friedman & friedman PA
ATTORNEYS AT LAW

October 30, 2017

Carlotta S. Stauffer, Commission Clerk
Office of Commission Clerk
Florida Public Service Commission
2540 Shumard Oak Blvd.
Tallahassee, FL 32399-0850

RE: Docket No. 20170006-WS; Water and Wastewater Instrustry Annual Reestablishment of Authorized Range of Return on Common Equity for Water and Wastewater Utilities Pursuant to Section 367.081(4)(f), F. S.
Our File No. 30057.87

Dear Ms. Stauffer:

Enclosed are the comments of Utilities, Inc. of Florida in the above-referenced Docket for the upcoming workshop.

Should you or Staff have any questions, please do not hesitate to give me a call.

Very truly yours,

/s/ Martin S. Friedman

MARTIN S. FRIEDMAN
For the Firm

MSF/

cc: John Hoy (via e-mail)
Patrick Flynn (via e-mail)
Jared Deason (via e-mails)
Pauline Ahern (via e-mail)
Andrew Maurey (via email)
Mark Cicchetti (via email)

DOCKET NO. 20170006-WS

IN RE: WATER AND WASTEWATER INDUSTRY ANNUAL REESTABLISHMENT OF AUTHORIZED RANGE OF RETURN ON COMMON EQUITY FOR WATER AND WASTEWATER UTILITIES PURSUANT TO SECTION 367.081(4)(F). F.S.

COMMENTS

ON

FLORIDA LEVERAGE FORMULA

TO ESTABLISH THE ANNUAL AUTHORIZED

RANGE OF RETURNS FOR WATER & WASTEWATER UTILITIES

OF

PAULINE M. AHERN, CRRA

EXECUTIVE DIRECTOR

SCOTTMADDEN, INC.

ON BEHALF OF

UTILITIES, INC. OF FLORIDA

Table of Contents

I. INTRODUCTION

My name is Pauline M. Ahern. I am an Executive Director of ScottMadden, Inc. My business address is 1900 West Park Road, Suite 250, Westborough, MA 01581. My mailing address is 3000 Atrium Way, Suite 241, Mount Laurel, NJ 08054

I have been requested by Utilities Inc. of Florida ("UIF") to provide comments on the Florida Public Service Commission's ("FPSC") leverage formula ("the Formula") methodology used to establish the annual authorized range of returns for water and wastewater utilities in response to the FPSC's "Notice of Staff Workshop", Docket No. 20170006-WS.

I agree with the FPSC, when it found in Order No. PSC-17-0249-PAA-WS issued June 25, 2017 in Docket No. 20170006-WS that from 2012 through 2016, " the range of returns on equity derived from the annual leverage formulas were not optimal for determining the appropriate authorized ROE for WAW utilities due to Federal Reserve monetary policies that resulted in historically low interest rates."

The currently low interest rate environment has been and continues to be engineered by central bank intervention, notwithstanding the Federal Reserve's ("Fed") initiating quantitative easing and beginning to raise its benchmark Federal Funds ("Fed Funds") rate. This central bank engineering has led some analysts to the conclusion that current capital costs are low and will continue to be so. This conclusion only holds true under the hypothesis of Perfectly Competitive Capital Markets ("PCCM") and the classical valuation framework which, under normal economic and capital market conditions, underpin the traditional cost of common equity models. [1] PCCM are capital markets in which no single trader, or "market-mover", would have the power to change the prices of goods or services, including bond and common stock securities. In other words, under the PCCM hypothesis, no single trader would have a significant effect on market prices.

Classic valuation theory assumes that investors trade securities rationally at prices reflecting their perceptions of value. Although the Fed has always had the ability to set benchmark interest rates, it has been maintaining below normal interest rates in an attempt to stimulate

[1] Discounted Cash Flow., Risk Premium and Capital Asset Pricing Models.

continued economic and capital market recovery. It therefore is reasonable to conclude that the Fed, and other central banks are acting as market-movers, which has a significant effect on the market prices of both bonds and stocks in all markets where a central bank is maintaining historically low interest rates. The presence of market-movers such as the Fed in current capital markets runs counter to the PCCM, which is the foundation of the traditional cost of common equity models. The engineering of interest rates directly has affected and continues to affect the measurement of the cost of common equity. The FPSC is correct that its Formula has not been "optimal for determining the appropriate authorized ROE . . . due to Federal Reserve Monetary policies."

With that in mind, these comments will address certain aspects of the Formula, specifically: 1) utilities used by the FPSC Staff (the "Staff") to establish the Formula; 2) staff' application of the Discounted Cash Flow Model ("DCF"); 3) Staff's application of the Capital Asset Pricing Model ("CAPM"); and 4) Staff's computation of the Formula. These commented will provide suggested revisions, which in my opinion will serve to mitigate the effect on the continued low interest rate environment. These comments are organized as follows.

Section II will address the possible use of a Water and Wastewater Index, in addition to or instead of a Natural Gas Index to establish a range of returns on common equity ("ROE") for the small regulated water and wastewater utilities operating under the jurisdiction of the FPSC. Section II will analyze the relative risk between water and wastewater utilities, electric utilities (including combination electric and natural gas) and natural gas utilities.

Section III will address Staff's application of the DCF and CAPM models. Relative to the DCF, Section III will provide empirical support for the use of forecasted earnings per share ("EPS") growth rates in the application of a single-stage constant growth DCF using the market data of both Staff's current Natural Gas Index as well as a Water and Wastewater Utilities Index comprised of eight publicly traded water companies covered by *Value Line Investment Survey* (*"Value Line"*). Relative to the CAPM, Section III suggests that Empirical CAPM ("ECAPM"), as supported in the empirical academic financial literature, be added to the application of the traditional CAPM. Section III also will provide additional measures of the Market Equity Risk Premium ("MERP") as the use of more data adds to the reliability and accuracy of the ROE estimation.

Section IV will address the issue of whether Staff's computation of the Formula should hold the debt rate constant over a range of common equity ratios and whether the pre-tax or post-tax Weighted Average Cost of Capital ("WACC") should also be held constant.

Section V will address Staff's computation of the Formula, suggesting the use of a forecasted Baa3 bond yield for consistency with Staff's use of a forecasted risk-free rate in its CAPM application, as well as the prospective nature of the cost of capital and ratemaking.

Section VI will summarize these comments, results of the analysis and conclusions.

Appendix A contains the empirical analyses related to these comments. All Schedules referenced in these comments can be found in Appendix A.

Appendix B contains copies of the citations in this report except for the U.S. Supreme Court *Hope* and *Bluefield* cases.

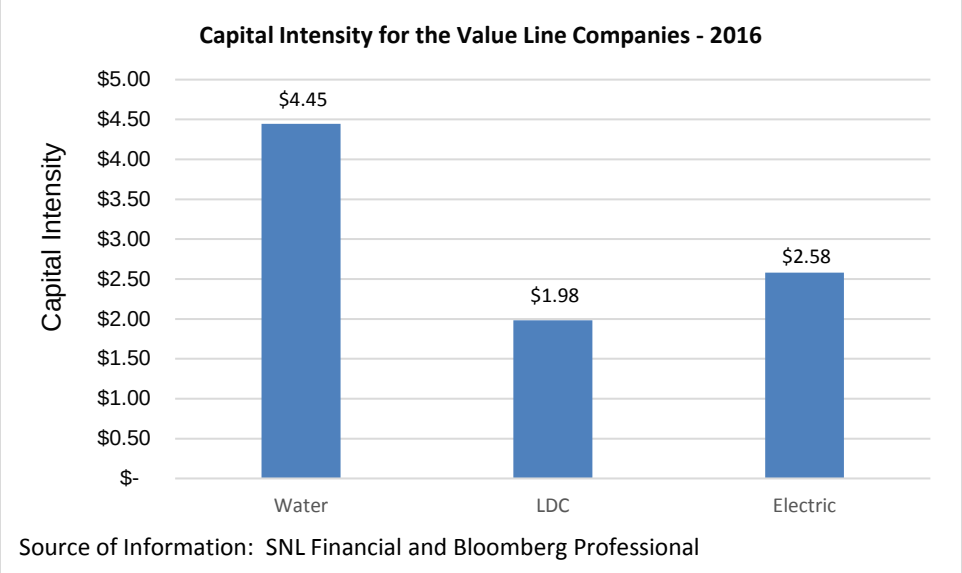
Appendix C contains my educational background, expert witness appearances, presentations I have given and articles I have co-authored.

II. UTILITIES USED IN THE APPLICATION OF THE FLORIDA LEVERAGE FORMULA

Electric and natural gas utilities, where transmission and distribution is separate from generation, generally do not produce the electricity or natural gas which they transmit and distribute. In contrast, water and wastewater utilities are typically vertically engaged in the entire process of acquiring supply, production (treatment) and distribution of water. Hence, water and wastewater utilities require significant capital investment in sources of supply and production (wells and treatment facilities), in addition to transmission and distribution systems, both to serve additional customers and to replace aging systems, creating a major risk facing water and wastewater utilities.

In addition, water and wastewater utilities are much more capital-intensive than the electric or natural gas utilities as the investment required to produce a dollar of revenue is greater. For example, as shown Chart 1 below, it took $4.45 of net utility plant on average to produce $1.00 in operating revenues in 2016 for water and wastewater utilities as a whole. In contrast, for electric and natural gas utility industries, on average it took only $1.98 and $2.58, respectively, to produce $1.00 in operating revenues in 2016.

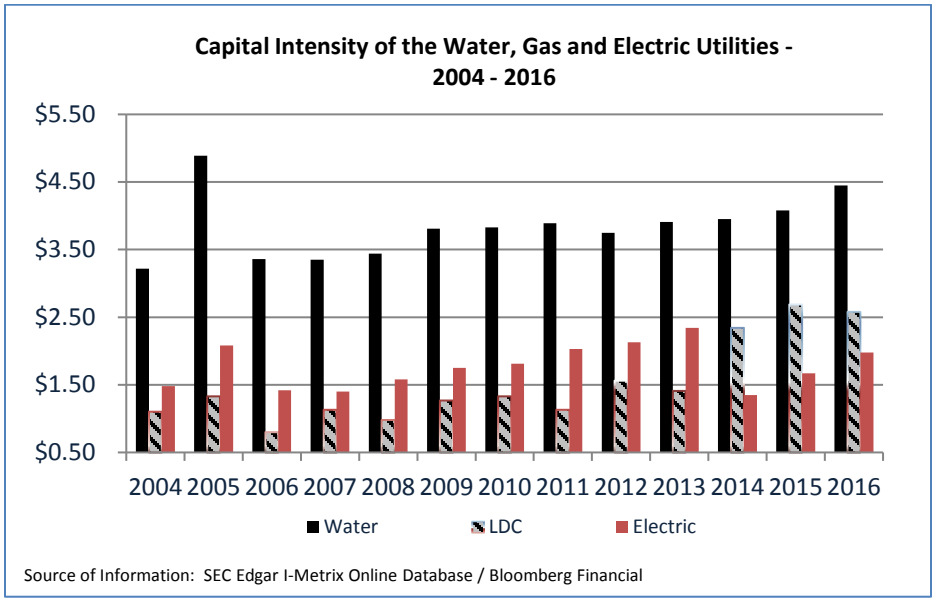
Chart 1



Source of Information: SNL Financial and Bloomberg Professional

The greater capital intensity of water and wastewater utilities is not a new phenomenon as water and wastewater utilities have exhibited a consistently and significantly greater capital intensity relative to electric and natural gas utilities from 2004 to 2016 as shown in Chart 2 below.

Chart 2

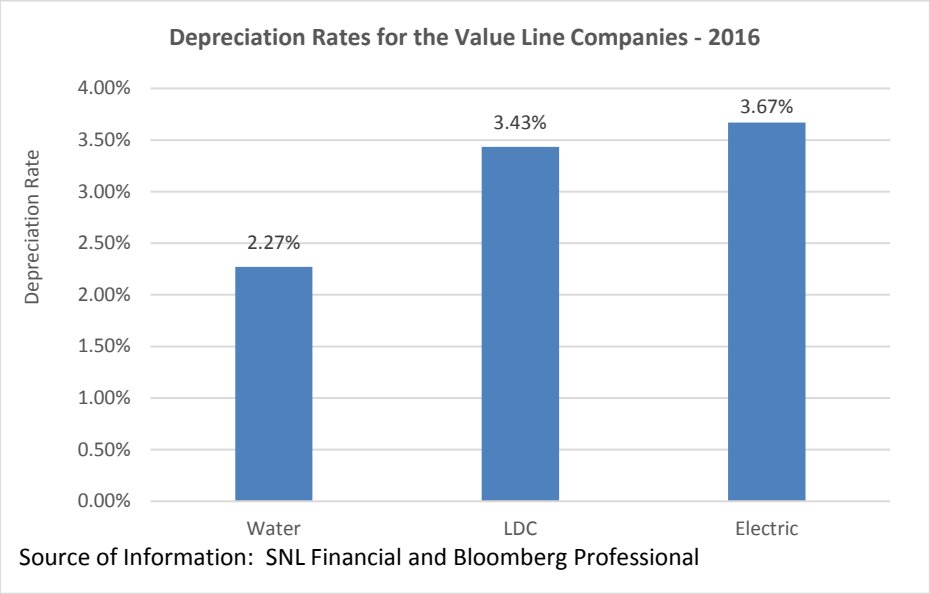


As financing needs have increased over the time, the competition for capital from traditional sources has increased, making the need to maintain financial integrity and the ability to attract needed new capital increasingly important. And, because investor-owned water and wastewater utilities typically do not receive federal funds for infrastructure replacement, the challenge to investor-owned water and wastewater utilities is exacerbated and their access to financing is restricted, thus increasing risk.

Water and wastewater utilities also experience lower relative depreciation rates than do other utilities. Lower depreciation rates, as one of the principal sources of internal cash flows for all utilities, mean that water and wastewater utility depreciation as a source of internally-generated cash is far less than for electric or natural gas utilities. Water and wastewater utilities' assets have longer lives and, hence, longer capital recovery periods than do the assets of electric and natural gas utilities. As such, water and wastewater utilities face greater risk due to inflation which results in a higher replacement cost per dollar of net plant than for other types of utilities. As shown in Chart 3 below, water and wastewater utilities experienced an average depreciation rate of 2.27%

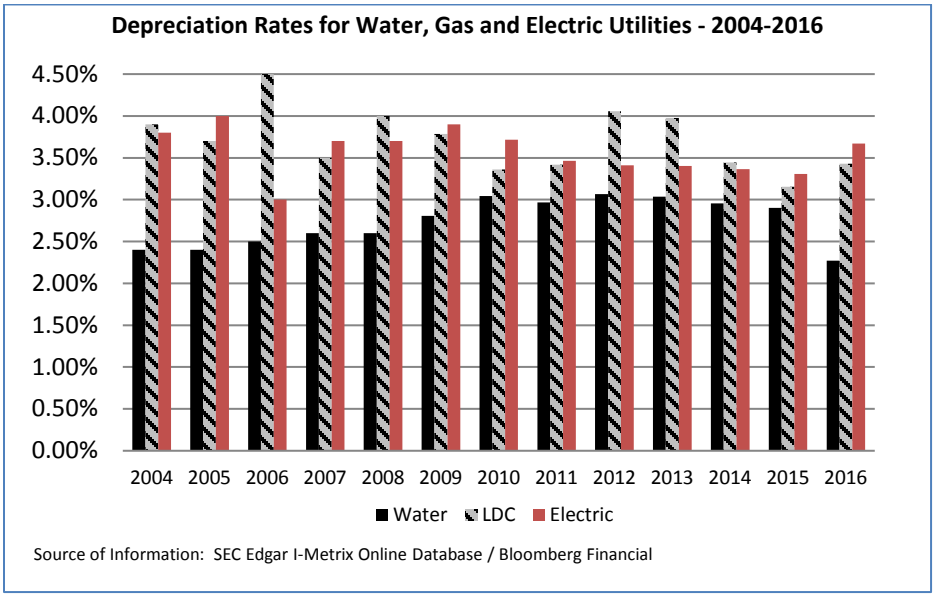
for 2016. In contrast, in 2016, the electric and natural gas utilities experienced average depreciation rates of 3.43% and 3.67%, respectively.

Chart 3



As with capital intensity, the lower relative depreciation rates of water and wastewater utilities is not a new phenomenon. As shown Chart 4 below, water utility depreciation rates have been consistently and significantly lower than those of the electric and natural gas utilities. Such low depreciation rates signify that the pressure on cash flows remains significantly greater for water and wastewater utilities than for other types of utilities.

Chart 4



In addition, not only are water and wastewater utilities historically capital intensive, it is expected to incur significant capital expenditure needs over the next 25 years. In the 2017 Infrastructure Report Card[2] published by the American Society of Civil Engineers ("ASCE") they state:

> Drinking water is delivered via one million miles of pipes across the country. Many of those pipes were laid in the early to mid-20th century with a lifespan of 75 to 100 years. The quality of drinking water in the United States remains high, but legacy and emerging contaminants continue to require close attention. While water consumption is down, there is still an estimated 240,000 water main breaks per year in the United States, wasting over two trillion gallons of treated drinking water. According to the American Water Works Association, an estimated $1 trillion is necessary to maintain and expand service to meet demands over the next 25 years.[3]

In addition, the ASCE estimates that $270 billion, $10.8 billion annually, "is needed for wastewater infrastructure over the next 25 years.[4]

---

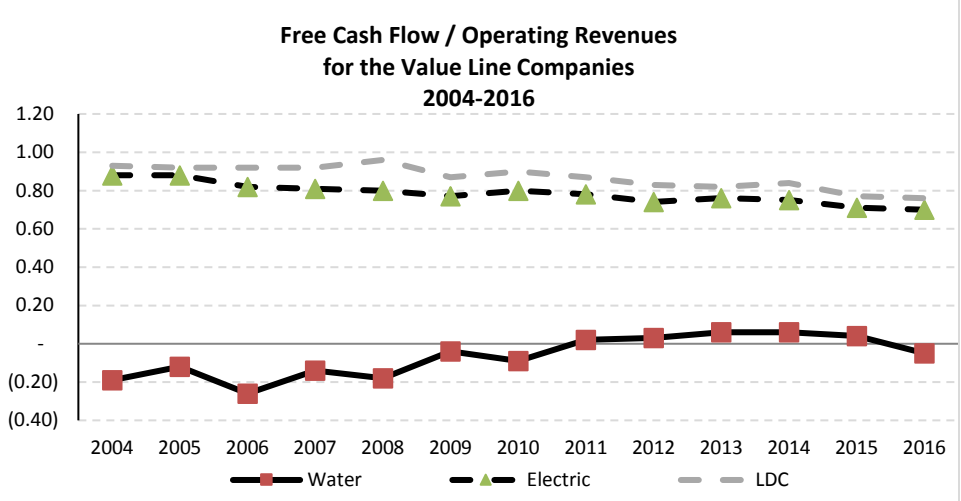
2 2017 Infrastructure Report Card – Drinking Water (American Society of Civil Engineers (2017), at 1. (*See* Appendix B, Workpaper UIF-UIF-1).

