost rates for 30-year treasury securities which are
 3 indicators of the interest rates for long-term utility bonds. As
 4 illustrated in the graph below, since the time of the last CWSNC
 5 stipulation filed on September 19, 2017, yields on 30-year treasury
 6 securities have risen 12 basis points; however, the yields on 30-year
 7 treasury securities are 60 basis point lower since January 10, 2014,
 8 the date that the cost of capital stipulation was filed in Docket W-354,
 9 Sub 336.



10

1 **Q. HOW DO INTEREST RATES AFFECT THE FINANCING COSTS**
2 **OF A COMPANY?**

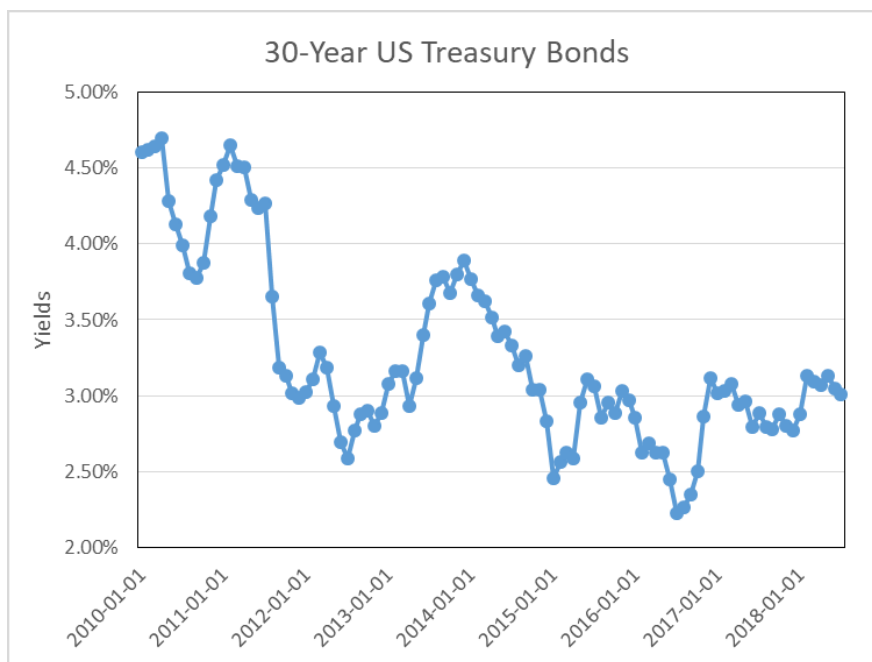
3 A. In simple terms, the current lower interest rates and stable
4 inflationary environment of today indicate that borrowers are paying
5 less for the time value of money. This is significant since utility
6 stocks and utility capital costs are highly interest rate-sensitive
7 relative to most industries within the securities markets.
8 Furthermore, given that investors often view purchases of the
9 common stocks of utilities as substitutes for fixed income
10 investments, the reductions in interest rates observed over the past
11 ten or more years has paralleled the decreases in investor required
12 rates of return on common equity.

13 **Q. GIVEN YOUR GRAPH OF YIELD CURVES SHOWS RATES HAVE**
14 **INCREASED, DO YOU RELY ON INTEREST RATE**
15 **PREDICTIONS IN YOUR INVESTIGATION?**

16 A. Yes, I will review predictions; however, I generally do not rely on
17 interest rate forecasts to determine the cost of equity. Rather, I
18 believe that relying on current interest rates, especially in relation to
19 yields on long-term bonds, is more appropriate for ratemaking in that,
20 it is reasonable to expect that as investors are pricing bonds, they
21 are based on expectations on future interest rates, inflation rates,

1 etc. While I have a healthy respect for forecasting, I'm aware of the
2 risk of relying on predictions of rising interest rates in rate cases. A
3 case can be observed in the supplemental testimony of Company
4 witness Ahern in the Aqua rate case in Docket W-218, Sub 363.
5 Here the witness identified several interest rate forecasts by Blue
6 Chip Financial Forecasts of 30-year Treasury Bonds yields that were
7 predicted to rise to 4.3% in 2015, 4.7% in 2016, 5.2% in 2017, and
8 5.5% for 2020-2024¹. The graph below, reveals how these forecasts
9 significantly over-estimated actual interest rates for 30-year Treasury
10 Bonds. As such, I tend to place more weight in current market
11 interest rates which are inherently forward looking as they reflect
12 investor expectations of current and future returns.

¹ Docket W-218 Sub 363, T. Vol. 2, page 171, lines 8-9



III. APPROPRIATE CAPITAL STRUCTURE AND COST OF LONG-TERM DEBT

2 **Q. WHY IS THE APPROPRIATE CAPITAL STRUCTURE**
3 **IMPORTANT FOR RATEMAKING PURPOSES?**

4 **A.** For companies that do not have monopoly power, the price that an
5 individual company charges for its products or services is set in a
6 competitive market and that price is generally not influenced by the
7 company's capital structure. However, the capital structure that is
8 determined to be appropriate for a regulated public utility has a

1 direct bearing on the fair rate of return, revenue requirement, and,
2 therefore, the prices charged to captive ratepayers.

3 **Q. PLEASE EXPLAIN THE TERM CAPITAL STRUCTURE AND**
4 **HOW THE CAPITAL STRUCTURE APPROVED FOR**
5 **RATEMAKING PURPOSES AFFECTS RATES.**

6 A. The capital structure is simply a representation of how a utility's
7 assets are financed. It is the relative proportions or ratios of debt
8 and common equity to the total of these forms of capital, which
9 have different costs. Common equity is far more expensive than
10 debt for ratemaking purposes for two reasons. First, as mentioned
11 earlier, there are income tax considerations. Interest on debt is
12 deductible for purposes of calculating income taxes. The cost of
13 common equity, on the other hand, must be "grossed up" to allow
14 the utility sufficient revenue to pay income taxes and to earn its cost
15 of common equity on a net or after-tax basis. Therefore, the
16 amount of revenue the utility must collect from ratepayers to meet
17 income tax obligations is directly related to both the common equity
18 ratio in the capital structure and cost of common equity. A second
19 reason for this cost difference is that the cost of common equity
20 must be set at a marginal or current cost rate. Conversely, the cost
21 of debt is set at an embedded rate because the utility is incurring

1 costs that are previously established in contracts with security
2 holders.

3 Because the Commission has the duty to promote economic utility
4 service, it must decide whether or not a utility's requested capital
5 structure is appropriate for ratemaking purposes. An example of
6 the cost difference can be seen in the Company's filing. Based
7 upon the Company's requested capital cost rates, each dollar of its
8 common equity, and long-term debt that supports the retail rate
9 base has the following approximate annual costs (including income
10 tax, regulatory fee, and gross receipts tax expense) to ratepayers:

11 (1) Each \$1 of common equity costs a ratepayer
12 approximately 12 cents per year.

