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Witness:	Ann E. Bulkley
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Sponsoring Party:	Missouri-American Water Company
Case No.:	WR-2017-0285 SR-2017-0286
Date:	June 30, 2017

MISSOURI PUBLIC SERVICE COMMISSION

CASE NO. WR-2017-0285
CASE NO. SR-2017-0286

DIRECT TESTIMONY

OF

ANN E. BULKLEY

ON BEHALF OF

MISSOURI-AMERICAN WATER COMPANY

Exhibit No. 8
Date 3/6/18
File No WR-2017-0285

Exhibit 8
WR-2017-0285
Direct Testimony of Ann E. Bulkley

DIRECT TESTIMONY
ANN E. BULKLEY
MISSOURI-AMERICAN WATER COMPANY
CASE NO. WR-2017-0285
CASE NO. SR-2017-0286

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BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

IN THE MATTER OF MISSOURI-AMERICAN WATER COMPANY FOR AUTHORITY TO FILE TARIFFS REFLECTING INCREASED RATES FOR WATER AND SEWER SERVICE	)))))	CASE NO. WR-2017-0285 CASE NO. SR-2017-0286

AFFIDAVIT OF ANN E. BULKLEY

Ann E. Bulkley, being first duly sworn, deposes and says that she is the witness who sponsors the accompanying testimony entitled "Direct Testimony of Ann E. Bulkley"; that said testimony and schedules were prepared by her and/or under her direction and supervision; that if inquiries were made as to the facts in said testimony and schedules, she would respond as therein set forth; and that the aforesaid testimony and schedules are true and correct to the best of her knowledge.

Ann E. Bulkley

State of Massachusetts
County of Middlesex
SUBSCRIBED and sworn to
Before me this 21 **day of** June **2017.**

Laureen G. Sasseville
Notary Public

My commission expires:

LAUREEN G. SASSEVILLE
Notary Public
COMMONWEALTH OF MASSACHUSETTS
My Commission Expires
October 19, 2023

DIRECT TESTIMONY

ANN E. BULKLEY

I. WITNESS IDENTIFICATION AND QUALIFICATIONS

Q. Please state your name, affiliation, and business address.

A. My name is Ann E. Bulkley. I am employed by Concentric Energy Advisors, Inc. ("Concentric") as a Senior Vice President. My business address is 293 Boston Post Road West, Suite 500, Marlborough, Massachusetts 01752.

Q. On whose behalf are you submitting this testimony?

A. I am submitting this testimony on behalf of Missouri-American Water Company ("MAWC" or the "Company"), a wholly-owned subsidiary of American Water Works Company, Inc. ("AWW").

Q. Please describe your background and professional experience in the energy and utility industries.

A. I hold a Bachelor's degree in Economics and Finance from Simmons College and a Master's degree in Economics from Boston University, with more than 20 years of experience consulting to the energy industry. I have advised numerous energy

and utility clients on a wide range of financial and economic issues with primary concentrations in valuation and utility rate matters. Many of these assignments have included the determination of the cost of capital for valuation and ratemaking purposes. My qualifications and testimony listing are presented in more detail in Attachment A.

Q. Please describe Concentric's activities in energy and utility engagements.

A. Concentric provides financial and economic advisory services to many and various energy and utility clients across North America. Our regulatory, economic, and market analysis services include utility ratemaking and regulatory advisory services; energy market assessments; market entry and exit analysis; corporate and business unit strategy development; demand forecasting; resource planning; and energy contract negotiations. Our financial advisory activities include buy- and sell-side merger, acquisition, and divestiture assignments; due diligence and valuation assignments; project and corporate finance services; and transaction support services. In addition, we provide litigation support services on a wide range of financial and economic issues on behalf of clients throughout North America.

II. PURPOSE AND OVERVIEW OF TESTIMONY

Q. What is the purpose of your Direct Testimony?

A. The purpose of my Direct Testimony is to present evidence and provide a recommendation regarding MAWC's authorized return on equity ("ROE" or "cost of equity") and to assess the reasonableness of its proposed capital structure for ratemaking purposes. My analyses and recommendations are supported by the data presented in Schedules AEB-1 through AEB-10.

Q. Please provide a brief overview of the analysis that led to your ROE recommendation.

A. In developing my ROE recommendation, I applied the Constant Growth Discounted Cash Flow ("DCF") model and the Capital Asset Pricing Model ("CAPM"). In addition to these analyses, I also considered the Value Line projected ROEs for the proxy group companies, and a Constant Growth DCF analysis based on projected dividend yields and share prices. My ROE recommendation also considers the following factors: (1) the risk associated with MAWC's capital expenditure program relative to the proxy group companies; (2) the effect of environmental regulations on water and wastewater utilities and the costs associated with compliance; and (3) the effect of regulatory lag on the ability of MAWC to earn its authorized ROE, and the Company's proposals to

reduce regulatory lag by way of a forecast test period through June 30, 2019 and a Revenue Stabilization Mechanism. Although I did not make any specific adjustments to my ROE estimates for the foregoing factors, I considered each of them when determining where the Company's ROE should fall within the range of analytical results. Finally, I compared MAWC's proposed capital structure to the actual capital structures of the proxy group companies.

Q. Please summarize your analytical results.

A. My analytical results are summarized in Table 1.

Table 1: Summary of Cost of Equity Results

Forward-Looking CAPM Results				
	Current Risk-Free Rate (2.95%)	**2017-2018 Projected Risk-Free Rate (3.48%)**	**2019-2023 Projected Risk-Free Rate (4.30%)**	**Mean Result**
Including AWW[1]				
Bloomberg Beta	10.64%	10.78%	10.99%	10.80%
Value Line Beta	10.39%	10.54%	10.78%	10.57%
Excluding AWW[2]				
Bloomberg Beta	10.89%	11.02%	11.21%	11.04%
Value Line Beta	10.48%	10.63%	10.86%	10.66%

1 *See* Schedule AEB-6.
2 *See* Schedule AEB-7.

	Mean Low	Mean	Mean High
Constant Growth DCF – 90 Day Average[3]			
Including AWW	6.78%	8.85%	11.43%
Excluding AWW	6.43%	8.62%	10.88%
Constant Growth DCF – Projected DCF Model 2020-2022[4]			
	Mean Low	**Mean**	**Mean High**
Including AWW	7.31%	9.38%	11.97%
Excluding AWW	6.89%	9.08%	11.34%
Value Line Projected Equity Returns 2020-2022[5]			
	Low	**Mean**	**High**
Including AWW	10.50%	11.94%	14.00%
Excluding AWW	11.00%	12.14%	14.00%

As shown in Schedule AEB-1, the DCF model is producing individual company results as low as 4.82 percent, or 44 basis points lower than MAWC's embedded cost of long-term debt of 5.26 percent for the 13-month average test year ending June 30, 2019.[6] There is more risk associated with owning common equity than debt because shareholders are the residual claimants on the firm's earnings and assets. As such, the return to equity holders must be higher than the return to bond holders.

[3] *See* Schedule AEB-1.
[4] *See* Schedule AEB-2.
[5] Source: Value Line Investment Survey, Water Industry, April 14, 2017, at 1782-1790.
[6] Source: Company provided data.

In addition, as discussed in more detail in Section IV of my Direct Testimony, there are concerns among investors and regulators that the DCF model is not producing reasonable results at this time due to anomalous conditions in capital markets. For that reason, my ROE recommendation also considers the results of a forward-looking CAPM analysis and the projected ROEs for the water utilities in the proxy group, as published by Value Line. In addition, I consider company-specific risk factors, and current and prospective capital market conditions.

Q. What is your conclusion regarding the appropriate authorized ROE for MAWC in this proceeding?

A. A reasonable range of ROE estimates for MAWC is from 10.00 percent to 10.80 percent. Considering the business and financial risk factors facing MAWC, I believe that an ROE of 10.80 percent is reasonable and appropriate. The required ROE should be a forward-looking estimate; therefore, the analyses supporting my recommendation rely on forward-looking inputs and assumptions (e.g., projected analyst growth rates in the DCF model, forecasted risk-free rate and Market Risk Premium in the CAPM analysis, etc...). I also take into consideration capital market conditions, including the effect of the current low interest rate environment on utility stock valuations and dividend yields, and the market's expectation for higher interest rates.

Q. How is the remainder of your Direct Testimony organized?

A. The remainder of my Direct Testimony is organized in seven sections. Section III reviews the regulatory guidelines pertinent to the development of the cost of capital. Section IV discusses the current and prospective capital market conditions and the effect of those conditions on MAWC's cost of equity. Section V explains my selection of a proxy group of water utilities. Section VI describes my analyses and the analytical basis for the recommendation of the appropriate ROE for MAWC. Section VII provides a discussion of specific business and financial risks that have a direct bearing on the Company's authorized ROE in this case. Section VIII provides an assessment of the reasonableness of MAWC's proposed capital structure relative to the proxy group. Section IX presents my conclusions and recommendations.

III. REGULATORY GUIDELINES

Q. Please describe the principles that guide the establishment of the cost of capital for a regulated utility.

A. The United States Supreme Court's *Hope* and *Bluefield* decisions established the standards for determining the fairness or reasonableness of a utility's authorized ROE. Among the standards established by the Court in those cases are: (1)

consistency with other businesses having similar or comparable risks; (2) adequacy of the return to support credit quality and access to capital; and (3) the principle that the specific means of arriving at a fair return are not important, only that the end result leads to just and reasonable rates.[7]

Q. Has the Missouri Public Service Commission ("Commission") provided similar guidance in establishing the appropriate return on common equity?

A. Yes. The Commission follows the precedents of the *Hope* and *Bluefield* cases and acknowledges that utility investors are entitled to a fair and reasonable return. This position was set forth by the Commission as follows:

1) A "just and reasonable" rate is one that is fair to both the utility and its customers; it is no more than is sufficient to "keep public utilty plants in proper repair for effective public service, and ... to insure to the investors a reasonable return upon funds invested."[8]

[7] Bluefield, 262 U.S. at 692-93; Hope, 320 U.S., at 603.

[8] In the Matter of Missouri Gas Energy and its Tariff Filing to Implement a General Rate Increase for Natural Gas Service, Report and Order, Missouri Public Service Commission, Case No. GR-2009-0355. February 10, 2010, at 7.

Q. Why is it important for a utility to be allowed the opportunity to earn a return that is adequate to attract capital at reasonable terms?

A. A return that is adequate to attract capital at reasonable terms enables MAWC to continuing providing safe, reliable water and wastewater service while maintaining its financial integrity. That return should be commensurate with returns expected elsewhere in the market for investments of equivalent risk. If it is not, debt and equity investors will seek alternative investment opportunities for which the expected return reflects the perceived risks, thereby inhibiting MAWC's ability to attract capital at reasonable cost.

Q. What are your conclusions regarding regulatory guidelines?

A. The ratemaking process is premised on the principle that, in order for investors and companies to commit the capital needed to provide safe and reliable utility services, a utility must have the opportunity to recover the return of, and the market-required return on, its invested capital. Because utility operations are capital-intensive, regulatory decisions should enable the utility to attract capital at reasonable terms; doing so balances the long-term interests of the utility and its customers.

The financial community carefully monitors the current and expected financial condition of utility companies, and the regulatory framework within which they

operate. In that respect, the regulatory framework is one of the most important factors in both debt and equity investors' assessments of risk. The Commission's order in this case, therefore, should establish rates that provide MAWC with the opportunity to earn a ROE that is: (1) adequate to attract capital at reasonable terms; (2) sufficient to ensure its financial integrity; and (3) commensurate with returns on investments in enterprises with similar risk. To the extent the Company is authorized the opportunity to earn its market-based cost of capital, the proper balance is achieved between customers' and shareholders' interests.

IV. CAPITAL MARKET CONDITIONS

Q. Why is it important to analyze capital market conditions?

A. The ROE estimation models rely on market data that are either specific to the proxy group, in the case of the DCF model, or the expectations of market risk, in the case of the CAPM. The results of the ROE estimation models can be affected by prevailing market conditions at the time the analysis is performed. Because the ROE established in a rate proceeding is intended to be forward-looking, the analyst uses current and projected market data, specifically stock prices, dividends, growth rates and interest rates in the ROE estimation models to estimate the required return for the subject company. As discussed in the remainder of this section, analysts and regulatory commissions have concluded

that current market conditions are anomalous and that these conditions have affected the results of the ROE estimation models. As a result, it is important to consider the effect of these conditions on the ROE estimation models when determining the appropriate range and recommended ROE for a future period. In this case, the test period is July 1, 2017 through June 30, 2019, which extends more than a year in the future. Therefore, it is very important to consider projected market data to estimate the return for that forward-looking period.

Q. What factors are affecting the cost of equity for regulated utilities in the current and prospective capital markets?

A. The cost of equity for regulated utility companies is being affected by several factors in the current and prospective capital markets, including: (1) the current low interest rate environment and the corresponding effect on valuations and dividend yields of utility stocks relative to historical levels; and (2) the market's expectation for higher interest rates. In this section, I discuss each of these factors and how it affects the models used to estimate the cost of equity for regulated utilities.

Q. How has the Federal Reserve's monetary policy affected capital markets in recent years?

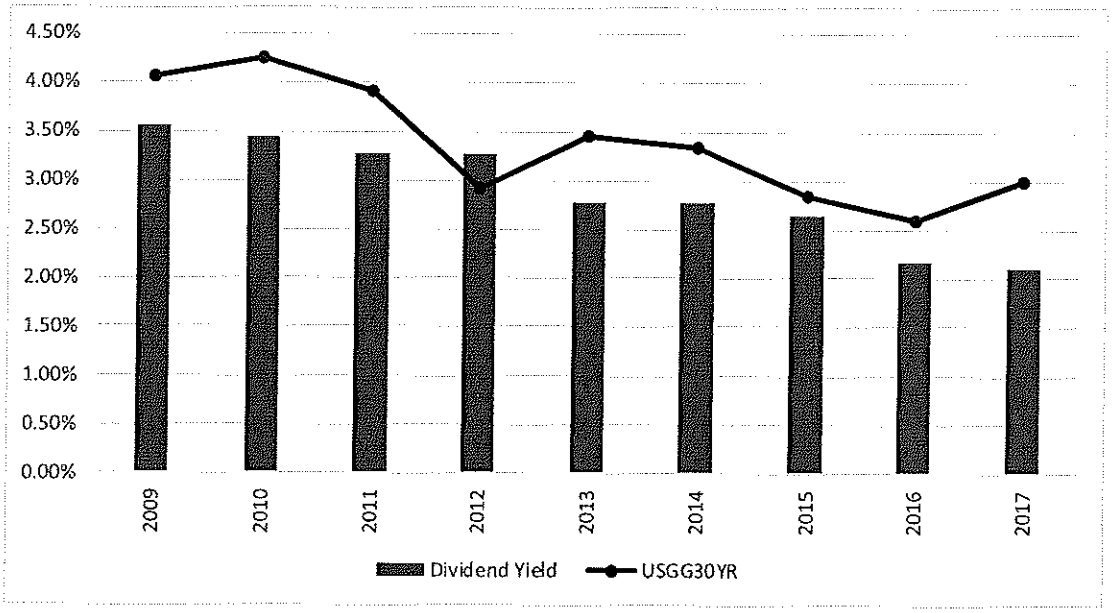
A. Extraordinary and persistent federal intervention in capital markets artificially lowered government bond yields after the Great Recession of 2008-09, as the Federal Open Market Committee ("FOMC") used monetary policy (both reductions in short-term interest rates and purchases of Treasury bonds and mortgage-backed securities) to stimulate the U.S. economy. As a result of very low returns on short-term government bonds, yield-seeking investors have been forced into longer-term instruments, bidding up prices and reducing yields on those investments. As investors have moved along the risk spectrum in search of yields that meet their return requirements, there has been increased demand for dividend-paying equities, such as water utility stocks.

Q. How has the period of abnormally low interest rates affected the valuations and dividend yields of water utility shares?

A. The Federal Reserve's accommodative monetary policy has caused investors to seek alternatives to the historically low interest rates available on Treasury bonds. As a result of this search for higher yield, the share prices for many common stocks, especially dividend-paying stocks such as utilities, have been driven higher while the dividend yields (which are computed by dividing the dividend

payment by the stock price) have decreased to levels well below the historical average. As shown in Chart 1, yields on 30-year Treasury bonds have declined by 106 basis points since 2009 when the Federal Reserve began to actively manage interest rates as a result of the Great Recession, while dividend yields on water utilities have declined by 146 basis points over this period.

Chart 1: Dividend Yields for Water Utility Stocks



Q. How are higher stock valuations and lower dividend yields for utility companies affecting the results of the DCF model?

A. During periods when stock valuations and dividend yields are not being distorted by the level of interest rates, the DCF model adequately reflects market conditions

and investor expectations. However, in the current market environment, the DCF model results are distorted by the historically low level of interest rates and the higher valuation of utility stocks. Value Line recently commented on the low dividend yields and high valuations for water utilities:

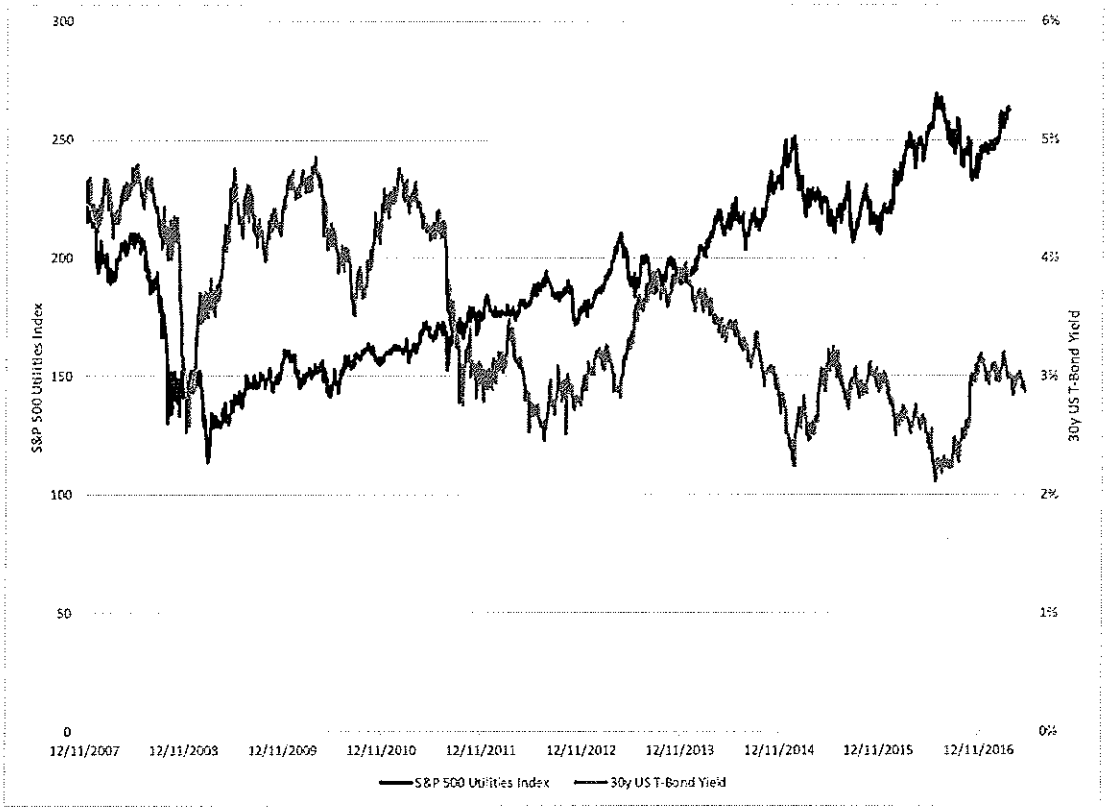
> Indeed, the industry's strong run has lowered the yield on an average water utility stock to a level close to the Value Line median. The yield spread between water stocks and other dividend paying equities in the Value Line Investment Survey is near an all-time low. Thus, we find it hard to recommend these stocks because they appear to be more than fully valued.
>
> ***
>
> As a result of the substantial rise in stock prices, the yield on these stocks has dropped substantially. As we went to press, the average dividend yield for the nine members of the industry was 2.15%, a measly 15 basis points higher than the average stock we follow. Scarcity is one of the reasons water stocks trade at a premium as the industry's market cap is relatively small: There are two large cap stocks, two medium cap stocks, and the remaining five are all small caps. For example, should institutional investors choose to enter this sector to diversify out of electric or gas utilities, they have to pay a higher relative price because there are so few equities to choose from.[9]

In order to assess how low interest rates are affecting the dividend yields for utility stocks, I compared the Standard & Poor's ("S&P") Utilities index (which includes American Water Works, the parent company of MAWC) to the yield on the 30-year Treasury bond since 2007. As shown in Chart 2, the S&P Utilities

[9] Source: Value Line Investment Survey, Water Industry, April 14, 2017, at 1781.

index has increased steadily as yields on 30-year Treasury bonds have declined in response to federal monetary policy.