3 $40,000,000 anually.

4 2017 Infrastructure Report Card –Wastewater (American Society of Civil Engineers (2017), at 2. (*See* Appendix B, Workpaper UIF-UIF-2).

Water utility capital expenditures as large as projected by the ASCE will require significant financing. The three sources typically used for financing are debt, equity (common and preferred) and cash flow. All three are intricately linked to the opportunity to earn a sufficient rate of return as well as the ability to achieve that return. Consistent with the *Bluefield*[5] and *Hope*[6] decisions, the return must be sufficient enough to maintain credit quality as well as enable the attraction of necessary new capital, be it debt or equity capital. If unable to raise debt or equity capital, the utility must turn to either retained earnings or free cash flow, both of which are directly linked to earning a sufficient rate of return. If either is inadequate, it will be nearly impossible for the utility to invest in needed infrastructure. Since all utilities typically experience negative free cash flows, it is clear that an insufficient rate of return can be financially devastating for utilities and for its customers, the ratepayers. Chart 5 below demonstrates that the free cash flows (funds from operations minus capital expenditures) of water and wastewater utilities as a percent of total operating revenues has been consistently negative, while that of electric and natural gas utilities from 2004 through 2016 has been low, but positive.

Chart 5



Source of Information: SNL Financial and Bloomberg Professional

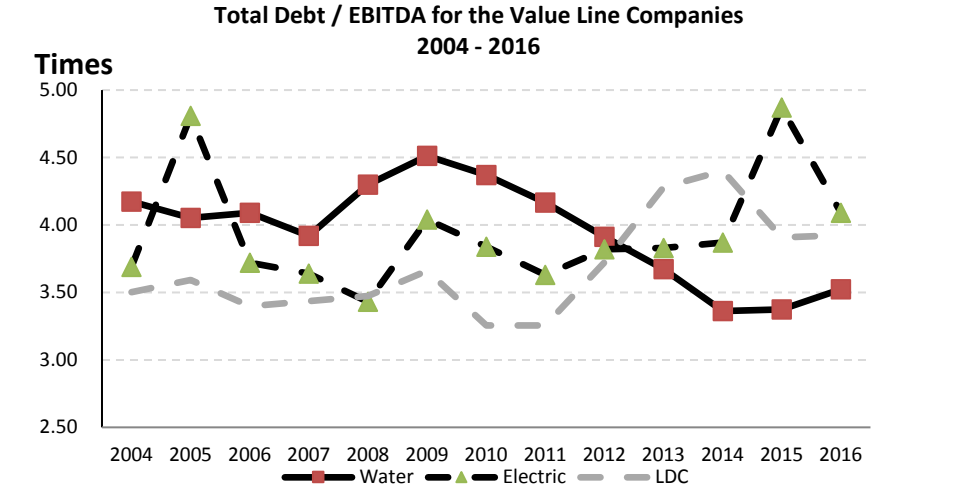
5 *Bluefield Water Works Improvement Co. v. Public Serv. Comm'n*, 262 U.S. 679 (1922).
6 *Federal Power Commission v. Hope Natural Gas Co.*, 320 U.S. 591 (1944).

Consequently, as with the previously discussed capital intensity and depreciation rates, significant capital expenditures relative to net plant as well as the consistently and more significantly negative free cash flow relative to operating revenues of water and wastewater utilities indicates greater investment risk for water and wastewater utilities relative to electric and natural gas utilities.

There are several other indications that the water and wastewater utilities exhibit more investment risk than electric and natural gas utilities. The following charts present several such indications: total debt / earnings before interest, taxes, depreciation and amortization ("EBITDA"); funds from operations ("FFO") / total debt; funds from operations / interest coverage; and before-income tax / interest coverage each utility industry from 2004 through 2016.

Total debt (including short-term) as a percentage of EBITDA and FFO as a percentage of debt are indications of the financial or credit risk of a company. Chart 6 below, shows that total debt / EBITDA rose early in the 2004 through 2016 period for water and wastewater utilities. Although declining below that of electric and natural gas utilities in the latter half of the period, total debt as a percentage of EBITDA is now rising again and approaching that of the electric and natural gas utilities.

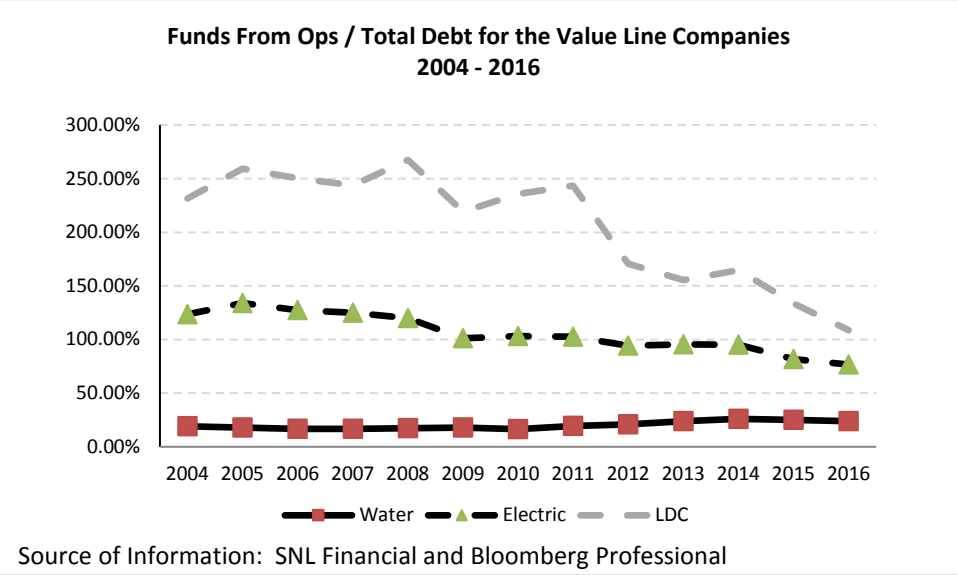
Chart 6



Source of Information: SNL Financial and Bloomberg Professional

Chart 7 below shows that from 2004 through 2016, FFO / total debt has declined somewhat but remaining well above 50.0%, for electric and natural gas utilities. Over the same period, for water and wastewater utilities, it has remained rather flat, although rising somewhat, averaging approximately 20.0%. The recent low level of FFO / total debt for the water and wastewater utilities is a further indication of the pressures upon water and wastewater utility cash flows and the increased relative investment risk which water and wastewater utilities face.

Chart 7



Charts 8 and 9 below 3 confirm the pressures upon both cash flows and income faced by water and wastewater utilities. Chart 8 shows that FFO / interest coverage for water, electric and natural gas utilities followed a similar pattern to FFO interest coverage from 2004 through 2016. FFO interest coverage remained relatively consistent for water and wastewater utilities, hovering around 4.0 times during the period. A similar pattern was exhibited by electric utilities, for which FFO / interest coverages hovering around 20.0 times. However, FFO / total debt for natural gas utilities dropped from just under 50.0 times to just over 30.0 times during the period, significantly exceeding that of water and wastewater utilities. Chart 9 shows that before-income tax coverage interest coverage for water and wastewater utilities while rising from around 3.0 times in 2011 to approximately 4. times in 2016, was still well below that of the electric and natural gas utilities for the entire period. Once again, the consistency and relatively low level of interest coverage ratios for water and wastewater utilities are further indications of the pressures upon cash flow which

water and wastewater utilities face, confirming greater investment risk for water and wastewater utilities relative to electric and natural gas utilities.

Chart 8

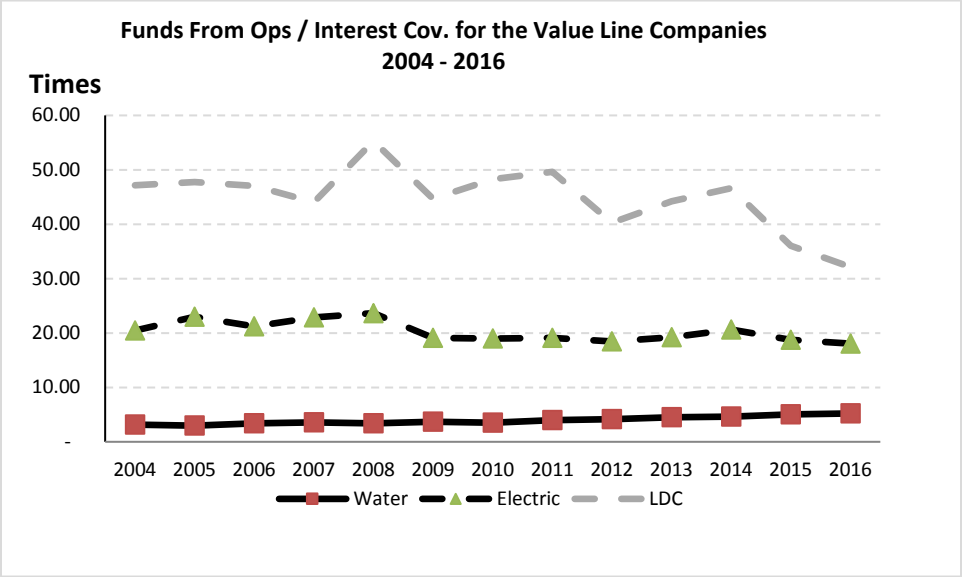
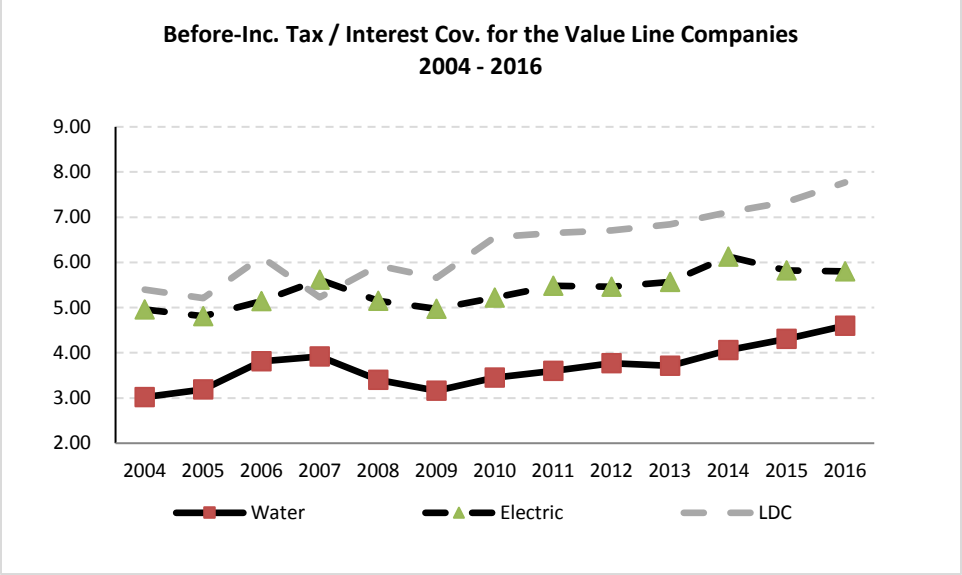


Chart 9

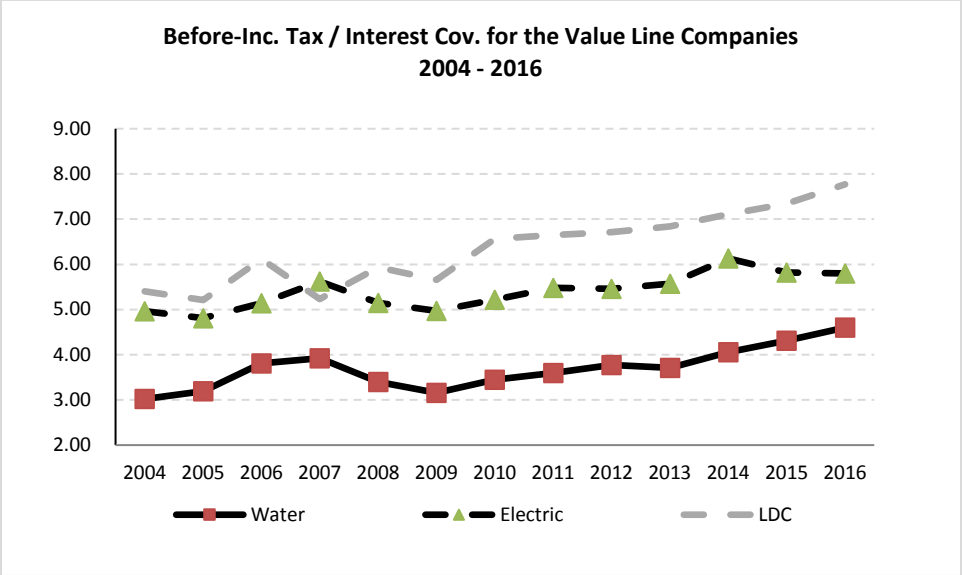


Exacerbating the greater investment risk demonstrated by the financial metrics discussed above, is the smaller size of water and wastewater utilities relative to electric and natural gas utilities. As shown in Chart 10 below, water and wastewater utilities' market capitalization rose from approximately $0.5M in 2004 to just over $2.5B in 2016, remaining consistently below that

of electric and natural gas utilities. The market capitalization of electric utilities grew dramatically from just approximately $6.5B in 2004 to nearly $16.0B in 2016, while natural gas utilities grew much more dramatically from approximately $1.5B in 2004 to just nearly $4.0 in 2016. Since relative size is an indication of the relative investment risk between companies or groups of companies as recognized by the FPSC with inclusion of a "Small-Utility Premium" in its leverage formula, the significantly smaller size of water and wastewater utilities on average exacerbates their investment risk.

Later in these comments, size as a factor of risk will be discussed in more depth, as specifically related to the FPSC Natural Gas Index and a group of publicly traded water and wastewater utilities, as well as UIF and by inference the other small water and wastewater utilities to whom the leverage formula applies.

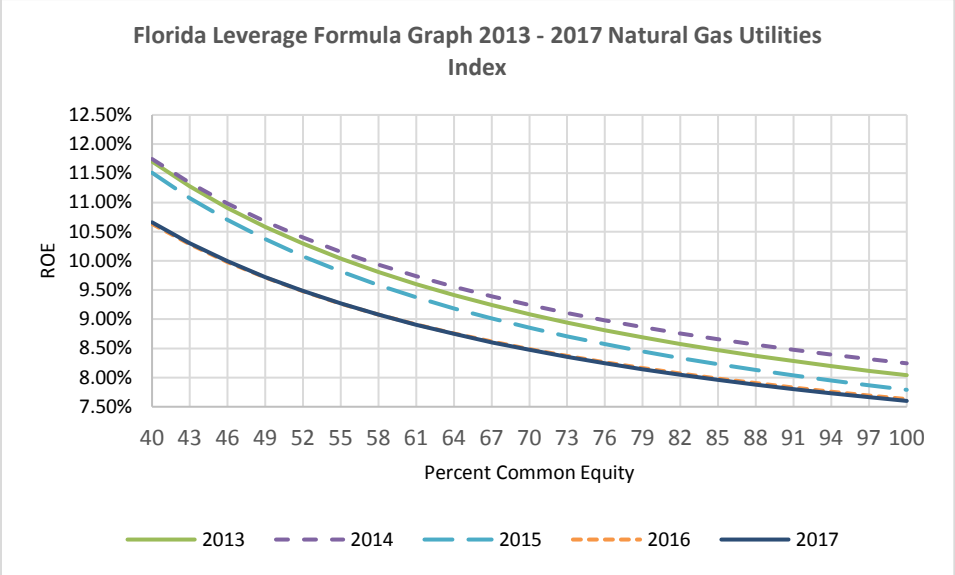
Chart 10



Therefore, I suggest that the FPSC consider including a Water and Wastewater Utilities Index in its annual Formula estimation, along with or replacing the Natural Gas Index. Since there are so few publicly traded water and wastewater utilities, I suggest that the eight publicly traded water utilities for which *Value Line* publishes a Rating and Report in its Standard Edition be used as the Water and Wastewater Utilities Index.

So that the FPSC may compare the results of the leverage formula applied to a group of water and wastewater utilities with those of the Natural Gas Index, I have applied the Formula to the Water and Wastewater Utilities Index for each year from 2013 through 2017[7] in a manner identical to that of the FPSC Staff.[8] That analysis is contained in Chart 11 and Chart 12 below, with the range of results summarized in Table 1.

Chart 11



7 *Value Line* did not publish a Rating & Report for all the eight water utilities proposed for the Water and Wastewater Index until 2013, so it was not possible to apply the Formula methodology to the Index for those years.