13 (2) Each \$1 of long-term debt costs a ratepayer less than 6
14 cents per year.

15 **Q. WHAT CAPITAL STRUCTURE HAS THE COMPANY**
16 **REQUESTED IN THIS CASE?**

17 A. The Company's application requests to use a capital structure of
18 47.11% long-term debt and 52.89% common equity as of
19 December 31, 2017.

1 **Q. DO YOU SUPPORT THE CAPITAL STRUTURE PROPOSED BY**
2 **THE COMPANY IN THIS CASE?**

3 A. No. I recommend that the Company update its capital structure as
4 of June 30, 2018. Secondly, I recommend that the capital structure
5 include the June 30, 2018 balance of the Company's Revolving
6 Credit Facility of \$80 million that was entered into on October 23,
7 2015 that contains a maturity date of October 23, 2020. I believe
8 that the updated capital structure that includes the Revolving Credit
9 Facility of 54.92% debt and 45.08% common equity is both
10 representative and reasonable for ratemaking.

11 **Q. WHAT IS YOUR RECOMMENDED COST OF LONG-TERM**
12 **DEBT?**

13 A. I recommend the use of the Company's proposed cost of debt that
14 has been updated as of June 30, 2018 to 5.87%. The Company
15 maintains that the make whole provisions contained in their existing
16 Notes make it uneconomic for refinancing. CWSNC and Utilities,
17 Inc. have a history of making private placements of debt at
18 relatively higher interest rates relative to public offerings by other
19 water and sewer utilities, such as with Aqua North Carolina. Unlike
20 Aqua North Carolina, CWSNC does not have any loans that are
21 associated with the rehabilitation of water infrastructure that were

1 enabled through the North Carolina State Revolving Fund Program
2 authorized by the Safe Drinking Water Act. The Public Staff urges
3 the Company to continue to investigate this source of funding which
4 are at cost rates that are typically significantly lower than available
5 in the market. My recommended capital structure and cost of debt
6 is as follows:

	CWSNC	
	as of June 30, 2018	
	Ratio	Debt Cost
7		
8		
9		
10	Long-Term Debt	54.92% 5.87%
11	Common Equity	45.08%
12	Total	100.00%

13 **IV. THE COST OF COMMON EQUITY CAPITAL**

14 **Q. HOW DID YOU DEFINE THE COST OF COMMON EQUITY?**

15 A. The cost of equity capital for a firm is the expected rate of return on
16 common equity that investors require in order to induce them to
17 purchase shares of the firm's common stock. The return is
18 expected given that when the investor buys a share of the firm's
19 common stock, he does not know with certainty what his returns will
20 be in the future.

1 **Q. HOW DID YOU DETERMINE THE COST OF COMMON EQUITY**
2 **CAPITAL FOR THE COMPANY?**

3 A. I used the discounted cash flow (DCF) model and the Risk
4 Premium model to determine the cost of equity for the Company.

5 **Q. PLEASE DESCRIBE YOUR DCF ANALYSIS.**

6 A. The discounted cash flow model is a method of evaluating the
7 expected cash flows from an investment by giving appropriate
8 consideration to the time value of money. The DCF model is based
9 on the theory that the price of the investment will equal the
10 discounted cash flows of returns. The return to an equity investor
11 comes in the form of expected future dividends and price
12 appreciation. However, as the new price will again be the sum of
13 the discounted cash flows, price appreciation is ignored and
14 attention focused on the expected stream of dividends.
15 Mathematically, this relationship may be expressed as follows:

16 Let D_1 = expected dividends per share over the next twelve months;

17 g = expected growth rate of dividends;

18 k = cost of equity capital; and

19 P = price of stock or present value of the future income
20 stream.

1 Then,

$$2 \quad P = \frac{D_1}{1+k} + \frac{D_1(1+g)}{(1+k)^2} + \frac{D_1(1+g)^2}{(1+k)^3} + \dots + \frac{D_1(1+g)^{t-1}}{(1+k)^t}$$

5 This equation represents the amount an investor would be willing to
6 pay for a share of common stock with a dividend stream over the
7 future periods. Using the formula for a sum of an infinite geometric
8 series, this equation may be reduced to:

$$9 \quad P = \frac{D_1}{k-g}$$

12 Solving for k yields the DCF equation:

$$13 \quad k = \frac{D_1 + g}{P}$$

14
15
16
17
18 Therefore, the rate of return on equity capital required by investors
19 is the sum of the dividend yield (D_1/P) plus the expected long-term
20 growth rate in dividends (g)

21 **Q. DID YOU APPLY THE DCF METHOD DIRECTLY TO CWSNC?**

22 A. No. I applied the DCF method to a comparable group of water
23 utilities followed by Value Line Investment Survey (Value Line).
24 The standard edition of Value Line covers nine water companies.
25 However, I excluded Connecticut Water Service, Inc. and The SJW

1 Group because of a merger of the two companies. I also excluded
2 Consolidated Water Co. because of its significant overseas
3 operations.

4 **Q. WHAT MEASURES OF RISK DID YOU REVIEW TO**
5 **DETERMINE THE COMPARABILITY OF INVESTING IN**
6 **CWSNC TO INVESTING IN OTHER WATER UTILITIES?**

7 A. I reviewed standard risk measures that are widely available to
8 investors that are considered by most investors when making
9 investment decisions. The beta coefficient is a measure of the
10 sensitivity of a stock's price to overall fluctuations in the market.
11 The Value Line Investment Survey beta coefficient describes
12 the relationship of a company's stock price with the New York
13 Stock Exchange Composite. A beta value of less than 1.0
14 means that the stock's price is less volatile than the movement
15 in the market; conversely, a beta value greater than 1.0
16 indicates that the stock price is more volatile than the market.

17 I reviewed the Value Line Safety Rank, which is defined as a
18 measure of the total risk of a stock. The Safety Rank is
19 calculated by averaging two variables (1) the stock's index of

1 price stability, and (2) the Financial Strength rating of the
2 company.

3 In addition, I reviewed the S&P Common Stock Rating. The
4 stock rating system takes into consideration two important
5 factors in the determination of a stock's rating: the stability and
6 growth of earnings and dividends. However, the stock rating
7 does not consider a company's balance sheet or other factors.
8 The stock rating system has seven grades with A+ being the
9 highest rating possible.