Chart 2: S&P Utilities Return and U.S. Treasury Bond Yields - 2007 – 2017



Q. Have regulators in other jurisdictions recently responded to the historically low dividend yields for utility companies and the corresponding effect on the DCF model?

A. Yes. Understanding the important role that dividend yields play in the DCF model, the Federal Energy Regulatory Commission ("FERC") recently determined that anomalous capital market conditions have caused the DCF model to understate equity costs for regulated utilities at this time. In Opinion No. 531, the FERC noted:

> There is 'model risk' associated with the excessive reliance or mechanical application of a model when the surrounding conditions are outside of the normal range. 'Model risk' is the risk that a theoretical model that is used to value real world transactions fails to predict or represent the real phenomenon that is being modeled.[10]

In Opinion No. 531, the FERC noted that the low interest rates and bond yields that persisted throughout the analytical period that was relied on (study period) resulted in anomalous market conditions and recognized the need to move away from the midpoint of the DCF analysis. In that case, the FERC relied on the CAPM and other risk premium methodologies to inform its judgment to set the return above the midpoint of the DCF results.

[10] FERC Docket No. EL11-66-001, Opinion No. 531, footnote 286. While Opinion No. 531 was recently remanded to the FERC by the D.C. Circuit Court, the Court's decision did not question the finding by the FERC that capital market conditions were anomalous.

In Opinion No. 551, issued in September 2016, the FERC recognized that those anomalous market conditions continued into the study period and again concluded that it was necessary to rely on ROE estimation methodologies other than the DCF model to set the appropriate ROE:

> Though the Commission noted certain economic conditions in Opinion No. 531, the principle argument was based on low interest rates and bond yields, conditions that persisted throughout the study period. Consequently, we find that capital market conditions are still anomalous as described above...[11]
>
> ****
>
> Because the evidence in this proceeding indicates that capital markets continue to reflect the type of unusual conditions that the Commission identified in Opinion No. 531, we remain concerned that a mechanical application of the DCF methodology would result in a return inconsistent with *Hope* and *Bluefield*.[12]
>
> ****
>
> As the Commission found in Opinion No. 531, under these circumstances, we have less confidence that the midpoint of the zone of reasonableness in this proceeding accurately reflects the equity returns necessary to meet the *Hope* and *Bluefield* capital attraction standards. We therefore find it necessary and reasonable to consider additional record evidence, including evidence of alternative methodologies...[13]

Yields on 10-year Treasury bonds are currently well below 3.00 percent, which is the level that FERC has determined represents "anomalous" capital market conditions. In summary, the results of the DCF model are understating the cost of

[11] FERC Docket No. EL14-12-002, Opinion No. 551, at para 121.
[12] *Id.*, at para 122.
[13] *Id.*

equity under current market conditions due to the low interest rate environment that has reduced dividend yields and raised valuations on utility shares to unsustainable levels. Consequently, it is necessary to consider the results of other Risk Premium models, such as the CAPM, in order to determine where to set the appropriate return.

Q. What evidence is there that the interest rate environment is shifting?

A. Based on stronger conditions in employment markets, a relatively stable inflation rate, steady economic growth, and increased household spending, the Federal Reserve raised the short term borrowing rate by 25 basis points at both the March and June 2017 meetings. Since December 2015, the Federal Reserve has increased interest rates four times, bringing the federal funds rate to the range of 1.00 percent to 1.25 percent. As the economy continues to expand, the Federal Reserve is expected to continue increasing short-term interest rates to sustain the desired balance between unemployment and consumer price inflation.[14] The Federal Reserve has indicated that it intends to raise short-term interest rates gradually in 25 basis point increments to the federal funds rate over time[15] and in

[14] Federal Open Market Committee, Federal Reserve press release, March 15, 2017.
[15] FOMC, Federal Reserve press release, June 14, 2017.

March 2017, projected it would raise interest rates three times in 2017 and three times again in 2018.[16]

Q. What is the financial market's perspective on the future path of interest rates?

A. According to the May 2017 issue of Blue Chip Financial Forecasts, 100 percent of those surveyed expect the Federal Reserve will raise short-term interest rates again at either the June or September 2017 meetings.[17] In response to the question regarding the amount of the additional increase in short-term interest rates by the Federal Reserve in 2017, 7 percent of those surveyed expect an additional increase of 25 basis points, 77 percent expect an additional increase of 50 basis points, and 16 percent expect an additional increase of 75 basis points.[18] In response to the same question for 2018, 13 percent of those surveyed expect the Federal Reserve to increase interest rates by 50 basis points, 44 percent expect

[16] Economic projections of Federal Reserve Board members and Federal Reserve Bank presidents under their individual assessments of projected appropriate monetary policy, March 2017. Advance release of table 1 of the Summary of Economic Projections to be released with FOMC minutes. For release at 2:00 p.m., EDT, March 15, 2017.

[17] Blue Chip Financial Forecasts, Vol. 36, Issue No. 5, May 1, 2017.

[18] *Id.*

an increase of 75 basis points, and 38 percent expect an increase of 100 basis points.[19]

Q. What effect do rising interest rates have on the cost of equity?

A. As interest rates increase, the calculated cost of equity for the proxy companies using the Constant Growth DCF model is likely to be a conservative estimate of investors' required return because the dividend yield is calculated based on stock prices when interest rates were substantially lower. As such, rising interest rates support the selection of a return toward the upper end of a reasonable range of ROE estimates that are based on current market data. Alternatively, my CAPM analysis includes estimated returns based on near-term projected interest rates.

Q. What conclusions do you draw from your analysis of capital market conditions?

A. My main conclusions are that the accommodative monetary policy of the Federal Reserve has driven dividend yields to historically and unsustainably low levels and that the DCF model, is, therefore, currently understating the forward-looking

[19] *Id.*

cost of equity.[20] Accordingly, it is important to give weight to the results of alternative financial models, such as the CAPM, in establishing the authorized ROE in this proceeding.

V. PROXY GROUP SELECTION

Q. Why have you used a group of proxy companies to estimate the cost of equity for MAWC?

A. In this proceeding, I am estimating the cost of equity for MAWC, which is a rate-regulated subsidiary of AWW. Since the ROE is a market-based concept, and given the fact that MAWC's operations do not make up the entirety of a publicly traded entity, it is necessary to establish a group of companies that is both publicly traded and comparable to the Company in certain fundamental business and financial respects to serve as its "proxy" for purposes of the ROE estimation process. The proxy companies used in my analyses all possess a set of operating and financial risk characteristics that are substantially comparable to MAWC, and, therefore, provide a reasonable basis for deriving the appropriate ROE.

[20] As the FOMC tightens monetary policy and increases interest rates, it is likely utility dividend yields will increase.

Q. Please provide a brief profile of MAWC.

A. MAWC, a wholly-owned subsidiary of AWW, provides water distribution service and wastewater service to approximately 477,200 customers in Missouri.[21] The Company generally accesses debt markets through American Water Capital Corp. ("AWCC"). The current credit ratings on senior unsecured debt for AWW and AWCC are as follows: (1) S&P - A (Outlook: Stable); and (2) Moody's - A3 (Outlook: Stable).[22]

Q. How did you select the companies in your proxy group?

A. I began with the group of nine U.S. utilities that Value Line classifies as Water Utilities, and I simultaneously applied the following screening criteria to select companies that:

- pay consistent quarterly cash dividends because companies that do not cannot be analyzed using the Constant Growth DCF model;
- have positive long-term earnings growth forecasts from at least two sources;
- have investment grade long-term issuer ratings from either S&P or Moody's; and

[21] Source: Company provided data.
[22] Source: Amercian Water Works Company, Inc., 2016 SEC Form 10-K, issued February 2017, at 57.

- derive more than 80 percent of their total operating income from regulated water operations.

Q. Did you include American Water Works in your analysis?

A. While my general practice is to exclude the subject company, or its parent holding company, from the proxy group, given the small number of companies classified by Value Line as Water Utilities and given the fact that Missouri is one of sixteen states served by AWW, I have presented my ROE results both including and excluding AWW.

Q. What is the composition of your proxy group?

A. The screening criteria discussed above resulted in a proxy group consisting of the companies in Table 2.

Table 2: Proxy Group

Company	Ticker
American States Water Company	AWR
American Water Works Company, Inc.	AWK
Aqua American, Inc.	WTR
California Water Service Group	CWT
Connecticut Water Service Inc.	CTWS
Middlesex Water Company	MSEX
SJW Corporation	SJW
York Water Company	YORW

Q. Why is it appropriate to rely on a water proxy group for the water and wastewater operations of MAWC?

A. MAWC's business operations are predominantly water distribution service. Therefore, it is appropriate to rely on a proxy group of publicly traded water companies to establish the ROE for the Company's water distribution service. I have also relied on that same proxy group to establish the ROE for the wastewater distribution service. There is an insufficient number of publicly traded wastewater utilities to develop a proxy group from that universe. The business operations and overall risk factors of the water utilities are more similar to wastewater operations than to any other regulated utility. Therefore, I believe that

the water utility proxy group is the most comparable to the wastewater operations from a risk perspective.

VI. COST OF EQUITY ESTIMATION

Q. Please briefly discuss the ROE in the context of the regulated rate of return ("ROR").

A. The overall ROR for a regulated utility is based on its weighted average cost of capital, in which the costs of the individual sources of capital are weighted by their respective book values. While the costs of debt and preferred stock can be directly observed, the cost of equity is market-based and, therefore, must be estimated based on observable market data.

Q. How is the required ROE determined?

A. The required ROE is estimated by using multiple analytical techniques that rely on market-based data to quantify investor expectations regarding required equity returns, adjusted for certain incremental costs and risks. Quantitative models produce a range of reasonable results from which the market-required ROE is selected. That selection must be based on a comprehensive review of relevant data and information, and does not necessarily lend itself to a strict mathematical solution. The key consideration in determining the cost of equity is to ensure that

the methodologies employed reasonably reflect investors' views of the financial markets in general and of the subject company (in the context of the proxy group) in particular.

Q. What methods did you use to estimate MAWC's cost of equity?

A. I considered the results of the Constant Growth DCF model and the CAPM. I also considered the Value Line projected ROEs for the proxy group companies, and the results of a forward-looking DCF analysis using projected dividend yields and projected share prices published by Value Line. I believe that a reasonable ROE estimate considers alternative methodologies, observable market data, and the reasonableness of their individual and collective results.

Q. Why is it important to use more than one analytical approach?

A. It is important to use more than one analytical approach because the cost of equity is not directly observable, and, therefore, it must be estimated based on both quantitative and qualitative information. In estimating the cost of equity, analysts and investors are inclined to gather and evaluate as much relevant data as can be reasonably analyzed. A number of models have been developed to estimate the cost of equity. Analysts and academics understand that ROE models are tools to be used in the ROE estimation process and that strict adherence to any single

approach, or the results of any single approach, can lead to flawed or irrelevant conclusions. Consistent with the *Hope* finding, it is the analytical result, not the methodology, which is controlling in arriving at ROE determinations.

A. Constant Growth DCF Model

Q. Are DCF models widely used to estimate the ROE for regulated utilities?

A. Yes. DCF models are widely used in regulatory proceedings and have sound theoretical bases, although neither the DCF model nor any other model can be applied without considerable judgment in the selection of data and the interpretation of results. As discussed in Section IV of my Direct Testimony, analysts are projecting that the currently high stock market valuations and low dividend yields for water utility companies are not sustainable. This is raising concerns among analysts and regulators that the DCF model is understating the cost of equity at this time.

Q. Please describe the DCF approach.

A. The DCF approach is based on the theory that a stock's current price represents the present value of all expected future cash flows. In its most general form, the DCF model is expressed as follows:

$$P_0 = \frac{D_1}{(1+k)} + \frac{D_2}{(1+k)^2} + \ldots + \frac{D_\infty}{(1+k)^\infty} \quad [1]$$

Where P_0 represents the current stock price, D1…D∞ are all expected future dividends, and k is the discount rate, or required ROE. Equation [1] is a standard present value calculation that can be simplified and rearranged into the following form:

$$k = \frac{D_0(1+g)}{P_0} + g \quad [2]$$

Equation [2] is often referred to as the Constant Growth DCF model in which the first term is the expected dividend yield and the second term is the expected long-term growth rate.

Q. What assumptions are required for the Constant Growth DCF model?

A. The Constant Growth DCF model requires the following assumptions: (1) a constant growth rate for earnings and dividends; (2) a stable dividend payout ratio; (3) a constant price-to-earnings ("P/E") ratio; and (4) a discount rate greater than the expected growth rate. To the extent any of these assumptions is violated, considered judgment and/or specific adjustments should be applied to the results.

Q. What market data did you use to calculate the dividend yield in your Constant Growth DCF model?

A. The dividend yield in my Constant Growth DCF model is based on the proxy companies' current annual dividend and average closing stock prices over the 30-, 90-, and 180-trading days as of May 31, 2017.

Q. Why did you use three averaging periods for stock prices?

A. It is important to use an average of trading days to calculate the price term in the DCF model to ensure that the calculated ROE is not skewed by anomalous events that may affect stock prices on any given trading day. The averaging period should be reasonably representative of expected capital market conditions over the long term. In my view, the use of the 30-, 90-, and 180-day averaging periods reasonably balances those considerations.

Q. Did you make any adjustments to the dividend yield to account for periodic growth in dividends?

A. Yes. Since utility companies tend to increase their quarterly dividends at different times throughout the year, it is reasonable to assume that dividend increases will be evenly distributed over calendar quarters. Given that assumption, it is reasonable to apply one-half of the expected annual dividend growth rate for

purposes of calculating the expected dividend yield component of the DCF model. This adjustment ensures that the expected first year dividend yield is, on average, representative of the coming twelve-month period, and does not overstate the aggregated dividends to be paid during that time.

Q. Why is it important to select appropriate measures of long-term growth in applying the DCF model?

A. In its Constant Growth form, the DCF model (i.e., Equation [2]) assumes a single long-term growth rate in perpetuity. In order to reduce the long-term growth rate to a single measure, one must assume that the dividend payout ratio remains constant and that earnings per share, dividends per share, and book value per share all grow at the same constant rate. Over the long run, however, dividend growth can only be sustained by earnings growth. For example, earnings growth rates tend to be least influenced by capital allocation decisions that companies may make in response to near-term changes in the business environment. Since such decisions may directly affect near-term dividend payout ratios, estimates of earnings growth are more indicative of long-term investor expectations than are dividend or book value growth estimates.

Q. What sources of long-term growth rates did you rely on in your Constant Growth DCF model?

A. My Constant Growth DCF model incorporates the following sources of long-term earnings growth rates: 1) consensus estimates from Zacks Investment Research; 2) consensus estimates from Thomson First Call (provided by Yahoo! Finance); 3) consensus estimates from Thomson Reuters; and 4) long-term earnings growth estimates from Value Line.

Q. How did you calculate the expected dividend yield?

A. I adjusted the dividend yield to reflect the growth rate that was being used in that particular scenario. This ensures that the growth rate used in the dividend yield calculation and the growth rate used as the "g" term of the DCF model are internally consistent.

Q. Please summarize the results of your Constant Growth DCF analyses.

A. The results of the Constant Growth DCF analysis are shown in Table 3.

Table 3: Summary of Constant Growth DCF Results

	Mean Low	Mean	Mean High
Constant Growth DCF – Including AWW			
30-Day Average	6.77%	8.84%	11.42%
90-Day Average	6.78%	8.85%	11.43%
180-Day Average	6.81%	8.88%	11.46%
Constant Growth DCF – Excluding AWW			
30-Day Average	6.42%	8.61%	10.87%
90-Day Average	6.43%	8.62%	10.88%
180-Day Aveage	6.46%	8.65%	10.90%

Q. How did you calculate the range of results for the Constant Growth DCF model?

A. I calculated the low DCF result using the minimum growth rate (i.e., the lowest of the Thomson First Call, Thomson Reuters, Zacks, and Value Line earnings growth rates) for each of the proxy group companies. Thus, the low result reflects the minimum DCF result for the proxy group. I used a similar approach to calculate the high results, using the highest growth rate for each proxy group company. The mean results were calculated using the average growth rates from all sources.

Q. What are your conclusions about the results of the Constant Growth DCF model?

A. As discussed previously, one primary assumption of the DCF model is a constant P/E ratio. That assumption is heavily influenced by the market price of utility stocks. To the extent utility valuations are high and may not be sustainable, it is important to consider the results of the DCF model with caution. As shown in Chart 2 above, the average dividend yield for the proxy group has declined from 3.56 percent in 2009 to 2.10 percent in 2017 due primarily to the low interest rate environment for government bonds. By comparison, the dividend yield on the 90-day average DCF analysis is 2.12 percent, which is at the bottom of the range of dividend yields for water utilities since 2009. While I have given weight to the results of the Constant Growth DCF model, my recommendation also gives weight to the results of other ROE estimation models.