Chart 12

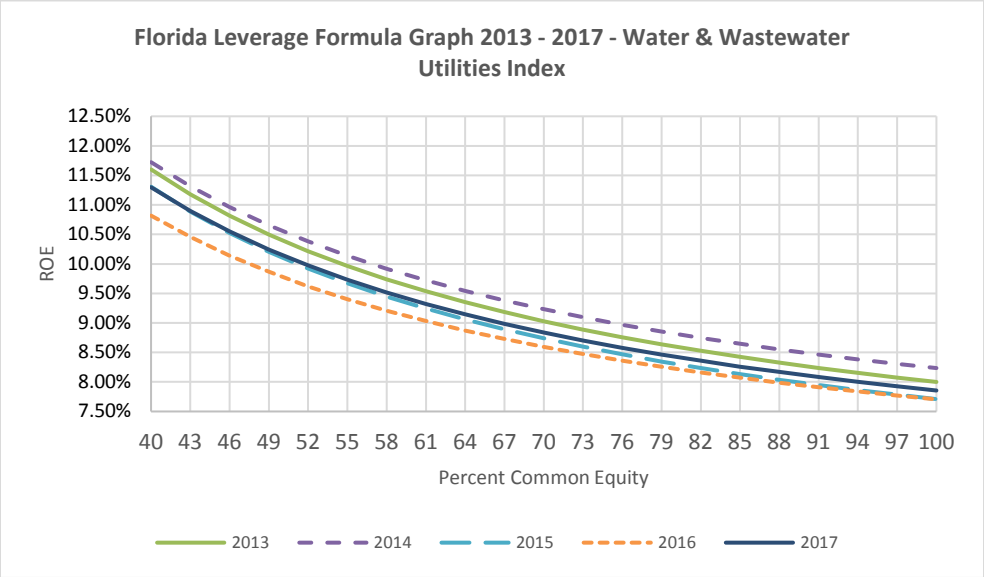


Table 1

Florida PSC Leverage Formula

	Natural Gas Utilities Index			Water & Wastewater Index		
	Common Equity Ratio			Common Equity Ratio		
	40%		100%	40%		100%
2013	11.70%	-	8.04%	11.60%	-	8.00%
2014	11.75%	-	8.24%	11.72%	-	8.24%
2015	11.51%	-	7.79%	11.31%	-	7.71%
2016	10.63%	-	7.63%	10.82%	-	7.71%
2017	10.66%	-	7.60%	11.30%	-	7.86%

III. COMMON EQUITY COST RATE MODELS

i. Discounted Cash Flow Model ("DCF")

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

Relative to Staff's application of the DCF, I suggest the FPSC consider two changes to its methodology. First, is a suggestion to utilize the single-stage DCF, as it is the simplest form of the DCF. In addition, in my rate case experience, is it also the most widely used form on the DCF in the regulatory arena. It is expressed as:

$$K = (D_1 / P_0) + g$$

Where:
- K = Cost of Equity Capital
- D_1 = Expected Dividend Per Share in one year
- P_0 = Current Market Price
- g = Expected Dividend Per Share Growth

Because dividends are paid quarterly, or periodically, as opposed to continuously (daily), an adjustment must be made to the dividend yield. This is often referred to as the discrete, or the "Gordon Periodic", version of the DCF model. DCF theory calls for the use of the full expectational growth rate, referred to as D_1, in calculating the dividend yield component of the model. However, since various utilities increase their quarterly dividend at various times during the year, a reasonable assumption is to reflect one-half the annual dividend growth rate in the dividend yield component, referred to as $D_{1/2}$. This is a conservative approach because it does not overstate the dividend yield, which should be representative of the next twelve-month period.

The second suggestion is to use expected growth in earnings per share ("EPS") as the growth rate component. Investors with more limited resources than institutional investors are likely to rely upon widely available financial information services, such as *Value Line*. 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.

Security analysts' earnings expectations have a significant, but not sole, influence upon market prices and are therefore reasonable indicators of investor expectations.[9] As noted by Morin: [10]

> Because of the dominance of institutional investors and their influence on individual investors, analysts' forecasts of long-run growth rates provide a sound basis for estimating required returns. Financial analysts exert a strong influence on the expectations of many investors who do not possess the resources to make their own forecasts, that is, they are a cause of g. [g = growth]

Over the long run, there can be no growth in DPS without growth in EPS. While security analysts' earnings expectations are not the only influence on market prices, they have a more significant influence on market prices than dividend expectations. Thus, the use of projected earnings growth rates in a DCF analysis provides a better matching between investors' market price appreciation expectations and the growth rate component of the DCF because projected earnings growth rates have a significant influence on market prices and the appreciation or "growth" experienced by investors.[11] This should be evident even to relatively unsophisticated investors just by listening to financial news reports on radio, TV or reading the newspapers.

In addition, Myron Gordon, the "father" of the standard regulatory version of the DCF model widely utilized throughout the United States in rate base/rate of return regulation,

---

9 Roger A. Morin, New Regulatory Finance (Public Utility Reports, Inc., 2006), at 298-303. (*See* Appendix B, Workpaper UIF-UIF-3)

10 Morin, at 298. (*See* Appendix B, Workpaper UIF-UIF-3)

11 Morin, at 298. (*See* Appendix B, Workpaper UIF-UIF-3)

recognized the significance of analysts' forecasts of growth in EPS in a speech he gave in March 1990 before the Institute for Quantitative Research and Finance.[12] As Professor Gordon stated:[13]

> We have seen that earnings and growth estimates by security analysts were found by Malkiel and Cragg to be superior to data obtained from financial statements for the explanation of variation in price among common stocks. . .

Professor Gordon recognized that total return is largely affected by the terminal price which is mostly affected by earnings (hence price earnings multiples). However, while EPS is the most significant factor influencing market prices, it is by no means the only factor that affects market prices, as recognized by Bonbright:[14]

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

As Professor Gordon noted, studies performed by Cragg and Malkiel[15] demonstrate that analysts' forecasts are superior to historical growth rate extrapolations. While some question the accuracy of analysts' forecasts of EPS growth, the level of accuracy of those analysts' forecasts well after the fact does not really matter for our purposes. What is important is that the forecasts reflect widely held expectations influencing investors at the time they make their pricing decisions and hence the market prices they pay.

---

12 Myron J. Gordon, "The Pricing of Common Stocks', Presented before the Spring 1990 Seminar, March 27, 1990 of the Institute for Quantitative Research in Finance, Palm Beach Fl. (*See* Appendix B, Workpaper UIF-4.)

13 Gordon, at 12. (*See* Appendix B, Workpaper UIF-4.)

14 Bonbright, Danielsen, & Kamerschen, at 334. (*See* Appendix B, Workpaper UIF-5)

15 John G. Cragg and Burton G. Malkiel, Expectations and the Structure of Share Prices (University of Chicago Press 1982) Chapter 4. (*See* Appendix B, Workpaper UIF-6)

Jeremy J. Siegel[16] also notes the importance of security analysts' EPS growth estimates to investors when he states:

> For the equity holder, the source of future cash flows is the earnings of firms
>
> * * *
>
> Some people argue that shareholders most value stocks' cash dividends. But this is not necessarily true.
>
> * * *
>
> Since the price of a stock depends primarily on the present discounted value of all expected future dividends, it appears that dividend policy is crucial to determining the value of the stock. However, this is not generally true.
>
> * * *
>
> Since stock prices are the present value of future dividends, it would seem natural to assume that economic growth would be an important factor influencing future dividends and hence stock prices. However, this is not necessarily so. The determinants of stock prices are earnings and dividends on a per-share basis. Although economic growth may influence aggregate earnings and dividends favorably, economic growth does not necessarily increase the growth of per-share earnings of dividends. It is earnings per share (EPS) that is important to Wall Street because per-share data, not aggregate earnings or dividends, are the basis of investor returns. (italics in original)

Moreover, there is no empirical evidence that investors would disregard analysts' estimates of growth in earnings per share. "Do Analyst Conflicts Matter? Evidence From Stock Recommendations"[17] by Anup Agrawal and Mark A. Chen examined whether conflicts of interest with investment banking ("IB") and brokerage businesses induced sell-side analysts to issue optimistic stock recommendations and whether investors were misled by such biases when they

---

[16] Jeremy J. Siegel, Stocks for the Long Run – The Definitive Guide to Financial Market Returns and Long-Term Investment Strategies (McGraw-Hill 2002), at 90-94. (*See* Appendix B, Workpaper UIF-7)

[17] Anup Agrawal and Mark A. Chen, "Do Analysts' Conflicts Matter? Evidence from Stock Recommendations", Journal of Law and Economics (August 2008), Vol. 51, at 503-537. (*See* Appendix B, Workpaper UIF-8)

state: "our findings do not support the view that conflicted analysts are able to systematically mislead investors with optimistic stock recommendations." (page 503)

Agrawal and Chen explain:[18]

> Overall, our empirical findings suggest that while analysts do respond to IB and brokerage conflicts by inflating their stock recommendations, the market discounts these recommendations after taking analysts' conflicts into account. These findings are reminiscent of the story of the nail soup told by Brealey and Myers (1991), except that here analysts (rather than accountants) are the ones who put the nail in the soup and investors (rather than analysts) are the ones to take it out. Our finding that the market is not fooled by biases stemming from conflicts of interest echoes similar findings in the literature on conflicts of interest in universal banking (for example, Kroszner and Rajan, 1994, 1997; Gompers and Lerner 1999) and on bias in the financial media (for examples, Bhattacharya et al. forthcoming; Reuter and Zitzewitz 2006). Finally, while we cannot rule out the possibility that some investors may have been naïve, our findings do not support the notion that the marginal investor was systematically misled over the last decade by analysts' recommendations.

Therefore, given the overwhelming academic/empirical support regarding the superiority of security analysts' EPS growth rate forecasts, I suggest that such EPS growth rate projections, as published in *Value Line* be used in a single-stage application of the DCF in the Formula.

I have applied the single-stage DCF model using Staff's dividends per share and average market prices for the Natural Gas Index, as well as the Water and Wastewater Index (using market prices from Yahoo!Finance) and *Value Line* projected 5-year EPS growth rates on Schedule UIF-1. As shown, the single-stage DCF results are 8.76% for the Natural Gas Index and 8.50% for the Water and Wastewater Index

ii. Capital Asset Pricing Model ("CAPM")

CAPM theory defines risk as the covariability of a security's returns with the market's returns as measured by beta (β). A beta less than 1.0 indicates lower variability while a beta greater than 1.0 indicates greater variability than the market. The CAPM assumes that all other risk, i.e.,

---

[18] Agrawal and Chen, at 531. (*See* Appendix B, Workpaper UIF-8)

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

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

Where:

R_s = Return rate on the common stock

R_f = Risk-free rate of return

R_m = Return rate on the market as a whole

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

a. Risk-free rate

I concur with Staff's use of a forecasted U.S. Treasury bond yield as the risk-free rate in its application of the CAPM as it is consistent with the prospective nature of both the cost of capital and ratemaking.

b. Beta

I also concur with Staff's use of *Value Line* adjusted betas.

c. Market Equity Risk Premium

While I concur in general with Staff's estimation of a market equity risk premium ("MERP") based upon an estimated return on a group of companies representing the competitive market, I do have some comments and suggestions for estimating the MERP.

First, relative to the group of companies Staff used to estimate the MERP, I would suggest that foreign companies be deleted since the Formula is being used to establish a range of authorized ROEs for water and wastewater utilities operating in the U.S. I also suggest that the estimated

return be based upon a market value weighted average of the individual company results, and not a simple average. A market value weighted average is consistent with the manner in which returns for the Standard & Poor's 500 Composite Index ("S&P) are estimated. Nevertheless, when a market value weighted average market return is estimated based upon Staff's April 2017 Market Return,[19] there is only 1 basis point difference from Staff's 10.97% market return. Since the S&P 500 is one of the generally considered "Market Indices" (the other being the New York Stock Exchange ("NYSE")), Staff should consider using the S&P 500 to estimate the MERP, instead of the group it now uses.

I also suggest adding two additional estimates of the MERP, both based upon holding period returns for large company common stocks less the average historical income returns on long-term government bonds as published in the 2017 Stocks, Bonds, Bills, and Inflation ("SBBI") Yearbook ("SBBI – 2017")[20] for the period 1926 to 2016. The use of holding period returns over a very long period of time is useful because it is consistent with the long-term investment horizon presumed by investing in a going concern, i.e., companies expect to operate in perpetuity as well as the infinite investment horizon presumed by DCF theory.

First, I used the arithmetic mean annual total returns for the large company stocks and yields (income returns) for long-term government bonds, because they are appropriate for the purpose of estimating the cost of capital as noted in SBBI – 2017.[21] The use of the arithmetic mean return rates and yields is appropriate because historical total returns and equity risk premiums differ in size and direction over time, providing insight into the variance and standard deviation of returns needed by investors in estimating future risk when making a current investment. Absent such valuable insight into the potential variance of returns, investors cannot meaningfully evaluate prospective risk. If investors alternatively relied upon the geometric mean of historical equity risk premiums, they would have no insight into the potential variance of future returns because the

---

19 Since I was not able to obtain market value capitalization for a majority of the companies in Staff's estimation of the Market Return for 2011 – 2016, I was not able to compare the arithmetic mean Market Returns for those years with market value weighted Market Returns.

20 SBBI – 2017 Appendix B Tables: Morningstar Stocks, Bonds, Bills, & Inflation 1926-2016. (*See* Appendix B, Workpaper UIF-9)

21 SBBI – 2017, at 10-22 (*See* Appendix B, Workpaper UIF-9)

geometric mean relates the change over many periods to a constant rate of change, thereby obviating the year-to-year fluctuations, or variance, which is critical to risk analysis. Moreover, since the annual total return on large company common stocks are not serially correlated, i.e., randomly generated, the arithmetic mean is statistically the best estimation of the expected return.

Regarding the use of the income return and not the total return for long-term U.S. government securities in deriving an equity risk premium, SBBI – 2017 states[22] :

> Another point to keep in mind when calculating the equity risk premium is that the income return on the appropriate-horizon Treasury security, rather than the total return, is used in the calculation.
>
> The total return is comprised of three return components: the income return, the capital appreciation return, and the reinvestment return. The income return is defined as the portion of the total return that results from a periodic cash flow or, in this case, the bond coupon payment. The capital appreciation return results from the price change of a bond over a specific period. Bond prices generally change in reaction to unexpected fluctuations in yields. Reinvestment return is the return on a given month's investment income when reinvested into the same asset class in the subsequent months of the year. *The income return is thus used in the estimation of the equity risk premium because it represents the truly riskless portion of the return*. (italics added)

Hence, it is appropriate to use the income return and not the total return on long-term U.S. government bonds when calculating a market equity risk premium. Therefore, the correct derivation of the historical market equity risk premium is the difference between the arithmetic mean 1926-2016 total return on large company stocks, 12.00%, and the arithmetic mean 1926-2016 income return on long-term government bonds, 5.00%, or 7.00%,[23] as derived page 1 of Schedule UIF-2.

Second, since the inverse relationship between equity risk premiums and interest rates is also well-supported in the academic literature as noted by Morin[24], I suggest the use of a MERP based upon this inverse relationship, using a linear Ordinary Least Squares ("OLS") regression, in

---

22 SBBI - 2017, at 10-22. (*See* Appendix B, Workpaper UIF-9)

23 7.00% = 12.00% - 5.00%.

24 Morin, at 128. Published studies by Brigham, Shome, and Vinson (1985), Harris (1986), Harris and Marston (1992, 1993), Carleton, Chambers, and Lakonishok (1983), Morin (2005), and McShane (2005), and others demonstrate that, beginning in 1980, risk premiums varied inversely with the level of interest rates - rising when rates fell and declining when interest rates rose. (*See* Appendix B, Workpaper UIF-3)

which the market equity risk premium is expressed as a function of long-term government bond yields:

$$RP = \alpha + \beta\ (R_f)$$

To derive the regression analysis-derived MERP of 8.68%, shown on page 1 Schedule UIF-2, I used the same annual total returns on large company common stocks relative to the annual income returns on long-term government bonds mentioned above. The relationship between interest rates and the market equity risk premium was modeled using the observed MERP as the dependent variable, and the income return on long-term government bond as the independent variable. The result of the OLS analysis is shown on page 1 of Schedule UIF-2, with the OLS-derived MERP of 8.68% shown on page 1. The OLS MERP is derived by solving for the MERP using Staff's risk-free rate of 3.50% and the following equation resulting from the OLS analysis.

$$MERP = (3.50\% * (-0.9798)) + 12.11\%$$

When averaged with Staff's MERP of 7.47%, the SBBI – 2017 based MERPs, of 7.00% and 8.68% result in an average MERP of 7.72%.[25]

d. Empirical CAPM

In addition to the suggestions discussed above, I also suggest the inclusion of the Empirical CAPM ("ECAPM"). Numerous tests of the CAPM have measured the extent to which security returns and betas are related, as predicted by the CAPM, confirming the CAPM's validity. However, the empirical CAPM ("ECAPM") reflects the reality that, while the results of these tests support the notion that beta is related to security returns, the empirical Security Market Line ("SML") described by the CAPM formula is not as steeply sloped as the predicted SML. Morin[26] states:

> With few exceptions, the empirical studies agree that …
>
> * * *

[25] 7.72% = (7.47% + 7.00% + 8.68%) / 3.

[26] Morin 175, 190. (*See* Appendix B, Workpaper UIF-3)

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

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

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

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

In view of theory and practical research, I suggest that the FPSC include the application of both a traditional CAPM and an ECAPM to the companies in the Natural Gas Index and the Water and Wastewater Index, averaging the results.

As shown on page 1 of Schedule UIF-2, the traditional CAPM and ECAPM results for the Natural Gas Index are 9.26% and 9.80%, respectively, averaging 9.53%, including 20 basis points for 4% flotation costs. As also shown on page 1 of Schedule UIF-2, the traditional CAPM and ECAPM results for the Water and Wastewater Index are 9.20% and 9.75%, respectively, averaging 9.48%, also including 20 basis points for 4% flotation costs.

iii. Average of DCF and CAPM Results

Table 2 below summarizes the DCF and CAPM results, reflecting the revisions suggested above, for the Natural Gas Index and Water and Wastewater Index

Table 2

	Natural Gas Index	Water & Wastewater Index
DCF	8.76%	8.50%
CAPM	9.53%	9.48%
Average	**9.14%**	**8.99%**

IV. DEBT COST RATE AND PRE-TAX VERSUS POST-TAX COMPUATION OF THE FPSC LEVERAGE FORMULA

i. Debt Cost Rate in Computation of the FPSC Leverage Formula

The current FPSC leverage formula holds the debt cost rate constant over a common equity ratio range of 40% to 100% as can be gleaned from Attachment 1 of Order No. PSC-17-0429-PAA-WS issued June 2017 in Docket No. 170006-WS. The relationship between leverage and financial risk has been formalized by financial economists, such as Modigliani and Miller[27] who showed that the cost of common equity may be expressed as:

$$k_{e,L} = k_{e,U} + (k_{e,U} - k_d)(1 - T)(D / E)$$

Where:

$k_{e,U}$	=	Cost of Equity for an unlevered firm
$k_{e,L}$	=	Cost of Equity for a levered firm
k_d	=	cost of debt (interest rate)
D	=	level of debt
E	=	level of equity
T	=	tax rate

Thus, the cost of common equity for a levered firm is expressed as the cost of common equity for an unlevered firm, which only reflects business risk, plus a premium for financial risk. Although it is theoretically valid that the debt cost rate will also rise as leverage increases, holding the debt cost rate constant over a range of common equity ratios assumes that all else is equal. In regard to public utility regulation, all else is not equal to the competitive markets.