10 I also reviewed S&P's Bond Rating, which is an assessment of
11 the creditworthiness of a company. Credit rating agencies focus
12 on the creditworthiness of the particular bond issuer, which
13 includes a detailed and thorough review of the potentials areas
14 of business risk and financial risk of the company. These and
15 other risk measures for the comparable group are shown in
16 Exhibit JRH-2 and are further explained in Appendix B.

17 **Q. HOW DID YOU DETERMINE THE DIVIDEND YIELD**
18 **COMPONENT OF THE DCF?**

19 A. I calculated the dividend yield by using the Value Line estimate of
20 dividends to be declared over the next 12 months divided by the

1 price of the stock as reported in the Value Line Summary and Index
2 sections for each week of the 13-week period June 29, 2018
3 through September 21, 2018. A 13-week averaging period tends to
4 smooth out short-term variations in the stock prices. This process
5 resulted in an average dividend yield of 2.1% for the comparable
6 group of water utilities.

7 **Q. HOW DID YOU DETERMINE THE EXPECTED GROWTH RATE**
8 **COMPONENT OF THE DCF?**

9 A. I employed the growth rates of the comparable group in earnings
10 per share (EPS), dividend per share (DPS), and book value per
11 share (BPS) as reported in Value Line over the past ten and five
12 years. I also employed the forecasts of the growth rates of the
13 comparable groups in EPS, DPS, and BPS as reported in Value
14 Line. The historical and forecast growth rates are prepared by
15 analysts of an independent advisory service that is widely available
16 to investors and should also provide an estimate of investor
17 expectations. I include both historical known growth rates and
18 forecast growth rates, because it is reasonable to expect that
19 investors consider both sets of data in deriving their expectations.

20 Finally, I incorporated the consensus of various analysts' forecasts

1 of five-year EPS growth rate projections as reported in Yahoo
2 Finance. The dividend yields and growth rates for each of the
3 companies and for the average for the comparable group are
4 shown in Exhibit JRH-3.

5 **Q. WHAT IS YOUR CONCLUSION REGARDING THE COST OF**
6 **COMMON EQUITY TO THE COMPANY BASED ON THE DCF**
7 **METHOD?**

8 A. Based upon the DCF analysis, I determined that a reasonable
9 expected dividend yield is 2.1% with an expected growth rate of
10 6.1% to 7.1%. While I consider historical growth rates in making
11 my recommendations, I often place the greatest weight on
12 predicted growth rates. In this case, the average growth is 6.6%
13 which produces a 8.7% mid-point result for my DCF analysis. As
14 such, the analysis produces a cost of common equity estimate for
15 CWSNC that is within the range of 8.20% to 9.20%.

16 **Q. PLEASE DESCRIBE YOUR RISK PREMIUM ANALYSIS.**

17 A. The equity risk premium method can be defined as the difference
18 between the expected return on a common stock and the expected
19 return on a debt security. The differential between the two rates of
20 return are indicative of the return investors require in order to

1 compensate them for the additional risk involved with an investment
2 in the Company's common stock over an investment in the
3 Company's bonds that involves less risk.

4 In order to quantify the risk premium, I need estimates of the cost of
5 equity and the cost of debt at contemporaneous points in time. In
6 that, my method relies on approved returns on common equity for
7 water utility companies from various public utility commissions that
8 is published by the Regulatory Research Associates, Inc. (RRA),
9 within SNL Global Market Intelligence. In order to estimate the
10 relationship with a representative cost of debt capital, I have
11 regressed the average annual allowed equity returns with the
12 average Moody's A-rated yields for Public Utility bonds from 2006
13 through 2018. The regression analysis which incorporates years of
14 historical data is combined with recent monthly yields to provide an
15 estimate of the current cost of common equity.

16 **Q. WHAT ARE THE STRENGTHS OF USING ALLOWED RETURNS?**

17 A. The use of allowed returns as the basis for the expected equity
18 return has two strengths over other approaches that involve various
19 models that estimate the expected equity return on common stocks
20 and subtracting a representative cost of debt. One strength of my

1 approach is that authorized returns on equity are generally arrived at
2 through lengthy investigations by various parties with opposing views
3 on the rate of return required by investors. Thus, it is reasonable to
4 conclude that the approved allowed returns are good estimates for
5 the cost of equity.

6 **Q. WHAT WERE THE RESULTS OF YOUR RISK PREMIUM**
7 **ANALYSIS?**

8 A. The summary data of risk premiums shown on Exhibit JRH-4, page
9 1 of 2 indicates that the average risk premium is 4.95% with a
10 maximum premium of 5.78% and minimum premium of 3.73%,
11 which when combined with the last six months of A-rated bond yields
12 produces yields with an average cost of equity of 9.11%, a maximum
13 cost of equity of 9.94%, and a minimum cost of equity of 7.89%. As
14 noted, a statistical regression was performed in order to quantify the
15 relationship of allowed equity returns and bond costs. Exhibit JRH-
16 4, page 2 of 2 displays a regression analysis of the data that
17 indicates a significant statistical relationship of the allowed equity
18 returns and bond costs, such that a one percent decrease in the
19 bond cost corresponds to an increase of approximately 26 basis

1 points in the equity risk premium.² While various studies on the cost
2 of equity capital have differed on the level of the negative
3 relationship of interest rates and risk premiums there has been
4 agreement that as interest rates fall, there is an increase in the
5 premium.³ Applying this relationship to the current utility bond cost
6 of 4.22%⁴ resulted in a current estimate of the cost of equity of
7 9.70% which reflects a risk premium of 5.48%.

8 **Q. GIVEN YOUR STUDY ON THE COST OF EQUITY, WHAT IS YOUR**
9 **RECOMMENDED COST OF EQUITY?**

10 A. Based on all of the results of my DCF model that indicate a cost of
11 equity from 8.2% to 9.2% with a central point estimate of 8.70% and
12 Risk Premium model that indicates a cost of equity of 9.70%, I
13 determined that the investor required rate of return for CWSNC is
14 between 8.70% and 9.70%. I further conclude that 9.20% is my
15 single best estimate of the Company's cost of common equity.

² The regression indicated a significant statistical relationship of $ROE = 0.08603 + 0.26086$, with an adjusted $R^2 = 0.74952$.

³ 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, pp. 33-45.

⁴ The 4.22% current bond yield was determined using the most recent six-month average yield-to-maturity rate of Moody's A-rated Utility Bond Yields.

1 **Q. WHAT OTHER EVIDENCE DID YOU CONSIDER IN YOUR**
2 **ASSESSMENT OF THE REASONABLENESS OF YOUR**
3 **RECOMMENDED RETURN?**

4 A. In regard to reasonableness assessment with financial risk, I
5 considered the pre-tax interest coverage ratio produced by my cost
6 of capital recommendation. Based on the recommended capital
7 structure, cost of debt, and equity return of 9.20%, the pre-tax
8 interest coverage ratio is approximately 3.7 times. This level of pre-
9 tax interest coverage should allow CWSNC to qualify for a single
10 "A" bond rating.