Q. Have you considered the results of any other DCF analyses?

A. Yes, I have considered two additional DCF analyses: 1) a projected Constant Growth DCF model; and 2) the expected returns on equity for the proxy group companies. Because analysts have indicated that utility stocks may currently be at unsustainably high prices due to market conditions, I considered the results of a projected Constant Growth DCF model. Under this DCF analysis, the dividend

yield is calculated using Value Line's projected average share prices and dividends for the period from 2020-2022, while the long-term growth rate is based on the same five-year projected EPS growth rates used in the Constant Growth DCF model. As shown in Schedule AEB-2, the projected DCF analysis produces a mean DCF result of 9.38 percent and a mean high result of 11.97 percent (including AWW) and 9.08 percent and 11.34 percent (excluding AWW). Relying on Value Line's projected dividend yields and share prices in 2020-2022, the mean results of the Constant Growth DCF model increase by 54 basis points (i.e., 9.38 percent vs. 8.84 percent shown in Schedules AEB-1 and AEB-2).[23]

I have also considered the expected returns on equity as reported by Value Line for each of the proxy group companies in 2017 and for the period from 2020-2022. As shown in Table 4 (also see Schedule AEB-3), the proxy group companies are expected to earn average returns on equity of 10.88 percent in 2017 and 11.94 percent from 2020-2022 (including AWW) and 11.00 percent in 2017 and 12.14 percent from 2020-2022 (excluding AWW). This demonstrates that investors are expecting substantially higher returns on equity for the water utilities than what is suggested by the DCF model.

[23] This comparison includes the results of Amercian Water Works.

Table 4: Value Line Projected Returns on Equity[24]

Company	Ticker	2017	2020-2022
American States Water Co	AWR	12.00%	14.00%
American Water Works Co. Inc.	AWK	10.00%	10.50%
Aqua America, Inc.	WTR	12.50%	12.50%
California Water Service, Inc.	CWT	9.50%	11.00%
Connecticut Water Service, Inc.	CTWS	10.00%	11.00%
Middlesex Water Company	MSEX	11.00%	12.50%
SJW Corporation	SJW	10.50%	11.50%
York Water Company	YORW	11.50%	12.50%
Mean		10.88%	11.94%
Mean excl. AWK		11.00%	12.14%

B. CAPM Analysis

Q. Please briefly describe the Capital Asset Pricing Model.

A. The CAPM is a risk premium approach that estimates the cost of equity for a given security as a function of a risk-free return plus a risk premium to compensate investors for the non-diversifiable or "systematic" risk of that security. Systematic risk is the risk inherent in the entire market or market segment. This form of risk cannot be diversified away using a portfolio of assets.

[24] Source: Value Line Investment Survey, Water Utilities, April, 14, 2017, at 1782-1790.

Non-systematic risk is the risk of a specific company that can be mitigated through portfolio diversification.

The CAPM is defined by four components, each of which must theoretically be a forward-looking estimate:

$$K_e = r_f + \beta(r_m - r_f) \quad [3]$$

Where:

K_e = the required market ROE;

β = Beta coefficient of an individual security;

r_f = the risk-free ROR; and

r_m = the required return on the market as a whole.

In this specification, the term ($r_m - r_f$) represents the Market Risk Premium. According to the theory underlying the CAPM, since unsystematic risk can be diversified away, investors should only be concerned with systematic risk. Systematic risk is measured by Beta. Beta is a measure of the volatility of a security as compared to the market as a whole. Beta is defined as:

$$\beta = \frac{Covariance(r_e, r_m)}{Variance(r_m)} \quad [4]$$

The variance of the market return (i.e., Variance (r_m)) is a measure of the uncertainty of the general market. The covariance between the return on a

specific security and the general market (i.e., Covariance (r_e, r_m)) reflects the extent to which the return on that security will respond to a given change in the general market return. Thus, Beta represents the risk of the security relative to the general market.

Q. What risk-free rate did you use in your CAPM analyses?

A. I relied on three sources for my estimate of the risk-free rate: (1) the current 30-day average yield on 30-year U.S. Treasury bonds (i.e., 2.95%);[25] (2) the projected 30-year U.S. Treasury bond yield for 2017 through 2018 (i.e., 3.48%);[26] and (3) the projected 30-year U.S. Treasury bond yield for 2019 through 2023 (i.e., 4.30%).[27]

Q. What Beta coefficients did you use in your CAPM analyses?

A. As shown in Schedule AEB-3, I used the average Beta coefficients for the proxy group companies as reported by Value Line and Bloomberg. Value Line's calculation is based on five years of weekly returns relative to the New York Stock Exchange Composite Index. The Bloomberg Betas are calculated based on

[25] Bloomberg Professional, as of May 31, 2017.
[26] Blue Chip Financial Forecasts, Vol. 36, No. 6, June 1, 2017, at 2.
[27] *Id.*, at 14.

two years of weekly returns relative to the New York Stock Exchange Composite Index.

Q. How did you estimate the Market Risk Premium in the CAPM?

A. I estimated the Market Risk Premium based on the expected total return on the S&P 500 Index less the 30-year Treasury bond yield. The expected total return on the S&P 500 Index is calculated using the Constant Growth DCF model for the companies in the S&P 500 Index. As shown in Schedule AEB-5, based on an estimated dividend yield of 2.01 percent and a long-term earnings growth rate of 11.27 percent, the estimated total market return for the S&P 500 Index is 13.39 percent. The implied Market Risk Premia over the current and projected yields on the 30-year U.S. Treasury bond range from 9.09 percent to 10.44 percent.

Q. What are the results of your CAPM analyses?

A. As shown in Table 5 (*see* also Schedules AEB-4 and AEB-5), my CAPM analyses produce a range of returns from 10.39 percent to 10.99 percent (including AWW) and from 10.48 percent to 11.21 percent (exlcuding AWW).

Table 5: Forward-Looking CAPM Results

Forward-Looking CAPM Results				
	Current Risk-Free Rate (2.95%)	**2017-2018 Projected Risk-Free Rate (3.48%)**	**2019-2023 Projected Risk-Free Rate (4.30%)**	**Mean Result**
Including AWW				
Bloomberg Beta	10.64%	10.78%	10.99%	10.80%
Value Line Beta	10.39%	10.54%	10.78%	10.57%
Excluding AWW				
Bloomberg Beta	10.89%	11.02%	11.21%	11.04%
Value Line Beta	10.48%	10.63%	10.86%	10.66%

VII. BUSINESS RISKS

Q. Do the mean DCF and CAPM results for the proxy group, taken alone, provide an appropriate estimate of the cost of equity for MAWC?

A. No. These mean results provide only a range of the appropriate estimate of MAWC's cost of equity. Several additional factors must be considered when determining where MAWC's cost of equity falls within the range of results. These factors, discussed below, should be considered with respect to their overall effect on MAWC's risk profile relative to the proxy group.

A. Risks Associated with Capital Expenditure Progam

Q. Please summarize MAWC's capital expenditure program.

A. MAWC projects that the Company will spend approximately $1.084 billion on capital investments for the period from 2018-2022, including significant investment to replace aging infrastructure necessary to meet the needs of its customers and to comply with various regulations.

Q. How is MAWC's risk profile affected by its substantial capital expenditure program?

A. As with any utility faced with substantial capital expenditures, MAWC's risk profile is adversely affected in two significant and related ways: (1) the heightened level of investment increases the risk of under-recovery, or delayed recovery, of the invested capital; and (2) an inadequate return would put downward pressure on key credit metrics.

Q. Do credit rating agencies recognize the risks associated with elevated capital expenditures?

A. Yes. From a credit perspective, the additional pressure on cash flows associated with high levels of capital expenditures exerts corresponding pressure on credit metrics and, therefore, credit ratings. A July 2014 report from S&P explains:

> [T]here is little doubt that the U.S. electric industry needs to make record capital expenditures to comply with the proposed carbon pollution rules over the next several years, while maintaining safety standards and grid stability. We believe the higher capital spending and subsequent rise in debt levels could strain these companies' financial measures, resulting in an almost consistent negative discretionary cash flow throughout this higher construction period. To meet the higher capital spending requirements, companies will require ongoing and steady access to the capital markets, necessitating that the industry maintains its high credit quality. We expect that utilities will continue to effectively manage their regulatory risk by using various creative means to recover their costs and to finance their necessary higher spending.[28]

While this S&P report refers to electric utilities, the same applies to water utilities. To the extent that MAWC's rates do not permit it to recover its full cost of doing business, the Company will face increased recovery risk and thus increased pressure on its credit metrics. In an August 2016 report, S&P explains the importance of regulatory support for large capital projects:

> When applicable, a jurisdiction's willingness to support large capital projects with cash during construction is an important aspect of our analysis. This is especially true when the project represents a major addition to rate base and entails long lead times and technological risks that make it susceptible to construction delays. Broad support for all capital spending is the most credit-sustaining. Support for only specific types of capital spending, such as specific environmental projects or system integrity plans, is less so, but still favorable for creditors. Allowance of a cash return on construction work-in-progress or similar ratemaking methods

[28] S&P, Ratings Direct, "U.S. Regulated Electric Utilities' Annual Capital Spending is Poised to Eclipse $100 Billion," July 2014.

> historically were extraordinary measures for use in unusual circumstances, but when construction costs are rising, cash flow support could be crucial to maintain credit quality through the spending program. Even more favorable are those jurisdictions that present an opportunity for a higher return on capital projects as an incentive to investors.[29]

Q. Have credit rating agencies commented specifically on AWW's capital spending program?

A. Yes, both S&P and Moody's have observed that AWW has significant capital spending requirements. S&P states:

> The Company's geographic diversity, reliability, and efficiency further support its business risk profile. AWK's elevated capital spending requirements for infrastructure replacement, increased compliance costs to meet water quality standards, and reliance on acquisitions to provide growth partially offset these strengths.[30]

Similarly, Moody's comments that one credit challenge for AWW is that it operates in a "highly capital intensive industry with an old asset base."[31]

[29] S&P Global Ratings, "Assessing U.S. Investor-Owned Utility Regulatory Environments," August 10, 2016, at 7.

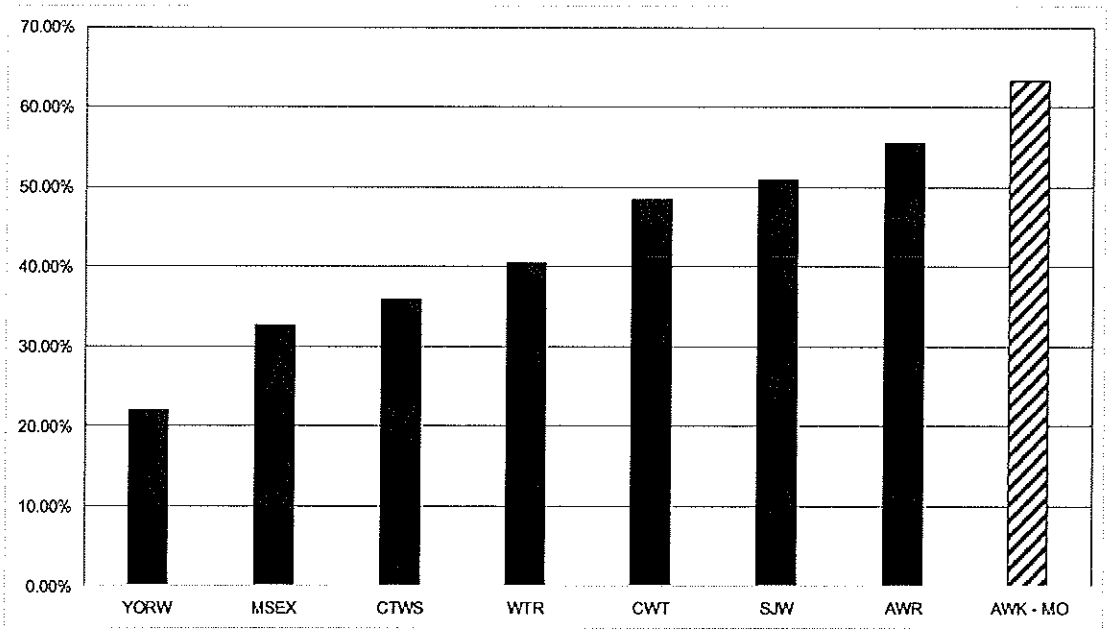
[30] S&P Global Ratings, "Summary: American Water Works Company, Inc.," August 10, 2016, at 3.

[31] Moody's Investors Service, Credit Opinion "American Water Works, Company, Inc.," August 10, 2016, at 2.

Q. Have you conducted any analysis of the Company's projected capital expenditures for water and wastewater services relative to the proxy companies?

A. Yes. I compared the ratio of projected capital expenditures from 2018 through 2022 to net utility plant as of December 31, 2016, for MAWC with each of the proxy group companies. Chart 3 demonstrates that MAWC's ratio of projected capital expenditures to net plant is higher than any of the seven proxy group companies (excluding AWK). Furthermore, as shown in Schedule AEB-8, MAWC's ratio of capital spending to net plant of 63.4 percent is well above the proxy group median of 40.4 percent, suggesting that the Company faces greater risk as compared to the proxy group.

Chart 3: Projected Capital Expenditures (2018-2022)/2016 Net Plant



Q. Does MAWC have an infrastructure replacement program?

A. Yes. MAWC has historically had an Infrastructure System Replacement Surcharge ("ISRS") that allowed the Company to recover the cost of infrastructure replacement in St. Louis County that occurred between rate cases through a tracking mechanism.[32] MAWC has been allowed to recover approximately 30-35 percent of its total capital investments through the ISRS in rate case years and 50-55 percent in non-rate case years. The authority of the Commission to grant the ISRS is a matter of litigation as of the date that this

[32] American Water Works Company, Inc., Securities and Exchange Commission Form 10-K, December 31, 2016, at 107.

testimony is being prepared. Therefore, while some portion of the MAWC capital program is expected to be recovered through the ISRS, there is some risk that the tracker will be denied by the Missouri Supreme Court.[33] In addition to the uncertainty related to the validity of the ISRS, the remaining amount of capital investment that was not included in that tracking mechanism would not be included in rates until the rate proceeding following the in-service date of the investment.

Q. Do the proxy group companies also have the ability to recover capital investments through a distribution system infrastructure surcharge?

A. Yes. As shown in Schedule AEB-9, the proxy companies, excluding AWK, have a distribution system infrastructure charge in approximately 54 percent of their operating jurisdictions.

Q. What are your conclusions regarding the effect of MAWC's capital spending program on its risk profile?

A. MAWC's projected capital expenditures are significant relative to the Company's current level of rate base investment and relative to the proxy group companies.

[33] *Id.*

Timely cost recovery is needed in order to maintain credit metrics at a level consistent with the current credit ratings. The financial community recognizes the additional risks associated with substantial capital expenditures. In my view, those factors support an ROE above the proxy group mean.

B. Risks Associated with Environmental and Water Quality Regulation

Q. Please provide an overview of the risks associated with environmental and regulations for MAWC.

A. Water supply utilities are subject to a complex array of regulations at the federal, state and river basin commission levels with respect to water quantity, water quality and other environmental aspects of their facilities and operations.

The testimony of Company Witness Bruce W. Aiton provides a detailed description of the environmental and regulatory risks facing water and wastewater utilities. As discussed in Mr. Aiton's direct testimony, MAWC faces risks related to the the cost associated with adopting programs to mitigate the potential exposure to lead in drinking water and also related to increased regulation of disinfectant byproducts. In addition, Mr. Aiton's testimony addresses the significant state and Federal environmental regulations that affect the operation of wastewater systems. In particular, at the Federal level, the wastewater operations are regulated under the Clean Water Act and many EPA regulations that are

related to this Act. At the state level, Missouri has recently increased the regulation of waterways that increases regulation of discharge from wastewater systems.

Q. How do these more stringent regulations potentially impact the cost of capital for water utilities?

A. More stringent environmental regulations for both water and wastewater operations create the potential need for additional investments in order to comply with the new standards. In addition, there is significant uncertainty regarding which regulations will be approved by the EPA, and how regulations will change over time, which serves to increase uncertainty among investors. Higher costs could become a key credit issue for regulated water utilities given the importance of managing customer rate increases. This has implications for relations with regulators, as well as economic and political ramifications that could heighten business risk. Any rating actions would likely not occur until there is further clarity from a utility about environmental regulations and recovery of compliance costs.

Q. What is your conclusion with respect to the effect of the risk associated with environmental regulations and water quality regulations on MAWC's cost of equity?

A. MAWC has significant risk and uncertainty associated with environmental and water quality regulations, and the recovery of costs to comply with those regulations. It is clear that the financial community recognizes the additional risks to credit quality associated with the capital investment required to meet environmental and water quality regulations. In my view, those factors in addition to the magnitude of the capital program that the Company has planned to ensure compliance, support an ROE above the proxy group mean.

C. Risk related to Regulatory Lag

Q. Please discuss the effect of regulatory lag on earnings attrition.

A. Regulatory lag occurs when a regulated utility is not able to recover its just and reasonable costs of providing service to customers on a timely basis. Regulatory lag is reflected in a utility's financial performance through earnings attrition, which is the inability of the utility to earn its authorized ROE due to delays in the recovery of allowable costs that have been incurred to provide regulated service to customers.

Q. Please summarize MAWC's proposals with respect to regulatory lag.

A. MAWC is proposing to rely on a test period from July 1, 2017 through June 30, 2019, which extends almost two years in the future. In addition, as discussed in the Direct Testimony of Company Witness John M. Watkins, MAWC is proposing to implement a revenue stabilization mechanism ("RSM"), which is designed to stabilize fluctuations in the Company's revenues caused by factors such as weather conditions or failure to meet sales forecasts due to reduced demand.

Q. Why is MAWC proposing these alternative ratemaking mechanisms?

A. As shown in Schedule GPR-6 to Company witness Greg Roach's testimony, MAWC has not earned its authorized revenue in nine of the ten years from 2007 through 2016. Over that time period, MAWC's total underearnings is estimated to be $88.6 million. The projected test year and the RSM would provide MAWC a more reasonable opportunity to earn its authorized return.

Q. How do MAWC's proposals affect the Company's overall risk profile?

A. For purposes of evaluating whether the these factors affect the auhorized ROE of MAWC, the relevant question is whether other companies in the proxy group are allowed to use a forecast test year or have similar mechanisms that reduce

volumetric risk. As shown in Schedule AEB-9, approximately 57 percent of the operating companies held by the proxy group have forward test periods, which serve to mitigate risk related to regulatory lag. In addition, another 19 percent of the operating companies have protection against volumetric risk (i.e., revenue stabilization mechanisms, revenue decoupling, etc.). The evidence demonstrates that the proxy companies have implemented some form of alternative ratemaking mechanism to increase the companies' ability to achieve the revenue requirement that was authorized by the regulatory commission. Therefore, the returns for the proxy companies already reflect any risk-reducing features of these mechanisms.

VIII. CAPITAL STRUCTURE

Q. What is the Company's proposed capital structure?

A. MAWC is proposing a capital structure comprised of 51.03 percent common equity 48.92% long-term debt, and 0.05% preferred stock.