Therefore, the FPSC's assumption that the debt cost rate is constant over a common equity range of 40% to100% is reasonable for two reasons. First, the revenue requirement formula under

---

[27] F. Modigliani and M. Miller, The Cost of Capital, Corporation Finance, and the Theory of Investment, The American Economic Review 48 No. 3, June 1958, at 261-297; F. Modigliani and M. Miller, Corporate Income Taxes and the Cost of Capital: A Correction, The American Economic Review 53 No. 3, June 1963 433 – 443. (*See* Appendix B, Workpaper UIF-10)

which utilities are regulated provides that the regulated utility will be compensated for prudently incurred operating and maintenance expenses, depreciation, taxes and a return on its investment, comprised of a senior capital (debt and or preferred stock) component and a common equity component. The revenue requirement formula ensures that the regulated utility will receive sufficient earnings to compensate it for both its debt and preferred stock obligations. To that end, it is typical, in the rate base / rate of return paradigm, to utilize the embedded cost of senior capital in the derivation of the allowed WACC. The embedded cost of senior capital is a function of many factors, including but not limited to the timing of the various issues of senior capital, capital market conditions at the time of issuance, the credit / bond rating (or equivalent in the case of private placements) of the regulated utility at the time of issuance, and the level of issuance costs and any premium / discounts at the time of issuance.

The current leverage formula assumes that if the Florida water and wastewater utilities had bonds which were rated, they would be rated Baa3 by Moody's which is equivalent to a BBB- by S&P. As discussed above, the bond rating process is comprehensive, both qualitative and quantitative and does not focus exclusively on the debt ratio.

In view of the foregoing, it is therefore reasonable to hold the debt rate constant over the common equity range of 40% to 100% in the leverage formula.

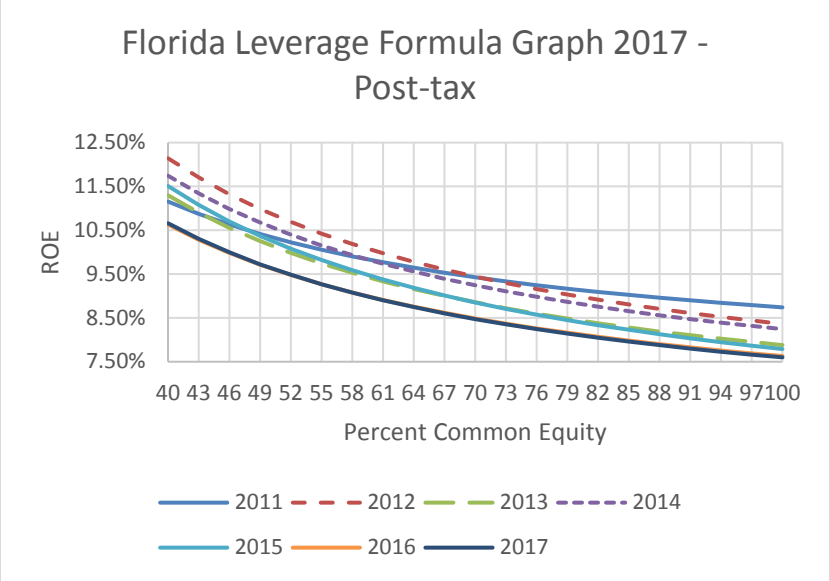
ii. Pre-Tax versus Post-Tax Computation of the FPSC Leverage Formula

The current FL PSC leverage formula holds the post-tax rate constant as the common equity ratio changes. Although it is true, as Modigliani / Miller demonstrated if it were not for income taxes and bankruptcy risk, the capital structure selected by any company would not impact the WACC. However, by holding the pre-tax WACC constant, the exact opposite can be demonstrated, namely, differing amounts of debt and equity in the capital structure have absolutely no impact, on the revenue cost of capital. For example, an 8.50% pre-tax WACC when multiplied by rate base represents a revenue cost of capital which equates to $8.50 to be recovered from ratepayers for each $100 of rate base. By keeping the pre-tax income tax WACC constant, no matter what the common equity ratio, 100.00%, 40.00% or something in between, that by holding the WACC of 8.50% constant, the revenue cost of capital will be $8.50 / $100 rate base, at any common equity ratio. In other words, various capital structure ratios have no impact on the revenue

cost of capital because no matter what the common equity ratio, 100.00% or 40.00%, ratepayers will be paying $8.50 per $100 of rate base. Hence, holding the pre-tax WACC constant demonstrates that capital structure is irrelevant to the revenue cost of capital, providing no incentive to maintain a reasonable capital structure because there is no change in the revenue cost of capital, i.e., the rates recovered from ratepayers, as the common equity ratio changes as discussed below.

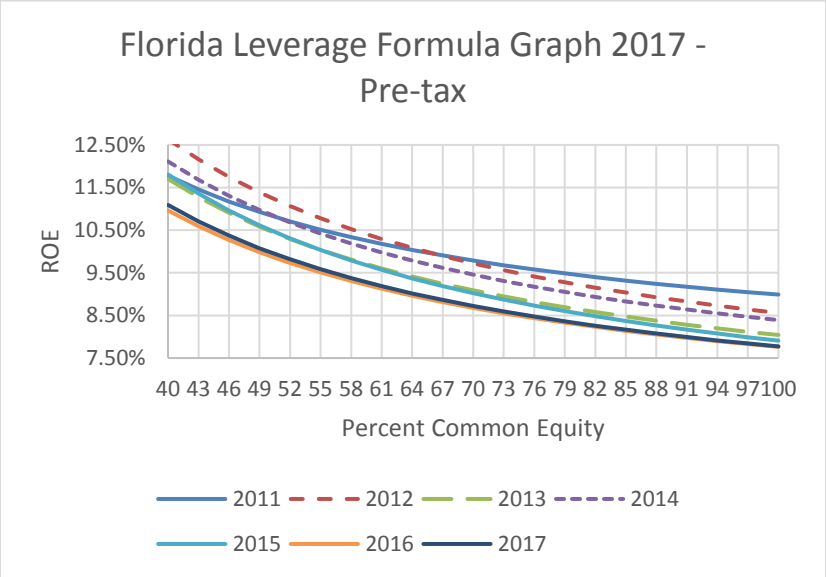
To test the effect on the FPSC leverage curves, I estimated the leverage curve for the years 2011 through 2017 on a pre-tax basis[28] and compared them to the leverage curves estimated by Staff as shown in Chart 2 on page 7 of Order No. PSC-17-0249-PAA-WS, Docket No. 170006-WS. Chart 13a and Chart 13b demonstrate that there is little, if any, relative difference in the slopes of the leverage formula curves from 2011 through 2017 between the pre-tax and post-tax estimation

Chart 13a



[28] Using a statutory combined federal and Florida income tax rate of 37.63%

Chart 13b



In addition, the ranges and spreads of the Formula for the years 2001 through 2017 are similarly wide. In fact, the pre-tax spreads are greater than the post-tax spreads as shown in Table 3 below.

Table 3

Pre-Tax and Post-Tax Ranges of ROEs

Year	Pre-Tax ROEs		Spread	Post-Tax ROEs		Spread
CE Ratio	40.00%	100.00%		40.00%	100.00%	
2011	11.78%	8.99%	2.79%	11.16%	8.74%	2.42%
2012	12.63%	8.56%	4.08%	12.14%	8.36%	3.78%
2013	11.70%	8.04%	3.66%	11.30%	7.88%	3.42%
2014	12.11%	8.39%	3.72%	11.75%	8.24%	3.50%
2015	11.81%	7.91%	3.90%	11.51%	7.79%	3.72%
2016	10.96%	7.76%	3.20%	10.63%	7.63%	3.00%
2017	11.09%	7.77%	3.32%	10.66%	7.60%	3.06%

In addition, because investor owned water and wastewater companies do have to pay income taxes, the WACC will increase as the percentage of common equity in the capital structure increases, because the amount of income taxes to be collected from ratepayers will increase. It is

precisely for this reason that it is necessary to hold the post-income tax rate constant, as is assumed by the current FPSC leverage formula, because then the revenue cost of capital will vary with varying capital structure ratios consistent with the Modigliani / Miller principle upon which the FPSC leverage formula is based. Therefore, I suggest that the computation of the Formula continue to hold the pre-tax WACC constant.

V. COMPUTATION OF THE FLORIDA LEVERAGE FORMULA

i. Adjustments to DCF and CAPM Results

Once Staff averages its DCF and CAPM results for the Natural Gas Index, it then makes four adjustments: 1) a Bond Yield Differential; 2) a Private Placement Premium; 3) a Small-Utility Risk Premium; and 4) an Adjustment to Reflect Require Equity Return at a 40% Equity Ratio.

a. Bond Yield Differential

I concur with Staff's Bond Yield Differential based upon a 120-month average spread between Baa3/BBB- and A rated public utility bonds. Therefore, I have no suggestions.

b. Private-Placement Premium

I also concur with Staff's Private-Placement Premium of 50 basis points. Therefore, I have no suggestions.

c. Small-Utility Risk Premium

While I concur with Staff's inclusion of a Small-Utility Risk Premium, in my opinion, it is extremely conservative, given how small the small water and wastewater utilities to which the Formula applies are relative to both the Natural Gas Index and the Water and Wastewater Index.

Not only is UIF is significantly smaller than the average company in the Natural Gas Index based upon estimated market capitalization as shown in Table 4 below, it is also significantly smaller than Water and Wastewater Index. By extension, the other small water and wastewater utilities to whom the FPSC leverage formula applies who are all smaller than UIF.

Table 4

	Market Capitalization (1) ($ Millions)	Times Greater than the Company
Utilities Inc. of Florida	$77.433	
Natural Gas Index	$3,834.458	49.5X
Water & Wastewater Index	$3,339.931	39.6X

(1) From page 1 of Schedule UIF-3.

As shown above, UIF's estimated market capitalization of $77.433 million is lower than the average market capitalization of the Natural Gas Index, $3.834 billion, or 49.5 times greater than UIF and the Water and Wastewater Index with a market capitalization of $3.339 billion, or 39.6 times greater than UIF.

Consequently, UIF has greater relative business risk because, all else being equal, size has a bearing on risk. Since Investors demand a higher return to compensate for assuming greater risk, UIF's greater relative business risk must be reflected in the cost of common equity derived from the market data of the less business risky Natural Gas and Water and Wastewater Indices.

An indication of the magnitude of an adjustment for the greater relative business risk due to smaller relative size is based upon the size premiums for the decile portfolios of New York Stock Exchange (NYSE), American Stock Exchange (AMEX) and NASDAQ listed companies for

1926-2016 as published SBBI -1017. [29] The average size premium for the 10th decile (5.59%), in which the market capitalization of UIF, falls has been compared with the average size premium for the 4th and 5th deciles (1.25%), between which the estimated market capitalization of Natural Gas Index falls, and the average size premium for the 5th decile (1.51%), in which the estimated market capitalization of the Water Index falls. As shown on page 1 of Schedule UIF-3, the size premium spread between the 4th and 5th and 10th deciles is 4.34%,[30] while the spread between the 5th and the 10th deciles is 4.08%.[31] Since the other small water and wastewater utilities in Florida to which the FPSC applies are smaller than UIF, it is likely that they too would fall in the 10th decile, with small size premiums of 4.34% and 4.08%, also applicable to these utilities. In view of the foregoing, the Small-Utility Premium included in the FPSC leverage formula is extremely conservative.

d. Adjustment to Reflect [a] Required Return at 40% Equity Ratio

In calculating the Baa3 bond yield to use in the derivation of the Cost of Equity for the Average Florida Water and Wastewater Utility at a 40% Equity Ratio, the FPSC Staff uses the most current[32] four-week average Moody's Baa / S&P BBB bond yield, adjusted by the most recent 120-month average spread between Baa2 and Baa3 / BBB and BBB- bond yields. Just as I concur with the 120-month average spread discussed previously, I concur with the 120-month average spread between Baa3 / BBB- and A rated public utility bonds for Staff's Bond Yield

---

29 SBBI – 2017, at 7-1. (*See* Appendix B, Workpaper UIF-9)
30 4.34% = 5.59% -1.25%.
31 4.08% = 5.59% - 1.51%.
32 April 2017 for the 2017 Formula.

Differential, I concur with the 120-month average spread between Baa2 and Baa3 / BBB and BBB- bond yields.

However, because the cost of capital and ratemaking are both prospective in nature, consistent with Staff's use of a projected risk-free rate in its CAPM analysis, I suggest that a similarly estimated projected yield on Baa3 / BBB- rated public utility bonds be used in the derivation of the Cost of Equity for an Average Florida Water and Wastewater Utility at a 40% Equity Ratio.

Page 2 of ScheduleUIF-4 presents the derivation of a projected Baa3 bond yield of 5.26% by:

1) First estimating an average projected Baa corporate bond yield from *Blue Chip Financial Forecasts ("Blue Chip")* for the furthest five quarters out from the May 1, 2017 *Blue Chip* of 5.32%. Using the furthest five quarters out from the May 1, 2017 *Blue Chip* is consistent with Staff's estimation of a projected risk-free rate in its CAPM analysis.
2) Adjusting the 5.32% projected Baa corporate bond yield by a negative 0.06%, the April 2017 spread between Baa corporate and Baa public utility bond yields to derive the projected Baa public utility bond yield of 5.26%.
3) Finally, as shown on page 1 of Schedule UIF-4: The Small-Utility Risk Premium or 0.50%; the Private Placement Premium of 0.50%; and the Adjustment to Reflect a Baa3 Public Utility Bond Yield of 0.1548% was added to the 5.26% projected Baa public utility bond yield.

The result is a projected Baa3 public utility bond yield of 6.415%.[33] This 6.415% was then used to estimate the ROE at a 40% common equity ratio for both the Natural Gas Index and the Water and Wastewater Index using their respective capital structure ratios. As shown on page 1 of Schedule UIF-4, the ROE at a 40% common equity ratio for the Natural Gas Index is 11.64% and for the Water and Wastewater Index, 11.96%.

Ranges of ROE for the Natural Gas Index and the Water and Wastewater Index, as shown in Tables 5a and 5b below, were then estimated using Staff's formula:

Debt Cost Rate = x / 40% = ROE

Where:

Debt Cost Rate = 6.41%

ROE (Gas) = 11.64 %

ROE (Water & Wastewater) = 11.96%

Table 5a

Natural Gas Index – Range of ROEs

6.41%	+ x/40% =	11.64%
X =	**2.091%**	
	40%	100%
	6.41%	6.41%
	5.2264%	2.091%
Range:	11.64%	8.51%

Table 5b

Water and Waste Water Index – Range of ROEs

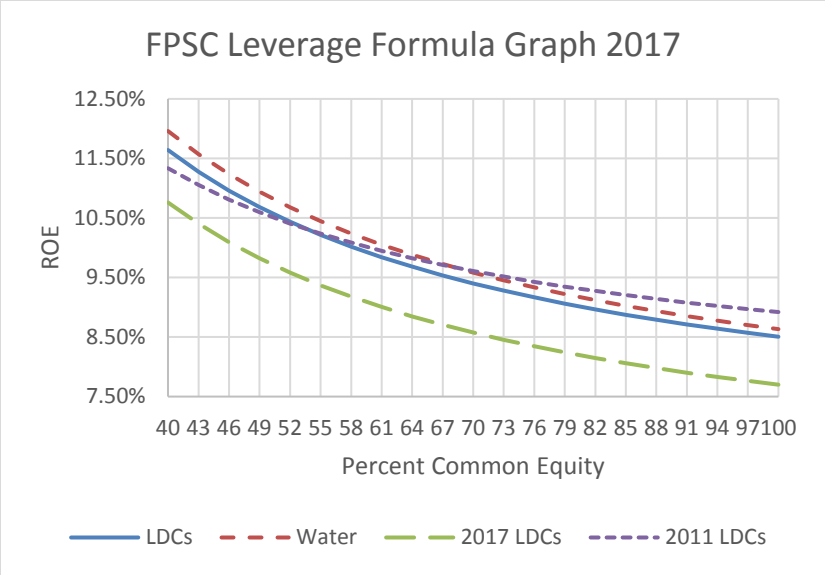
[33] 6.415% = (5.26% + 0.50% + 0.50% + 0.1548%).

6.41%	+ x/40% =	11.96%
X =	**2.218%**	
	40%	100%
	6.41%	6.41%
	5.5452%	2.218%
Range:	11.96%	8.63%

Chart 13 below graphs the Ranges of ROE for the Natural Gas Index and the Water and Wastewater Index for 2017 using all of the suggested revisions to the formula discussed above:, i.e., forecasted EPS growth rates in a single-stage DCF model; MERPs based upon SBBI – 2017 data; inclusion of the ECAPM in the CAPM analysis; and a forecasted Baa3 public utility bond yield in the computation of the Formula. As shown in Chart 14, the slopes of these ranges of ROE (LDCs and Water) are nearly identical to the slope of the 2011 LDC Formula currently authorized and significantly different from the slope of the 2017 LDC Formula using the existing leverage formula.

Chart 14[34]

[34] LDCs and Water Series (with suggested revisions), 2017 LDCs (FPSC Staff derived), 2011 LDCs (FPSC Staff derived)


FPSC Leverage Formula Graph 2017
12.50%
11.50%
10.50%
9.50%
8.50%
7.50%
ROE
40 43 46 49 52 55 58 61 64 67 70 73 76 79 82 85 88 91 94 97100
Percent Common Equity
LDCs
Water
2017 LDCs
2011 LDCs

VI. SUMMARY AND CONCUSIONS

These comments have reviewed "the applicability of the leverage formula methodology used to establish the annual authorized range of returns for water and wastewater utilities" per the Notice of Staff Workshop, Docket No. 20170006-WS, dated August 22, 2017.

Upon this review, to mitigate the effect of the continued low interest rate environment upon the Formula, I suggest that the FPSC consider the inclusion of a Water and Wastewater Index, in addition to or in place of the current Natural Gas Index. Section II demonstrated that water and wastewater utilities exhibit greater investment risk than either electric or gas distribution utilities. As there is a similar availability to market data for water and wastewater utilities as for natural gas utilities, it is no more difficult to estimate the ROE for water and wastewater utilities, than for natural gas utilities.

These comments include a review of the DCF and CAPM methodologies current used to estimate the Formula. Relative to the application of the DCF model, I suggest the FPSC consider following

- Use of a single-stage constant growth DCF model for simplicity of application; and
- Use of forecasted growth in EPS as the growth component of the model given the academic and empirical support for the use of such forecasts.

As for the application of the CAPM, I suggest that the FPSC consider the following:

- Consideration of using a market value weighted average expected return when estimating the market return, as such an average is more consistent with the manner in which the returns for the market indices, such as S&P500, are calculated;
- Use of an arithmetic mean historical MERP based upon SBBI's total returns on large common stocks over the long-term (currently 1926 – 2016) less the income return on long-term U.S government bonds over the same period. Statistically, the arithmetic mean of any randomly generated data series is expectational.
- Use of a MERP derived from the same SBBI data but based upon a regression analysis of the inverse relationship between equity risk premiums and interest rates.