11 **Q. TO WHAT EXTENT DOES YOUR RECOMMENDED RATE OF**
12 **RETURN ON COMMON EQUITY TAKE INTO CONSIDERATION**
13 **THE IMPACT OF A WATER/SEWER SYSTEM IMPROVEMENT**
14 **MECHANISM PURSUANT TO N.C. GEN. STAT. § 62-133.12 ON**
15 **THE COMPANY'S FINANCIAL RISK?**

16 A. In my opinion, the water and sewer improvement charge
17 mechanism (WSIC and SSIC) provides the ability for enhanced
18 cost recovery of the eligible capital improvements which reduces
19 regulatory lag through incremental and timely rate increases. I
20 believe this mechanism is seen by debt and equity investors as
21 supportive regulation that mitigates business and regulatory risk.

1 As such, I believe that this mechanism is noteworthy and is
2 supportive of my recommendation.

3 **Q. TO WHAT EXTENT DOES YOUR RECOMMENDED RATE OF**
4 **RETURN ON EQUITY TAKE INTO CONSIDERATION THE**
5 **IMPACT OF CHANGING ECONOMIC CONDITIONS ON**
6 **CWSNC'S CUSTOMERS?**

7 A. I am aware of no clear numerical basis for quantifying the impact of
8 changing economic conditions on customers in determining an
9 appropriate return on equity in setting rates for a public utility.
10 Rather, the impact of changing economic conditions nationwide is
11 inherent in the methods and data used in my study to determine the
12 cost of equity for utilities that are comparable to Aqua. I have
13 reviewed certain information on the economic conditions in the
14 areas served by CWSNC, specifically, the 2014, 2015, and 2016
15 data on total personal income from the Bureau of Economic
16 Analysis (BEA) and the Development Tier Designations published
17 by the North Carolina Department of Commerce for the counties in
18 which Aqsa's systems are located. The BEA data indicates that
19 from 2014 to 2016, total personal income weighted by the number
20 of water customers by county grew at a compound annual growth
21 rate (CAGR) of approximately 3%.

1 The North Carolina Department of Commerce annually ranks the
2 state's 100 counties based on economic well-being and assigns
3 each a Tier designation. The most distressed counties are rated a
4 "1" and the most prosperous counties are rated a "3." The rankings
5 examine several economic measures such as, household income,
6 poverty rates, unemployment rates, population growth, and per
7 capita property tax base. For 2017, the average Tier ranking that
8 has been weighted by the number of water customers by county is
9 2.6. Both these economic measures indicate that there have been
10 improvement in the economic conditions for CWSNC's service area
11 relative to the three previous rate increases in Docket Nos. W-354,
12 Subs 356, 344, and 336 that were approved in 2017, 2015, and
13 2014, respectively.

14 As discussed above, it is the Commission's duty to set rates as low
15 as reasonably possible consistent within constitutional constraints.
16 This duty exists regardless of the customers' ability to pay.
17 Moreover, the rate of return on common equity is only one
18 component of the rate established by the Commission. N.C. Gen.
19 Stat. § 62-133 sets out an intricate formula for the Commission to
20 follow in determining a utility's overall revenue requirement. It is the
21 combination of rate base, expenses, capital structure, cost rates for

1 debt and equity capital, and capital structure that determines how
2 much customers pay for utility service and how much investors
3 receive in return for their investment. The Commission must
4 exercise its best judgment in balancing the interests of both groups.
5 My analysis indicates that my recommended rate of return on
6 equity will allow the Company to properly maintain its facilities,
7 provide adequate service to its customers, attract capital on terms
8 that are fair and reasonable to its customers and investors, and will
9 result in rates that are just and reasonable.

10 **V. CONCERNS WITH COMPANY WITNESS D'ASCENDIS'**

11 **TESTIMONY**

12 **Q. DO YOU HAVE CONCERNS ABOUT COMPANY WITNESS**
13 **D'ASCENDIS' TESTIMONY?**

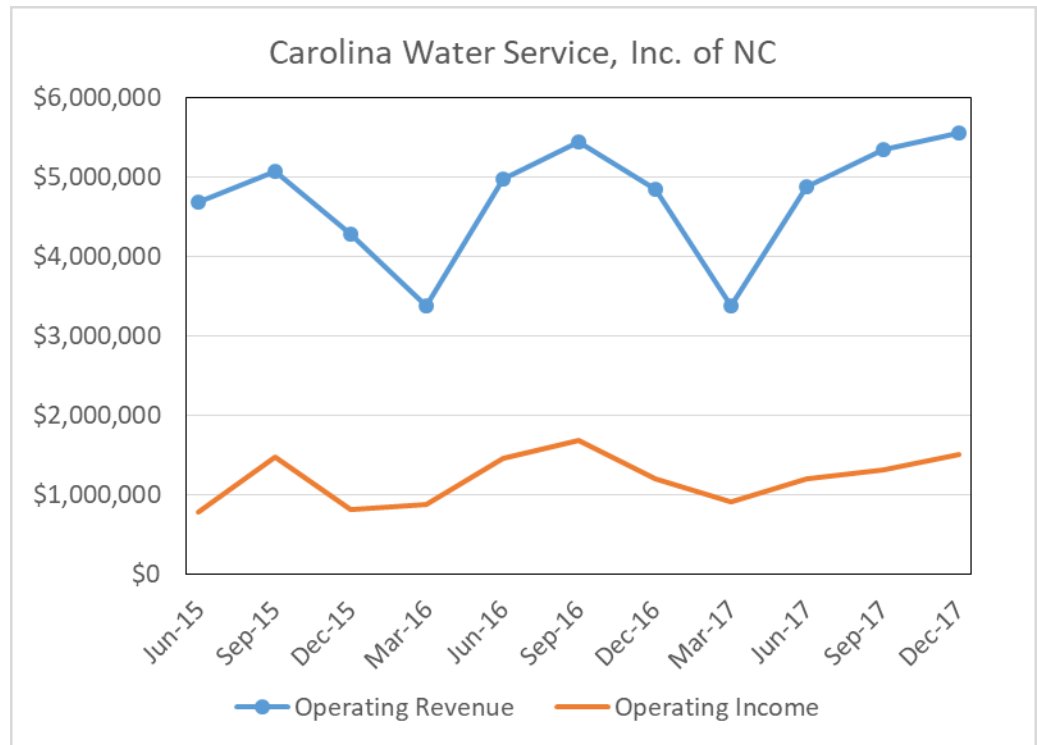
14 **A.** Yes, my first concern is his adjustment for business risk. I do not
15 believe that it is appropriate to add a risk premium to the cost of
16 equity due to the size of a regulated utility company. My reasons
17 are as follows: first, from a regulatory policy perspective, ratepayers
18 should not be required to pay higher rates because they are located
19 in the franchise area of a utility of a size which is arbitrarily
20 considered to be small. Further if such adjustments were routinely

1 allowed, an incentive would exist for large existing utilities to form
2 subsidiaries when merging or even to split-up into subsidiaries as to
3 obtain higher allowed returns. Lastly, CWSNC operates in a
4 franchise environment that insulates the company from competition
5 and it operates with procedures in place that allow for rate
6 adjustments for eligible capital improvements, cost increases, and
7 other unusual circumstances that impact its earnings.