Q. Have you conducted any analysis to determine a reasonable equity ratio for MAWC?

A. Yes, I reviewed the capital structures of the proxy companies.

Q. Why is it appropriate to consider the equity ratio for the proxy companies?

A. The determination of the ROE is based on the expected return for a proxy group of companies that are comparable to MAWC. The equity ratio is a measure of the financial risk of the company, and the authorized ROE is the return to compensate investors for that risk. If the Commission is going to rely on the ROE estimates for the proxy companies to establish the authorized ROE for MAWC, it is important that the financial risk of MAWC be similar to the financial risk of the proxy group. This is accomplished when the equity ratio of the subject company (in this case MAWC) is within the range established by the proxy group.

Q. How did you conduct your analysis of the proxy group capital structures?

A. I calculated the mean and median proportions of common equity and long-term debt[34] over the past five years (2012-2016) for each of the proxy group companies. As shown in Schedule AEB-10, the mean and median common equity ratios for the proxy group (excluding AWW) at December 31, 2016 were 55.03 percent and 54.17 percent, respectively, within a range from 49.31 percent to 60.60 percent. Including AWW, the mean equity ratio for the proxy group is 53.97 percent. MAWC's proposed common equity ratio of 51.03 percent is near

[34] Long-term debt includes the current portion of long-term debt, assuming that the current portion would be refinanced with debt at maturity.

the lower end of the range for the proxy group, and below the mean and median common equity ratios for the proxy group. On that basis, MAWC has somewhat higher financial risk than the proxy group companies.

Q. Please explain why it is appropriate to use the actual capital structure of MAWC rather than the consolidated capital structure of AWW for ratemaking purposes.

A. The determination of the ROE and capital structure in this proceeding are for ratemaking purposes for MAWC and therefore should be based on the stand-alone capital structure of MAWC. According to the stand-alone principle, the various equity and debt cost rates and capital structure components should be set as if the operating utility company were going to the financial market to raise capital on its own merits. Furthermore, as discussed previously, because my ROE recommendation for MAWC is based on a proxy group of risk comparable companies, it is appropriate to also consider the subject company's equity ratio in comparison to the average equity ratio for that same proxy group of companies.

Q. What would be the effect of relying on an equity ratio significantly below the average equity ratio for the proxy group?

A. As discussed previously, the equity ratio is an important indicator of financial risk for a regulated utility such as MAWC. To the extent the authorized equity ratio is significantly lower than the average of the proxy group, the financial risk of MAWC is higher than the benchmark group. Therefore, it would be necessary to compensate investors for the greater financial risk associated with a lower equity ratio through an increase in the authorized ROE.

Q. How would you estimated the adjustment that would be necessary if the AWW capital structure was used instead of the MAWC proposed capital structure?

A. MAWC's proposed capital structure and ROE results in a Weighted Average Cost of Capital ("WACC") of 8.07 percent (51.03% x 10.8% + 0.05% X 9.70% + 48.92% x 5.24%= 8.07%). Adjusting the equity ratio in the Company's proposal, from the 51.03% proposed to the AWW consolidated equity ratio of 45.17 percent, reduces the WACC to 7.75 percent. In order to establish a WACC of 8.07 percent at the lower equity ratio, it would be necessary to increase the ROE by 71 basis points (45.17% x 11.51% + 0.05% X 9.70% + 54.78% x 5.24%= 8.07%).

Q. What is your conclusion with regard to MAWC's proposed capital structure?

A. Based on my review of the equity ratios of the proxy companies, MAWC's proposed common equity ratio of 51.03 percent is reasonable, if not conservative, relative to the proxy group.

IX. CONCLUSIONS AND RECOMMENDATION

Q. What is your conclusion regarding a fair ROE for MAWC?

A. Based on the various quantitative analyses summarized in Table 6 and the qualitative analyses presented in my Direct Testimony, a reasonable range of ROE results for MAWC is from 10.00 percent to 10.80 percent. I recommend that the Commission set the Company's authorized rate of return on common equity at 10.80 percent. A return at the high end of the range of results takes into account MAWC's company-specific risks relative to the proxy group, as discussed in my Direct Testimony. In addition, the recommended ROE takes into consideration the anomalous conditions in the capital markets that are causing the DCF model to understate the cost of equity, including the effect of the current low interest rate environment on utility stock valuations and dividend yields, and the market's expectation for higher interest rates during the period in which the rates established in this proceeding would be in effect.

Table 6: Summary of Analytical Results

Forward-Looking CAPM Results				
	Current Risk-Free Rate (2.95%)	**2017-2018 Projected Risk-Free Rate (3.48%)**	**2019-2023 Projected Risk-Free Rate (4.30%)**	**Mean Result**
Including AWW[35]				
Bloomberg Beta	10.64%	10.78%	10.99%	10.80%
Value Line Beta	10.39%	10.54%	10.78%	10.57%
Excluding AWW[36]				
Bloomberg Beta	10.89%	11.02%	11.21%	11.04%
Value Line Beta	10.48%	10.63%	10.86%	10.66%

[35] *See* Schedule AEB-6.
[36] *See* Schedule AEB-7.

	Mean Low	Mean	Mean High
Constant Growth DCF – 90 Day Average[37]			
Including AWW	6.78%	8.85%	11.43%
Excluding AWW	6.43%	8.62%	10.88%
Constant Growth DCF – Projected DCF Model 2020-2022[38]			
	Mean Low	**Mean**	**Mean High**
Including AWW	7.31%	9.38%	11.97%
Excluding AWW	6.89%	9.08%	11.34%
Value Line Projected Equity Returns 2020-2022[39]			
	Low	**Mean**	**High**
Including AWW	10.50%	11.94%	14.00%
Excluding AWW	11.00%	12.14%	14.00%

Q. What is your conclusion regarding MAWC's proposed capital structure?

A. My conclusion is that MAWC's proposed capital structure consisting of 51.03 percent common equity and 48.97 percent long-term debt is reasonable, if not conservative, as compared to the proxy group companies and should be adopted.

Q. Does this conclude your Direct Testimony?

A. Yes.

[37] *See* Schedule AEB-1.
[38] *See* Schedule AEB-2.
[39] Source: Value Line Investment Survey, Water Industry, April 14, 2017, at 1782-1790.

Ann E. Bulkley
Senior Vice President

Ms. Bulkley more than two decades of management and economic consulting experience in the energy industry. Ms. Bulkley has extensive state and federal regulatory experience on both electric and natural gas issues including rate of return, cost of equity and capital structure issues. Ms. Bulkley has advised clients seeking to acquire utility assets, providing valuation services including an understanding of regulation, market expected returns, and the assessment of utility risk factors. Ms. Bulkley has assisted clients with valuations of public utility and industrial properties for ratemaking, purchase and sale considerations, ad valorem tax assessments, and accounting and financial purposes. In addition, Ms. Bulkley has experience in the areas of contract and business unit valuation, strategic alliances, market restructuring and regulatory and litigation support.

REPRESENTATIVE PROJECT EXPERIENCE

Regulatory Analysis and Ratemaking

Ms. Bulkley has provided a range of advisory services relating to regulatory policy analysis and many aspects of utility ratemaking. Specific services have included: cost of capital and return on equity testimony, cost of service and rate design analysis and testimony, development of ratemaking strategies; development of merchant function exit strategies; analysis and program development to address residual energy supply and/or provider of last resort obligations; stranded costs assessment and recovery; performance-based ratemaking analysis and design; and many aspects of traditional utility ratemaking (e.g., rate design, rate base valuation).

Cost of Capital

Ms. Bulkley has provided expert testimony on the cost of capital testimony before several state regulatory commissions. In addition, Ms. Bulkley has prepared and provided supporting analysis for at least forty Federal and State regulatory proceedings over the past seven years. Ms. Bulkley's expert testimony experience includes:

- Northern States Power Company: Before the North Dakota Public Service Commission, provided expert testimony on the cost of capital for the company's North Dakota electric utility operations.
- WE Energies: Before the Michigan Public Service Commission, provided expert testimony in support of the company's cost of capital for its electric utility operations.
- Atmos Energy: Provided expert testimony in support of the company's return on equity and capital structure before the Public Utilities Commission for the State of Colorado.
- UNS Electric: Provided expert testimony in support of the company's return on equity and capital structure before the Arizona Corporation Commission.
- Portland Natural Gas Transmission: Provided testimony strategy as well as analytical support for cost of capital testimony before the Federal Energy Regulatory Commission.

- In addition to the specific cases listed above, Ms. Bulkley has provided testimony strategy as well as analytical support on cost of capital in several cases in the following states: Arizona, Colorado, Connecticut, Massachusetts, Minnesota, New Mexico, New York, North Carolina, South Carolina, South Dakota, Virginia, and Utah.

Valuation

Ms. Bulkley has provided valuation services to utility clients, unregulated generators and private equity clients for a variety of purposes including ratemaking, fair value, ad valorem tax, litigation and damages, and acquisition. Ms. Bulkley's appraisal practices are consistent with the national standards established by the Uniform Standards of Professional Appraisal Practice. In addition, Ms. Bulkley has relied on other simulation based valuation methodologies.

Representative projects/clients have included:

- Northern Indiana Fuel and Light: Provided expert testimony regarding the fair value of the company's natural gas distribution system assets. Valuation relied on cost approach.
- Kokomo Gas: Provided expert testimony regarding the fair value of the company's natural gas distribution system assets. Valuation relied on cost approach.
- Prepared fair value rate base analyses for Northern Indiana Public Service Company for several electric rate proceedings. Valuation approaches used in this project included income, cost and comparable sales approaches.
- Confidential Utility Client: Prepared valuation of fossil and nuclear generation assets for financing purposes for regulated utility client.
- Prepared a valuation of a portfolio of generation assets for a large energy utility to be used for strategic planning purposes. Valuation approach included an income approach, a real options analysis and a risk analysis.
- Assisted clients in the restructuring of NUG contracts through the valuation of the underlying assets. Performed analysis to determine the option value of a plant in a competitively priced electricity market following the settlement of the NUG contract.
- Prepared market valuations of several purchase power contracts for large electric utilities in the sale of purchase power contracts. Assignment included an assessment of the regional power market, analysis of the underlying purchase power contracts, a traditional discounted cash flow valuation approach, as well as a risk analysis. Analyzed bids from potential acquirers using income and risk analysis approached. Prepared an assessment of the credit issues and value at risk for the selling utility.
- Prepared appraisal of a portfolio of generating facilities for a large electric utility to be used for financing purposes.
- Prepared an appraisal of a fleet of fossil generating assets for a large electric utility to establish the value of assets transferred from utility property.
- Conducted due diligence on an electric transmission and distribution system as part of a buy-side due diligence team.
- Provided analytical support for and prepared appraisal reports of generation assets to be used in ad valorem tax disputes.

- Provided analytical support and prepared testimony regarding the valuation of electric distribution system assets in five communities in a condemnation proceeding.
- Valued purchase power agreements in the transfer of assets to a deregulated electric market.

Ratemaking

Ms. Bulkley has assisted several clients with analysis to support investor-owned and municipal utility clients in the preparation of rate cases. Sample engagements include:

- Assisted several investor-owned and municipal clients on cost allocation and rate design issues including the development of expert testimony supporting recommended rate alternatives.
- Worked with Canadian regulatory staff to establish filing requirements for a rate review of a newly regulated electric utility. Analyzed and evaluated rate application. Attended hearings and conducted investigation of rate application for regulatory staff. Prepared, supported and defended recommendations for revenue requirements and rates for the company. Developed rates for gas utility for transportation program and ancillary services.

Strategic and Financial Advisory Services

Ms. Bulkley has assisted several clients across North America with analytically based strategic planning, due diligence and financial advisory services.

Representative projects include:

- Preparation of feasibility studies for bond issuances for municipal and district steam clients.
- Assisted in the development of a generation strategy for an electric utility. Analyzed various NERC regions to identify potential market entry points. Evaluated potential competitors and alliance partners. Assisted in the development of gas and electric price forecasts. Developed a framework for the implementation of a risk management program.
- Assisted clients in identifying potential joint venture opportunities and alliance partners. Contacted interviewed, and evaluated potential alliance candidates based on company-established criteria for several LDCs and marketing companies. Worked with several LDCs and unregulated marketing companies to establish alliances to enter into the retail energy market. Prepared testimony in support of several merger cases and participated in the regulatory process to obtain approval for these mergers.
- Assisted clients in several buy-side due diligence efforts, providing regulatory insight and developing valuation recommendations for acquisitions of both electric and gas properties.

PROFESSIONAL HISTORY

Concentric Energy Advisors, Inc. (2002 – Present)
Senior Vice President
Vice President

Assistant Vice President
Project Manager

Navigant Consulting, Inc. (1995 - 2002)
Project Manager

Cahners Publishing Company (1995)
Economist

EDUCATION

M.A., Economics, Boston University, 1995
B.A., Economics and Finance, Simmons College, 1991
Certified General Appraiser licensed in the Commonwealth of Massachusetts

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
Arizona Corporation Commission				
Tucson Electric Power Company	11/15	Tucson Electric Power Company	Docket No. E-01933A-15-0322	Return on Equity
UNS Electric	12/12	UNS Electric	Docket No. E-04204A-12-0504	Return on Equity
UNS Electric	05/15	UNS Electric	Docket No. E-04204A-15-0142	Return on Equity
Arkansas Public Service Commission				
Arkansas Oklahoma Gas Corporation	10/13	Arkansas Oklahoma Gas Corporation	Docket No. 13-078-U	Return on Equity
Colorado Public Utilities Commission				
Atmos Energy Corporation	05/13	Atmos Energy Corporation	Docket No. 13AL-0496G	Return on Equity
Atmos Energy Corporation	04/14	Atmos Energy Corporation	Docket No. 14AL-0300G	Return on Equity
Atmos Energy Corporation	05/15	Atmos Energy Corporation	Docket No. 15AL-0299G	Return on Equity
Connecticut Public Utilities Regulatory Authority				
The United Illuminating Company	07/16	The United Illuminating Company	Docket No. 16-06-04	Return on Equity
Federal Energy Regulatory Commission				
Tallgrass Interstate Gas Transmission	10/15	Tallgrass Interstate Gas Transmission	RP16-137	Return on Equity

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
Indiana Utility Regulatory Commission				
Indianapolis Power and Light Company	09/15	Indianapolis Power and Light Company	Cause No. 44576 Cause No. 44602	Fair Value
Indianapolis Power and Light Company	12/16	Indianapolis Power and Light Company	Cause No.44893	Fair Value
Kokomo Gas and Fuel Company	09/10	Kokomo Gas and Fuel Company	Cause No. 43942	Fair Value
Northern Indiana Fuel and Light Company, Inc.	09/10	Northern Indiana Fuel and Light Company, Inc.	Cause No. 43943	Fair Value
Northern Indiana Public Service Company	10/15	Northern Indiana Public Service Company	Cause No. 44688	Fair Value
Kansas Corporation Commission				
Atmos Energy Corporation	08/15	Atmos Energy Corporation	Docket No. 16-ATMG-079-RTS	Return on Equity
Massachusetts Department of Public Utilities				
Unitil Corporation	01/04	Fitchburg Gas and Electric	DTE 03-52	Integrated Resource Plan; Gas Demand Forecast
Michigan Public Service Commission				
Wisconsin Electric Power Company	12/11	Wisconsin Electric Power Company	Case No. U-16830	Return on Equity
Michigan Tax Tribunal				
Covert Township	07/14	New Covert Generating Co., LLC.	Docket No. 399578	Valuation of Electric Generation Assets

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
New Mexico Public Regulation Commission				
Southwestern Public Service Company	06/15	Southwestern Public Service Company	Case No. -15-001398-UT	Return on Equity
Southwestern Public Service Company	10/15	Southwestern Public Service Company	Case No. -15-00296-UT	Return on Equity
Southwestern Public Service Company	12/16	Southwestern Public Service Company	Case No. -- 16-00269-UT	Return on Equity
New York State Department of Public Service				
Corning Natural Gas Corporation	06/16	Corning Natural Gas Corporation	Case No. 16-G-0369	Return on Equity
KeySpan Energy Delivery	01/16	KeySpan Energy Delivery	Case No. 15-G-0059	Return on Equity
National Fuel Gas Company	04/16	National Fuel Gas Company	Case No. 16-G-0257	Return on Equity
New York State Electric and Gas Company	05/15	New York State Electric and Gas Company	Case No. 15-G-0284	Return on Equity
North Dakota Public Service Commission				
Northern States Power Company	12/10	Northern States Power Company	C-PU-10-657	Return on Equity
Northern States Power Company	12/12	Northern States Power Company	C-PU-12-813	Return on Equity
Oklahoma Corporation Commission				
Arkansas Oklahoma Gas Corporation	01/13	Arkansas Oklahoma Gas Corporation	Cause No. PUD 201200236	Return on Equity

SPONSOR	DATE	CASE/APPLICANT	DOCKET /CASE NO.	SUBJECT
Public Utility Commission of Texas				
Southwestern Public Service Company	01/14	Southwestern Public Service Company	Docket No. 42004	Return on Equity
South Dakota Public Utilities Commission				
Northern States Power Company	06/14	Northern States Power Company	Docket No. EL14-058	Return on Equity

30-DAY CONSTANT GROWTH DCF

Company		[1] Annualized Dividend	[2] Stock Price	[3] Dividend Yield	[4] Expected Dividend Yield	[5] Value Line Earnings Growth	[6] Yahoo! Finance Earnings Growth	[7] Zacks Earnings Growth	[8] Reuters High	[9] Reuters Low	[10] Reuters Mean	[11] Average Growth Rate	[12] Low ROE	[13] Mean ROE	[14] High ROE
American States Water Co	AWR	$0.97	$44.87	2.16%	2.21%	6.50%	5.05%	4.00%	6.10%	4.00%	5.05%	5.15%	6.20%	7.36%	8.73%
American Water	AWK	$1.66	$77.64	2.14%	2.23%	8.50%	7.70%	7.80%	13.00%	7.00%	8.76%	8.19%	9.21%	10.42%	15.26%
Aqua America, Inc.	WTR	$0.77	$32.37	2.36%	2.44%	7.00%	5.25%	5.50%	9.00%	5.00%	6.50%	6.06%	7.42%	8.50%	11.47%
California Water Service Group	CWT	$0.72	$35.15	2.05%	2.14%	9.00%	9.70%	6.00%	9.70%	9.70%	9.70%	8.60%	8.11%	10.74%	11.85%
Connecticut Water Service, Inc.	CTWS	$1.19	$53.54	2.22%	2.28%	4.50%	5.15%	6.00%	6.00%	4.30%	5.15%	5.20%	6.57%	7.48%	8.29%
Middlesex Water Company	MSEX	$0.85	$36.23	2.33%	2.40%	8.50%	2.70%	n/a	n/a	n/a	n/a	5.60%	5.06%	8.00%	10.93%
SJW Corporation	SJW	$0.87	$48.57	1.79%	1.87%	3.00%	14.00%	n/a	n/a	n/a	n/a	8.50%	4.82%	10.37%	15.92%
York Water Company	YORW	$0.64	$34.78	1.84%	1.90%	7.00%	4.90%	n/a	n/a	n/a	n/a	5.95%	6.79%	7.85%	8.91%
Mean				2.11%	2.18%	6.75%	6.81%	5.66%	8.76%	6.00%	7.03%	6.66%	6.77%	8.84%	11.42%
Mean excluding AWK				2.11%	2.18%	6.50%	6.68%	5.38%	7.70%	5.75%	6.60%	6.44%	6.42%	8.61%	10.87%