The equation resulting from such a regression can then be used to estimate the MERP for any given interest rate / bond yield.

- Inclusion of the ECAPM which reflects the reality that, while the results of numerous tests of the CAPM have confirmed the notion that beta is related to security returns, the empirical Security Market Line ("SML") described by the CAPM formula is not as steeply sloped as the predicted SML. In other words, low-beta securities earn returns higher than the CAPM predicts, and high-beta securities earn less than the predicted by the CAPM. These comments also evaluated whether to hold the debt rate, as well as the post-tax WACC constant in the computation of the Formula, suggesting that the FPSC continue to hold both the debt cost rate and the post-tax WACC constant in its estimation of the Formula.

After a review of the adjustments to the DCF and CAPM used in the computation of the Formula, I suggest the following:

- Retention of the Bond Yield Differential;
- Retention of the Private-Placement Premium;
- Retention of the Small-Utility Risk Premium, with a suggestion that it be increased to a minimum of 100 basis points, given the extremely small size of the small water and wastewater utilities to which the Formula applies;
- Uses of a forecasted yield on Baa3 rated public utility bonds, consistent with Staff's use of a forecasted risk-free rate in its application of the CAPM.

Finally, I suggest that a reasonableness check on the results of the Formula, whether using the Natural Gas Index, the Water and Wastewater Index, or both, be conducted relative to electric and natural gas authorized returns and costs of common equity, as these comments have clearly demonstrated that water and wastewater utilities, in general and especially the small water and wastewater utilities operating in Florida, are more risky than electric and natural gas utilities.

In conclusion, these comments have demonstrated that if all of the suggestions are included in the estimation of the Formula, the slopes of the Formula relative to the Natural Gas

Index and the Water and Wastewater Index are more similar[35]r to the slope of the Formula relative to the Natural Gas Index in 2011 than the most recently estimated 2017 Formula for the Natural Gas Index.

[35] As shown in Chart 14 above.

DOCKET NO. 20170006-WS

IN RE: WATER AND WASTEWATER INDUSTRY ANNUAL REESTABLISHMENT OF AUTHORIZED RANGE OF RETURN ON COMMMON EQUITY FOR WATER AND WASTEWATER UTILITIES PURSUANT TO SECTION 367.081(4)(F). F.S.

APPENDIX A

TO THE

COMMENTS

ON

FLORIDA LEVERAGE FORMULA

TO ESTABLISH THE ANNUAL AUTHORIZED

RANGE OF RETURNS FOR WATER & WASTERWATER UTILITIES

OF

PAULINE M. AHERN, CRRA

EXECUTIVE DIRECTOR

SCOTTMADDEN, INC.

ON BEHALF OF

UTILITIES, INC. OF FLORIDA

Application of the Single-Stage Discounted Cash Flow Model

Natural Gas Index	Div_1 1 (1)	AVER-PR (1)	Div Yld	VL Proj. EPS GR (3)	D * (1+g/2)	DCF
Atmos Energy Corporation	$ 1.80	$ 78.325	2.30%	6.0%	2.37%	8.37%
Northwest Natural Gas Company	1.88	$ 59.015	3.19%	6.0%	3.28%	9.28%
WGL Holdings	2.02	$ 82.985	2.43%	3.5%	2.48%	5.98%
Southwest Gas Holdings	1.90	$ 83.350	2.28%	6.5%	2.35%	8.85%
Spire Inc.	2.10	$ 66.075	3.18%	8.0%	3.31%	11.31%
Average	$ 1.94	$ 73.950	2.68%	6.0%	2.76%	8.76%

Water and Wastewater Index	Div_1 1 (1)	AVER-PR (1)	Div Yld	VL Proj. EPS GR (4)	D * (1+g/2)	DCF
Aqua America Inc	$ 0.70	$ 43.340	1.62%	7.0%	1.67%	8.67%
American Water Works Company	$ 0.65	$ 76.765	0.85%	8.5%	0.88%	9.38%
American States Water	$ 0.75	$ 31.350	2.39%	6.5%	2.47%	8.97%
California Water Service Group	$ 0.75	$ 35.775	2.10%	9.0%	2.19%	11.19%
Connecticut Water Service Inc	$ 0.65	$ 54.420	1.19%	4.5%	1.22%	5.72%
Middlesex Water Company	$ 0.75	$ 38.530	1.95%	8.5%	2.03%	10.53%
SJW Group	$ 0.70	$ 49.975	1.40%	3.0%	1.42%	4.42%
York Water Company	$ 0.75	$ 37.000	2.03%	7.0%	2.10%	9.10%
Average	$ 0.71	$ 45.894	1.69%	6.8%	1.75%	8.50%

Notes:
(1) From 2007 FPSC Leverage Formula Worksheets / Value Line Investment Survey
(2) From 2007 FPSC Leverage Formula Worksheets / Yahoo!Finance.
(3) Value Line Investment Survey, March 3, 2017
(4) Value Line Investment Survey, April 14, 2017

2017 Water & Wastewater Leverage Formula
Docket No. 170006-WS

CAPM

Natural Gas Index

		BETA
1	Atmos Energy Corporation	0.70
2	Northwest Natural Gas Company	0.65
3	WGL Holdings	0.80
4	Southwest Gas Holdings	0.75
5	Spire Inc.	0.70

Average Beta	0.720
Market Return on April 16, 2016	10.97%
Risk Free Rate	3.50%
Market Risk Premium	7.47%
SBBI - 2017 Arithmetic Mean Return on Large Company Common Stocks | 1926 - 2016	12.00%
Income Return on Long-Term Gov't Bonds | 1926 - 2016	5.00%
Market Risk Premium	7.00%
Market Risk Premium based upon the Application of a Regression Analysis to SBBI Data	8.68%
Average Market Equity Risk Premium	7.72%

CAPM Results	=	Rf	+	*B*	(MR - Rf)	+ 20 basis points			
		3.50%	+	0.72	7.72% -	3.50%	+ .20%		
CAPM ROE plus 20 basis points for Flotation Costs	=	**9.26%**							
ECAPM ROE plus 20 basis points for Flotation Costs	=	**9.80%**							
Average CAPM	=	**9.53%**							

Source:
Value Line Ratings & Reports March 3, 2017
Blue Chip Financial Forecast May 1, 2017
D&P

Water & Wastewater Index

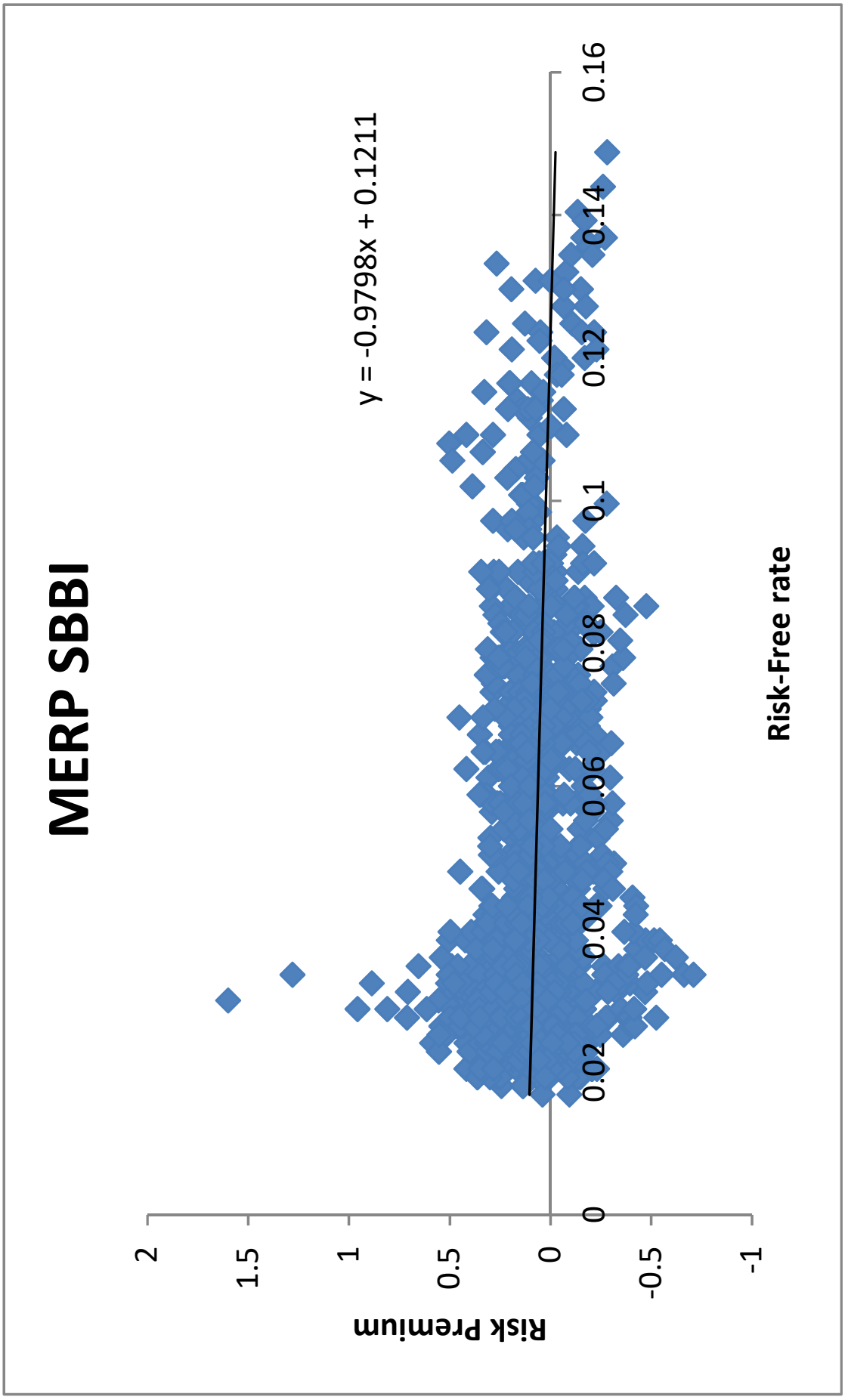
		BETA
1	Aqua America Inc	0.70
2	American Water Works Company	0.65
3	American States Water	0.75
4	California Water Service Group	0.75
5	Connecticut Water Service Inc	0.65
6	Middlesex Water Company	0.75
7	SJW Group	0.70
8	York Water Company	0.75

Average Beta	0.713
Market Return on April 16, 2016	10.97%
Risk Free Rate	3.50%
Market Risk Premium	7.47%
SBBI - 2017Arithmetic Mean Return on Large Company Common Stocks | 1926 - 2016	12.00%
Income Return on Long-Term Gov't Bonds | 1926 - 2016	5.00%
Market Risk Premium	7.00%
Market Risk Premium based upon the Application of a Regression Analysis to SBBI Data	8.68%
Average Market Equity Risk Premium	7.72%

CAPM Results	=	Rf	+	*B*	Average (MR - Rf)	+ 20 basis points			
		3.50%	+	0.713	7.72% -	3.50%	+ .20%		
CAPM ROE plus 20 basis points for Flotation Costs	=	**9.20%**							
ECAPM ROE plus 20 basis points for Flotation Costs	=	**9.75%**							
Average CAPM	=	**9.48%**							

Source:
Value Line Ratings & ReportsApril 14, 2017
Blue Chip Financial Forecast May 1, 2017

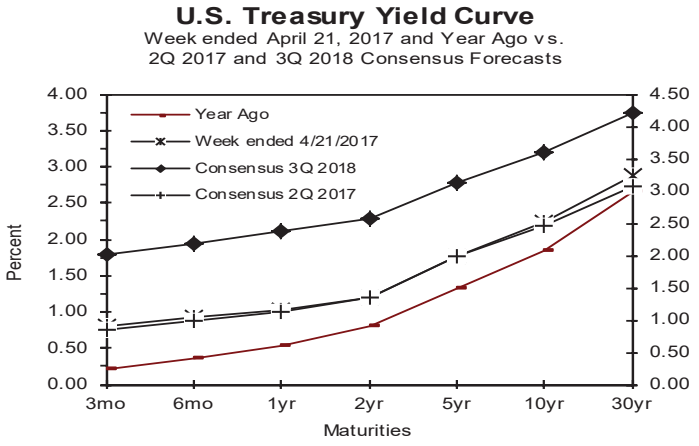
K = Investors' required return on equity
Rf = Risk-free rate (Blue Chip forecast for 30-year Treasury Bonds for the 5 farthest out quarters)
B = Beta = Statistical measure of industry specific risk (Average for companies in the index for DCF and RP models)
Rm = Investors' required rate of return for the market
Mp = Market risk premium = (Rm - Rf)

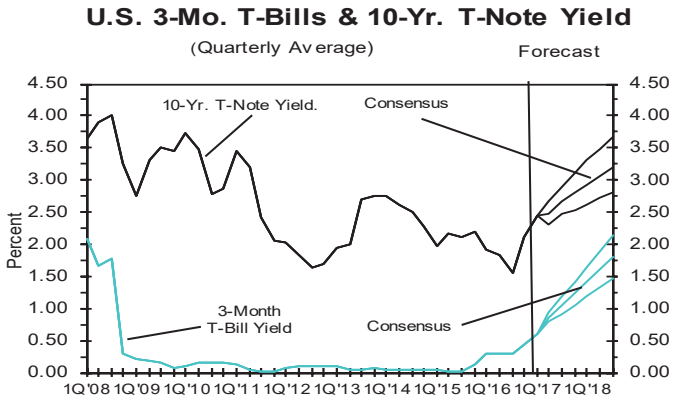

MERP SBBI
y = -0.9798x + 0.1211
Risk Premium
Risk-Free rate
2
1.5
1
0.5
0
-0.5
-1
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16

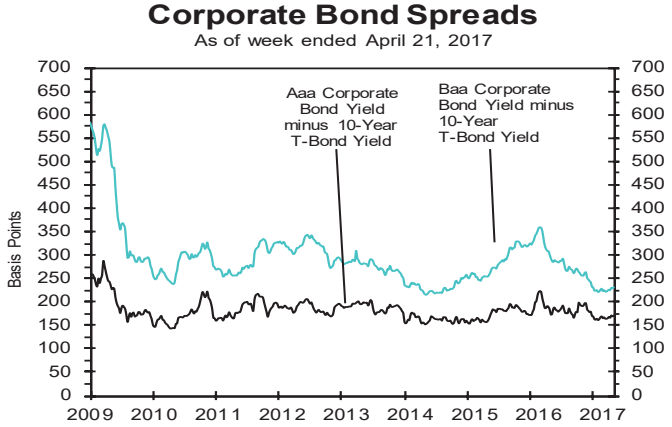
Consensus Forecasts Of U.S. Interest Rates And Key Assumptions[1]

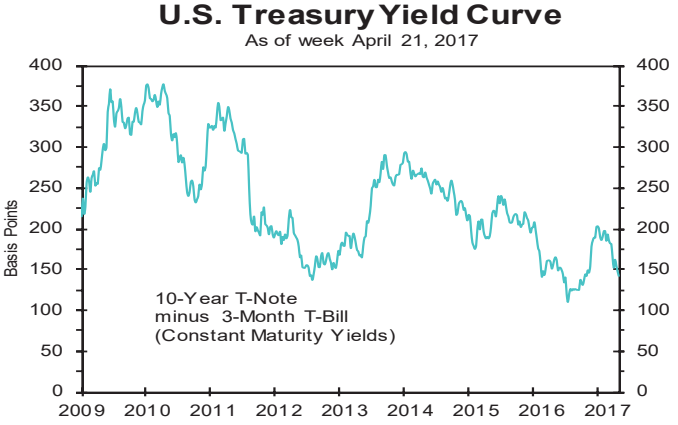
	History				History				Consensus Forecasts-Quarterly Avg.					
	Average For Week Ending				Average For Month			Latest Qtr	2Q	3Q	4Q	1Q	2Q	3Q
Interest Rates	Apr. 21	Apr. 14	Apr. 7	Mar. 31	Mar.	Feb.	Jan.	1Q 2017	2017	2017	2017	2018	2018	2018
Federal Funds Rate	0.91	0.91	0.87	0.91	0.76	0.66	0.65	0.69	1.0	1.2	1.3	1.5	1.7	1.9
Prime Rate	4.00	4.00	4.00	4.00	3.85	3.75	3.75	3.78	4.0	4.2	4.4	4.6	4.8	5.0
LIBOR, 3-mo.	1.15	1.16	1.15	1.15	1.13	1.04	1.02	1.06	1.2	1.4	1.6	1.8	2.0	2.2
Commercial Paper, 1-mo.	0.83	0.82	0.83	0.82	0.77	0.61	0.64	0.67	1.0	1.1	1.4	1.6	1.7	1.9
Treasury bill, 3-mo.	0.81	0.82	0.80	0.78	0.73	0.53	0.52	0.59	0.9	1.1	1.2	1.4	1.6	1.8
Treasury bill, 6-mo.	0.93	0.95	0.93	0.91	0.87	0.65	0.62	0.71	1.0	1.2	1.4	1.5	1.7	1.9
Treasury bill, 1 yr.	1.02	1.05	1.04	1.03	1.00	0.82	0.83	0.88	1.1	1.3	1.5	1.7	1.9	2.1
Treasury note, 2 yr.	1.20	1.25	1.25	1.28	1.30	1.20	1.21	1.24	1.4	1.6	1.8	1.9	2.1	2.3
Treasury note, 5 yr.	1.76	1.83	1.88	1.94	2.00	1.91	1.92	1.94	2.0	2.2	2.4	2.5	2.6	2.8
Treasury note, 10 yr.	2.23	2.30	2.35	2.40	2.47	2.43	2.43	2.44	2.5	2.7	2.8	2.9	3.1	3.2
Treasury note, 30 yr.	2.88	2.93	2.99	3.01	3.07	3.04	3.02	3.04	3.1	3.3	3.4	3.5	3.6	3.7
Corporate Aaa bond	3.94	3.99	4.06	4.06	4.13	4.10	4.06	4.10	4.1	4.3	4.5	4.6	4.7	4.9
Corporate Baa bond	4.54	4.59	4.65	4.65	4.71	4.68	4.66	4.68	4.8	5.0	5.2	5.3	5.5	5.6
State & Local bonds	3.51	3.55	3.59	3.64	3.72	3.72	3.70	3.71	3.8	4.0	4.2	4.3	4.4	4.5
Home mortgage rate	3.97	4.08	4.10	4.23	4.20	4.17	4.15	4.17	4.2	4.4	4.5	4.7	4.8	4.9
	History				History				Consensus Forecasts-Quarterly					
	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q
Key Assumptions	2015	2015	2015	2016	2016	2016	2016	2017	2017	2017	2017	2018	2018	2018
Major Currency Index	89.9	91.8	93.1	93.3	89.6	90.3	93.7	94.4	94.3	94.7	95.0	95.1	94.8	94.5
Real GDP	2.6	2.0	0.9	0.8	1.4	3.5	2.1	0.7	2.7	2.4	2.4	2.4	2.5	2.4
GDP Price Index	2.3	1.3	0.8	0.5	2.3	1.4	2.1	2.3	1.7	2.1	2.1	2.2	2.2	2.2
Consumer Price Index	2.4	1.5	0.4	0.1	2.3	1.8	3.0	3.1	1.6	2.4	2.3	2.4	2.3	2.4