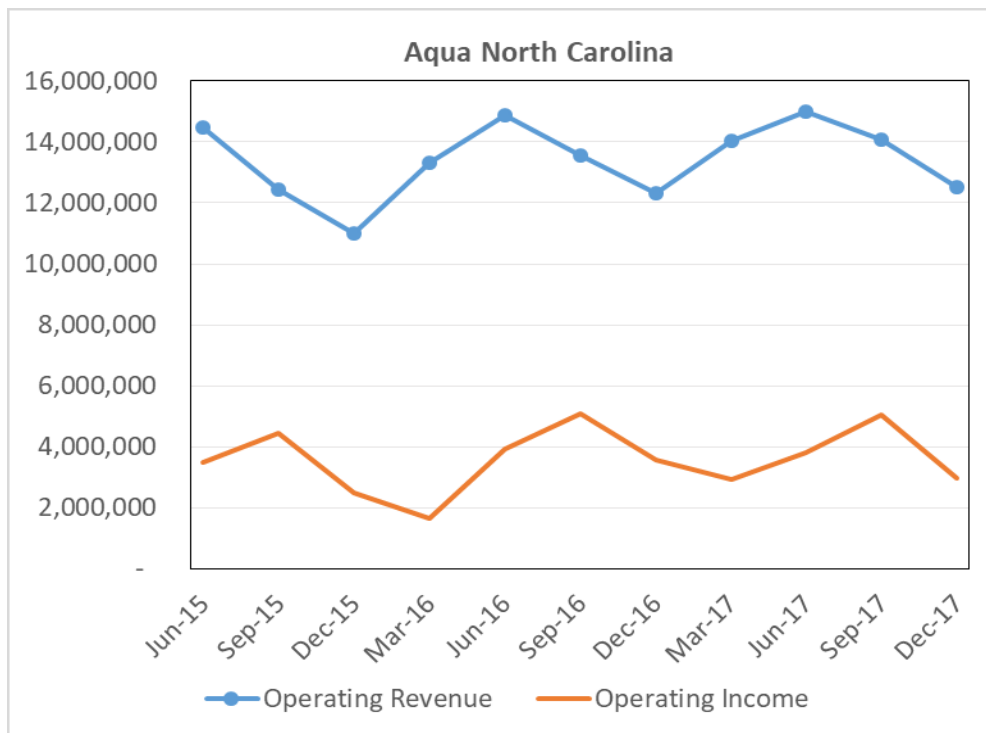
8 Furthermore, CWSNC operates in an industry where bottled water
9 provides the only alternative to utility service. Thus, the industry is
10 often considered less risky from an investor's perspective relative to
11 natural gas industry, which competes with electric service, propane,
12 and other alternative fuel sources. As such, I have compared the
13 quarterly operating revenue and the quarterly operating income
14 before interest and income taxes of CWSNC, Aqua North Carolina,
15 Inc., Public Service Company of North Carolina, Inc. (PSNC) and
16 the North Carolina operations of Piedmont Natural Gas Company,
17 Inc. (Piedmont) over the last couple of years. As expected, the
18 operating revenue and the operating income⁵ of CWSNC and Aqua

⁵ The operating revenue and income data is from monthly and quarterly reports provided to the Public Staff. Operating income includes general taxes; but, excludes interest charges and state and federal income taxes.

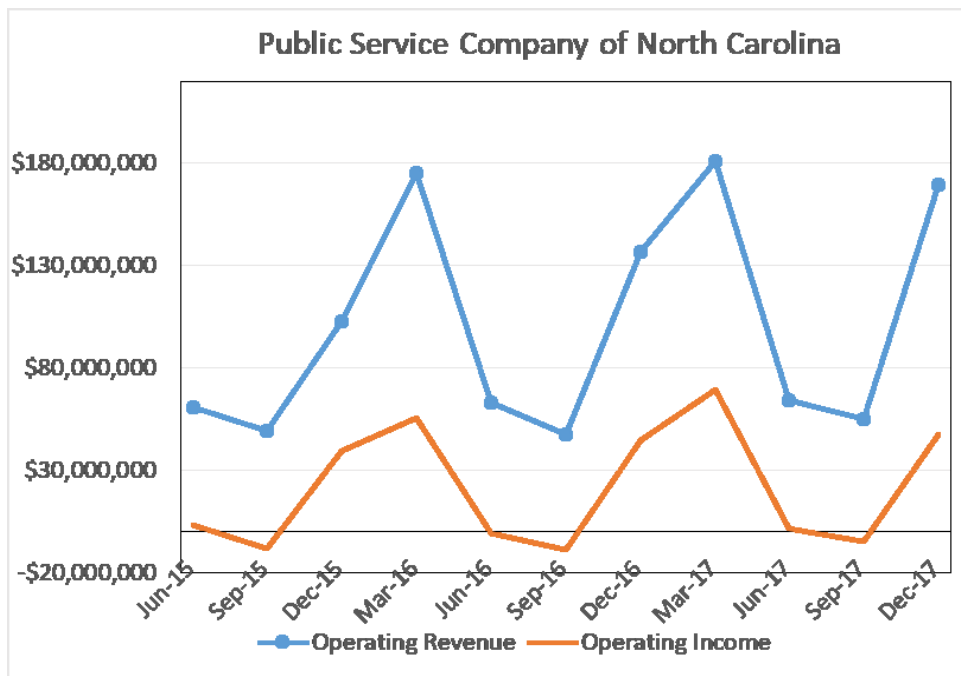
1 are more predictable and stable overtime relative to PSNC and
2 Piedmont, as shown in the following graphs:



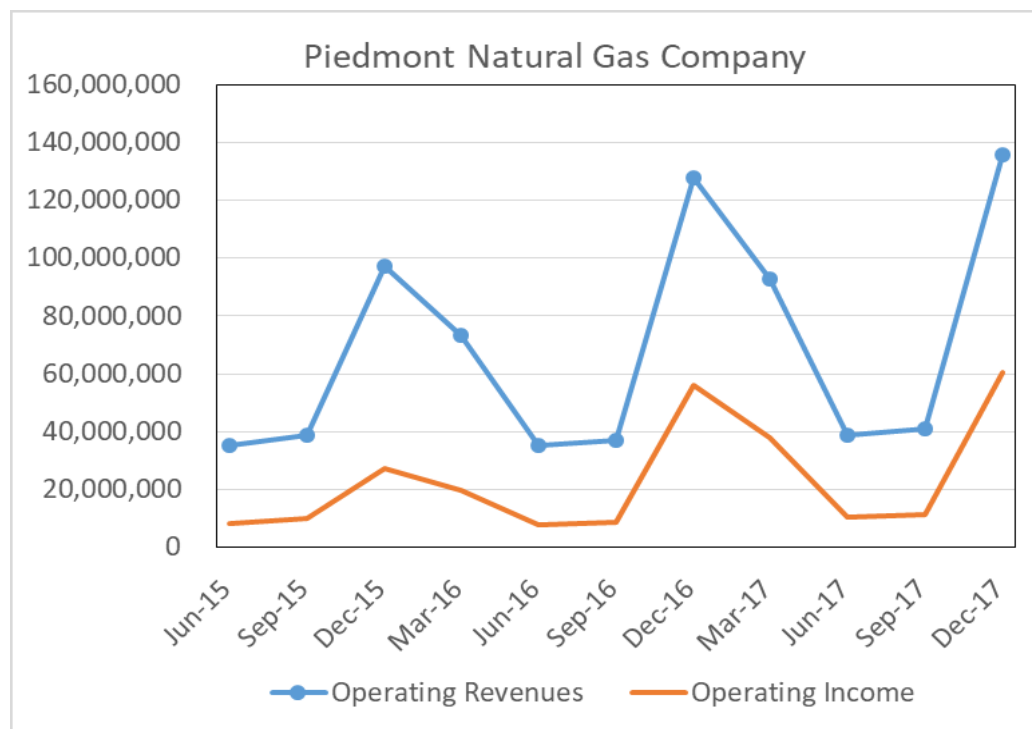
3



1



2



1

2 **Q. DO YOU KNOW OF STUDIES THAT QUESTION THE**
 3 **ADDITIONAL RISK TO UTILITIES AS IT RELATES TO SIZE?**

4 A. Yes, I am aware of a study by Dr. Annie Wong⁶ that focuses on the
 5 size of regulated utilities and risk. Dr. Wong has tested for a size
 6 premium in utilities and concluded that, unlike industrial stocks,
 7 utility stocks do not exhibit a significant size premium. As explained
 8 by Professor Wong, there are several reasons why such a size
 9 premium would not be attributable to utilities; in that, utilities are

⁶ Annie Wong, "Utility Stocks and the Size Effect: An Empirical Analysis," Journal of the Midwest Finance Association, pp. 95-101, (1993).

1 regulated closely by state and federal agencies and commissions,
2 and hence, their financial performance is monitored on an ongoing
3 basis by both the state and federal governments.

4 I believe that size premiums as advocated by witness D'Ascendis
5 cannot be applied to regulated utilities in the same manner as they
6 are applied for non-price regulated companies. In that, regulated
7 water companies do not face the same operating and financing
8 risks of other companies that have to compete for business. The
9 above counter arguments to a size premium were persuasive to the
10 NC Commission in a previous 1997 decision involving CWS
11 Systems, Inc.⁷ that were made by Frank J. Hanley of AUS
12 Consultants, Inc.

13 **VI. SUMMARY AND RECOMMENDATIONS**

14 **Q. WOULD YOU PLEASE SUMMARIZE YOUR RECOMMEND-**
15 **ATIONS CONCERNING THE COST OF CAPITAL?**

16 A. Based upon the results of this study, it is my recommendation that
17 the appropriate capital structure to employ for ratemaking purposes
18 in this proceeding consists of 54.92% long-term debt and 45.08%

⁷ NCUC Order Granting Partial Rate Increase, Docket No. W-778, Sub 31, issued November 26, 1997, Finding of Fact No. 43, pages 61-62.

1 common equity. The appropriate embedded cost of long-term debt
2 associated with this capital structure is 5.87% and the
3 recommended cost of common equity of 9.20%. My recommended
4 overall weighted cost of capital produced is 7.37%, as shown on
5 Exhibit JRH-5.

6 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

7 **A. Yes.**

QUALIFICATIONS AND EXPERIENCE

JOHN ROBERT HINTON

I received a Bachelor of Science degree in Economics from the University of North Carolina at Wilmington in 1980 and a Master of Economics degree from North Carolina State University in 1983. I joined the Public Staff in May of 1985. I filed testimony on the long-range electrical forecast in Docket No. E-100, Sub 50. In 1986, 1989, and 1992, I developed the long-range forecasts of peak demand for electricity in North Carolina. I filed testimony on electricity weather normalization in Docket Nos. E-7, Sub 620, E-2, Sub 833, and E-7, Sub 989. I filed testimony on customer growth and the level of funding for nuclear decommissioning costs in Docket No. E-2, Sub 1023. I filed testimony on the level of funding for nuclear decommissioning costs in Docket Nos. E-7, Sub 1026 and E-7, Sub 1146. I have filed testimony on the Integrated Resource Plans (IRPs) filed in Docket No. E-100, Subs 114 and 125, and I have reviewed numerous peak demand and energy sales forecasts and the resource expansion plans filed in electric utilities' annual IRPs and IRP updates.

I have been the lead analyst for the Public Staff in numerous avoided cost proceedings, filing testimony in Docket No. E-100, Subs 106, 136, 140,

and 148. I have filed a Statement of Position in the arbitration case involving EPCOR and Progress Energy Carolinas in Docket No. E-2, Sub 966. I have filed testimony in applications of avoided cost for cost recovery of energy efficiency programs and demand side management programs in Dockets Nos. E-7, Sub 1032, E-7, Sub 1130, E-2, Sub 1145, and E-2, Sub 1174.

I have filed testimony on the issuance of certificates of public convenience and necessity (CPCN) in Docket Nos. E-2, Sub 669, SP-132, Sub 0, E-7, Sub 790, E-7, Sub 791, and E-7, Sub 1134.

I filed testimony on the merger of Dominion Energy, Inc. and SCANA Corp. in Docket Nos. E-22, Sub 551 and G-5, Sub 585.