Notes:
[1] Source: Bloomberg Professional
[2] Source: Bloomberg Professional, equals 30-day average as of May 31, 2017
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.50 x [8])
[5] Source: Value Line
[6] Source: Yahoo! Finance
[7] Source: Zacks
[8] Source: Reuters
[9] Source: Reuters
[10] Source: Reuters
[11] Equals Average ([5], [6], [7], [10])
[12] Equals [3] x (1 + 0.50 x Minimum ([5], [6], [7], [8], [9]) + Minimum ([5], [6], [7],[8], [9])
[13] Equals [4] + [11]
[14] Equals [3] x (1 + 0.50 x Maximum ([5], [6], [7], [8], [9]) + Maximum ([5], [6], [7], [8], [9])

90-DAY CONSTANT GROWTH DCF

Company		[1] Annualized Dividend	[2] Stock Price	[3] Dividend Yield	[4] Expected Dividend Yield	[5] Value Line Earnings Growth	[6] Yahoo! Finance Earnings Growth	[7] Zacks Earnings Growth	[8] Reuters High	[9] Reuters Low	[10] Reuters Mean	[11] Average Growth Rate	[12] Low ROE	[13] Mean ROE	[14] High ROE
American States Water Co	AWR	$0.97	$44.20	2.19%	2.25%	6.50%	5.05%	4.00%	6.10%	4.00%	5.05%	5.15%	6.23%	7.40%	8.76%
American Water	AWK	$1.66	$76.25	2.18%	2.27%	8.50%	7.70%	7.80%	13.00%	7.00%	8.76%	8.19%	9.25%	10.46%	15.32%
Aqua America, Inc.	WTR	$0.77	$31.57	2.42%	2.50%	7.00%	5.25%	5.50%	9.00%	5.00%	6.50%	6.06%	7.48%	8.56%	11.53%
California Water Service Group	CWT	$0.72	$35.18	2.05%	2.13%	9.00%	9.70%	6.00%	9.70%	9.70%	9.70%	8.60%	8.11%	10.73%	11.85%
Connecticut Water Service, Inc.	CTWS	$1.19	$53.84	2.21%	2.27%	4.50%	5.15%	6.00%	6.00%	4.30%	5.15%	5.20%	6.56%	7.47%	8.26%
Middlesex Water Company	MSEX	$0.85	$36.65	2.31%	2.37%	8.50%	2.70%	n/a	n/a	n/a	n/a	5.60%	5.04%	7.97%	10.90%
SJW Corporation	SJW	$0.87	$48.60	1.79%	1.87%	3.00%	14.00%	n/a	n/a	n/a	n/a	8.50%	4.82%	10.37%	15.92%
York Water Company	YORW	$0.64	$34.97	1.83%	1.89%	7.00%	4.90%	n/a	n/a	n/a	n/a	5.95%	6.78%	7.84%	8.90%
Mean				2.12%	2.19%	6.75%	6.81%	5.86%	8.76%	6.00%	7.03%	6.66%	6.78%	8.85%	11.43%
Mean excluding AWK				2.11%	2.18%	6.50%	6.68%	5.38%	7.70%	5.75%	6.60%	6.44%	6.43%	8.62%	10.88%

Notes:
[1] Source: Bloomberg Professional
[2] Source: Bloomberg Professional, equals 90-day average as of May 31, 2017
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.50 x [8])
[5] Source: Value Line
[6] Source: Yahoo! Finance
[7] Source: Zacks
[8] Source: Reuters
[9] Source: Reuters
[10] Source: Reuters
[11] Equals Average ([5], [6], [7], [10])
[12] Equals [3] x (1 + 0.50 x Minimum ([5], [6], [7], [8], [9]) + Minimum ([5], [6], [7],[8], [9])
[13] Equals [4] + [11]
[14] Equals [3] x (1 + 0.50 x Maximum ([5], [6], [7], [8], [9]) + Maximum ([5], [6], [7], [8], [9])

180-DAY CONSTANT GROWTH DCF

Company		[1] Annualized Dividend	[2] Stock Price	[3] Dividend Yield	[4] Expected Dividend Yield	[5] Value Line Earnings Growth	[6] Yahoo! Finance Earnings Growth	[7] Zacks Earnings Growth	[8] Reuters High	[9] Reuters Low	[10] Reuters Mean	[11] Average Growth Rate	[12] Low ROE	[13] Mean ROE	[14] High ROE
American States Water Co	AWR	$0.97	$42.93	2.25%	2.31%	6.50%	5.05%	4.00%	6.10%	4.00%	5.05%	5.15%	6.30%	7.46%	8.83%
American Water	AWK	$1.66	$74.60	2.23%	2.32%	8.50%	7.70%	7.80%	13.00%	7.00%	8.76%	8.19%	9.31%	10.51%	15.37%
Aqua America, Inc.	WTR	$0.77	$30.79	2.48%	2.56%	7.00%	5.25%	5.50%	9.00%	5.00%	6.50%	6.06%	7.55%	8.62%	11.60%
California Water Service Group	CWT	$0.72	$34.07	2.11%	2.20%	9.00%	9.70%	6.00%	9.70%	9.70%	9.70%	8.60%	8.18%	10.80%	11.92%
Connecticut Water Service, Inc.	CTWS	$1.19	$53.34	2.23%	2.29%	4.50%	5.15%	6.00%	6.00%	4.30%	5.15%	5.20%	6.58%	7.49%	8.30%
Middlesex Water Company	MSEX	$0.85	$37.33	2.26%	2.33%	8.50%	2.70%	n/a	n/a	n/a	n/a	5.60%	4.99%	7.93%	10.86%
SJW Corporation	SJW	$0.87	$49.10	1.77%	1.85%	3.00%	14.00%	n/a	n/a	n/a	n/a	8.50%	4.80%	10.35%	15.90%
York Water Company	YORW	$0.64	$34.30	1.87%	1.92%	7.00%	4.90%	n/a	n/a	n/a	n/a	5.95%	6.81%	7.87%	8.93%
Mean				2.15%	2.22%	6.75%	6.81%	5.86%	8.76%	6.00%	7.03%	6.66%	6.81%	8.88%	11.46%
Mean Excluding AWK				2.14%	2.21%	6.50%	6.68%	5.38%	7.70%	5.75%	6.60%	6.44%	6.46%	8.65%	10.90%

Notes:
[1] Source: Bloomberg Professional
[2] Source: Bloomberg Professional, equals 180-day average as of May 31, 2017
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.50 x [8])
[5] Source: Value Line
[6] Source: Yahoo! Finance
[7] Source: Zacks
[8] Source: Reuters
[9] Source: Reuters
[10] Source: Reuters
[11] Equals Average ([5], [6], [7], [10])
[12] Equals [3] x (1 + 0.50 x Minimum ([5], [6], [7], [8], [9]) + Minimum ([5], [6], [7] [8], [9])
[13] Equals [4] + [11]
[14] Equals [3] x (1 + 0.50 x Maximum ([5], [6], [7], [8], [9]) + Maximum ([5], [6], [7], [8], [9])

PROJECTED CONSTANT GROWTH DCF -- ALL WATER COMPANIES

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]
		Annualized Dividend (2020 - 2022)	Stock Price (2020 - 2022)						Yahoo! Finance			Reuters					
Company			High	Low	Mean	Dividend Yield	Expected Dividend Yield	Value Line Earnings Growth	Earnings Growth	Zacks Earnings Growth	High	Low	Mean	Average Growth Rate	Low ROE	Mean ROE	High ROE
American States Water Co	AWR	$1.35	$55.00	$40.00	$47.50	2.84%	2.92%	6.50%	5.05%	4.00%	6.10%	4.00%	5.05%	5.15%	6.93%	8.07%	9.43%
American Water	AWK	$2.35	$90.00	$60.00	$75.00	3.13%	3.26%	8.50%	7.70%	7.50%	13.00%	7.00%	8.76%	8.19%	10.24%	11.45%	16.34%
Aqua America, Inc.	WTR	$1.15	$45.00	$35.00	$40.00	2.88%	2.96%	7.00%	5.25%	5.50%	9.00%	5.00%	6.50%	6.06%	7.95%	9.02%	12.00%
California Water Service Group	CWT	$0.89	$50.00	$30.00	$40.00	2.48%	2.58%	9.00%	9.70%	6.00%	9.70%	9.70%	9.70%	8.60%	8.55%	11.18%	12.30%
Connecticut Water Service, Inc.	CTWS	$1.40	$60.00	$40.00	$50.00	2.80%	2.87%	4.50%	5.15%	6.00%	6.00%	4.30%	5.15%	5.20%	7.16%	8.07%	8.86%
Middlesex Water Company	MSEX	$1.02	$50.00	$35.00	$42.50	2.40%	2.47%	8.50%	2.70%	n/a	n/a	n/a	n/a	5.60%	5.13%	8.07%	11.00%
SJW Corporation	SJW	$1.12	$75.00	$50.00	$62.50	1.79%	1.87%	3.00%	14.00%	n/a	n/a	n/a	n/a	8.50%	4.82%	10.37%	15.92%
York Water Company	YORW	$0.90	$40.00	$25.00	$32.50	2.77%	2.85%	7.00%	4.90%	n/a	n/a	n/a	n/a	5.95%	7.74%	8.80%	9.87%
Mean						2.64%	2.72%	6.75%	6.81%	5.85%	8.76%	6.00%	7.03%	6.66%	7.31%	9.38%	11.97%
Mean excl AWK						2.56%	2.65%	6.50%	6.68%	5.38%	7.70%	5.75%	6.60%	6.44%	6.89%	9.08%	11.34%

Notes:
[1] Source: Value Line dated April 14, 2017
[2] Source: Value Line dated April 14, 2017
[3] Source: Value Line dated April 14, 2017
[4] Source: Value Line dated April 14, 2017
[5] Equals [1] / [4]
[6] Equals [5] x (1 + 0.50 x [13])
[7] Source: Value Line
[8] Source: Yahoo! Finance
[9] Source: Zacks
[10] Source: Reuters
[11] Source: Reuters
[12] Source: Reuters
[13] Equals Average ([7], [8], [9], [12])
[12] Equals [5] x (1 + 0.50 x Minimum ([7], [8], [9], [10], [11]) + Minimum ([7], [8], [9], [10], [11])
[13] Equals [6] + [13]
[14] Equals [5] x (1 + 0.50 x Maximum ([7], [8], [9], [10], [11]) + Maximum ([7], [8], [9], [10], [11])

VALUE LINE ROE PROJECTIONS

Company	Ticker	2017	2020-2022
American States Water Co	AWR	12.00%	14.00%
American Water Works Co, Inc.	AWK	10.00%	10.50%
Aqua America, Inc.	WTR	12.50%	12.50%
California Water Service Group	CWT	9.50%	11.00%
Connecticut Water Service, Inc.	CTWS	10.00%	11.00%
Middlesex Water Company	MSEX	11.00%	12.50%
SJW Corporation	SJW	10.50%	11.50%
York Water Company	YORW	11.50%	12.50%
	Mean	10.88%	11.94%
	Mean excl AWK	11.00%	12.14%

Source: Value Line Reports, April 14, 2017

PROXY COMPANY
BETAS

		[1]	[2]
		Bloomberg	Value Line
American States Water Co	AWR	0.72	0.75
American Water	AWK	0.57	0.65
Aqua America, Inc.	WTR	0.61	0.70
California Water Service Group	CWT	0.74	0.75
Connecticut Water Service, Inc.	CTWS	0.64	0.65
Middlesex Water Company	MSEX	0.89	0.75
SJW Corporation	SJW	0.81	0.70
York Water Company	YORW	0.92	0.75
	Mean	0.736	0.713
	Mean excl AWK	0.761	0.721

Notes:
[1] Source: Bloomberg Professional, May 31, 2017
[2] Source: Value Line; dated April 14, 2017

MARKET RISK PREMIUM DERIVED FROM ANALYSTS' LONG-TERM GROWTH ESTIMATES

[1] Estimated Weighted Average Dividend Yield	2.01%
[2] Estimated Weighted Average Long-Term Growth Rate	11.27%
[3] S&P 500 Estimated Required Market Return	13.39%

STANDARD AND POOR'S 500 INDEX

		[4]	[5]	[6]	[7]	[8]
Name	Ticker	Weight in Index	Current Dividend Yield	Cap-Weighted Dividend Yield	Long-Term Growth Est.	Cap-Weighted Long-Term Growth Est.
LyondellBasell Industries NV	LYB	0.15%	4.47%	0.01%	6.50%	0.01%
American Express Co	AXP	0.32%	1.66%	0.01%	7.25%	0.02%
Verizon Communications Inc	VZ	0.88%	4.95%	0.04%	1.62%	0.01%
Broadcom Ltd	AVGO	0.45%	1.70%	0.01%	15.64%	0.07%
Boeing Co/The	BA	0.53%	3.03%	0.02%	14.57%	0.08%
Caterpillar Inc	CAT	0.29%	2.92%	0.01%	7.64%	0.02%
JPMorgan Chase & Co	JPM	1.36%	2.43%	0.03%	8.43%	0.11%
Chevron Corp	CVX	0.91%	4.17%	0.04%	48.63%	0.44%
Coca-Cola Co/The	KO	0.90%	3.25%	0.03%	5.16%	0.05%
AbbVie Inc	ABBV	0.49%	3.88%	0.02%	10.97%	0.05%
Walt Disney Co/The	DIS	0.78%	1.45%	0.01%	8.60%	0.07%
Extra Space Storage Inc	EXR	0.05%	4.03%	0.00%	6.41%	0.00%
El du Pont de Nemours & Co	DD	0.32%	1.93%	0.01%	6.90%	0.02%
Exxon Mobil Corp	XOM	1.58%	3.83%	0.06%	10.04%	0.16%
Phillips 66	PSX	0.18%	3.68%	0.01%	16.53%	0.03%
General Electric Co	GE	1.10%	3.51%	0.04%	10.03%	0.11%
HP Inc	HPQ	0.15%	2.83%	0.00%	1.93%	0.00%
Home Depot Inc/The	HD	0.85%	2.32%	0.02%	13.25%	0.11%
International Business Machines Corp	IBM	0.67%	3.93%	0.03%	6.05%	0.04%
Concho Resources Inc	CXO	0.09%	n/a	n/a	-1.89%	0.00%
Johnson & Johnson	JNJ	1.60%	2.62%	0.04%	6.42%	0.10%
McDonald's Corp	MCD	0.57%	2.49%	0.01%	9.93%	0.06%
Merck & Co Inc	MRK	0.83%	2.89%	0.02%	5.55%	0.05%
3M Co	MMM	0.57%	2.30%	0.01%	7.87%	0.04%
American Water Works Co Inc	AWK	0.06%	2.12%	0.00%	7.00%	0.00%
Bank of America Corp	BAC	1.04%	1.34%	0.01%	14.95%	0.15%
CSRA Inc	CSRA	0.02%	1.33%	0.00%	7.50%	0.00%
Pfizer Inc	PFE	0.90%	3.92%	0.04%	5.00%	0.05%
Procter & Gamble Co/The	PG	1.05%	3.13%	0.03%	7.50%	0.08%
AT&T Inc	T	1.10%	5.09%	0.06%	4.50%	0.05%
Travelers Cos Inc/The	TRV	0.16%	2.31%	0.00%	6.88%	0.01%
United Technologies Corp	UTX	0.45%	2.18%	0.01%	8.56%	0.04%
Analog Devices Inc	ADI	0.15%	2.10%	0.00%	11.76%	0.02%
Wal-Mart Stores Inc	WMT	1.11%	2.60%	0.03%	5.14%	0.06%
Cisco Systems Inc	CSCO	0.73%	3.68%	0.03%	7.35%	0.05%
Intel Corp	INTC	0.79%	3.02%	0.02%	7.87%	0.06%
General Motors Co	GM	0.24%	4.48%	0.01%	10.23%	0.02%
Microsoft Corp	MSFT	2.50%	2.23%	0.06%	10.48%	0.26%
Dollar General Corp	DG	0.09%	1.42%	0.00%	9.40%	0.01%
Kinder Morgan Inc/DE	KMI	0.19%	2.67%	0.01%	9.85%	0.02%
Citigroup Inc	C	0.77%	1.06%	0.01%	4.43%	0.03%
American International Group Inc	AIG	0.27%	2.01%	0.01%	11.00%	0.03%
Honeywell International Inc	HON	0.47%	2.00%	0.01%	9.05%	0.04%
Altria Group Inc	MO	0.68%	3.23%	0.02%	7.97%	0.05%
HCA Holdings Inc	HCA	0.14%	n/a	n/a	11.18%	0.02%
Under Armour Inc	UAA	0.02%	n/a	n/a	16.49%	0.00%
International Paper Co	IP	0.10%	3.50%	0.00%	7.00%	0.01%
Hewlett Packard Enterprise Co	HPE	0.14%	1.38%	0.00%	-2.47%	0.00%
Abbott Laboratories	ABT	0.37%	2.32%	0.01%	10.63%	0.04%
Aflac Inc	AFL	0.14%	2.28%	0.00%	3.30%	0.00%
Air Products & Chemicals Inc	APD	0.15%	2.64%	0.00%	8.78%	0.01%
Royal Caribbean Cruises Ltd	RCL	0.11%	1.74%	0.00%	18.43%	0.02%
American Electric Power Co Inc	AEP	0.16%	3.29%	0.01%	4.00%	0.01%
Hess Corp	HES	0.07%	2.18%	0.00%	-31.26%	-0.02%
Anadarko Petroleum Corp	APC	0.13%	0.40%	0.00%	-2.25%	0.00%
Aon PLC	AON	0.16%	1.10%	0.00%	11.08%	0.02%
Apache Corp	APA	0.08%	2.14%	0.00%	-16.24%	-0.01%
Archer-Daniels-Midland Co	ADM	0.11%	3.08%	0.00%	10.00%	0.01%
Automatic Data Processing Inc	ADP	0.21%	2.23%	0.00%	11.10%	0.02%
Verisk Analytics Inc	VRSK	0.06%	n/a	n/a	9.88%	0.01%
AutoZone Inc	AZO	0.08%	n/a	n/a	12.80%	0.01%
Avery Dennison Corp	AVY	0.03%	2.14%	0.00%	7.10%	0.00%
Baker Hughes Inc	BHI	0.11%	1.23%	0.00%	33.00%	0.04%
Ball Corp	BLL	0.07%	0.98%	0.00%	8.00%	0.01%
Bank of New York Mellon Corp/The	BK	0.23%	1.61%	0.00%	11.73%	0.03%
CR Bard Inc	BCR	0.10%	0.34%	0.00%	9.30%	0.01%
Baxter International Inc	BAX	0.15%	1.08%	0.00%	13.08%	0.02%
Becton Dickinson and Co	BDX	0.20%	1.54%	0.00%	10.47%	0.02%
Berkshire Hathaway Inc	BRK/B	1.01%	n/a	n/a	n/a	n/a