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









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

Line No.		[1] Market Capitalization (1) (millions)		[2] Applicable Decile of the NYSE/AMEX/ NASDAQ (2)	[3] Applicable Size Premium (3)	[4] Spread from Applicable Size Premium (4)		
1.	Utilities Inc. of Florida	$ 77.433		10	5.59%			
2.	Natural Gas Index	$ 3,834.458	49.5 x	4 - 5	1.25%	4.34%	$ 349.651	2.89
3	Water and Wastewater Index	$ 3,065.625	39.6 x	5	1.51%	4.08%	$ 607.827	2.38%

	Decile	Number of Companies	Recent Total Market Capitalization (millions)	Recent Average Market Capitalization (millions)	Size Premium (Return in Excess of CAPM)		
Largest	1	191	$15,290,475.30	$80,054.84	-0.35%	1 - 2	$47,554.100
	2	200	$3,010,671.02	$15,053.36	0.61%	2 - 3	$11,510.776
	3	202	$1,609,575.62	$7,968.20	0.89%	3 - 4	$6,271.093
	4	221	$1,010,851.81	$4,573.99	0.98%	4 - 5	$3,778.449
	5	227	$677,120.07	$2,982.91	1.51%	5 - 6	$2,535.929
	6	259	$541,038.00	$2,088.95	1.66%	6 - 7	$1,723.148
	7	283	$384,129.20	$1,357.35	1.72%	7 - 8	$1,090.259
	8	361	$297,164.94	$823.17	2.08%	8 - 9	$629.871
	9	487	$212,609.64	$436.57	2.68%	9 - 10	$277.071
Smallest	10	790	$92,882.17	$117.57	5.59%		
	Mid-Cap (3-5)	660	$3,297,547.49	$4,996.28	1.02%		
	Low-Cap (6-8)	903	$1,222,332.14	$1,353.63	1.75%		
	Micro-Cap (9-10)	1,227.0000	$305,491.81	$248.97	3.67%		

*From 2017 Stocks, Bonds, Bills, and Inflation (SBBI) Yearbook

Notes:

(1) From page 2 of this Schedule.
(2) Gleaned from Column (D) on the bottom of this page. The appropriate decile (Column (A)) corresponds to the
(3) Corresponding risk premium to the decile is provided on Column (E) on the bottom of this page.
(4) Line No. 1 Column 3 – Line No. 2 Column 3. For example, the 4.% in Column 4, Line No. 2 is derived as follows 4.34% = 5.59% - 1.25%.

Market Capitalization of the
Natural Gas Index and the Water and Wastewater Index

Company	[1] Total Common Equity (millions)	[2] Market Capitalization (2) (millions)	[3] Market-to-Book Ratio (3)
Utilities Inc. of Florida	$ 47.00 (1)		
Natural Gas Index		$ 77.433 (4)	164.8 % (5)
Water and Wastewater Index		$ 134.608 (4)	286.4 % (5)
Natural Gas Index			
Atmos Energy Corporation	$ 3,463.00	$ 8,374.60	241.8 %
Northwest Natural Gas Company	$ 850,497.00	$ 1,704.30	0.2
WGL Holdings	$ 1,404.00	$ 4,217.20	300.4
Southwest Gas Holdings	$ 1,661.00	$ 1,523.29	91.7
Spire Inc.	$ 1,768.00	$ 3,352.90	189.6
Average	$ 171,758.60	$ 3,834.46	164.8 %
Water and Wastewater Index			
Aqua America Inc	$ 1,850.07	$ 5,700.00	308.1 %
American Water Works Company	$ 5,218.00	$ 12,900.00	247.2
American States Water	$ 494.30	$ 1,600.00	323.7
California Water Service Group	$ 659.47	$ 1,700.00	257.8
Connecticut Water Service Inc	$ 236.03	$ 600.00	254.2
Middlesex Water Company	$ 218.44	$ 600.00	274.7
SJW Group	$ 421.65	$ 975.00	231.2
York Water Company	$ 114.06	$ 450.00	394.5
Average	$ 1,151.501	$ 3,065.625	286.4 %

NA= Not Available

Notes:
(1) Company provided Column 3 / Column 1.
(2) From Data Input Tab
(3) Column 2 / Column 1.
(4) If Utilities Inc. of Florida's common stock traded at a market-to-book ratio equal to the average market-to-book ratio of the Natural Gas Distribution Index, 164.8% , its market capitalization would be $77.433 million. If Utilities Inc. of Florida's common stock traded at a market-to-book ratio equal to that of the Water and Wastewater Index, 286.4%, its market capitalization would be $134.608 million.

(5) The market-to-book ratio of Utilities Inc. of Florida is assumed to be equal to the market-to-book ratio of the Natural Gas Distribution Index and the Water and Wastewater Index, respectively.

2017 Water & Wastewater Leverage Formula
Docket No. 170006-WS

Current Natural Gas Index

Natural Gas Utilities Index	
Single Stage Annual DCF Model- EPS Growth	8.76%
CAPM*	9.53%
* including 20 basis points for 4% flotation costs	
AVERAGE	9.14%
Bond Yield Differential	0.62%
Private Placement Premium	0.50%
Small Utility Risk Premium	0.50%
Adjustment to Reflect Required Equity Return at a 40% Equity Ratio	0.88%
Cost of Equity for Average Florida WAW Utility at a 40% Equity Ratio	11.64%

Small Utility Risk Premium	0.50%		
Private Placement Premium	0.50%		
Baa2 Bond Yield (Corp. Baa furthest 5 quarter forecast from May 1, 2017 Blue Chip, less April spread btw Aaa corp. and Baa public utility bonds - negative 6 basis pionts)	5.2600%	5	
Adjust for Baa3	0.1548%	5.415%	
Baa Rate	**6.415%**		
CAPITAL COMPONENT			WEIGHT
CE	48.11%	10.76%	5.18%
TOTAL DEBT	51.89%	6.41%	3.33%
	100.00%		8.51%
CE	40.00%	11.64%	4.66%
TOTAL DEBT	60.00%	6.41%	3.85%
	100.00%		8.51%
ADJ. TO REFLECT REQ. EQUITY RETURN @ 40% EQ.. RATIO			**0.88%**

	Risk Free	NG Beta	Mkt. Return
CAPM * - Natural Gas Utilities Index	3.50%	0.72	
	CAPM =	9.53%	

A 40% equity ratio is the floor for calculating the required return on common equity. The return on equity at a 40% equity ratio =

6.41%	+ x/40% =	11.64%
X =	**2.091%**	
	40%	100%
	6.41%	6.41%
	5.2264%	2.091%
Range:	11.64%	8.51%

Docket No. 170006-WS

Water Index

Water Index		
Single Stage Annual DCF Model- EPS Growth		8.50%
CAPM*	new	9.48%
* including 20 basis points for 4% flotation costs		
AVERAGE		8.99%
Bond Yield Differential		0.62%
Private Placement Premium		0.50%
Small Utility Risk Premium		0.50%
Adjustment to Reflect Required Equity Return at a 40% Equity Ratio		1.35%
Cost of Equity for Average Florida WAW Utility at a 40% Equity Ratio		11.96%

Small Utility Risk Premium	0.50%		
Private Placement Premium	0.50%		
Baa2 Bond Yield (Corp. Baa furthest 5 quarter forecast from May 1, 2017 Blue Chip, less April spread btw Aaa corp. and Baa public utility bonds - negative 6 basis pionts)	5.2600%	5	
Adjust for Baa3	0.1548%	5.415%	
Baa Rate	**6.415%**		
CAPITAL COMPONENT			WEIGHT
CE	52.92%	10.61%	5.61%
TOTAL DEBT	47.08%	6.41%	3.02%
	100.00%		8.63%
CE	40.00%	11.96%	4.78%
TOTAL DEBT	60.00%	6.41%	3.85%
	100.00%		8.63%
ADJ. TO REFLECT REQ. EQUITY RETURN @ 40% EQ.. RATIO			**1.35%**

	Risk Free	WG Beta	Mkt. Return
CAPM * - Natural Gas Utilities Index	3.50%	0.71	
	CAPM =	9.48%	

A 40% equity ratio is the floor for calculating the required return on common equity. The return on equity at a 40% equity ratio =

6.41%	+ x/40% =	11.96%
X =	**2.218%**	
	40%	100%
	6.41%	6.41%
	5.5452%	2.218%
Range:	11.96%	8.63%

Appendix A
Schedule UIF-4
Page 1 of 2

Derivation of a Projected Baa3 / BBB- Rated
Public Utility Bond Yield

Projected Corporate Baa Bond Yield (1)	
Third Quarter 2017	5.00%
Fourth Quarter 2017	5.20%
First Quarter 2018	5.30%
Second Quarter 2028	5.50%
Third Quarter 2028	5.60%
Average	5.32%
April 2017 Baa Bond Yield (2)	
Corporate	4.57%
Public Utility	4.51%
Spread	-0.06%
Projected Public Utility Baa Bond Yield (2)	5.26%

Notes:
(1) From Blue Chip Financial Forecasts, May 1, 2017.
(2) Downloaded from Bloomberg Professional Service, April 28, 2017.
(3) From 2017 FPSC Leverage Formula Worksheets

DOCKET NO. 20170006-WS

IN RE: WATER AND WASTEWATER INDUSTRY ANNUAL REESTABLISHMENT OF AUTHORIZED RANGE OF RETURN ON COMMMON EQUITY FOR WATER AND WASTEWATER UTILITIES PURSUANT TO SECTION 367.081(4)(F). F.S.

APPENDIX C

TO THE

COMMENTS

ON

FLORIDA LEVERAGE FORMULA

TO ESTABLISH THE ANNUAL AUTHORIZED

RANGE OF RETURNS FOR WATER & WASTERWATER UTILITIES

OF

PAULINE M. AHERN, CRRA

EXECUTIVE DIRECTOR

SCOTTMADDEN, INC.

ON BEHALF OF

UTILITIES, INC. OF FLORIDA

Pauline M. Ahern, CRRA
Executive Director
ScottMadden Inc.

Ms. Ahern has served as a consultant for investor-owned and municipal utilities and authorities for nearly 30 years. As a Certified Rate of Return Analyst (CRRA), she has extensive experience in rate of return analyses, including the development of ratemaking capital structure ratios, senior capital cost rates, and the cost rate of common equity for regulated public utilities. She has testified as an expert witness before 32 regulatory commissions in the U.S. and Canada.

She also maintains the benchmark index against which the American Gas Association's (AGA) Mutual Fund performance is measured. Ms. Ahern has also served as President of the Society of Utility Regulatory and Financial Analysts (SURFA) from 2006-2010 and now sits on its Board of Directors. SURFA is a non-profit organization founded to promote the education and understanding of rate of return analysis which represents utility financial analysts in government, the financial community, industry and academia. She also serves on the Finance/Accounting/Taxation Committees of the National Association of Water Companies. Ms. Ahern is also a member of the Advisory Council, Financial Research Institute, University of Missouri - Robert J. Trulaske, Sr. School of Business. She is also a member of Edison Electric Institute's Cost of Capital Working Group.

PROFESSIONAL HISTORY

ScottMadden Inc. (2016 – Present)

Sussex Economic Advisors, LLC (2015 – 2016)
Partner

AUS Consultants (1988 – 2015)
Principal

- Offered testimony as an expert witness on the subjects of fair rate of return, cost of capital and related issues before state public utility commissions.
- Provided assistance and support to clients throughout the entire ratemaking litigation process; supervision of the financial analyst and administrative staff in the preparation of fair rate of return and cost of capital testimonies and exhibits which are filed along with expert testimony before various state and federal public utility regulatory bodies as well as the preparation of interrogatory responses, as well as rebuttal exhibits.
- Responsible for the production, publishing, and distribution of the AUS Utility Reports (formerly C. A. Turner Utility Reports), which has provided financial data and related ratios for about 80 public utilities (*i.e.*, electric, combination gas and electric, natural gas distribution, natural gas transmission, telephone, and water utilities, on a monthly, quarterly and annual basis) since 1930. Subscribers include utilities, many state regulatory commissions, federal agencies, individuals, brokerage firms, attorneys, as well as public and academic libraries.
- Responsible for maintaining and calculating the performance of the AGA Index, a market capitalization weighted index of the common stocks of the approximately 70 corporate members of the AGA, which serves as the benchmark for the AGA Gas Utility Index Fund.

Assistant Vice President

- Prepared fair rate of return and cost of capital exhibits which were filed along with expert testimony before various state and federal public utility regulatory bodies; supporting exhibits include the determination of an appropriate ratemaking capital structure and the development of embedded cost rates of senior capital and also support the determination of a recommended

return on common equity through the use of various market models, such as, but not limited to, Discounted Cash Flow analysis, Capital Asset Pricing Model and Risk Premium Methodology, as well as an assessment of the risk characteristics of the client utility.

- Assisted in the preparation of responses to any interrogatories received regarding such testimonies filed on behalf of client utilities. Following the filing of fair rate of return testimonies, assisted in the evaluation of opposition testimony in order to prepare interrogatory questions, areas of cross-examination, and rebuttal testimony and evaluated and assisted in the preparation of briefs and exceptions following the hearing process.
- Submitted testimony before state public utility commissions regarding appropriate capital structure ratios and fixed capital cost rates.

Senior Financial Analyst

- Supervised two analysts and assisted in the preparation of fair rate of return and cost of capital exhibits which are filed along with expert testimony before various state and federal public utility regulatory bodies; the team also assisted in the preparation of interrogatory responses.
- Evaluated the final orders and decisions of various commissions to determine whether further actions were warranted and to gain insight which assisted in the preparation of future rate of return studies.
- Assisted in the preparation of an article authored by Frank J. Hanley and A. Gerald Harris entitled "Does Diversification Increase the Cost of Equity Capital?" published in the July 15, 1991 issue of Public Utilities Fortnightly.

Administrator of Financial Analysis for AUS Utility Reports

- Oversaw the preparation of this monthly publication, as well as the accompanying annual publication, Financial Statistics - Public Utilities.

Financial Analyst

- Assisted in the preparation of fair rate of return studies including capital structure determination, development of senior capital cost rates, determination of an appropriate rate of return on equity, preparation of interrogatory responses, interrogatory questions of the opposition, areas of cross-examination and rebuttal testimony, as well as preparation of the annual publication C. A. Turner Utility Reports - Financial Statistics - Public Utilities.

Research Dept. of the Regional Economics Division of the Federal Reserve Bank of Boston (1973 – 1975)

Research Assistant

- Involved in the development and maintenance of econometric models to simulate regional economic conditions in New England in order to study the effects of, among other things, the energy crisis of the early 1970's and property tax revaluations on the economy of New England. I was also involved in the statistical analysis and preparation of articles for the New England Economic Review. Also, I was Assistant Editor of New England Business Indicators.

Office of the Assistant Secretary for International Affairs, U.S. Treasury Department, Washington, D.C. (1972)

Research Assistant

- Developed and maintained econometric models which simulated the economy of the United States in order to study the results of various alternate foreign trade policies so that national trade policy could be formulated and recommended.

EDUCATION

M.B.A., Rutgers University, High Honors, 1991
B.A., Clark University, Honors, 1973

DESIGNATIONS AND PROFESSIONAL AFFILIATIONS

Advisory Council
Financial Research Institute
University of Missouri's Robert J. Trulaske, Sr. School of Business
Edison Electric Institute
Cost of Capital Working Group
National Association of Water Companies
Member of the Finance/Accounting/Taxation and Rates and Regulation Committees
Society of Utility and Regulatory Financial Analysts
Member, Board of Directors – 2010-2014 President – 2006-2008 and 2008-2010
Secretary/Treasurer – 2004-2006
American Finance Association
Financial Management Association

SPEAKING ENGAGEMENTS

"Leadership in the Financial Services Sector", Guest Professor – Cost of Capital, Business Leader Development Program, Rutgers University School of Business, February 24, 2015, Camden, NJ.

Sponsor / Moderator: Hot Topic Hotline (webinar) of the Financial Research Institute - University of Missouri's Robert J. Trulaske, Sr. School of Business: "The Cost of Capital: Slower and Lower for Longer" presenter: John Lonski, Managing Director & Chief Capital Market Economist, *Capital Markets Research Group*, Moody's Analytics, November 2, 2016.

"Leadership in the Financial Services Sector", Guest Professor – Cost of Capital, Business Leader Development Program, Rutgers University School of Business, February 20, 2015, Camden, NJ.

"ROE: Trends & Analysis", American Gas Association, AGA Mini-Forum for the Financial Analysts Community & Finance Committee Meeting, September 11, 2014, The Princeton Club, New York, NY.

Guest Professor, "Measuring Risk", Asset Supervision and Administration Commission of the State Council of the Peoples' Republic of China, Rutgers School of Business, July 21, 2014, New Brunswick, NJ.

Instructor, "Cost of Capital 101", EPCOR Water America, Inc., Regulatory Management Team, June 9, 2014, Phoenix, AZ.

Moderator: Society of Utility Financial Analysts: 46th Financial Forum – "The Rating Agencies' Perspectives: Regulatory Mechanisms and the Regulatory Compact", April 22-25, 2014, Indianapolis, IN.

"The Return on Equity Debate: Its Impact on Budgeting and Investment and Wall Street's View of Risk", National Association of Water Companies – 2014 Indiana Chapter Water Summit, March 13, 2014, Indianapolis, IN.

"Regulatory Training in Financing, Planning, Strategies and Accounting Issues for Publicly- and Privately-Owned Water and Wastewater Utilities", New Mexico State University Center for Public Utilities, October 13-18, 2013, Instructor (Cost of Capital).