I have filed testimony on the issue of fair rate of return in Docket Nos. E-22, Sub 333; E-22, Sub 412; P-26, Sub 93; P-12, Sub 89; G-21, Sub 293; P-31, Sub 125; G-5, Sub 327; G-5, Sub 386; G-9, Sub 351; P-100, Sub 133b; P-100, Sub 133d (1997 and 2002); G-21, Sub 442; W-778, Sub 31; and W-218, Sub 319, E-22, Sub 532, and W-218, Sub 497 and in several smaller water utility rate cases.. I have filed testimony on credit metrics and the risk of a downgrade in Docket No. E-7, Sub 1146.

I have filed testimony on the hedging of natural gas prices in Docket No. E-2, Subs 1001 and 1018. I have filed testimony on the expansion of natural gas in Docket No. G-5, Subs 337 and 372. I performed the financial analysis in the two audit reports on Mid-South Water Systems, Inc., Docket No. W-100, Sub 21. I testified in the application to transfer of the CPCN from North Topsail Water and Sewer, Inc. to Utilities, Inc., in Docket No. W-1000, Sub 5. I have filed testimony on rainfall normalization with respect of water sales in Docket No. W-274, Sub 160.

With regard to the 1996 Safe Drinking Water Act, I was a member of the Small Systems Working Group that reported to the National Drinking Water Advisory Council of the U.S. Environmental Protection Agency. I have published an article in the National Regulatory Research Institute's Quarterly Bulletin entitled Evaluating Water Utility Financial Capacity.

RISK MEASURES

VALUE LINE SAFETY RANK

The Safety Rank is a measure of the total risk of a stock. It includes factors unique to the company's business such as its financial condition, management competence, etc. The Safety Rank is derived by averaging two variables: the stock's Price Stability Index, and the Financial Strength Rating of the company. The Safety Rank ranges from 1 (Highest) to 5 (Lowest).

VALUE LINE BETA (β)

The Beta is derived from a regression analysis between weekly percent changes in the price of a stock and weekly percent price changes in the New York Stock Exchange Composite Index over a period of five years.

There has been a tendency over the years for high Beta stocks to become lower and for low Beta stocks to become higher. This tendency can be measured by studying Betas of stocks in five consecutive intervals. The Betas published in the Value Line Investment Survey are adjusted for this tendency and hence are likely to be better predictors of future Betas than those based exclusively on the experience of the past five years.

The New York Stock Exchange Composite Index is used as the basis for calculating the Beta because this index is a good proxy for the complete equity portfolio. Since Beta's significance derives primarily from its usefulness in portfolios rather than individual stocks, it is best constructed by relating to an overall market portfolio. The Value Line Index, because it weights all stocks equally, would not serve as well.

The security's return is regressed against the return on the New York Stock Exchange Composite Index over the past five years, so that 259 observations of weekly price changes are used. Value Line adjusts its estimate of Beta (β_i) for regression described by Blume (1971). The estimated Beta is adjusted as follows:

$$\text{Adjusted } \beta_i = 0.35 + 0.67\beta$$

VALUE LINE FINANCIAL STRENGTH RATING

The Financial Strength Ratings are primarily a measure of the relative financial strength of a company. The rating considers key variables such as coverage of debt, variability of return, stock price stability, and company size. The Financial Strength Ratings range from the highest at A++ to the lowest at C.

VALUE LINE PRICE STABILITY INDEX

The Price Stability Index is based upon a ranking of the standard deviation of weekly percent changes in the price of a stock over the last five years. The top 5% carry a Price Stability Index of 100; the next 5%, 95; and so on down to an Index of 5.

VALUE LINE EARNINGS PREDICTABILITY INDEX

The Earnings Predictability Index is a measure of the reliability of an earnings forecast. The most reliable forecasts tend to be those with the highest rating (100); the least reliable (5).

S&P BETA (β)

The Beta is derived from a regression analysis between 60 months of price changes in a company's stock price (plus corresponding dividend yield) and the monthly price changes in the S&P 500 Index (plus corresponding dividend yield). Prices and dividends are adjusted for all subsequent stock splits and stock dividends.

S&P BOND RATING

The S&P Bond Ratings is an appraisal of the credit quality based on relevant risk factors. S&P reviews both the company's financial and business profiles. Shown below are the rankings:

AAA An extremely strong capacity to pay interest and repay principal.

AA+ A very strong capacity to pay interest and repay principal.

AA There is only a small degree of difference between "AAA" or "AA" debt issues.

A+ A strong capacity to pay interest and repay principal. These

A these ratings indicate the obligor is more susceptible to

A- changes in economic conditions than "AAA" or "AA" debt issues.

BBB+ An adequate capacity to pay interest and repay principal.
BBB economic conditions or changing circumstances are more likely to
BBB- lead to a weakened capacity to pay interest and repay principal.

BB+ “BB” indicates less near-term vulnerability to default than other
BB speculative issues. However, these bonds face major ongoing
BB- uncertainties or exposure to adverse conditions that could lead to
inadequate capacity to meet timely interest and principal payments.

S&P STOCK RANKING

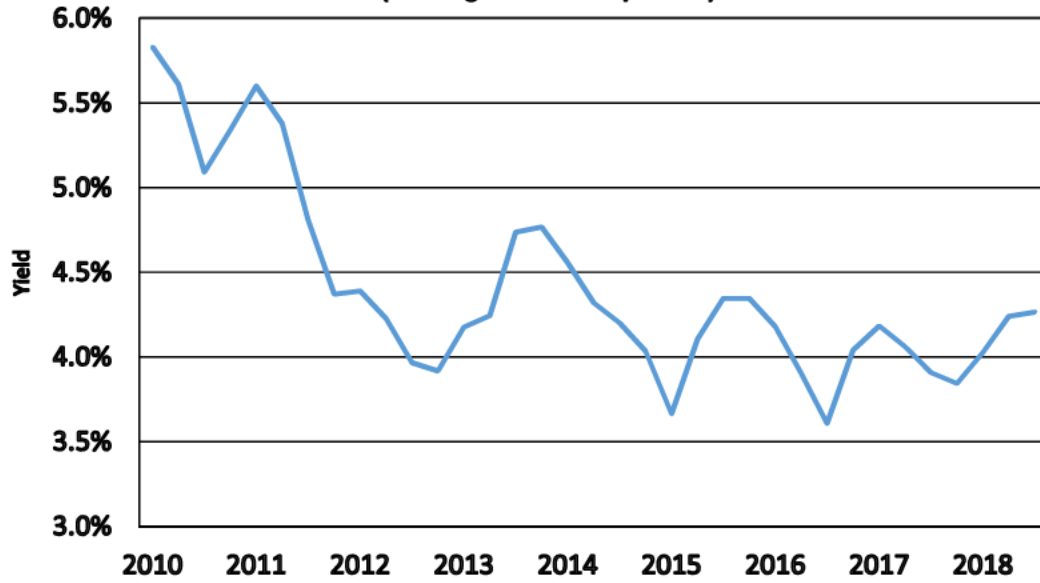
The S&P Stock Rankings is an appraisal of the growth and stability of the company’s earnings and dividends over the past 10 years. The final score for each stock is measured against a scoring matrix determined by an analysis of the scores of a large and representative sample of stocks. Shown below are the rankings:

A+	Highest
A	High
A-	Above average
B+	Average
B	Below Average
B-	Lower
C	Lowest
D	In Reorganization
NR	Not rated

Sources:

1. Value Line Investment Analyzer, Version 3.0.15a, New York, NY.
2. Standard & Poor’s, Utility Compustat II, September 15, 1993, New York, NY.