STANDARD AND POOR'S 500 INDEX

Name	Ticker	[4] Weight in Index	[5] Current Dividend Yield	[6] Cap-Weighted Dividend Yield	[7] Long-Term Growth Est.	[8] Cap-Weighted Long-Term Growth Est.
Best Buy Co Inc	BBY	0.08%	2.29%	0.00%	13.28%	0.01%
H&R Block Inc	HRB	0.03%	3.32%	0.00%	11.00%	0.00%
Boston Scientific Corp	BSX	0.17%	n/a	n/a	10.54%	0.02%
Bristol-Myers Squibb Co	BMY	0.41%	2.89%	0.01%	9.10%	0.04%
Fortune Brands Home & Security Inc	FBHS	0.05%	1.14%	0.00%	12.48%	0.01%
Brown-Forman Corp	BF/B	0.05%	1.41%	0.00%	1.53%	0.00%
Cabot Oil & Gas Corp	COG	0.05%	0.90%	0.00%	40.65%	0.02%
Campbell Soup Co	CPB	0.08%	2.43%	0.00%	5.49%	0.00%
Kansas City Southern	KSU	0.05%	1.39%	0.00%	12.70%	0.01%
Advanced Micro Devices Inc	AMD	0.05%	n/a	n/a	5.00%	0.00%
Carnival Corp	CCL	0.16%	2.50%	0.00%	13.55%	0.02%
Qorvo Inc	QRVO	0.05%	n/a	n/a	13.24%	0.01%
CenturyLink Inc	CTL	0.06%	8.66%	0.01%	0.46%	0.00%
Cigna Corp	CI	0.19%	0.02%	0.00%	12.87%	0.02%
UDR Inc	UDR	0.05%	3.21%	0.00%	6.46%	0.00%
Clorox Co/The	CLX	0.08%	2.48%	0.00%	7.14%	0.01%
CMS Energy Corp	CMS	0.06%	2.81%	0.00%	6.83%	0.00%
Colgate-Palmolive Co	CL	0.31%	2.10%	0.01%	9.10%	0.03%
Comerica Inc	CMA	0.06%	1.52%	0.00%	10.97%	0.01%
CA Inc	CA	0.06%	3.21%	0.00%	4.20%	0.00%
Conagra Brands Inc	CAG	0.08%	2.08%	0.00%	8.65%	0.01%
Consolidated Edison Inc	ED	0.12%	3.33%	0.00%	4.27%	0.01%
SL Green Realty Corp	SLG	0.05%	3.07%	0.00%	0.27%	0.00%
Corning Inc	GLW	0.12%	2.13%	0.00%	9.19%	0.01%
Cummins Inc	CMI	0.12%	2.60%	0.00%	10.20%	0.01%
Danaher Corp	DHR	0.27%	0.66%	0.00%	9.62%	0.03%
Target Corp	TGT	0.14%	4.35%	0.01%	-1.49%	0.00%
Deere & Co	DE	0.18%	1.96%	0.00%	8.20%	0.01%
Dominion Resources Inc/VA	D	0.24%	3.74%	0.01%	5.23%	0.01%
Dover Corp	DOV	0.06%	2.13%	0.00%	13.63%	0.01%
CBOE Holdings Inc	CBOE	0.04%	1.16%	0.00%	20.00%	0.01%
Dow Chemical Co/The	DOW	0.35%	2.97%	0.01%	6.12%	0.02%
Duke Energy Corp	DUK	0.28%	3.99%	0.01%	5.53%	0.02%
Eaton Corp PLC	ETN	0.16%	3.10%	0.00%	10.20%	0.02%
Ecolab Inc	ECL	0.18%	1.11%	0.00%	12.96%	0.02%
PerkinElmer Inc	PKI	0.03%	0.44%	0.00%	8.10%	0.00%
Emerson Electric Co	EMR	0.18%	3.25%	0.01%	7.07%	0.01%
EOG Resources Inc	EOG	0.24%	0.74%	0.00%	-26.71%	-0.06%
Entergy Corp	ETR	0.07%	4.40%	0.00%	-3.83%	0.00%
Equifax Inc	EFX	0.08%	1.14%	0.00%	9.00%	0.01%
EQT Corp	EQT	0.04%	0.22%	0.00%	n/a	n/a
XL Group Ltd	XL	0.05%	2.01%	0.00%	9.00%	0.00%
Gartner Inc	IT	0.05%	n/a	n/a	13.75%	0.01%
FedEx Corp	FDX	0.24%	0.83%	0.00%	13.67%	0.03%
Macy's Inc	M	0.03%	6.43%	0.00%	0.65%	0.00%
FMC Corp	FMC	0.05%	0.88%	0.00%	12.00%	0.01%
Ford Motor Co	F	0.20%	5.40%	0.01%	3.82%	0.01%
NextEra Energy Inc	NEE	0.31%	2.78%	0.01%	6.67%	0.02%
Franklin Resources Inc	BEN	0.11%	1.91%	0.00%	10.00%	0.01%
Freeport-McMoRan Inc	FCX	0.08%	n/a	n/a	17.33%	0.01%
TEGNA Inc	TGNA	0.02%	1.84%	0.00%	5.50%	0.00%
Gap Inc/The	GPS	0.04%	4.09%	0.00%	5.03%	0.00%
General Dynamics Corp	GD	0.28%	1.65%	0.00%	8.40%	0.02%
General Mills Inc	GIS	0.15%	3.38%	0.01%	8.13%	0.01%
Genuine Parts Co	GPC	0.06%	2.92%	0.00%	10.32%	0.01%
WW Grainger Inc	GWW	0.05%	2.97%	0.00%	12.28%	0.01%
Halliburton Co	HAL	0.18%	1.59%	0.00%	n/a	n/a
Harley-Davidson Inc	HOG	0.04%	2.75%	0.00%	8.80%	0.00%
Harris Corp	HRS	0.06%	1.89%	0.00%	n/a	n/a
HCP Inc	HCP	0.07%	4.72%	0.00%	-2.14%	0.00%
Helmerich & Payne Inc	HP	0.03%	5.32%	0.00%	-1.80%	0.00%
Fortive Corp	FTV	0.10%	0.45%	0.00%	8.70%	0.01%
Hershey Co/The	HSY	0.08%	2.14%	0.00%	9.97%	0.01%
Synchrony Financial	SYF	0.10%	1.94%	0.00%	8.20%	0.01%
Hormel Foods Corp	HRL	0.08%	2.02%	0.00%	5.60%	0.00%
Arthur J Gallagher & Co	AJG	0.05%	2.75%	0.00%	9.95%	0.00%
Mondelez International Inc	MDLZ	0.33%	1.63%	0.01%	10.49%	0.03%
CenterPoint Energy Inc	CNP	0.06%	3.74%	0.00%	6.53%	0.00%
Humana Inc	HUM	0.16%	0.69%	0.00%	12.53%	0.02%
Willis Towers Watson PLC	WLTW	0.09%	1.45%	0.00%	12.85%	0.01%
Illinois Tool Works Inc	ITW	0.23%	1.84%	0.00%	8.40%	0.02%
Ingersoll-Rand PLC	IR	0.11%	1.79%	0.00%	10.26%	0.01%
Foot Locker Inc	FL	0.04%	2.09%	0.00%	8.41%	0.00%
Interpublic Group of Cos Inc/The	IPG	0.05%	2.89%	0.00%	9.21%	0.00%
International Flavors & Fragrances Inc	IFF	0.05%	1.86%	0.00%	7.90%	0.00%
Jacobs Engineering Group Inc	JEC	0.03%	1.14%	0.00%	10.54%	0.00%
Hanesbrands Inc	HBI	0.03%	2.91%	0.00%	13.80%	0.00%
Kellogg Co	K	0.12%	2.91%	0.00%	6.46%	0.01%
Perrigo Co PLC	PRGO	0.05%	0.88%	0.00%	1.21%	0.00%

STANDARD AND POOR'S 500 INDEX

Name	Ticker	[4] Weight in Index	[5] Current Dividend Yield	[6] Cap-Weighted Dividend Yield	[7] Long-Term Growth Est.	[8] Cap-Weighted Long-Term Growth Est.
Kimberly-Clark Corp	KMB	0.21%	2.99%	0.01%	6.75%	0.01%
Kimco Realty Corp	KIM	0.03%	6.16%	0.00%	7.82%	0.00%
Kohl's Corp	KSS	0.03%	5.72%	0.00%	5.58%	0.00%
Oracle Corp	ORCL	0.87%	1.67%	0.01%	9.06%	0.08%
Kroger Co/The	KR	0.13%	1.61%	0.00%	6.60%	0.01%
Leggett & Platt Inc	LEG	0.03%	2.77%	0.00%	19.00%	0.01%
Lennar Corp	LEN	0.05%	0.31%	0.00%	10.09%	0.00%
Leucadia National Corp	LUK	0.04%	1.03%	0.00%	18.00%	0.01%
Eli Lilly & Co	LLY	0.41%	2.61%	0.01%	12.98%	0.05%
L Brands Inc	LB	0.07%	4.65%	0.00%	6.73%	0.00%
Charter Communications Inc	CHTR	0.43%	n/a	n/a	19.30%	0.08%
Lincoln National Corp	LNC	0.07%	1.79%	0.00%	8.98%	0.01%
Loews Corp	L	0.07%	0.53%	0.00%	n/a	n/a
Lowe's Cos Inc	LOW	0.31%	1.78%	0.01%	15.67%	0.05%
Host Hotels & Resorts Inc	HST	0.06%	4.45%	0.00%	4.35%	0.00%
Marsh & McLennan Cos Inc	MMC	0.19%	1.93%	0.00%	11.78%	0.02%
Masco Corp	MAS	0.06%	1.07%	0.00%	13.68%	0.01%
Mattel Inc	MAT	0.04%	6.63%	0.00%	13.00%	0.00%
S&P Global Inc	SPGI	0.17%	1.15%	0.00%	10.00%	0.02%
Medtronic PLC	MDT	0.54%	2.04%	0.01%	6.34%	0.03%
CVS Health Corp	CVS	0.36%	2.60%	0.01%	11.87%	0.04%
Micron Technology Inc	MU	0.16%	n/a	n/a	10.00%	0.02%
Motorola Solutions Inc	MSI	0.06%	2.25%	0.00%	2.80%	0.00%
Murphy Oil Corp	MUR	0.02%	4.10%	0.00%	n/a	n/a
Mylan NV	MYL	0.10%	n/a	n/a	12.00%	0.01%
Laboratory Corp of America Holdings	LH	0.07%	n/a	n/a	10.03%	0.01%
Newell Brands Inc	NWL	0.12%	1.74%	0.00%	11.96%	0.01%
Newmont Mining Corp	NEM	0.08%	0.59%	0.00%	-12.95%	-0.01%
Twenty-First Century Fox Inc	FOXA	0.13%	1.33%	0.00%	9.60%	0.01%
NIKE Inc	NKE	0.33%	1.36%	0.00%	11.59%	0.04%
NiSource Inc	NI	0.04%	2.69%	0.00%	6.98%	0.00%
Noble Energy Inc	NBL	0.06%	1.39%	0.00%	10.59%	0.01%
Norfolk Southern Corp	NSC	0.17%	1.97%	0.00%	12.75%	0.02%
Eversource Energy	ES	0.09%	3.06%	0.00%	6.10%	0.01%
Northrop Grumman Corp	NOC	0.21%	1.54%	0.00%	7.26%	0.02%
Wells Fargo & Co	WFC	1.19%	2.97%	0.04%	13.41%	0.16%
Nucor Corp	NUE	0.09%	2.60%	0.00%	5.55%	0.00%
PVH Corp	PVH	0.04%	0.14%	0.00%	8.32%	0.00%
Occidental Petroleum Corp	OXY	0.21%	5.16%	0.01%	-3.28%	-0.01%
Omnicom Group Inc	OMC	0.09%	2.63%	0.00%	6.81%	0.01%
ONEOK Inc	OKE	0.05%	4.95%	0.00%	25.10%	0.01%
Raymond James Financial Inc	RJF	0.05%	1.22%	0.00%	17.00%	0.01%
PG&E Corp	PCG	0.16%	3.10%	0.01%	3.70%	0.01%
Parker-Hannifin Corp	PH	0.10%	1.68%	0.00%	10.27%	0.01%
PPL Corp	PPL	0.13%	3.96%	0.00%	1.80%	0.00%
PepsiCo Inc	PEP	0.78%	2.76%	0.02%	6.40%	0.05%
Exelon Corp	EXC	0.16%	3.61%	0.01%	4.00%	0.01%
ConocoPhillips	COP	0.26%	2.37%	0.01%	7.00%	0.02%
PulteGroup Inc	PHM	0.03%	1.59%	0.00%	17.50%	0.01%
Pinnacle West Capital Corp	PNW	0.05%	2.97%	0.00%	5.90%	0.00%
PNC Financial Services Group Inc/The	PNC	0.27%	1.85%	0.00%	6.65%	0.02%
PPG Industries Inc	PPG	0.13%	1.50%	0.00%	8.14%	0.01%
Praxair Inc	PX	0.18%	2.38%	0.00%	11.30%	0.02%
Progressive Corp/The	PGR	0.11%	1.60%	0.00%	11.08%	0.01%
Public Service Enterprise Group Inc	PEG	0.11%	3.83%	0.00%	3.20%	0.00%
Raytheon Co	RTN	0.22%	1.95%	0.00%	7.83%	0.02%
Robert Half International Inc	RHI	0.03%	2.07%	0.00%	8.00%	0.00%
Ryder System Inc	R	0.02%	2.65%	0.00%	15.00%	0.00%
SCANA Corp	SCG	0.05%	3.59%	0.00%	6.00%	0.00%
Edison International	EIX	0.12%	2.66%	0.00%	6.18%	0.01%
Schlumberger Ltd	SLB	0.45%	2.87%	0.01%	44.77%	0.20%
Charles Schwab Corp/The	SCHW	0.24%	0.83%	0.00%	20.22%	0.05%
Sherwin-Williams Co/The	SHW	0.14%	1.02%	0.00%	10.59%	0.02%
JM Smucker Co/The	SJM	0.07%	2.35%	0.00%	6.20%	0.00%
Snap-on Inc	SNA	0.04%	1.76%	0.00%	9.55%	0.00%
AMETEK Inc	AME	0.07%	0.59%	0.00%	9.86%	0.01%
Southern Co/The	SO	0.23%	4.58%	0.01%	4.65%	0.01%
BB&T Corp	BBT	0.16%	2.88%	0.00%	8.41%	0.01%
Southwest Airlines Co	LUV	0.17%	0.83%	0.00%	8.27%	0.01%
Stanley Black & Decker Inc	SWK	0.10%	1.69%	0.00%	11.00%	0.01%
Public Storage	PSA	0.17%	3.71%	0.01%	5.75%	0.01%
SunTrust Banks Inc	STI	0.12%	1.95%	0.00%	8.20%	0.01%
Sysco Corp	SYY	0.14%	2.42%	0.00%	8.92%	0.01%
Tesoro Corp	TSO	0.05%	2.64%	0.00%	16.90%	0.01%
Texas Instruments Inc	TXN	0.38%	2.42%	0.01%	10.43%	0.04%
Textron Inc	TXT	0.06%	0.17%	0.00%	9.16%	0.01%
Thermo Fisher Scientific Inc	TMO	0.31%	0.35%	0.00%	11.78%	0.04%
Tiffany & Co	TIF	0.05%	2.30%	0.00%	9.90%	0.00%
TJX Cos Inc/The	TJX	0.22%	1.66%	0.00%	11.70%	0.03%