"Regulated Utilities – Access to Capital", (panelist) - Innovation: Changing the Future of Energy, 2013 Deloitte Energy Conference, Deloitte Center for Energy Solutions, May 22, 2013, Washington, DC.

"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", (co-presenter with Richard A. Michelfelder, Ph.D., Rutgers University) – Advanced Workshop in Regulation and Competition, 32nd Annual Eastern Conference of the Center for Research in Regulated Industries (CRRI), May 17, 2013, Rutgers University, Shawnee on the Delaware, PA.

"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.

"Issues Surrounding the Determination of the Allowed Rate of Return", before the Staff Subcommittee on Electricity of the National Association of Regulatory Utility Commissioners, Winter 2013 Committee Meetings, February 3, 2013, Washington, DC.

"Leadership in the Financial Services Sector", Guest Professor – Cost of Capital, Business Leader Development Program, Rutgers University School of Business, February 1, 2013, Camden, NJ.

"Analyst Training in the Power and Gas Sectors", SNL Center for Financial Education, Downtown Conference Center at Pace University, New York City, December 12, 2012, Instructor (Financial Statement Analysis).

"Regulatory Training in Financing Planning, Strategies and Accounting Issues for Publicly and Privately Owned Water and Wastewater Utilities", New Mexico State University Center for Public Utilities, October 14-19, 2012, Instructor (Cost of Financial Capital).

"Application of a New Risk Premium Model for Estimating the Cost of Common Equity", Co-Presenter with Dylan W. D'Ascendis, CRRA, AUS Consultants, Edison Electric Institute Cost of Capital Working Group, October 3, 2012, Webinar.

"Application of a New Risk Premium Model for Estimating the Cost of Common Equity", Co-Presenter with Dylan W. D'Ascendis, CRRA, AUS Consultants, Staff Subcommittee on Accounting and Finance of the National Association of Regulatory Commissioners, September 10, 2012, St. Paul, MN.

"Analyst Training in the Power and Gas Sectors", SNL Center for Financial Education, Downtown Conference Center at Pace University, New York City, August 7, 2012, Instructor (Financial Statement Analysis).

"Advanced Regulatory Training in Financing Planning, Strategies and Accounting Issues for Publicly and Privately Owned Water and Wastewater Utilities", New Mexico State University Center for Public Utilities, May 13-17, 2012, Instructor (Cost of Financial Capital).

"A New Approach for Estimating the Equity Risk Premium Applied to Public Utilities", before the Finance and Regulatory Committees of the National Association of Water Companies, March 29, 2012, Telephonic Conference.

"A New Approach for Estimating the Equity Risk Premium Applied to Public Utilities", (co-presenter with Frank J. Hanley, Principal and Director, AUS Consultants) before the Water Committee of the National Association of Regulatory Utility Commissioners' Winter Committee Meetings, February 7, 2012, Washington, DC.

"A New Approach for Estimating the Equity Risk Premium Applied to Public Utilities", (co-presenter with Richard A. Michelfelder, Ph.D., Rutgers University and Frank J. Hanley, Principal and Director, AUS Consultants) before the Wall Street Utility Group, December 19, 2011, New York City, NY.

"Advanced Cost and Finance Issues for Water", (co-presenter with Gary D. Shambaugh, Principal & Director, AUS Consultants), 2011 Advanced Regulatory Studies Program – Ratemaking, Accounting and Economics, September 29, 2011, Kellogg Center at Michigan State University – Institute for Public Utilities, East Lansing, MI.

"Public Utility Betas and the Cost of Capital", (co-presenter with Richard A. Michelfelder, Ph.D., Rutgers University) – Advanced Workshop in Regulation and Competition, 30th Annual Eastern Conference of the Center for Research in Regulated Industries (CRRI), May 20, 2011, Rutgers University, Skytop, PA.

Moderator: Society of Utility and Regulatory Financial Analysts: 43rd Financial Forum – "Impact of Cost Recovery Mechanisms on the Perception of Public Utility Risk", April 14-15, 2011, Washington, DC.

"A New Approach for Estimating the Equity Risk Premium for Public Utilities", (co-presenter with Richard A. Michelfelder, Ph.D., Rutgers University) – Hot Topic Hotline Webinar, December 3, 2010, Financial Research Institute of the University of Missouri.

"A New Approach for Estimating the Equity Risk Premium for Public Utilities", (co-presenter with Richard A. Michelfelder, Ph.D., Rutgers University) before the Indiana Utility Regulatory Commission Cost of Capital Task Force, September 28, 2010, Indianapolis, IN.

Tomorrow's Cost of Capital: Cost of Capital Issues 2010, Deloitte Center for Energy Solutions, 2010 Deloitte Energy Conference, "Changing the Great Game: Climate, Customers and Capital", June 7-8, 2010, Washington, DC.

"A New Approach for Estimating the Equity Risk Premium for Public Utilities", (co-presenter with Richard A. Michelfelder, Ph.D., Rutgers University) – Advanced Workshop in Regulation and Competition, 29th Annual Eastern Conference of the Center for Research in Regulated Industries (CRRI), May 20, 2010, Rutgers University, Skytop, PA.

Moderator: Society of Utility and Regulatory Financial Analysts: 42nd Financial Forum – "The Changing Economic and Capital Market Environment and the Utility Industry", April 29-30, 2010, Washington, DC.

"A New Model for Estimating the Equity Risk Premium for Public Utilities" (co-presenter with Richard A. Michelfelder, Ph.D., Rutgers University) – Spring 2010 Meeting of the Staff Subcommittee on Accounting and Finance of the National Association of Regulatory Utility Commissioners, March 17, 2010, Charleston, SC.

"New Approach to Estimating the Cost of Common Equity Capital for Public Utilities" (co-presenter with Richard A. Michelfelder, Ph.D., Rutgers University) - Advanced Workshop in Regulation and Competition, 28th Annual Eastern Conference of the Center for Research in Regulated Industries (CRRI), May 14, 2009, Rutgers University, Skytop, PA.

Moderator: Society of Utility and Regulatory Financial Analysts: 41st Financial Forum – "Estimating the Cost of Capital in Today's Economic and Capital Market Environment", April 16-17, 2009, Washington, DC.

"Water Utility Financing: Where Does All That Cash Come From?", AWWA Pre-Conference Workshop: Water Utility Ratemaking, March 25, 2008, Atlantic City, NJ.

PAPERS

"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, Dylan W. D'Ascendis, and Frank J. Hanley, The Electricity Journal, May, 2013.

"A New Approach for Estimating the Equity Risk Premium for Public Utilities", co-authored with Frank J. Hanley and Richard A. Michelfelder, Ph.D., Rutgers University, The Journal of Regulatory Economics (December 2011), 40:261-278.

"Comparable Earnings: New Life for Old Precept" co-authored with Frank J. Hanley, Financial Quarterly Review, (American Gas Association), Summer 1994.

SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
City Council of the City of Edmonton, CA				
EPCOR Water Services, Inc.	5/16	EPCOR Water Services, Inc.		Rate of Return
Arizona Corporation Commission				
EPCOR Water Arizona Inc.	8/17	EPCOR Arizona Water Inc.	W-01445A-1-	Return on Equity
Arizona Water Company	12/16	Arizona Water Company	W-01445A-16-0443	Return on Equity
Arizona Water Company	08/15	Arizona Water Company	W-01445A-15-0277	Return on Equity
EPCOR Water Arizona, Inc.	04/16	EPCOR Water Arizona, Inc.	WS-01303A-16-0145	Return on Equity
EPCOR Water Arizona, Inc.	03/14	EPCOR Water Arizona, Inc.	WS-01303A-14-0010	Return on Equity
Arizona Water Company	04/12	Arizona Water Company - Eastern Group	W-01445A-11-0310	DSIC Mechanism - Credit Quality; Return on Equity
Chaparral City Water Company	04/13	Chaparral City Water Company	W-02113A-13-118	Return on Equity
Arizona Water Company	08/12	Arizona Water Company - Northern Group	W-01445A-12-0348	Return on Equity
Bermuda Water Co.	09/11	Bermuda Water Co.	W-01812A-10-0521	Return on Equity
Arkansas Public Service Commission				
United Water Arkansas, Inc.	03/10	United Water Arkansas, Inc.	09-130-U	Fair Rate of Return
United Water Arkansas, Inc.	12/06	United Water Arkansas, Inc.	06-160-U	Fair Rate of Return
United Water Arkansas, Inc.	09/03	United Water Arkansas, Inc.	03-161-U	Return on Equity
Arkansas Western Gas Company d/b/a Associated Natural Gas Company	02/97	Associated Natural Gas Company	97-019-U	Capital Structure
Arkansas Western Gas Company	02/97	ANG Division – Arkansas	97-019-I	Capital Structure
Arkansas Western Gas Company	02/96	ANG Division – Arkansas	GR-97-272	Return on Equity
Arkansas Eastern Gas Company	02/96	Arkansas Western Gas Company	96-030-U	Capital Structure
British Columbia Utilities Commission				
Corix Utilities, Inc.	07/13	Corix Utilities, Inc.	Generic Cost of Capital Proceeding- Phase II	Return on Equity
Corix Utilities, Inc.	08/12	Corix Utilities, Inc.	Generic Cost of Capital Proceeding – Phase I	Return on Equity
California Public Utilities Commission				
San Jose Water Company	04/17	San Jose Water Company	U-168-W	Return on Equity
San Gabriel Valley Water Company	05/12	San Gabriel Valley Water Company	12-05-002	Return on Equity
San Jose Water Company	05/09	San Jose Water Company	U-168-W	Return on Equity
San Jose Water Company	05/11	San Jose Water Company	U-168-W	Return on Equity

Thames RWE re: California-American Water Co.	05/02	Thames RWE re: California-American Water Co.	02-01-036	Return on Equity
Connecticut Department of Public Utility Control				
Aquarion Water Co. of Connecticut	03/13	Aquarion Water Co. of Connecticut	13-02-30	Return on Equity
Connecticut Water Company	01/10	Connecticut Water Company	09-12-11	Return on Equity
Aquarion Water Company	03/10	Aquarion Water Company	10-02-13	Return on Equity
United Water Connecticut	09/10	United Water Connecticut	10-09-08	Fair Rate of Return
United Water Connecticut	05/07	United Water Connecticut	07-05-44	Fair Rate of Return
Delaware Public Service Commission				
SUEZ Water Delaware Inc.	02/16	SUEZ Water Delaware Inc.		Fair Rate of Return
Artesian Water Company	04/14	Artesian Water Company	14-132	Fair Rate of Return
Tidewater Utilities, Inc.	11/13	Tidewater Utilities, Inc.	13-466	Return on Equity
Tidewater Utilities, Inc.	09/11	Tidewater Utilities, Inc.	11-397	Fair Rate of Return
Artesian Water Company	04/11	Artesian Water Company	11-207	Fair Rate of Return
United Water Delaware, Inc.	12/10	United Water Delaware, Inc.	10-421	Fair Rate of Return
United Water Delaware, Inc.	02/09	United Water Delaware, Inc.	09-60	Fair Rate of Return
Tidewater Utilities, Inc.	01/09	Tidewater Utilities, Inc.	09-29	Fair Rate of Return
Artesian Water Company	04/08	Artesian Water Company	14-132	Fair Rate of Return
Sussex Shores Water Company	10/07	Sussex Shores Water Company	07-278	Fair Rate of Return
United Water Delaware, Inc.	05/06	United Water Delaware, Inc.	06-174	Fair Rate of Return
Tidewater Utilities, Inc.	04/06	Tidewater Utilities, Inc.	06-145	Fair Rate of Return
Tidewater Utilities, Inc.	04/04	Tidewater Utilities, Inc.	04-152	Fair Rate of Return
Tidewater Utilities, Inc.	01/02	Tidewater Utilities, Inc.	02-28	Fair Rate of Return
Sussex Shores Water Company	11/99	Sussex Shores Water Company	99-576	Fair Rate of Return
Tidewater Utilities, Inc.	9/99	Tidewater Utilities, Inc.	99-446	Fair Rate of Return
Long Neck Water Company	01/99	Long Neck Water Company	99-31	Overall Rate of Return
United Water Delaware, Inc.	03/98	United Water Delaware	98-98	Return on Equity
United Water Delaware, Inc.	08/96	United Water Delaware, Inc.	96-164	Capital Structure and Fixed Capital Cost Rates
Florida Public Service Commission				
Utilities Inc.	08/08	Utilities Inc.	080006-WS	Fair Rate of Return
Utilities, Inc. of Florida	06/03	Utilities, Inc. of Florida	020071-WS	Fair Rate of Return
Hawaiian Public Utilities Commission				
Laie Water Company, Inc.	9/16	Laie Water Company, Inc.	2016-0229	Fair Rate of Return
GTE Hawaiian Telephone	10/96	GTE Hawaiian Telephone	95-0054	Common Equity Cost,

				Capital Structure and Storm Damage Cost Recovery
GTE Hawaiian Telephone	06/96	GTE Hawaiian Telephone	95-0051/94-0298	Self-Insurance Property Damage Reserve-Ratepayer Responsibility
Idaho Public Utility Commission				
United Water Idaho, Inc.	05/15	United Water Idaho, Inc.	UWI-W-15-01	State Property Tax Study
United Water Idaho, Inc.	08/11	United Water Idaho, Inc.	UWI-W-11-02	Fair Rate of Return
United Water Idaho, Inc.	11/04	United Water Idaho, Inc.	UWI-W-04-04	Fair Rate of Return
Illinois Commerce Commission				
Illinois-American Water Company	10/11	Illinois-American Water Company	11-0767	Return on Equity
Apple Canyon Utility Co. / Lake Wildwood Utilities Corp.	04/10	Apple Canyon Utility Co. / Lake Wildwood Utilities Corp.	09-0548/0549	Fair Rate of Return
Illinois American Water Company	05/09	Illinois American Water Company	09-0319	Return on Equity
Illinois-American Water Company	08/07	Illinois-American Water Company	07-0507	Return on Equity
Aqua Illinois, Inc.	02/06	Aqua Illinois, Inc. - Kankakee Water Division	06-0285	Return on Equity
Aqua Illinois	12/04	Aqua Illinois - Woodhaven Water & Sewer Divisions	05-0071	Return on Equity
Aqua Illinois	12/04	Aqua Illinois - Oak Run Water & Sewer Divisions	05-0072	Return on Equity
Aqua Illinois	05/04	Aqua Illinois - Vermillion Water Division	04-0442	Return on Equity
Aqua Illinois (formerly Consumers Ill. Water Co.)	05/03	Aqua Illinois (formerly Consumers Ill. Water Co.)	03-0403	Fair Rate of Return
Aqua Illinois (formerly Consumers Ill. Water Co.)	04/00	Aqua Illinois (formerly Consumers Ill. Water Co.)	00-0337, 00-0338, 00-0339	Return on Equity
Indiana Utility Regulatory Commission				
Indiana-American Water Company	01/14	Indiana-American Water Company	44450	Return on Equity
Pioneer Water LLC	10/13	Pioneer Water LLC	4434	Return on Equity
Utility Center, Inc.	03/10	Utility Center, Inc.	43874	Fair Rate of Return
Twin Lakes Utilities, Inc.	11/06	Twin Lakes Utilities, Inc.	43128	Fair Rate of Return
Utility Center, Inc.	08/07	Utility Center, Inc.	43331	Fair Rate of Return
Twin Lakes Utilities, Inc.	09/03	Twin Lakes Utilities, Inc.	42488	Fair Rate of Return
United Water West Lafayette, Inc.	01/97	United Water West Lafayette, Inc.	41046	Return on Equity
United Water Indiana, Inc.	01/97	United Water Indiana, Inc.	41047	Return on Equity

Iowa Utilities Board				
Iowa-American Water Company	04/11	Iowa-American Water Company	RPU-2011-0001	Return on Equity
Iowa-American Water Company	04/09	Iowa-American Water Company	RPU-2009-0004	Return on Equity
Iowa-American Water Company	08/07	Iowa-American Water Company	RPU-2007-0003	Return on Equity
Kentucky Public Service Commission				
Water Service Corp. of Kentucky	01/09	Water Service Corp. of Kentucky	2008-00563	Fair Rate of Return
Water Service Corp. of Kentucky	08/05	Water Service Corp. of Kentucky	2005-00325	Fair Rate of Return
Louisiana Public Service Commission				
Louisiana Water Service, Inc.	03/08	Louisiana Water Service, Inc.	U-30553	Fair Rate of Return
Maine Public Service Commission				
Maine Water Company	12/13	Maine Water Company – Camden & Rockland Division	2013-00362	Return on Equity
Consumers Maine Water Company	05/00	Consumers Maine Water Company	2000-96 & 2000-175	Return on Equity
Maryland Public Service Commission				
Greenridge Utilities, Inc.	05/03	Greenridge Utilities, Inc.	8962	Fair Rate of Return
Michigan Public Service Commission				
Alpena Power Company	06/17	Alpena Power Company	U18324	Fair Rate of Return
Alpena Power Company	05/09	Alpena Power Company	U-15935	Fair Rate of Return
Alpena Power Company	04/07	Alpena Power Company	U-15250	Fair Rate of Return
Alpena Power Company	07/99	Alpena Power Company	U-12000	Return on Equity
Missouri Public Service Commission				
Missouri Gas Energy	04/17	Missouri Gas Energy	GR-2014-0216	Fair Rate of Return
Laclede Gas Company	04/17	Laclede Gas Company	GR-2017-0215	Fair Rate of Return
Union Elec. Co., D/B/A Ameren Missouri	01/17	Union Elec. Co., D/B/A Ameren Missouri	ER-2016-0179	Capital Structure
Missouri Gas Energy	09/13	Missouri Gas Energy	GR-2014-0007	Return on Equity
Missouri-American Water Company	06/11	Missouri-American Water Company	WR-2011-0337 / SR-2011-0338	Fair Rate of Return
Missouri-American Water Company	10/09	Missouri-American Water Company	WR-2010-0131	Return on Equity
Missouri American Water Company	03/08	Missouri American Water Company	WR-2008-0311 / SR-2008-0312	Return on Equity
Missouri American Water Company	12/06	Missouri American Water Company	WR-2007-0216 / WR-2007-0217	Return on Equity
Missouri-American Water Company	05/03	Missouri-American Water Company	WR-2003-0500 & WC-2004-0168	Fair Rate of Return
Arkansas Western Gas Company	02/97	ANG Division – Missouri	GR-97-272	Capital Structure