Moody's A-Rated Utility Bond Yields
(averaged over a quarter)



RISK MEASURES
Group of Water Companies

Company Name	Value Line ¹					S&P		
	Safety	Beta	Financial Strength	Earnings Predict.	Price Stability	Bond Rating ²	Stock Rating ³	Beta ⁴
1 American States Water	2	0.80	A	95	75	A+	A+	0.27
2 American Water Works	3	0.65	B+	90	100	A	B	0.17
3 Aqua America	2	0.75	A	90	95	A+	A+	0.42
4 California Water Service	3	0.80	B++	65	75	A+	A+	0.60
5 Middlesex Water	2	0.80	B++	80	65	A	A-	0.45
6 York Water	3	0.80	B+	90	60	A-	A	0.37
Average	2.5	0.77		85	78			0.38

Sources:

¹ Value Line Reports for July 13, 2018.

² S&P Global Ratings, various issues.

³ S&P Global, CFPR Quantitative Stock Report, dated August 17, 2018 and August 18, 2018.

⁴ ibid.

Connecticut Water	3	0.65	B+	85	85	A	A
SJW Corp.	3	0.75	B+	45	65	A	B+

2. Value Line Reports for March 3, 2017.

DCF ANALYSIS Group of Water Utility Companies

Company Name	Yield ¹	Value Line ²						Yahoo ³				Average ⁴ Forecast Growth Rate
		Value Line ²			Value Line Forecast ²			Forecast				
		EPS 10-Yr	DPS 10-Yr	BPS 10-Yr	EPS 5-Yr	DPS 5-Yr	BPS 5-Yr	EPS 5-Yr	DPS 5-Yr	BPS 5-Yr	EPS 5-Yr	
1 American States Water	1.9	9.0	7.0	5.0	7.0	10.5	4.5	6.0	8.0	4.0	4.0	5.5
2 American Water Works	2.2	NA	NA	1.0	7.5	8.5	4.0	10.0	10.0	6.0	8.1	8.5
3 Aqua America	2.5	8.5	7.5	6.5	9.5	8.0	7.5	7.5	9.0	5.5	5.0	6.8
4 California Water	1.9	4.5	2.0	4.5	4.0	2.5	5.0	9.5	6.5	3.0	9.8	7.2
5 Middlesex Water	2.1	5.0	2.0	3.5	8.0	2.0	3.5	8.0	5.5	4.0	2.7	5.1
6 York Water	2.1	5.5	3.5	5.0	6.5	3.5	3.5	9.0	8.0	5.0	4.9	6.7
Average	2.1	6.5	4.4	4.3	7.1	5.8	4.7	8.3	7.8	4.6	5.8	6.6
DCF Result		8.6	6.5	6.4	9.2	7.9	6.8	10.4	9.9	6.7	7.9	8.7

Source:

- ¹ Value Line Summary and Index for June 29, 2018 through September 21, 2018.
- ² July 13, 2018 Value Line Reports.
- ³ Yahoo Finance reporting of 5-Yr consensus EPS forecasts, downloaded on September 24, 2018.
- ⁴ The average calculation includes all four measures of predicted growth rate.

Note: Connecticut Water Service, Inc. and the SJW Group were excluded from the Value Line sample due to a merger.

REGRESSION ANALYSIS OF ALLOWED RETURNS ON EQUITY

Year	[A] Water Utilities Approved Returns on Equity ¹	[B] Moody's A-Rated Bond Yields ²	[C]=[A]-[B] Water Utility Risk Premium
2006	10.23%	6.07%	4.16%
2007	10.07%	6.05%	4.02%
2008	10.24%	6.51%	3.73%
2009	10.18%	6.04%	4.15%
2010	10.18%	5.47%	4.71%
2011	10.04%	5.04%	5.00%
2012	9.90%	4.13%	5.77%
2013	9.73%	4.48%	5.25%
2014	9.59%	4.28%	5.31%
2015	9.76%	4.12%	5.65%
2016	9.71%	3.93%	5.78%
2017	9.56%	4.00%	5.56%
2018	9.41%	4.17%	5.24%
		Average	4.95%
		Maximum	5.78%
		Minimum	3.73%

Sources:

¹ Regulatory Research Associates, Water Advisory, June 8, 2017 and July 27, 2018.

² Moody's Credittrends with yield data as of August 31, 2018.

REGRESSION ANALYSIS OF ALLOWED RETURNS ON EQUITY

<i>Regression Statistics</i>	
Multiple R	0.87772
R Square	0.77039
Adjusted R Square	0.74952
Standard Error	0.00142
Observations	13

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	7.48492E-05	7.48492E-05	37.952701	7.10034E-05
Residual	11	2.16939E-05	1.97217E-06		
Total	12	9.65431E-05			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>
Intercept	0.086038	0.002157	39.885740	0.000000
X Variable 1	0.260653	0.042905	6.075145	0.000080

Moody's A-Rated Public Utility Bond Yield	
May-18	4.09%
Jun-18	4.17%
Jul-18	4.28%
Aug-18	4.27%
Jul-18	4.27%
Aug-18	4.26%
Average	4.22%

Predicted Cost of Equity **9.70%**

Note:
Predicted Cost of Equity of 9.70% = 0.086038 + 0.260653 x 4.22%.

Carolina Water Service, Inc. of North Carolina
Cost of Capital as of June 30, 2018

Item	Ratios	Cost Rate	Weighted Cost Rate	Pre-Tax Cost of Capital
Long-Term Debt	54.92%	5.87%	3.22%	3.22%
Common Equity	45.08%	9.20%	4.15%	5.42%
Total	100.00%		7.37%	8.64%

Pre-Tax Interest Coverage 3.7