STANDARD AND POOR'S 500 INDEX

Name	Ticker	[4] Weight in Index	[5] Current Dividend Yield	[6] Cap-Weighted Dividend Yield	[7] Long-Term Growth Est.	[8] Cap-Weighted Long-Term Growth Est.
Torchmark Corp	TMK	0.04%	0.79%	0.00%	7.57%	0.00%
Total System Services Inc	TSS	0.05%	0.67%	0.00%	11.00%	0.01%
Johnson Controls International plc	JCI	0.18%	2.39%	0.00%	11.33%	0.02%
Ulta Beauty Inc	ULTA	0.09%	n/a	n/a	21.83%	0.02%
Union Pacific Corp	UNP	0.41%	2.19%	0.01%	9.58%	0.04%
UnitedHealth Group Inc	UNH	0.78%	1.43%	0.01%	12.96%	0.10%
Unum Group	UNM	0.05%	2.05%	0.00%	6.53%	0.00%
Marathon Oil Corp	MRO	0.05%	1.54%	0.00%	8.60%	0.00%
Varian Medical Systems Inc	VAR	0.04%	n/a	n/a	8.00%	0.00%
Ventas Inc	VTR	0.11%	4.66%	0.01%	4.07%	0.00%
VF Corp	VFC	0.10%	3.12%	0.00%	7.91%	0.01%
Vornado Realty Trust	VNO	0.08%	3.08%	0.00%	3.91%	0.00%
Vulcan Materials Co	VMC	0.08%	0.80%	0.00%	25.81%	0.02%
Weyerhaeuser Co	WY	0.12%	3.76%	0.00%	7.50%	0.01%
Whirlpool Corp	WHR	0.06%	2.37%	0.00%	15.88%	0.01%
Williams Cos Inc/The	WMB	0.11%	4.20%	0.00%	15.50%	0.02%
WEC Energy Group Inc	WEC	0.09%	3.31%	0.00%	6.70%	0.01%
Xerox Corp	XRX	0.03%	3.54%	0.00%	1.80%	0.00%
Adobe Systems Inc	ADBE	0.33%	n/a	n/a	17.48%	0.06%
AES Corp/VA	AES	0.04%	4.11%	0.00%	7.50%	0.00%
Amgen Inc	AMGN	0.53%	2.96%	0.02%	4.86%	0.03%
Apple Inc	AAPL	3.70%	1.65%	0.06%	10.43%	0.39%
Autodesk Inc	ADSK	0.11%	n/a	n/a	71.51%	0.08%
Cintas Corp	CTAS	0.06%	1.06%	0.00%	11.08%	0.01%
Comcast Corp	CMCSA	0.92%	1.51%	0.01%	10.91%	0.10%
Molson Coors Brewing Co	TAP	0.09%	1.73%	0.00%	8.80%	0.01%
KLA-Tencor Corp	KLAC	0.08%	2.08%	0.00%	4.80%	0.00%
Marriott International Inc/MD	MAR	0.19%	1.23%	0.00%	14.78%	0.03%
McCormick & Co Inc/MD	MKC	0.05%	1.81%	0.00%	n/a	n/a
Nordstrom Inc	JWN	0.03%	3.54%	0.00%	7.13%	0.00%
PACCAR Inc	PCAR	0.10%	1.59%	0.00%	6.73%	0.01%
Costco Wholesale Corp	COST	0.37%	1.11%	0.00%	10.47%	0.04%
Stryker Corp	SYK	0.25%	1.19%	0.00%	8.04%	0.02%
Tyson Foods Inc	TSN	0.08%	1.57%	0.00%	7.40%	0.01%
Applied Materials Inc	AMAT	0.23%	0.87%	0.00%	18.97%	0.04%
Time Warner Inc	TWX	0.36%	1.62%	0.01%	9.30%	0.03%
Bed Bath & Beyond Inc	BBBY	0.02%	1.74%	0.00%	5.64%	0.00%
American Airlines Group Inc	AAL	0.11%	0.83%	0.00%	0.11%	0.00%
Cardinal Health Inc	CAH	0.11%	2.49%	0.00%	7.74%	0.01%
Celgene Corp	CELG	0.41%	n/a	n/a	20.51%	0.09%
Cerner Corp	CERN	0.10%	n/a	n/a	12.43%	0.01%
Cincinnati Financial Corp	CINF	0.05%	2.85%	0.00%	n/a	n/a
DR Horton Inc	DHI	0.06%	1.22%	0.00%	11.77%	0.01%
Flowserve Corp	FLS	0.03%	1.57%	0.00%	11.74%	0.00%
Electronic Arts Inc	EA	0.16%	n/a	n/a	9.40%	0.02%
Express Scripts Holding Co	ESRX	0.16%	n/a	n/a	11.99%	0.02%
Expeditors International of Washington Inc	EXPD	0.04%	1.57%	0.00%	8.80%	0.00%
Fastenal Co	FAST	0.06%	2.97%	0.00%	14.55%	0.01%
M&T Bank Corp	MTB	0.11%	1.92%	0.00%	6.57%	0.01%
Fiserv Inc	FISV	0.12%	n/a	n/a	10.13%	0.01%
Fifth Third Bancorp	FITB	0.08%	2.36%	0.00%	1.40%	0.00%
Gilead Sciences Inc	GILD	0.39%	3.21%	0.01%	-2.84%	-0.01%
Hasbro Inc	HAS	0.06%	2.17%	0.00%	9.63%	0.01%
Huntington Bancshares Inc/OH	HBAN	0.06%	2.55%	0.00%	10.43%	0.01%
Welltower Inc	HCN	0.12%	4.80%	0.01%	4.46%	0.01%
Biogen Inc	BIIB	0.24%	n/a	n/a	7.09%	0.02%
Range Resources Corp	RRC	0.03%	0.35%	0.00%	-13.43%	0.00%
Northern Trust Corp	NTRS	0.09%	1.74%	0.00%	13.12%	0.01%
Paychex Inc	PAYX	0.10%	3.11%	0.00%	9.00%	0.01%
People's United Financial Inc	PBCT	0.03%	4.16%	0.00%	2.00%	0.00%
Patterson Cos Inc	PDCO	0.02%	2.36%	0.00%	2.69%	0.00%
QUALCOMM Inc	QCOM	0.39%	3.98%	0.02%	8.40%	0.03%
Roper Technologies Inc	ROP	0.11%	0.62%	0.00%	12.87%	0.01%
Ross Stores Inc	ROST	0.12%	1.00%	0.00%	12.51%	0.01%
IDEXX Laboratories Inc	IDXX	0.07%	n/a	n/a	10.42%	0.01%
AutoNation Inc	AN	0.02%	n/a	n/a	7.92%	0.00%
Starbucks Corp	SBUX	0.43%	1.57%	0.01%	17.30%	0.07%
KeyCorp	KEY	0.09%	2.18%	0.00%	7.42%	0.01%
Staples Inc	SPLS	0.03%	5.29%	0.00%	1.27%	0.00%
State Street Corp	STT	0.14%	1.87%	0.00%	11.28%	0.02%
US Bancorp	USB	0.40%	2.20%	0.01%	8.54%	0.03%
Symantec Corp	SYMC	0.09%	0.99%	0.00%	11.77%	0.01%
T Rowe Price Group Inc	TROW	0.08%	3.24%	0.00%	11.72%	0.01%
Waste Management Inc	WM	0.15%	2.33%	0.00%	10.77%	0.02%
CBS Corp	CBS	0.10%	1.18%	0.00%	12.64%	0.01%
Allergan PLC	AGN	0.35%	1.25%	0.00%	13.30%	0.05%
Whole Foods Market Inc	WFM	0.05%	2.06%	0.00%	6.65%	0.00%
Constellation Brands Inc	STZ	0.15%	1.14%	0.00%	15.95%	0.02%
Xilinx Inc	XLNX	0.08%	2.10%	0.00%	8.55%	0.01%

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Name	Ticker	[4] Weight in Index	[5] Current Dividend Yield	[6] Cap-Weighted Dividend Yield	[7] Long-Term Growth Est.	[8] Cap-Weighted Long-Term Growth Est.
DENTSPLY SIRONA Inc	XRAY	0.07%	0.55%	0.00%	9.53%	0.01%
Zions Bancorporation	ZION	0.04%	0.80%	0.00%	9.00%	0.00%
Alaska Air Group Inc	ALK	0.05%	1.38%	0.00%	11.77%	0.01%
Invesco Ltd	IVZ	0.06%	3.66%	0.00%	11.75%	0.01%
Intuit Inc	INTU	0.17%	0.97%	0.00%	15.60%	0.03%
Morgan Stanley	MS	0.36%	1.92%	0.01%	15.80%	0.06%
Microchip Technology Inc	MCHP	0.09%	1.74%	0.00%	15.08%	0.01%
Chubb Ltd	CB	0.31%	1.98%	0.01%	10.63%	0.03%
Hologic Inc	HOLX	0.06%	n/a	n/a	10.52%	0.01%
Chesapeake Energy Corp	CHK	0.02%	n/a	n/a	-13.42%	0.00%
Citizens Financial Group Inc	CFG	0.08%	1.64%	0.00%	19.13%	0.02%
O'Reilly Automotive Inc	ORLY	0.10%	n/a	n/a	16.27%	0.02%
Allstate Corp/The	ALL	0.15%	1.71%	0.00%	10.60%	0.02%
FLIR Systems Inc	FLIR	0.02%	1.58%	0.00%	n/a	n/a
Equity Residential	EQR	0.11%	3.10%	0.00%	5.70%	0.01%
BorgWarner Inc	BWA	0.04%	1.32%	0.00%	6.22%	0.00%
Newfield Exploration Co	NFX	0.03%	n/a	n/a	18.69%	0.01%
Incyte Corp	INCY	0.12%	n/a	n/a	41.56%	0.05%
Simon Property Group Inc	SPG	0.22%	4.54%	0.01%	7.64%	0.02%
Eastman Chemical Co	EMN	0.05%	2.55%	0.00%	6.97%	0.00%
AvalonBay Communities Inc	AVB	0.12%	2.97%	0.00%	6.87%	0.01%
Prudential Financial Inc	PRU	0.21%	2.86%	0.01%	9.70%	0.02%
United Parcel Service Inc	UPS	0.34%	3.13%	0.01%	8.50%	0.03%
Apartment Investment & Management Co	AIV	0.03%	3.36%	0.00%	6.53%	0.00%
Walgreens Boots Alliance Inc	WBA	0.41%	1.85%	0.01%	11.00%	0.04%
McKesson Corp	MCK	0.16%	0.69%	0.00%	8.70%	0.01%
Lockheed Martin Corp	LMT	0.38%	2.59%	0.01%	6.33%	0.02%
AmerisourceBergen Corp	ABC	0.09%	1.59%	0.00%	9.45%	0.01%
Capital One Financial Corp	COF	0.17%	2.08%	0.00%	5.76%	0.01%
Waters Corp	WAT	0.07%	n/a	n/a	7.55%	0.01%
Dollar Tree Inc	DLTR	0.09%	n/a	n/a	15.30%	0.01%
Darden Restaurants Inc	DRI	0.05%	2.52%	0.00%	9.69%	0.00%
NetApp Inc	NTAP	0.05%	1.98%	0.00%	7.39%	0.00%
Citrix Systems Inc	CTXS	0.06%	n/a	n/a	12.73%	0.01%
Goodyear Tire & Rubber Co/The	GT	0.04%	1.24%	0.00%	n/a	n/a
DXC Technology Co	DXC	0.10%	0.93%	0.00%	n/a	n/a
DaVita Inc	DVA	0.06%	n/a	n/a	7.60%	0.00%
Hartford Financial Services Group Inc/The	HIG	0.08%	1.86%	0.00%	9.50%	0.01%
Iron Mountain Inc	IRM	0.04%	6.30%	0.00%	12.90%	0.01%
Estee Lauder Cos Inc/The	EL	0.10%	1.44%	0.00%	10.45%	0.01%
Yahoo! Inc	YHOO	0.22%	n/a	n/a	10.53%	0.02%
Principal Financial Group Inc	PFG	0.08%	2.92%	0.00%	9.64%	0.01%
Stericycle Inc	SRCL	0.03%	n/a	n/a	9.18%	0.00%
Universal Health Services Inc	UHS	0.05%	0.35%	0.00%	9.49%	0.00%
E*TRADE Financial Corp	ETFC	0.04%	n/a	n/a	16.17%	0.01%
Skyworks Solutions Inc	SWKS	0.09%	1.05%	0.00%	14.35%	0.01%
National Oilwell Varco Inc	NOV	0.06%	0.61%	0.00%	n/a	n/a
Quest Diagnostics Inc	DGX	0.07%	1.65%	0.00%	8.64%	0.01%
Activision Blizzard Inc	ATVI	0.21%	0.51%	0.00%	10.92%	0.02%
Rockwell Automation Inc	ROK	0.09%	1.92%	0.00%	11.21%	0.01%
Kraft Heinz Co/The	KHC	0.52%	2.60%	0.01%	8.39%	0.04%
American Tower Corp	AMT	0.26%	1.89%	0.00%	19.73%	0.05%
Regeneron Pharmaceuticals Inc	REGN	0.22%	n/a	n/a	19.77%	0.04%
Amazon.com Inc	AMZN	2.21%	n/a	n/a	34.40%	0.76%
Ralph Lauren Corp	RL	0.02%	2.95%	0.00%	1.79%	0.00%
Boston Properties Inc	BXP	0.09%	2.47%	0.00%	5.90%	0.01%
Amphenol Corp	APH	0.11%	0.86%	0.00%	10.03%	0.01%
Arconic Inc	ARNC	0.06%	0.87%	0.00%	13.10%	0.01%
Pioneer Natural Resources Co	PXD	0.13%	0.05%	0.00%	15.00%	0.02%
Valero Energy Corp	VLO	0.13%	4.56%	0.01%	13.15%	0.02%
Synopsys Inc	SNPS	0.05%	n/a	n/a	9.03%	0.00%
L3 Technologies Inc	LLL	0.06%	1.78%	0.00%	6.57%	0.00%
Western Union Co/The	WU	0.04%	3.68%	0.00%	4.72%	0.00%
CH Robinson Worldwide Inc	CHRW	0.04%	2.69%	0.00%	9.26%	0.00%
Accenture PLC	ACN	0.36%	1.94%	0.01%	10.07%	0.04%
TransDigm Group Inc	TDG	0.06%	n/a	n/a	8.32%	0.01%
Yum! Brands Inc	YUM	0.12%	1.65%	0.00%	12.62%	0.01%
Prologis Inc	PLD	0.14%	3.17%	0.00%	4.82%	0.01%
FirstEnergy Corp	FE	0.06%	4.92%	0.00%	-0.40%	0.00%
VeriSign Inc	VRSN	0.04%	n/a	n/a	9.30%	0.00%
Quanta Services Inc	PWR	0.02%	n/a	n/a	16.80%	0.00%
Henry Schein Inc	HSIC	0.07%	n/a	n/a	10.23%	0.01%
Ameren Corp	AEE	0.06%	3.10%	0.00%	5.80%	0.00%
Scripps Networks Interactive Inc	SNI	0.03%	1.81%	0.00%	7.56%	0.00%
NVIDIA Corp	NVDA	0.40%	0.39%	0.00%	9.56%	0.04%
Sealed Air Corp	SEE	0.04%	1.44%	0.00%	2.51%	0.00%
Cognizant Technology Solutions Corp	CTSH	0.18%	0.90%	0.00%	14.03%	0.03%
Intuitive Surgical Inc	ISRG	0.16%	n/a	n/a	9.73%	0.02%
Affiliated Managers Group Inc	AMG	0.22%	1.38%	0.00%	11.61%	0.03%

STANDARD AND POOR'S 500 INDEX

Name	Ticker	[4] Weight in Index	[5] Current Dividend Yield	[6] Cap-Weighted Dividend Yield	[7] Long-Term Growth Est.	[8] Cap-Weighted Long-Term Growth Est.
Aetna Inc	AET	0.04%	0.52%	0.00%	15.57%	0.01%
Republic Services Inc	RSG	0.10%	2.01%	0.00%	9.48%	0.01%
eBay Inc	EBAY	0.17%	n/a	n/a	9.63%	0.02%
Goldman Sachs Group Inc/The	GS	0.39%	1.42%	0.01%	7.16%	0.03%
Sempra Energy	SRE	0.14%	2.82%	0.00%	12.15%	0.02%
Moody's Corp	MCO	0.11%	1.28%	0.00%	8.00%	0.01%
Priceline Group Inc/The	PCLN	0.43%	n/a	n/a	16.75%	0.07%
F5 Networks Inc	FFIV	0.04%	n/a	n/a	12.17%	0.00%
Akamai Technologies Inc	AKAM	0.04%	n/a	n/a	14.18%	0.01%
Reynolds American Inc	RAI	0.45%	3.03%	0.01%	8.88%	0.04%
Devon Energy Corp	DVN	0.08%	0.71%	0.00%	37.66%	0.03%
Alphabet Inc	GOOGL	1.36%	n/a	n/a	15.34%	0.21%
Red Hat Inc	RHT	0.07%	n/a	n/a	14.92%	0.01%
Allegion PLC	ALLE	0.33%	n/a	n/a	41.30%	0.13%
Netflix Inc	NFLX	0.03%	0.81%	0.00%	13.10%	0.00%
Agilent Technologies Inc	A	0.09%	0.88%	0.00%	10.20%	0.01%
Anthem Inc	ANTM	0.22%	1.43%	0.00%	9.49%	0.02%
CME Group Inc	CME	0.19%	2.25%	0.00%	9.84%	0.02%
Juniper Networks Inc	JNPR	0.05%	1.36%	0.00%	9.15%	0.00%
BlackRock Inc	BLK	0.31%	2.44%	0.01%	13.16%	0.04%
DTE Energy Co	DTE	0.09%	3.01%	0.00%	6.00%	0.01%
Nasdaq Inc	NDAQ	0.05%	2.25%	0.00%	8.35%	0.00%
Philip Morris International Inc	PM	0.86%	3.47%	0.03%	9.96%	0.09%
salesforce.com Inc	CRM	0.30%	n/a	n/a	27.90%	0.08%
MetLife Inc	MET	0.25%	3.16%	0.01%	7.14%	0.02%
Under Armour Inc	UA	0.24%	1.84%	0.00%	10.10%	0.02%
Monsanto Co	MON	0.02%	n/a	n/a	11.28%	0.00%
Coach Inc	COH	0.06%	2.92%	0.00%	12.60%	0.01%
Fluor Corp	FLR	0.03%	1.87%	0.00%	17.50%	0.01%
CSX Corp	CSX	0.23%	1.48%	0.00%	11.06%	0.03%
Edwards Lifesciences Corp	EW	0.11%	n/a	n/a	16.68%	0.02%
Ameriprise Financial Inc	AMP	0.09%	2.75%	0.00%	8.40%	0.01%
Xcel Energy Inc	XEL	0.11%	3.01%	0.00%	5.90%	0.01%
Rockwell Collins Inc	COL	0.08%	1.21%	0.00%	9.60%	0.01%
TechnipFMC PLC	FTI	0.06%	n/a	n/a	4.30%	0.00%
Zimmer Biomet Holdings Inc	ZBH	0.11%	0.81%	0.00%	8.38%	0.01%
CBRE Group Inc	CBG	0.05%	n/a	n/a	10.23%	0.01%
Mastercard Inc	MA	0.02%	2.58%	0.00%	3.53%	0.00%
Signet Jewelers Ltd	SIG	0.60%	0.72%	0.00%	14.50%	0.09%
CarMax Inc	KMX	0.05%	n/a	n/a	13.42%	0.01%
Intercontinental Exchange Inc	ICE	0.17%	1.33%	0.00%	11.06%	0.02%
Fidelity National Information Services Inc	FIS	0.13%	1.35%	0.00%	9.08%	0.01%
Chipotle Mexican Grill Inc	CMG	0.06%	n/a	n/a	34.67%	0.02%
Wynn Resorts Ltd	WYNN	0.06%	1.55%	0.00%	19.80%	0.01%
Assurant Inc	AIZ	0.02%	2.16%	0.00%	21.41%	0.01%
NRG Energy Inc	NRG	0.02%	0.75%	0.00%	-15.70%	0.00%
Regions Financial Corp	RF	0.13%	n/a	n/a	20.30%	0.03%
Monster Beverage Corp	MNST	0.08%	2.02%	0.00%	9.76%	0.01%
Teradata Corp	TDC	0.02%	n/a	n/a	3.39%	0.00%
Mosaic Co/The	MOS	0.04%	2.65%	0.00%	16.35%	0.01%
Expedia Inc	EXPE	0.09%	0.78%	0.00%	19.34%	0.02%
Discovery Communications Inc	DISCA	0.02%	n/a	n/a	14.10%	0.00%
CF Industries Holdings Inc	CF	0.03%	4.46%	0.00%	6.00%	0.00%
Viacom Inc	VIAB	0.06%	2.30%	0.00%	1.59%	0.00%
Wyndham Worldwide Corp	WYN	1.55%	n/a	n/a	15.34%	0.24%
Alphabet Inc	GOOG	0.05%	2.30%	0.00%	13.90%	0.01%
Mead Johnson Nutrition Co	MJN	0.08%	1.85%	0.00%	4.65%	0.00%
Cooper Cos Inc/The	COO	0.13%	2.03%	0.00%	6.75%	0.01%
TE Connectivity Ltd	TEL	0.05%	0.03%	0.00%	12.00%	0.01%
Discover Financial Services	DFS	0.10%	2.04%	0.00%	5.70%	0.01%
TripAdvisor Inc	TRIP	0.02%	n/a	n/a	15.14%	0.00%
Dr Pepper Snapple Group Inc	DPS	0.08%	2.50%	0.00%	8.58%	0.01%
Visa Inc	V	0.82%	0.69%	0.01%	16.00%	0.13%
Mid-America Apartment Communities Inc	MAA	0.05%	3.41%	0.00%	n/a	n/a
Xylem Inc/NY	XYL	0.04%	1.38%	0.00%	12.10%	0.01%
Marathon Petroleum Corp	MPC	0.13%	2.77%	0.00%	10.00%	0.01%
Level 3 Communications Inc	LVLT	0.03%	1.96%	0.00%	14.10%	0.00%
Tractor Supply Co	TSCO	0.10%	n/a	n/a	5.00%	0.00%
Mettler-Toledo International Inc	MTD	0.07%	n/a	n/a	12.24%	0.01%
Albemarle Corp	ALB	0.06%	1.13%	0.00%	11.70%	0.01%
Transocean Ltd	RIG	0.02%	n/a	n/a	-25.20%	0.00%
Essex Property Trust Inc	ESS	0.08%	2.72%	0.00%	7.15%	0.01%
GGP Inc	GGP	0.09%	3.95%	0.00%	5.90%	0.01%
Realty Income Corp	O	0.07%	4.61%	0.00%	5.07%	0.00%
Seagate Technology PLC	STX	0.06%	5.78%	0.00%	13.27%	0.01%
WestRock Co	WRK	0.06%	2.94%	0.00%	7.88%	0.01%
Western Digital Corp	WDC	0.12%	2.22%	0.00%	14.62%	0.02%
Church & Dwight Co Inc	CHD	0.06%	1.47%	0.00%	8.53%	0.01%
Federal Realty Investment Trust	FRT	0.04%	3.19%	0.00%	6.36%	0.00%