New Hampshire Public Utilities Commission				
Aquarion Water Co. of New Hampshire, Inc.	03/13	Aquarion Water Co. of New Hampshire, Inc.	DW 12-085	Return on Equity
New Jersey Board of Public Utilities				
SUEZ Water Arlington Hills, Inc.	2/17	SUEZ Water Arlington Hills, Inc.	WR-16060510	Return on Equity
Atlantic City Sewerage Company	10/16	Atlantic City Sewerage Company	WR-16100951	Return on Equity
Jersey Central Power & Light Co.	4/16	Jersey Central Power & Light Co.	ER-16040383	Return on Equity
Aqua New Jersey, Inc.	01/16	Aqua New Jersey, Inc.	WR-16010089	Return on Equity
United Water New Jersey, Inc.	10/15	United Water New Jersey, Inc.	WR-15101177	Return on Equity
United Water Toms River, Inc.	02/15	United Water Toms River, Inc.	W-01303A-14-0010	Return on Equity
Atlantic City Sewerage Company	10/14	Atlantic City Sewerage Company	WR-14101263	Return on Equity
Aqua New Jersey, Inc.	01/14	Aqua New Jersey, Inc.	WR-14010019	Fair Rate of Return
Middlesex Water Company	11/13	Middlesex Water Company	WR-13111059	Return on Equity
United Water New Jersey, Inc.	03/13	United Water New Jersey, Inc.	WR-13030210	Fair Rate of Return
Jersey Central Power & Light Company	11/12	Jersey Central Power & Light Company	ER-12111052	Return on Equity
United Water Toms River, Inc.	09/12	United Water Toms River, Inc.	WR-12090830	Fair Rate of Return
Pinelands Water Company	08/12	Pinelands Water Company	WR-12080735	Return on Equity
Pinelands Wastewater Company	08/12	Pinelands Wastewater Company	WR-12080734	Return on Equity
Middlesex Water Company	01/12	Middlesex Water Company	WR-12010027 / PUC 1653-2012	Fair Rate of Return
Aqua New Jersey, Inc.	12/11	Aqua New Jersey, Inc.	WR 11120859	Fair Rate of Return
The New Jersey Utilities Association	10/11	The New Jersey Utilities Association	PUC 07146-09 (OAL) / WO-090148 (BPU)	Return on Equity
United Water New Jersey, Inc.	07/11	United Water New Jersey, Inc.	WR-11070428	Fair Rate of Return
The Atlantic City Sewerage Company	04/11	The Atlantic City Sewerage Company	WR-11040247	Fair Rate of Return
United Water Great Gorge, Inc./United Water Vernon Sewerage, Inc.	10/10	United Water Great Gorge, Inc./United Water Vernon Sewerage, Inc.	WR-10100785	Fair Rate of Return
United Water New Jersey, Inc.	12/09	United Water New Jersey, Inc.	WR-09120987	Fair Rate of Return
Aqua New Jersey, Inc.	12/09	Aqua New Jersey, Inc.	WR-09121005	Fair Rate of Return
The Atlantic City Sewerage Company	11/09	The Atlantic City Sewerage Company	WR-09110940	Fair Rate of Return
United Water Toms River, Inc.	11/09	United Water Toms River, Inc.	WR-09110934	Fair Rate of Return
Middlesex Water Company	08/09	Middlesex Water Company	WR-0908066	Fair Rate of Return
United Water New Jersey, Inc.	09/08	United Water New Jersey, Inc.	WR-08090710	Fair Rate of Return

United Water West Milford, Inc.	09/08	United Water West Milford, Inc.	WR-08100928	Fair Rate of Return
United Water Arlington Hills, Inc.	09/08	United Water Arlington Hills, Inc.	WR-08100929	Fair Rate of Return
Applied Wastewater Management	08/08	Applied Wastewater Management	WR-08080550	Fair Rate of Return
Middlesex Water Company	04/08	Pinelands Water Company	WR-08040282	Return on Equity
United Water Toms River, Inc.	03/08	United Water Toms River, Inc.	R-WR-08030139	Fair Rate of Return
Aqua New Jersey, Inc.	12/07	Aqua New Jersey, Inc.	WR-07120955	Fair Rate of Return
The Atlantic City Sewerage Company	11/07	The Atlantic City Sewerage Company	WR-0007110866	Fair Rate of Return
Middlesex Water Company	04/07	Middlesex Water Company	PUCRL 05663-2007N	Fair Rate of Return
United Water New Jersey, Inc.	02/07	United Water New Jersey, Inc.	WR-07020135	Fair Rate of Return
Aqua New Jersey, Inc.	12/05	Aqua New Jersey, Inc.	WR-05121022	Fair Rate of Return
Pinelands Water Company	08/05	Pinelands Water Company	WR-05080681	Return on Equity
Pinelands Wastewater Company	08/05	Pinelands Wastewater Company	WR-05080680	Return on Equity
Middlesex Water Company	05/05	Middlesex Water Company	WR-05050451	Fair Rate of Return
Pinelands Wastewater Company	12/03	Pinelands Wastewater Company	WR-031201017	Return on Equity
Pinelands Water Company	12/03	Pinelands Water Company	WR-031201016	Return on Equity
Aqua New Jersey, Inc. (formerly Consumers New Jersey Water Co.)	12/03	Aqua New Jersey, Inc. (formerly Consumers New Jersey Water Co.)	WR-03120974	Return on Equity
Middlesex Water Company	11/03	Middlesex Water Company	WR-03110900	Fair Rate of Return
Mount Holly Water Company	07/03	Mount Holly Water Company	WR-03070509 & OAL PUCRL 07280-2003N	Fair Rate of Return
Elizabethtown Water Company	07/03	Elizabethtown Water Company	WR-03070510 & OAL PUCRL 07281-2003N	Return on Equity
New Jersey-American Water Company	04/03	New Jersey-American Water Company	WR-03070511 & OAL PUCRL 07279-2003N	Fair Rate of Return
Thames RWE re: New Jersey-American Water Co.	08/02	Thames RWE re: New Jersey-American Water Co.	WM-01120833	Return on Equity
Aqua New Jersey, Inc. (formerly Consumers New Jersey Water Co.)	03/02	Aqua New Jersey, Inc. (formerly Consumers New Jersey Water Co.)	WR-02030133	Return on Equity
Elizabethtown Water Company	04/01	Elizabethtown Water Company	WR-01040205	Overall Fair Rate of Return
Middlesex Water Company	06/00	Middlesex Water Company	WR-00060362	Fair Rate of Return
Aqua New Jersey, Inc. (formerly Consumers New Jersey Water Co.)	03/00	Aqua New Jersey, Inc. (formerly Consumers New Jersey Water Co.)	WR-00030174 & OAL PUCRS04524-00S	Return on Equity
Middlesex Water Company	09/98	Middlesex Water Company	98-090795	Fair Rate of Return
Middlesex Water Company	11/96	Middlesex Water Company	96-110818	Return on Equity
New York State Public Service Commission				
SUEZ New York Inc.	2/16	SUEZ New York Inc.	16-W-0130	Fair Rate of Return

United Water New Rochelle, Inc. / United Water West Chester, Inc.	11/13	United Water New Rochelle, Inc. / United Water West Chester, Inc.	13-W-0539/13-W-564	Return on Equity
United Water New York, Inc.	07/13	United Water New York, Inc.	13-W-0295	Fair Rate of Return
Long Island American Water Company d/b/a Long Island American Water for Water Service	05/11	Long Island American Water Company	11-W-0200	Return on Equity
United Water Owego-Nichols, Inc.	02/11	United Water Owego-Nichols, Inc.	11-W-0082	Fair Rate of Return
United Water Westchester, Inc.	11/09	United Water Westchester, Inc.	09-W-0828	Fair Rate of Return
United Water New Rochelle Inc.	11/09	United Water New Rochelle Inc.	09-W-0824	Fair Rate of Return
United Water New York, Inc.	09/09	United Water New York, Inc.	09-W-0731	Fair Rate of Return
United Water Owego/Nichols, Inc.	05/07	United Water Owego/Nichols, Inc.	07-W-0639 / 07-W0872	Fair Rate of Return
United Water New York, Inc. / South County	01/06	United Water New York, Inc.	Cases 06-W-0131 and 06-W-0244	Fair Rate of Return
United Water New Rochelle, Inc.	09/04	United Water New Rochelle, Inc.	04-W-1221	Fair Rate of Return
North Carolina Utility Commission				
Carolina Water Service of North Carolina	08/15	Carolina Water Company of North Carolina	W-354, Sub 344	Return on Equity
Aqua North Carolina, Inc.	12/13	Aqua North Carolina, Inc.	W-218, Sub 363	Fair Rate of Return
Carolina Water Service, Inc. of NC.	10/13	Carolina Water Service, Inc. of NC.	W-354 Sub 336	Fair Rate of Return
Pluris, LLC	08/12	Pluris, LLC	W-1282, Sub 8	Return on Equity
Aqua North Carolina, Inc.	05/11	Aqua North Carolina, Inc.	W-218, Sub 319	Fair Rate of Return
Carolina Water Service, Inc. of NC	10/10	Carolina Water Service, Inc. of NC	W-354. Sub 324	Fair Rate of Return
Carolina Water Service, Inc. of NC	10/10	Carolina Water Service, Inc. of NC - Ops. in Currituck Co.	W-354. Sub 327	Fair Rate of Return
Transylvania Utilities, Inc.	05/06	Transylvania Utilities, Inc.	W-1012, Sub 7	Fair Rate of Return
Carolina Pines Utilities, Inc.	04/04	Carolina Pines Utilities, Inc.	W-1151	Return on Equity
Transylvania Utilities, Inc.	04/04	Transylvania Utilities, Inc.	W-1012, Sub 5	Return on Equity
Nero Utilities, Inc.	04/04	Nero Utilities, Inc.	W-1152	Return on Equity
Pennsylvania Public Utility Commission				
Metropolitan Edison Co.	04/16	Metropolitan Edison Co.	R-2016-2537349	Return on Equity
Pennsylvania Electric Co.	04/16	Pennsylvania Electric Co.	R-2016-2537352	Return on Equity
Pennsylvania Power Co.	04/16	Pennsylvania Power Co.	R-2016-2537355	Return on Equity
West Penn Power Co.	04/16	West Penn Power Co.	R-2016-2537359	Return on Equity
United Water Pennsylvania Inc.	01/15	United Water Pennsylvania Inc.	R-2015-2462523	Return on Equity
Penn Estates Utilities, Inc.	12/11	Penn Estates Utilities, Inc.	R-2011-2255159	Return on Equity
United Water Pennsylvania, Inc.	05/11	United Water Pennsylvania, Inc.	R-2011-2232985	Fair Rate of Return

United Water Pennsylvania, Inc.	09/09	United Water Pennsylvania, Inc.	R-2009-2122887	Fair Rate of Return
Penn Estates Utilities, Inc. (Water) / (Sewer)	09/09	Penn Estates Utilities, Inc. (Water) / (Sewer)	R-2009-2117532 / R-2009-2117400	Fair Rate of Return
Utilities, Inc. - Westgate	09/09	Utilities, Inc. - Westgate	R-2009-2117389	Fair Rate of Return
Utilities, Inc. of Pennsylvania	09/09	Utilities, Inc. of Pennsylvania	R-2009-2117402	Fair Rate of Return
Trigen-Philadelphia Energy Corp.	06/09	Trigen-Philadelphia Energy Corp.	R-2009-2111011	Fair Rate of Return
The Columbia Water Company	12/08	The Columbia Water Company	R-2008-2045157	Return on Equity
The Newtown Artesian Water Company	11/08	The Newtown Artesian Water Company	R-2008-2042293	Fair Rate of Return
NRG Energy Center Harrisburg	03/08	NRG Energy Center Harrisburg	R-2008-2028395	Fair Rate of Return
Total Environmental Solutions, Inc. - Treasure Lake Water Division	02/08	Total Environmental Solutions, Inc. - Treasure Lake Water Division	R-00072493	Fair Rate of Return
Total Environmental Solutions, Inc. - Treasure Lake Sewer Division	02/08	Total Environmental Solutions, Inc. - Treasure Lake Sewer Division	R-00072495	Fair Rate of Return
Emporium Water Company	06/06	Emporium Water Company	R-00061297	Fair Rate of Return
NRG Energy Center Pittsburgh	06/06	NRG Energy Center Pittsburgh	R-00061435	Fair Rate of Return
City of DuBois, PA	04/06	City of DuBois, PA	R-00050671	Fair Rate of Return
United Water Pennsylvania, Inc.	01/06	United Water Pennsylvania, Inc.	R-00051186	Fair Rate of Return
Valley Energy, Inc.	10/04	Valley Energy, Inc.	R-00049345	Fair Rate of Return
Borough of Hanover	08/02	Borough of Hanover	R-00027522	Fair Rate of Return
Audubon Water Company	04/02	Audubon Water Company	R-00027104	Fair Rate of Return
Wellsboro Electric Company	10/01	Wellsboro Electric Company	R-00016356	Fair Rate of Return
Emporium Water Company	09/00	Emporium Water Company	R-00005050	Fair Rate of Return
Penn Estates Utilities, Inc.	01/00	Penn Estates Utilities, Inc.	R-00005031 & R-00005032	Fair Rate of Return
Pittsburgh Thermal, L.P.	11/99	Pittsburgh Thermal, L.P.	R-00994641	Fair Rate of Return
PG Energy	03/98	PG Energy	R-009880	Capital Structure and Embedded Fixed Capital Cost Rates
Western Utilities, Inc.	08/97	Western Utilities, Inc.	R-00963856	Fair Rate of Return
PG Energy	05/96	PG Energy	R-0096312	Capital Structure and Embedded Fixed Capital Cost Rates
Public Service Commission of Nevada				
Utilities Inc. of Central Nevada	06/15	Utilities Inc. of Central Nevada	15-06063	Fair Rate of Return
Utilities Inc. of Central Nevada	12/09	Utilities Inc. of Central Nevada	09-12017	Fair Rate of Return
Utilities Inc., of Nevada	06/09	Utilities Inc., of Nevada	09-06037	Fair Rate of Return

Spring Creek Utilities, Inc.	06/08	Spring Creek Utilities, Inc.	08-06036	Fair Rate of Return
Utilities, Inc. of Central Nevada	12/06	Utilities, Inc. of Central Nevada	06-12023	Fair Rate of Return
Spring Creek Utilities, Inc.	04/06	Spring Creek Utilities, Inc.	06-01002	Fair Rate of Return
Corporation Commission of Oklahoma				
Public Service Company of Oklahoma	06/17	**American Electric Power Company, Inc.**	**PUD 201700151**	**Regulatory Policy**
Public Service Commission of South Carolina				
United Utility Companies, Inc.	09/13	United Utility Companies, Inc.	2013-199-WS	Capital Structure
Utilities Services of South Carolina	09/13	Utilities Services of South Carolina	2013-201-WS	Capital Structure
Tega Cay Water Services Inc.	12/12	Tega Cay Water Services Inc.	2012-177-WS	Fair Rate of Return
Carolina Water Service, Inc.	08/11	Carolina Water Service, Inc.	2011-47-WS	Fair Rate of Return
Tega Cay Water Service, Inc.	04/10	Tega Cay Water Service, Inc.	2009-473-WS	Fair Rate of Return
United Utility Companies, Inc.	02/10	United Utility Companies, Inc.	2009-479-W/S	Fair Rate of Return
Utilities Services of South Carolina	11/07	Utilities Services of South Carolina	2007-286-WS	Fair Rate of Return
Southland Utilities, Inc.	09/07	Southland Utilities, Inc.	2007-244-W	Fair Rate of Return
Tega Cay Water Service, Inc.	07/06	Tega Cay Water Service, Inc.	2006-97-WS	Return on Equity
United Utility Companies, Inc.	07/06	United Utility Companies, Inc.	2006-107-W/S	Fair Rate of Return
Carolina Water Service, Inc.	06/06	Carolina Water Service, Inc.	2006-92-W/S	Fair Rate of Return
Utilities Services of South Carolina	11/05	Utilities Services of South Carolina	2005-217-WS	Fair Rate of Return
Carolina Water Service of South Carolina	04/05	Carolina Water Service of South Carolina	2004-357-W/S	Fair Rate of Return
United Utility Companies	01/02	United Utility Companies	2000-0210-W/S	Fair Rate of Return
Carolina Water Service of South Carolina	06/01	Carolina Water Service of South Carolina	2000-0207-W/S	Fair Rate of Return
Public Utility Commission of Ohio				
Aqua Ohio, Inc.	12/13	Aqua Ohio, Inc.	13-2124-WW-AIR	Return on Equity
Ohio American Water Company	8/12	Ohio American Water Company	11-4161-WS-AIR	Fair Rate of Return
Ohio American Water Company	6/09	Ohio American Water Company	09-391-WS-AIR	Fair Rate of Return
Ohio American Water Company	10/06	Ohio American Water Company	06-433-WS-AIR	Fair Rate of Return
Ohio-American Water Company	11/04	Ohio-American Water Company	03-2390-WS-AIR	Return on Equity
Regulatory Commission of Alaska				
Fairbanks Natural Gas, LLC	6/14	Fairbanks Natural Gas, LLC	U-14-102	Fair Rate of Return
Rhode Island Public Utilities Commission				
United Water Rhode Island, Inc.	8/13	United Water Rhode Island, Inc.	4434	Fair Rate of Return
United Water Rhode Island, Inc.	6/11	United Water Rhode Island, Inc.	4255	Fair Rate of Return
Virginia State Corporation Commission				

Aqua Virginia, Inc.	8/14	Aqua Virginia, Inc.	PUE-2014-00045	Return on Equity
Massanutten Public Service Corporation	9/09	Massanutten Public Service Corporation	PUE-2009-00041	Return on Equity
Land'Or Utility Company	12/06	Land'Or Utility Company	PUE-2006-00128	Return on Equity
Massanutten Public Service Corporation	12/06	Massanutten Public Service Corporation	PUE-2006-00126	Return on Equity
Reston Lake Anne Air Conditioning Corp.	5/12	Reston Lake Anne Air Conditioning Corp.	PUE-2011-00130	Return on Equity
Aqua Virginia, Inc.	10/11	Aqua Virginia, Inc. (Monticello)	PUE-2005-00080	Return on Equity
Aqua Virginia, Inc.	10/11	Aqua Virginia, Inc. - Sydnor Hydrodynamics, Inc.	PUE-2011-00099	Return on Equity
United Water Virginia, Inc.	10/97	United Water Virginia, Inc.	PUE-2097-0544	Fair Rate of Return
Washington Utilities & Transportation Commission				
Washington Natural Gas Company	03/95	Washington Natural Gas Company	UG-950278	Capital Structure Ratios - Fixed Capital Cost Rates