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Twenty-First Century Fox Inc	FOX	0.10%	1.34%	0.00%	9.60%	0.01%
Alliant Energy Corp	LNT	0.04%	3.04%	0.00%	6.43%	0.00%
JB Hunt Transport Services Inc	JBHT	0.04%	1.08%	0.00%	13.43%	0.01%
Lam Research Corp	LRCX	0.12%	1.16%	0.00%	20.88%	0.02%
Mohawk Industries Inc	MHK	0.08%	n/a	n/a	7.01%	0.01%
Pentair PLC	PNR	0.06%	2.08%	0.00%	5.28%	0.00%
Vertex Pharmaceuticals Inc	VRTX	0.14%	n/a	n/a	69.80%	0.10%
Facebook Inc	FB	1.66%	n/a	n/a	27.35%	0.45%
United Rentals Inc	URI	0.04%	n/a	n/a	17.76%	0.01%
Alexandria Real Estate Equities Inc	ARE	0.05%	2.85%	0.00%	7.09%	0.00%
United Continental Holdings Inc	UAL	0.12%	n/a	n/a	1.91%	0.00%
Delta Air Lines Inc	DAL	0.02%	4.44%	0.00%	8.00%	0.00%
Navient Corp	NAVI	0.17%	1.65%	0.00%	11.38%	0.02%
Mallinckrodt PLC	MNK	0.02%	n/a	n/a	6.50%	0.00%
News Corp	NWS	0.01%	1.46%	0.00%	13.05%	0.00%
Centene Corp	CNC	0.06%	n/a	n/a	13.22%	0.01%
Regency Centers Corp	REG	0.05%	3.48%	0.00%	8.80%	0.00%
Macerich Co/The	MAC	0.04%	4.95%	0.00%	7.87%	0.00%
Martin Marietta Materials Inc	MLM	0.07%	0.75%	0.00%	21.84%	0.01%
Envision Healthcare Corp	EVHC	0.03%	n/a	n/a	8.06%	0.00%
PayPal Holdings Inc	PYPL	0.29%	n/a	n/a	19.55%	0.06%
Coty Inc	COTY	0.07%	2.64%	0.00%	2.01%	0.00%
DISH Network Corp	DISH	0.07%	n/a	n/a	-4.85%	0.00%
Alexion Pharmaceuticals Inc	ALXN	0.10%	n/a	n/a	20.93%	0.02%
News Corp	NWSA	0.02%	1.49%	0.00%	13.05%	0.00%
Global Payments Inc	GPN	0.06%	0.06%	0.00%	13.00%	0.01%
Crown Castle International Corp	CCI	0.17%	3.74%	0.01%	19.97%	0.03%
Delphi Automotive PLC	DLPH	0.11%	1.32%	0.00%	11.88%	0.01%
Advance Auto Parts Inc	AAP	0.05%	0.18%	0.00%	14.85%	0.01%
Michael Kors Holdings Ltd	KORS	0.02%	n/a	n/a	2.40%	0.00%
Illumina Inc	ILMN	0.12%	n/a	n/a	14.57%	0.02%
Acuity Brands Inc	AYI	0.03%	0.32%	0.00%	20.00%	0.01%
Alliance Data Systems Corp	ADS	0.06%	0.86%	0.00%	14.50%	0.01%
LKQ Corp	LKQ	0.05%	n/a	n/a	13.05%	0.01%
Nielsen Holdings PLC	NLSN	0.06%	3.53%	0.00%	10.00%	0.01%
Garmin Ltd	GRMN	0.05%	3.92%	0.00%	5.70%	0.00%
Cimarex Energy Co	XEC	0.05%	0.30%	0.00%	43.05%	0.02%
Zoetis Inc	ZTS	0.14%	0.67%	0.00%	12.76%	0.02%
Digital Realty Trust Inc	DLR	0.16%	1.81%	0.00%	40.67%	0.06%
Equinix Inc	EQIX	0.09%	3.15%	0.00%	5.49%	0.00%
Discovery Communications Inc	DISCK	0.03%	n/a	n/a	14.10%	0.00%

Notes:
[1] Equals Sum ([6])
[2] Equals Sum ([8])
[3] Equals ([1] x (1 + (0.5 x [2]))) + [2]
[4] Equals weight in S&P 500 based on market capitalization
[5] Source: Bloomberg Professional
[6] Equals [4] x [5]
[7] Source: Bloomberg Professional
[8] Equals [4] x [7]

CAPITAL ASSET PRICING MODEL

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

	[4]	[5]	[6]	[7]	[8]
	Risk-Free Rate (R_f)	Beta (β)	Market Return (R_m)	Market Risk Premium ($R_m - R_f$)	ROE (K)
Proxy Group Average Bloomberg Beta					
Current 30-day average of 30-year U.S. Treasury bond yield [1]	2.95%	0.736	13.39%	10.44%	10.64%
Near-term projected 30-year U.S. Treasury bond yield (Q3 2017 - Q3 2018) [2]	3.48%	0.736	13.39%	9.91%	10.78%
Projected 30-year U.S. Treasury bond yield (2019 - 2023) [3]	4.30%	0.736	13.39%	9.09%	10.99%
Average					10.80%
Proxy Group Average Value Line Beta					
Current 30-day average of 30-year U.S. Treasury bond yield [1]	2.95%	0.713	13.39%	10.44%	10.39%
Near-term projected 30-year U.S. Treasury bond yield (Q3 2017 - Q3 2018) [2]	3.48%	0.713	13.39%	9.91%	10.54%
Projected 30-year U.S. Treasury bond yield (2019 - 2023) [3]	4.30%	0.713	13.39%	9.09%	10.78%
Average					10.57%
Overall Average					**10.69%**

Notes:
[1] Source: Bloomberg Professional as of May 31, 2017
[2] Source: Blue Chip Financial Forecasts, Vol. 36, No. 6, June 1, 2017, at 2
[3] Source: Blue Chip Financial Forecasts, Vol. 36, No. 6, June 1, 2017, at 14
[4] See Notes [1], [2], and [3]
[5] Source: Exhibit AEB-4
[6] Source: Exhibit AEB-5
[7] Equals [6] – [4]
[8] Equals [4] + [5] x [7]

CAPITAL ASSET PRICING MODEL EXCLUDING AWK

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

	[4] Risk-Free Rate (R_f)	[5] Beta (β)	[6] Market Return (R_m)	[7] Market Risk Premium ($R_m - R_f$)	[8] ROE (K)
Proxy Group Average Bloomberg Beta					
Current 30-day average of 30-year U.S. Treasury bond yield [1]	2.95%	0.761	13.39%	10.44%	10.89%
Near-term projected 30-year U.S. Treasury bond yield (Q3 2017 - Q3 2018) [2]	3.48%	0.761	13.39%	9.91%	11.02%
Projected 30-year U.S. Treasury bond yield (2019 - 2023) [3]	4.30%	0.761	13.39%	9.09%	11.21%
Average					11.04%
Proxy Group Average Value Line Beta					
Current 30-day average of 30-year U.S. Treasury bond yield [1]	2.95%	0.721	13.39%	10.44%	10.48%
Near-term projected 30-year U.S. Treasury bond yield (Q3 2017 - Q3 2018) [2]	3.48%	0.721	13.39%	9.91%	10.63%
Projected 30-year U.S. Treasury bond yield (2019 - 2023) [3]	4.30%	0.721	13.39%	9.09%	10.86%
Average					10.66%
Overall Average					**10.85%**

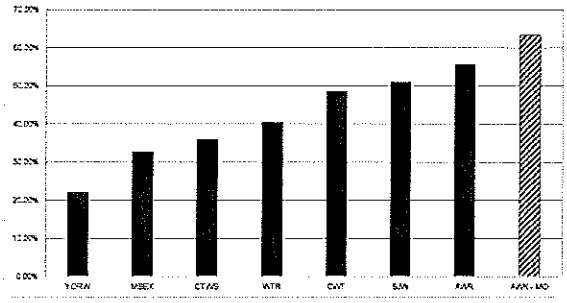
Notes:
[1] Source: Bloomberg Professional as of May 31, 2017
[2] Source: Blue Chip Financial Forecasts, Vol. 36, No. 6, June 1, 2017, at 2
[3] Source: Blue Chip Financial Forecasts, Vol. 36, No. 6, June 1, 2017, at 14
[4] See Notes [1], [2], and [3]
[5] Source: Exhibit AEB-4
[6] Source: Exhibit AEB-5
[7] Equals [6] - [4]
[8] Equals [4] + [5] x [7]

2018-2022 CAPITAL EXPENDITURES AS A PERCENT OF 2016 NET PLANT
($ Millions)

		[1] 2016	[2] 2018	[3] 2019	[4] 2020	[5] 2021	[6] 2022	[7]
American States Water	AWR							
Capital Spending per Share			3.15	3.35	3.60	3.60	3.60	
Common Shares Outstanding			36.70	36.85	37.00	37.00	37.00	
Capital Expenditures			115.61	124.37	133.20	133.20	133.20	
Net Plant		1,150.93						
2018-22 Capital Spending / 2016 Net Plant								55.57%
Connecticut Water	CTWS							
Capital Spending per Share			4.35	3.85	3.35	3.35	3.35	
Common Shares Outstanding			11.50	11.75	12.00	12.00	12.00	
Capital Expenditures			50.03	45.24	40.20	40.20	40.20	
Net Plant		601.40						
2018-22 Capital Spending / 2016 Net Plant								35.89%
California Water	CWT							
Capital Spending per Share			3.65	3.65	3.65	3.65	3.65	
Common Shares Outstanding			48.00	49.00	50.00	50.00	50.00	
Capital Expenditures			175.20	178.85	182.50	182.50	182.50	
Net Plant		1,659.30						
2018-22 Capital Spending / 2016 Net Plant								48.49%
Middlesex Water	MSEX							
Capital Spending per Share			1.90	1.88	2.05	2.05	2.05	
Common Shares Outstanding			16.50	16.75	17.00	17.00	17.00	
Capital Expenditures			31.35	33.06	34.85	34.85	34.85	
Net Plant		517.80						
2018-22 Capital Spending / 2016 Net Plant								32.63%
SJW Corp	SJW							
Capital Spending per Share			5.50	5.25	5.00	5.00	5.00	
Common Shares Outstanding			22.00	22.50	23.00	23.00	23.00	
Capital Expenditures			121.00	118.13	115.00	115.00	115.00	
Net Plant		1,146.40						
2018-22 Capital Spending / 2016 Net Plant								50.95%
Aqua America	WTR							
Capital Spending per Share			2.25	2.25	2.25	2.25	2.25	
Common Shares Outstanding			178.50	179.25	180.00	180.00	180.00	
Capital Expenditures			401.63	403.31	405.00	405.00	405.00	
Net Plant		5,031.60						
2018-22 Capital Spending / 2016 Net Plant								40.39%
York Water	YORW							
Capital Spending per Share			1.25	1.05	0.85	0.85	0.85	
Common Shares Outstanding			12.75	12.38	12.00	12.00	12.00	
Capital Expenditures			15.94	12.99	10.20	10.20	10.20	
Net Plant		270.93						
2018-22 Capital Spending / 2016 Net Plant								21.56%
American Water - Missouri	AWK - MO							
Capital Expenditures [8]			196,225,876	192,533,668	218,347,748	260,651,872	216,247,612	
Net Plant [8]		1,711,212,061						
2018-22 Capital Spending / 2016 Net Plant								63.36%

Notes:
[1] Source: Value Line; dated April 14, 2017
[2] Source: Value Line; dated April 14, 2017
[3] Source: Value Line; dated April 14, 2017
[4] Source: Value Line; dated April 14, 2017
[5] Source: Value Line; dated April 14, 2017
[6] Source: Value Line; dated April 14, 2017
[7] Equals Sum ([2], [3], [4], [5], [6]) / [1]
[8] Source: Company provided data

2018-2022 CAPITAL EXPENDITURES AS A PERCENT OF 2016 NET PLANT
($ Millions)



		2018-2022 Capital Spending / 2016 Net Plant
York Water	YORW	21.56%
Middlesex Water	MSEX	32.63%
Connecticut Water	CTWS	35.89%
Aqua America	WTR	40.39%
California Water	CWT	48.49%
SJW Corp	SJW	50.95%
American States Water	AWR	55.57%
American Water - Missouri	AWK - MO	63.36%
Proxy Group Median		40.39%

Company	Ticker	State	Infrastructure Replacement Surchage	Future Test Year	Revenue Stabilization or Decoupling	Citations [1]
American States Water Co	AWR					
		California		Yes	Yes	2016 Annual Report, page 8
American Water	AWK					2016 10-K, pages 3 and 6
		New Jersey	Yes			
		Pennsylvania	Yes	Yes		
		Illinois	Yes	Yes	Yes	
		Missouri	Yes			
		Indiana	Yes	Yes		
		California		Yes	Yes	
		West Virginia	Yes			
		Georgia				
		Hawaii		Yes		
		Iowa				
		Kentucky		Yes		
		Maryland				
		Michigan				
		New York	Yes	Yes	Yes	
		Tennessee	Yes	Yes		
		Virginia		Yes		
Aqua America, Inc.	WTR					2016 10-K, page 8
		Pennsylvania	Yes	Yes		
		Ohio	Yes	Yes		
		Texas				
		Illinois	Yes	Yes		
		North Carolina	Yes			
		New Jersey	Yes			
		Indiana	Yes	Yes		
		Virginia		Yes		
California Water Service Group	CWT					2016 10-K, page 9
		California		Yes	Yes	
		New Mexico		Yes		
		Washington				
		Hawaii		Yes		
Connecticut Water Service, Inc.	CTWS					2016 10-K, pages 7-9
		Connecticut	Yes		Yes	
		Maine	Yes			
Middlesex Water Company	MSEX					2016 10-K, page 6
		New Jersey	Yes			
		Delaware	Yes			
		Pennsylvania	Yes	Yes		
SJW Corporation	SJW					2016 10-K, page 3
		California		Yes	Yes	
		Texas				
York Water Company	YORW					2016 10-K page 4
		Pennsylvania	Yes	Yes		
Total Number of Jurisdictions (Y)			20	21	7	
Total Number of Jurisdictions			37	37	37	
Percent of Jurisdictions			54.05%	56.76%	18.92%	
Total Number of Jurisdictions (excl AWK) (Y)			12	12	4	
Total Number of Jurisdictions (excl AWK)			21	21	21	
Percent of Jurisdictions (excl. AWK)			57.14%	57.14%	19.05%	

[1] The following report was used if the 10-K did not have sufficient detail:
"Alternative Regulation and Ratemaking Approaches for Water Companies," September 23, 2013, The Brattle Group

CAPITAL STRUCTURE OF PROXY GROUP COMPANIES

Company Name	Ticker	2016	2015	2014	2013	2012	5-Year Average
American States Water Co.	AWR						
Common Equity		60.60%	59.19%	60.85%	59.70%	57.51%	59.57%
Preferred Stock		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Long-Term Debt		39.40%	40.81%	39.15%	40.30%	42.49%	40.43%
Total Capital		100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Aqua America Inc.	WTR						
Common Equity		49.49%	49.57%	50.55%	49.39%	46.58%	49.12%
Preferred Stock		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Long-Term Debt		50.51%	50.43%	49.45%	50.61%	53.42%	50.88%
Total Capital		100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
California Water Service Group	CWT						
Common Equity		54.17%	55.54%	59.54%	57.97%	49.61%	55.36%
Preferred Stock		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Long-Term Debt		45.83%	44.46%	40.46%	42.03%	50.39%	44.64%
Total Capital		100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Connecticut Water Service Inc.	CTWS						
Common Equity		53.80%	56.07%	53.80%	52.36%	50.66%	53.34%
Preferred Stock		0.18%	0.19%	0.20%	0.20%	0.21%	0.20%
Long-Term Debt		46.02%	43.74%	46.00%	47.44%	49.13%	46.47%
Total Capital		100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Middlesex Water Co.	MSEX						
Common Equity		60.41%	59.43%	57.74%	57.75%	55.45%	58.16%
Preferred Stock		0.67%	0.70%	0.71%	0.88%	1.02%	0.80%
Long-Term Debt		38.91%	39.87%	41.54%	41.36%	43.53%	41.04%
Total Capital		100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
SJW Corp.	SJW						
Common Equity		49.31%	50.20%	48.34%	48.91%	44.61%	48.27%
Preferred Stock		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Long-Term Debt		50.69%	49.80%	51.66%	51.09%	55.39%	51.73%
Total Capital		100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
York Water Co.	YORW						
Common Equity		57.40%	56.33%	55.19%	54.93%	54.02%	55.57%
Preferred Stock		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Long-Term Debt		42.60%	43.67%	44.81%	45.07%	45.98%	44.43%
Total Capital		100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Proxy Group Mean excluding AWW							
Common Equity		55.03%	55.19%	55.14%	54.43%	51.20%	54.20%
Preferred Stock		0.12%	0.13%	0.13%	0.16%	0.18%	0.14%
Long-Term Debt		44.85%	44.68%	44.72%	45.42%	48.62%	45.66%
Total Capital		100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Proxy Group Median excluding AWW							
Common Equity		54.17%	56.07%	55.19%	54.93%	50.66%	54.20%
Preferred Stock		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Long-Term Debt		45.83%	43.74%	44.81%	45.07%	49.13%	45.72%
Total Capital		100.00%	99.81%	100.00%	100.00%	99.79%	99.92%
American Water	AWK						
Common Equity		45.17%	46.00%	47.18%	47.41%	45.49%	46.25%
Preferred Stock		0.09%	0.11%	0.14%	0.17%	0.20%	0.14%
Long-Term Debt		54.74%	53.89%	52.68%	52.42%	54.32%	53.61%
Total Capital		100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Proxy Group Mean including AWW							
Common Equity		53.79%	54.04%	54.15%	53.55%	50.49%	53.21%
Preferred Stock		0.12%	0.13%	0.13%	0.16%	0.18%	0.14%
Long-Term Debt		46.09%	45.83%	45.72%	46.29%	49.33%	46.65%
Total Capital		100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Source: Company 10-K's and annual reports